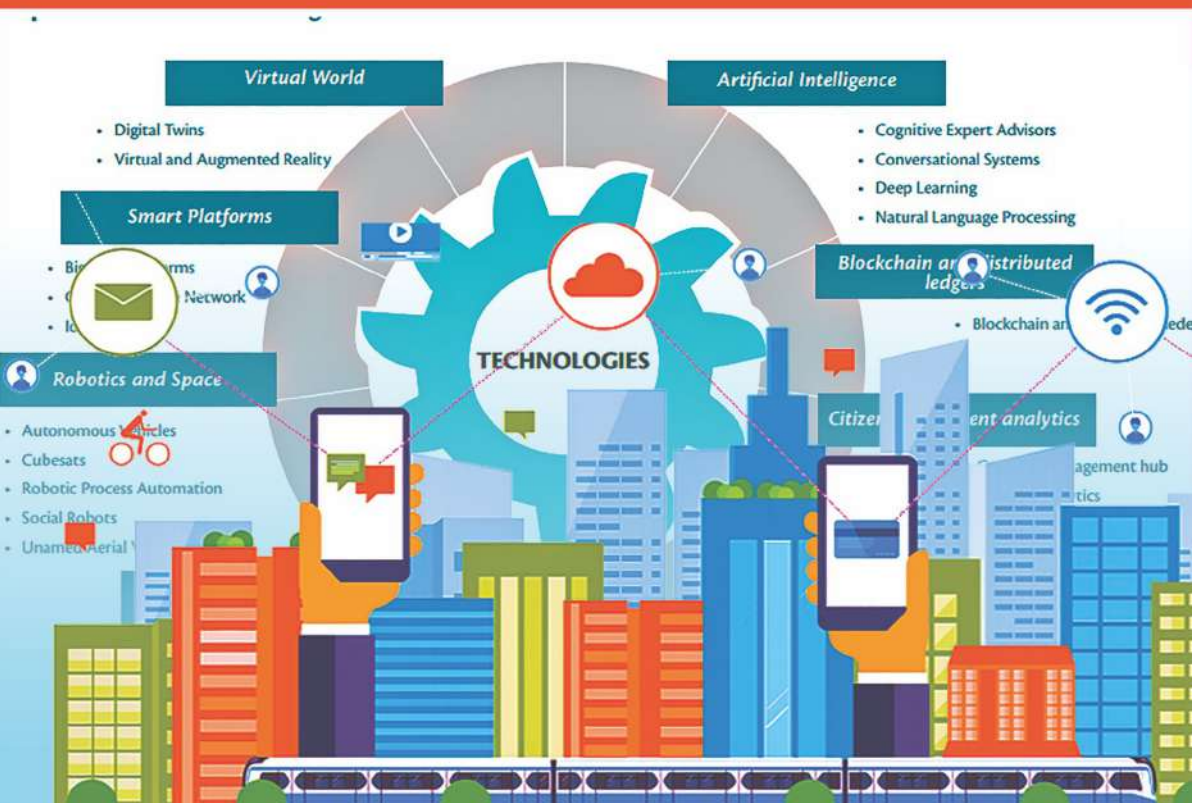
Innovative Technologies for Smart Governance

Selected eGovernance Initiatives - 2022

Prof. D. K. Dwivedi | Prof. G. P. Sahu | Prof. S. J. Pawar | Dr. Rakesh Kumar



Innovative Technologies for Smart Governance
Selected eGovernance Initiatives – 2022

This compendium presents a selection of eGovernance initiatives in India which competed for the coveted Computer Society of India's CSI SIG eGovernance awards for the year 2022 and have either been considered for the awards or have reached up to the finalist stage.

The primary objective of this compendium is to bring to the attention of National and global audience, a small selection of the inspired effort of a number of e-Government functionaries in the Country who strive hard to bring to the common citizens of India, the best that Digital Governance has to offer for Digital Society.

The awards to winners of this year will be presented by the Computer Society of India's Special Interest Group on eGovernance (CSI-SIGeGov) during a glittering awards ceremony organised at Delhi Technological University, Delhi on 25th March, 2023.

- Editors

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Prof. D. K. Dwivedi
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Dr. Rakesh Kumar

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About Computer Society of India & CSI SIGeGov

Formed in 1965, the Computer Society of India (CSI) has been instrumental in guiding the Indian IT industry down the right path since its formative years. The organisation has grown to an enviable size of 100,000 strong members consisting of professionals with varied backgrounds including Software developers, Scientists, Academicians, Project Managers, CIO's , CTO's & IT vendors to just name a few. It has spread its branches all over the country. Currently having around 500 student branches and rooted firmly at 75+ different locations, CSI has plans of opening many more chapters & activity centers in smaller towns and cities of the country.

The mission of the CSI is to facilitate research, knowledge sharing, learning and career enhancement for all categories of IT professionals, while simultaneously inspiring and nurturing new entrants into the industry and helping them to integrate into the IT community. The CSI is also working closely with other industry associations, government bodies and academia to ensure that the benefits of IT advancement ultimately percolate down to every single citizen of India.

CSI regularly organizes Regional and National level Seminars, Conferences, Competitions, Workshops and Annual Conventions on topics related to current and futuristic ICT for its members and general public. Through its permanent membership of international forums such as IFIP, CSI successfully collaborates with other ICT institutions across the world to formulate international trends and standards.

CSI has a number of Special Interest groups and CSI SIG eGov is one such group with focus on sharing eGovernance best practices & knowledge. CSI eGovernance Awards activity is one of such efforts in that direction, recognizing some of the successful eGovernance initiatives in the country.

About the Editors

Prof. D.K. Dwivedi is having 34+ years professional experience in Academia & Government.

In July 1988, Prof. Dwivedi started his career as a Scientist/ Programmer/ Tutor in Defence Research & Development organisation (DRDO), Ministry of Defence, Government of India Project at Allahabad University. He was responsible for design & development of softwares, teaching and practical training to the students of B.Sc. (Computer Sc.), M.Sc. (Computer Sc.), B.Tech. &M.Tech. Courses. In the year 1989, he was selected for undergoing CICC Practical Programmer Course at Centre of International Cooperation for Computerization (CICC), Tokyo, Japan with full sponsorship by Consortium of giant Computer manufacturers of Japan & Government of Japan where he got wide exposure of programming knowledge and practical operational training on advanced Mainframe Computers of Hitachi, NEC and Fuzitsu. He was trained programmer on ECIL make Cyber Medha-180/ 360, Mainframes and CDAC's PARAM Super Computer also.

In Sept.1991, he joined as Software Designer in Project entitled "**Technology Development for Indian Languages (TDIL)**" of Department of Electronics, Government of India at Sampurnanand Sanskrit University, Varanasi. Responsibilities included design and development of Corpora of 13 million Sanskrit words in machine readable form to be used for automatic interpretation and analysis as per different traditional schools of Sanskrit Education i.e. Vyakaran, Mimansa&Nyay, design of software for automatic generation of forms from Sanskrit words and roots, building lexicon for Natural Language Processing of Sanskrit text.

In June 1996, he joined Allahabad High Court and served in various capacities such as System Analyst, Senior System Analyst, System Manager. He was nodal officer for computerization of Courts of Uttar Pradesh. His responsibilities included System Analysis, establishment of high end infrastructure for Computerization of Courts at High Court level & all courts subordinate to it, design & development of G2G, G2B, G2C application softwares for administrative and Judicial business of the Courts, sensitization as well as customised training to various user groups/ stakeholders (Judges of High Court and Subordinate Courts, Staff of the Court, Advocates) in the Courts. He was presenting officer in various Committees of Judges for recruitment/ promotion, purchase of IT equipments items, establishment of infrastructure and processed all related matters. He established State of the Art Data Centre, Digitization Centre, Information Technology Centre in Allahabad High Court and its Bench at Lucknow.

In Sept. 2016, he joined as Professor of Computer Science & Engineering at SIET, Allahabad affiliated to Dr. A.P.J. Abdul Kalam Technical University, Uttar Pradesh. He also held various other responsibilities such as HOD-CSE and Director (Corporate Resource Centre, Capacity Building & Entrepreneurship Cell)

Prof. Dwivedi is Senior & Life member of Computer Society of India. He has been actively involved in the activities of CSI Allahabad Chapter since 1988 and represented Chapter as Chairman, Vice Chairman, and Hony. Secretary from 2004-2008. He was awarded Chapter Patron Award by CSI in its Annual Convention in the year 2012.Prof. Dwivedi has been Organizing Chair/ Programme Chair of number of National Conferences/ Seminars & Coordinator of Workshops, Faculty Development

Programmes (FDP's), Technical programmes under the aegis of various professional societies such as IEEE, CSI, IETE, ISTE, EUPCCI, Allahabad Management Association, AIMA etc. CSI Allahabad Chapter bagged Best Regional Chapter Award for so many years due to his active involvement in quality programmes for CSI professional and student members.

He has been Co-Convener, CSI Young IT Professional Awards 2013-2014. He represented CSI on various Statutory Committees from time to time.

He is actively involved in CSI-SIG-E-Gov Awards activities since 2009-2010 and has evaluated 250+ e-Governance Projects nominated by Central/ State Governments. He is Convener of CSI-SIG eGov Awards (2020-2024). He has edited compendium of Selected E-Governance Initiatives- 2020, 2021 as part of SIGeGov Publications.

Prof. G. P. Sahu is Professor and former Head, School of Management Studies, Motilal Nehru National Institute of Technology Allahabad, India. He has more than 24 years of teaching and research experience. He completed his one-year Post-Doctoral Fellowship program from California State University Monterey Bay, California, US, He was Visiting Professor at California State University Monterey Bay, US during year 2014-2015 for one year. Prof. Sahu holds a PhD in Management from Indian Institute of Technology Delhi, India. His research interests are in the areas of MIS, E-governance, Green Information Systems, and Digital Marketing etc. Prof. Sahu has published around 95 research papers in international journals and conferences. He has coordinated a few international conferences. He has also edited nine books in the area of MIS and E-governance. Prof. Sahu has acted as a reviewer for international journals and has served as Guest Editor of International Journal of Electronic Governance.

Prof. Sahu has been on the jury for the CSIeGovernance National Awards, India since 2006, he has served as Convener, CSI SIG Award 2009-10 District Category. He has edited compendium of Selected E-Governance Initiatives- 2016, 2020, 2021 as part of SIGeGov Publications.

Prof. Sahu has served as Vice Chairman (Chairman Elect) (April 1, 2018 – March 31, 2019), CSI Allahabad Chapter and Chairman (April 1, 2019 – March 31, 2020), CSI Allahabad Chapter and presently serving as Convener, CSI SIG eGov (2020-2024).

Prof. S. J. Pawar is a Professor and former Head of the Department of Applied Mechanics at Motilal Nehru National Institute of Technology Allahabad, Prayagraj, India. He has more than 23 years of Teaching and Research experience and one year of Industrial experience. He has held an honorary "Advisory Consultant" position at the National Research Center for Executive Search of Nanfang College of Sun Yat-sen University, Guangzhou, China, since Nov. 2016. Also, he holds the position of Co-Convener (Awards) of the Computer Society of India, Special Interest Group on eGovernance (CSI SIG eGov) since 2022, and member of the Audio Engineering Society's (AES's) Convention Policy Subcommittee (CvP) for 2022.His past positions include an international honorary "Consultant" position for the Master's Program of Electro-acoustic at Feng Chia University, Taichung, Taiwan, from 2016 to 2021. He also had the honorary "Consultant" position at Merry Electronic, Taichung, Taiwan, at Shenzhen Factory, China, in 2010. He is a member of more than ten International and National Professional Societies. His research area includes Electroacoustic Transducers, Acoustics, Acoustic Materials, Composites, Ceramics & Bio-ceramics,

Noise, MEMS, etc. He has published around nearly 100 research papers in International and National Journals and Conferences. He has also authored 4 books, and contributed 3 book chapters.

His educational qualification includes B. E (Mechanical Engineering) from Govt. College of Engineering, Karad, Maharashtra, India, M. E. (CAD/CAM) from Motilal Nehru Regional Engineering College, Allahabad, UP, India, andPh.D. (Mech. and Aero. Deptt.), College of Engineering, Feng Chia University, Taichung, Taiwan (ROC).

Dr. Rakesh Kumar is presently working as Assistant Professor in School of ManagementStudies, Motilal Nehru National Institute of Technology Allahabad. He is involved inteaching and research from the last 12 years. He has received his PhD degree fromDepartment of Business Administration, University of Lucknow. His teaching interestsincludes Marketing Management, International Marketing, Market Research, Marketing ofServices, Retail Management, Consumer Behavior, Business Statistics, ResearchMethodology etc. His research mainly focuses in the area of technology adoption socialmedia marketing, sustainable consumption and entrepreneurship and innovation. He haspublished a number of papers in Scopus/SSCI/ABDC listed Journals. He is also reviewer tomany internationally renowned journals. He has also contributed in organizing severalnational and international conference and workshops. He has contributed as editor to theedited books with titles ‘Digital Marketing Insights’ (published by Bharti Publication, NewDelhi) and ‘Present Day Contemporary Issues in Commerce and Management’ (published byFirst Print Publication, Prayagraj)He is a life member of Computer Society of India (CSI) andserved as member-managing committee and member nomination committee to the Allahabadchapter of CSI. He has also contributed as reviewer and jury member to CSI SIG eGovAwards since 2019.

Contents

Acknowledgements

This compendium-**Innovative Technologies for Smart Governance: Selected eGovernance Initiatives 2022** is a result of the untiring efforts of the nominees comprising senior bureaucrats & technical professional teams from Ministries/ Government Departments & other institutions from across the country who have successfully implemented the eGovernance initiatives at their jurisdictional space, submitted nominations for CSI SIG eGovernance Awards 2022, accorded consent to include their eGov initiatives in our publication on successful presentations of these initiatives before the experts in Digital Dialogue for Field Validations to reach the finalist stage.

CSI SIG eGov acknowledges their contribution in achieving the goals for entering into a new era of digital governance for digital society. Each of the initiatives presented in this book have their own learnings - at every stage of project life cycle. This compendium book contains invited articles and the efforts of the authors in bringing out the analytical details on emerging trends in e Governance space are worth appreciation

It has been our sincere effort on behalf of the CSI SIG eGov team to compile the contributions of best eGovernance practices from those who are at the helm of affairs for policy framing, its execution and implementation for the routine business of their own Ministries/ Departments, benefit of the citizens and other stakeholders. Compendium of selected eGovernance initiatives of the country showcases knowledge and awareness on projects to eGovernance practitioners, industry and researchers.

CSI SIG eGov team also realized the need of process-reengineering in award process life cycle due to challenging circumstances due to Covid-19. New portal was launched within a timeframe of less than month to cater the requirements of all the stakeholders involved in the Award process. This portal is very helpful in building repository of the eGov best practices for future reference by the eGov practitioners. Whole award process starting from submission of nominations, assignment of nominations to experts, submission of scores, shortlisting based on weighted scores on each of the parameters listed under the different heads of the nominations for various categories of Awards, e-communications to the experts as well as nominees was completed by using various features of the new portal. All the stages of assessment were completely virtual since last three years.

Late Maj. General Dr. R.K. Bagga was a great visionary to take a lead for the recognition of best eGovernance projects in the country and he has been a source of inspiration & driving force to CSI SIG eGov team to take the SIG activities forward for so many years at IIIT, Hyderabad.

We would like to express our gratitude to the Core Committee members:Dr. Ashok K Agarwal, Shri Surendra Kapoor, Sri Prabhu Gollamudi, Dr. K.S. Vijaya Shekhar, Prof. Harish P Iyer, Dr. Piyush Gupta, Dr. C.V. Ramamohan, Ms. Ayaluri Sridevi, Prof. Nityesh Bhat for thie support and guidance to the current team throughout the awards process cycle.

Assessment of hundreds of nominations received from nominees involves multistage shortlisting process which requires time and dedicated efforts of the expert team members. We would like to express our gratitude to the following experienced team of experts drawn from different sectors viz Government, Industry, Academia, Research Institutions, independent eGov consultants whose voluntary and selfless association have brought a rich perspective to the assessment process.

Experts who voluntary contributed in the assessment of nominations in different stages

Title & Name	Desg./ Affiliation	Email
Dr. A K Srinivas	Ex-Air Force, Ex-World Bank	aksri69@gmail.com
Smt. A Sridevi	Centre of Good Governance, Hyd	sridevi.ayaluri@gmail.com
Smt. Alka Mishra	NIC, New Delhi	amishra@nic.in
Prof. (Dr.) Anil Kumar	DIT University, Dehradun	dahiyaanil@yahoo.com
Prof. Anil Mengrajanianil	Nirma University	menghrajani@nirmauni.ac.in
Shri Anuj Bhati	Freelance Consultant, Hyderabad	anujbhati@gmail.com
Prof. Arunabha Mukhopadhyay	IIM Lucknow	arunabha@iiml.ac.in
Prof. Ashok Agarwal	Founder member, CSI SIG eGov	agarwal.ashok.k@gmail.com
Dr. Ashok Jetawat	IIC, Udaipur	jetawatashok@gmail.com
Shri B G Gupta	IT & eGov Consultant	bggupta1@gmail.com
Prof. Balakrishnan Unny	Nirma University	balakrishnan@nirmauni.ac.in
Dr. C V Ramamohan	Past Convener, CSI SIG eGov	cvramamohan@gmail.com
Dr. Charru Malhotra	IIPM, New Delhi	charrumalhotra@gmail.com
Prof. D K Dwivedi	Convener (Awards) CSI SIG eGov	dwivedi.devesh@gmail.com
Shri Deepak Goswami	Ex SIO, NIC	deepakg42@gmail.com
Dr. G P Sahu	Convener, CSI SIG eGov	drgpsahu@gmail.com
Shri G S Bansal	Ex DDG & SIO, NIC	gs.bansal57@gmail.com
Shri G S N Prabhu	Past Convener, CSI SIG eGov	snp.gollamudi@gmail.com
Dr. Gayatri Doctor	CEPT University, Ahmedabad	gayatri.doctor@cept.ac.in
Dr. Harshita Bhatnagar	IIT Delhi	harshita.moia@gmail.com
Shri K Adiseshu	EA & IS Specialist	kaseshu@gmail.com
Prof. K L Narayana	ICFAI University	drklnarain@gmail.Com
Mr. K Mohan Raidu	Informatics India, Hyderabad	kmraidu@gmail.com
Dr. K S Vijay Sekhar	IIIT Hyderabad	ksvsekhar@gmail.com
Shri K Vijay Bhaskar	Mindgraph Technologies Pvt Ltd	vbkankipati@gmail.com
Shri M S Rama Rao	Ex APSCOB	msakethu@yahoo.co.in
Ms. Mini U	CUSAT, Cochin	mini.ulanat@gmail.com
Dr. Monika Singh	MNNIT Allahabad	monika2286@gmail.com
Mr. N. Venkatesh	CRI Pumps Pvt. Ltd., Coimbatore	psnv2000@gmail.com
Shri Nagesh Shastri	NIC, New Delhi	nagesh@nic.in
Prof. Narsi Bolloju	BITS, Hyderabad	narsi.bolloju@gmail.com
Prof. Nityesh Bhatt	Nirma University	nityesh@nirmauni.ac.in
Prof. OmkarSahoo	Nirma University	omkar.sahoo@nirmauni.ac.in
Prof. P Krishna Reddy	IIIT, Hyderabad	pkreddy@iiit.ac.in
Shri P N Jain	R & B Dept, Govt. of Gujarat	pnjce@yahoo.co.in
Dr. Piyush Gupta	CSC Academy	piyushgupta.egov@gmail.com
Prof. Prabhakar Pradeep	Past President, IETE	pprabs06@yahoo.co.in
Dr. Prabhat Kumar	NIT, Patna	prabhat@nitp.ac.in
Shri Praveen Dwivedi	STPI Lucknow	prv.dwivedi@gmail.com
Shri PVK Patanjali	Ex TCS	pataditvid@gmail.com
Shri R K Vyas	Past President, CSI	rkvyas05@gmail.com
Shri R Srinivasan	Programme Head, ICFOSS	srinitvm@ieee.org
Prof. Rajeev Tripathi	MNNIT Allahabad	rt@mnnit.ac.in
Shri Rajnish Malhotra	IT &eGov Consultant	rm3411@yahoo.co.in
Shri Rajveer Singh Shekhawat	Manipal University, Jaipur	rajveer1957@hotmail.com
Dr. Rakesh Kumar	MNNIT Allahabad	rakesh@mnnit.ac.in

Dr. Ram K. Pathak	IT Consultant	rampathak@rediffmail.com
Shri Rama L Sastri M	IT &eGov Consultant	sastrylm@gmail.com
Shri Ranga Rajgopal	ACENET Technologies	rangagopal1@gmail.com
Shri Rapolu Chakradhar,	eGov Consultant	rapolu.ch.dhar@gmail.com
Prof. S J Pawar	MNNIT Allahabad	sjpawar@mnnit.ac.in
Shri S. Padmanabhan	EDS Pvt. Ltd., Coimbatore	sp@easydesignsystems.com
Dr. Sandeep Inampudi	Central University of Karnataka	sandeep.inampudi@gmail.com
Shri Satish Babu	Past President, CSI	sb@inapp.com
Prof. Satyendra Kumar Sharma	MITRC, Alwar	skpacific323@gmail.com
Prof. Shubham Goswami	Nirma University	shubham.goswami@nirmauni.ac.in
Dr. Somen Dey	MNNIT Allahabad	somen@mnnit.ac.in
Wg Cdr Srikumar	Ex-Air Force	gsri1250@gmail.com
Prof. SrinivasJosyula	IIM Visakhapatnam	jsrinivas@outlook.com
Dr. Sudhakar Tripathi	REC, Ambedkar Nagar	p.stripathi@gmail.com
Shri Surendra Kapoor	Ex CMC	kapoorsurendra@yahoo.com
Shri Vijay Nair	Panappsinc., kochi	vijayn@panapps.co
Shri VinayApsingikar	CMC	cmc.vinay@cmc.com
Shri Vishnu Chandra	Ex DDG, NIC	vishnu@nic.in
Dr. Vishnu Kumar	CUSAT, Cochin	vishnukumars2006@gmail.com

It was a privilege to have galaxy of Past Presidents of the Computer Society of India– Shri Satish Babu, Sri R.K. Vyas and many more voluntarily helping us in the assessment of nominations as well as other CSI SIG eGov activities in their own capacity.

We are thankful to Sri Rajesh Gera, Director General, NIC for encouraging NIC State Centre(s) across the country and NIC Units in different Ministries/ Departments to send nominations for the CSI SIG eGov Awards as well as nominating Ms. Alka Mishra, Dy. Director General from NIC in the panel of experts committee.

We express our sincere thanksto all HOD's, IT Secretaries, Project In-charge Officers, nominees without whom it would not have been possible to complete assessment of the nominations received within the set timelines.

We are also thankful to Director, MNNIT Allahabad for giving full support to the CSI SIG e-Governance Awards team and for giving unrestricted access to MNNIT's facilities and infrastructure whenever required.

We appreciate the efforts of Ms. Somya Gupta, Mr. Darshan Kalasua, Mr. Vikash Tiwari, Ms. Ankita Singh, Mr. Nitin Garg, Ms. Akansha Srivastava, Ms. Shubhi Changani, Ms. Divya Sharma, and Research Scholars & Mr. Dheerendra Singh Yadav, Staff from MNNIT Allahabad who have consistently helped in preparation of manuscript for this compendium and other secretarial works of the CSI SIG eGov from time to time.

We also appreciate the extraordinary support of our Publisher Rishikul Prakashan for desktop publishing support in bringing out this compendium under tight deadlines.

Prof. D. K. Dwivedi, Prof. G. P. Sahu, Prof. S.J. Pawar & Dr. Rakesh Kumar

Editors

Message

Computer Society of India (CSI) Special Interest Group on e-Governance (CSI SIG eGov) has been engaged in recognition of good work done by Central/State Government Ministries/Departments, Local Administration/ Local Bodies through awards for the last two decades. 20th edition of CSI e-Governance awards in succession gives a special pleasure and satisfaction to me as I have been associated from the inception of these awards in the year 2002, CSISIG eGov publishes the case studies of e-Governance projects which are selected for recognition as well as those which reached upto the finalist stage and slightly missed for the consideration of the awards.. I am delighted that CSI SIG eGov is bringing out another compendium with the title "Innovative Technologies for Smart Governance: Selected eGovernance Initiatives 2022" this year which will be a good resource to the practitioners and researchers in the field.

I am extremely delighted to see the responses from Government of India, State Governments, Local Governments, Municipalities and Panchayats which implies that CSI SIG eGovernace awards are well received at all levels of the Government. Many of the Central Government Departments and State Governments have already taken initiatives of using emerging innovative technologies such as Artificial Intelligence, Machine Learning, Deep Learning, Blockchain, Internet of Things, Data Analytics, Cloud Computing, GIS, Cyber Security issues taking e-governance to the next level ,which help Government in smart governance as well as in better and efficient citizen service delivery. It is seen that Government at all levels is bringing technology driven reforms by adopting innovative methods powered by emerging technologies. Covid-19 created an environment in which GovTech and Smart Governance has grown very fast.

Digital transformation has become a fundamental part of government operations as it forced top level to local authorities to onboard innovative methods and remote working solutions. Lot of innovations were done during the Covid-19 pandemic which completely changed and improved the governance processes. Common Citizens also need to understand Digital transformations and learn to adopt and use them effectively for their own use. With the Technological disruption increasing year after year, It may be prudent for all stake holders to relook at all applications and plan how to transform them utilizing the latest technology, Incremental improvements may not be optimal and may require a complete change. On the same ground, CSI-SIGeGov team also do need to look at the awards process both from positioning the awards as well as framework of evaluation process used. The current process has been tremendously useful over years, but may require a second look for the future,

CSI-SIG eGov core team, specially Prof. G. P. Sahu and Prof. D. K. Dwivedi deserve appreciation for taking on the mantle of CSI e-Governance Awards, despite challenging circumstances and other constraints. Our own processes were reengineered and a new portal of CSI SIG eGov was designed and developed for inviting online nominations and providing interface to all the stakeholders of the award process. My personal appreciation to them for their extraordinary efforts put in for the successful completion of 20thedition of CSI SIG eGovernance Awards using the new portal.

The excellent work done by the editorial team consisting of Prof. D.K. Dwivedi, Prof.G.P.Sahu, Prof. S.J. Pawar, and Dr. Rakesh Kumar is highly appreciated and congratulations to them for their sincere and passionate efforts in bringing out this compendium well in time.

It would not have been possible to complete the award process timely without the active participation from the nominees, who responded to the request to participate in large numbers.

The immense timely supporthas been provided by our team of experts spread across the country. My personal congratulations tothem for their dedication and passion. Their contributions have been the key driver of success for these Awards.

Last, but not the least, my personal congratulations to all Award winners for doing great work andbecoming role models to others and encourage them to do better and better in future years.

Best wishes,

Dr Ashok K Agarwal

Founder CSI SIGeGov and CSI Fellow

Preface

Information Communication Technology is the foundation on which Smart Governance is based. ICT enhances the level of collaboration between government departments and other Stakeholders. It provides a means to deliver services efficiently and sustainably. ICT has given rise to an information-based atmosphere that can be exploited by Smart Governance for routine government businesses and citizens.

The rationale behind any governance framework is to stabilise the operations of any institution and ensure a consistent and stable outcome, IoT is no different". IEEE has called for a framework on which to implement IoT and Smart Governance. The structure of the Internet governance ecosystem should ensure the meaningful and accountable participation of all stakeholders, including governments, the private sector, civil society, the technical community, the academic community, and users.

Global IoT governance ecosystem models should be open, participative, transparent, and consensus-driven. Internet governance should be carried out through a distributed, decentralised, and multi-stakeholder ecosystem.

Smart Governance or smart e-governance use technology and innovation to facilitate and support enhanced decision-making and planning within governing bodies. It is often associated with improving the democratic processes and transforming the ways that public services are delivered. We focus on how public services are delivered and better inform how governing bodies make their decisions based on the data derived from our innovative solutions. The importance of Smart Governance has been recognised as a fundamental necessity of smart cities as it creates a strong link between a government and its citizens.

Designing and implementing new e-Governance initiatives, leveraging emerging technologies- Artificial Intelligence, Machine Learning, Deep Learning, Blockchain, IoT, use cases of the advanced analytics is finding relevance in the government ecosystem in almost all the domains. Government has already taken initiatives to put in place requisite infrastructure, policies and processes that can drive country into the next era of smart governance driven by innovative technologies. These innovative technologies are not only used in independent projects but also providing impetus to various smart governance initiatives such as smart cities etc. improving the overall efficiency of the system.

The Central and State Government ministries/departments having already started moving forward with innovative initiatives using emerging technologies, identifying their priority areas, digitally transforming the processes, framing policies, collaborating with other entities, for the overall development and good governance in the domain of agriculture, animal husbandry, environment, water, energy, ease of doing business, education, training & employment, grievance redressal, housing urban development & transport, revenue, finance, social and citizen welfare schemes

This compendium aims to provide an overview of excellent work being done in the field of eGovernance in the country to share the better understand: the current state of the art, novel applications of technology and government services, identify the factors that lead to successful adoption of existing services, and provide workable solutions for strategic management of e-government projects. CSI SIG eGov adopts multistage shortlisting process to evaluate the e-Governance/m-governance projects implemented by Ministries/Departments of the Central/State/Local governments with

the help of the experts having rich experience in academia, industry, software project consultancy policy formulation and governance practices. Keeping in the view the submission of nominations of the e-Governance initiatives from diverse domain areas and to take care of the biases of the experts, well design AHP system is applied where weights are applicable for each of the parameters of the Result Enablers and Value Indicators and thus keeping an appropriate balance amongst the overall impact of the documentation, usage of technology, result enablers and value indicators in the assessment results.

This compendium contains the rich information the Award-winning e-Governance initiatives in various categories which are marked with star (*) as well as of those initiatives which reached up to the Finalist Stage. This compendium will be very useful and great value to the decision makers, policy makers, practitioners and researcher in the field of e-Governance. We on the behalf of CSI SIG eGov made our sincere efforts to validate the information provided through submissions made by the Government Departments; however, it is advised to the prospective readers to make their own assessment while drawing inferences.

Prof. D. K. Dwivedi, Prof. G. P. Sahu, Prof. S. J. Pawar & Dr. Rakesh Kumar
Editors

Section-I
Invited Articles

An examination of e- governance, cybersecurity and social media in India

Divya Sharma, Shubhi Changani and Rakesh Kumar

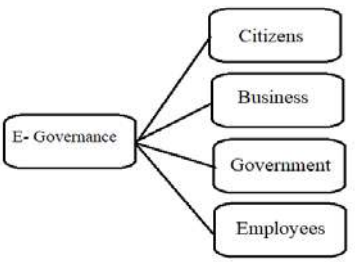
Introduction

Ubiquitous internet access, digital governance, and improved e-governance are the prerequisite of the high-tech society. The government is trying to endeavor these services via e-platform and enhancing congruency to stimulate economic growth, and literacy and boost public involvement, but the risk present in violating these platform factually persist. These threats include cybercriminals, cyber terrorism, foreign powers, etc. remnant challenge (Subban and Jarbandhan, 2019). Thus, cyber security has become pivotal in the existence of any state to prevent integrity, fulfil citizen presumption for public services, and arrange administration for digital republic (Cisse, 2016).

1.1 E-Governance

According to the World Bank (AOEMA2 Report 2004) E-governance is the "use by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transform relations with citizens, businesses, and other arms of government. These technologies can be used for variety of purposes, including better citizen service delivery, better relationship with business and industry, citizen empowerment via information access, or more effective government management."

Following is the classification of e governance: (G2C), Government to business (G2B), Government to government (G2G), and Government to employees (G2E) (Shaalaa.com, 2023).



Government to citizen- inters connection between the government and the citizens.

- Citizen are getting access anytime and anywhere
- Services like e-aadhar, license renewable and other are provided
- Primary aim is to make government citizen friendly

Government to business- business inaction using e-governance tools

- Eliminate paper work and create transparency in business
- Access to forms that are needed to comply by business
- Service such as government website for business to pay tax, portal for MSME registration.

Government to government- interaction between various government entities

- Include different departments and agencies of government or two government such as central and state or state (two or more) governments
- Services can be local level or international level
- Primary aim to increase effectiveness and output

Government to employees- interconnection between government and its employees

- ICT tools to help in fast and effective work which help enhancing employees satisfaction
- Service such as reviewing of salary payment record, applying for leave etc can be done
- Example of such e-governance is e- Seva project, e- Mitra etc.

Evolution of E-Governance in India

Rising use of IT by government in late 90s led to starting point of E- governance around the world. But n India it initialized after the launch of Department of Electronics after which, National Informatics Centre launched Data Information System program for the computation work in 1977 to all the district office in the nation. This computerized system aims to aid in-house government application to manage rigorous operation related to the tax administration, election etc. Tax department was the first to largely use e-governance in India (Keruwala, 2013).

E-governance obtained strength in 1987 with the launch of NICNET. Centre; state government begins their e-governance project in later period (Chetia, 2019). Followed by set up of National task force on IT and Software development in 1998. NISG was setup in 2002 and National policy on Information Technology approved in 2012.

The milestone for E- governance effort and goals represented in Table 1 (Mishra and Hiremath, 2009).

Year	Mile-stones for E-Governance Efforts	Goal
1984	New Computer Policy	Spread of Computer Use
1986	Policy on Software Export, Development and Training	To promote Sectoral growth in ITeS, Business Process Outsourcing
1987	Setting up of NICNET, DISNIC	Setting up of IT infrastructure in Government Sector
1994	Policy on National Telecommunication (NTP 94)	To ensure better Tele-density, focus on Rural Telephony
1995	Launching of Internet; Spectrum Allocation and Release	Web Access and bandwidth allocation for use
1997	Establishment of Telecom. Regulatory Authority (TRAI)	To unbundle telecommunication services (last mile)
1998	National Task Force on IT	To formulate an IT policy document
1999	Creation of Ministry of IT	To oversee implementation of IT policy
1999	Policy on National Telecommunication (NTP 99)	To accelerate tele-density
2000	Formulation of IT Act	To provide legal status to use of IT in business, government, and governance systems
2000	Formulation of Communication Convergence Bill	Convergence of content, convergence of carriage, and convergence of Terminal
2000	Telecom Disputes Settlement and Appellate Tribunal (TDSAT)	Fair and transparent telecom. Services
2000	Corporatisation of DoT (formation of BSNL)	Unbundling of the telecommunication sector, private sector investments and managing USO
2004	Formulation of Broadband Policy	To implement broadband services in the last mile
2006	National E-Governance Plan (NeGP)	To formulate, plan, design, and deploy e-government solutions and establish citizen interfaces
2007	Mission 2007	To consider each village a knowledge centre

Table 1(Source: Mishra, 2009)

1.2 Cybersecurity

One of the most prominent risk in internet use is the cyber attacks (World Economic Forum Global Risk report 2019). Figure 1 show top 20 countries who are at risk of cybercrime.

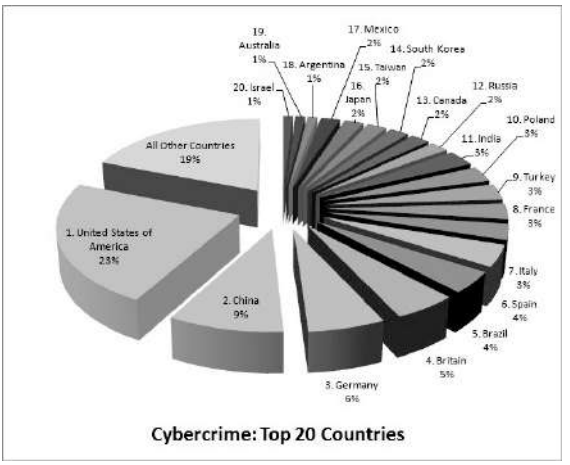


Figure 1 (Source: Enigma software)

Cybersecurity incorporate protection and measures that are used to prevent cyber domain for general public and defense field, from the threat and risk that can be harmful for the interconnected network and information infrastructure. Cybersecurity attempts to secure the assessable and uprightness of the network and secrecy of information which are present in the network (EU Cybersecurity strategy, 2013).

Chapter 1 Below is the Market size of cyber security in India 2018-2023(Figure 2) . In the year 2021, with a CAGR of about 40%, Indian cyber security market is estimated to be of the value close to $10 billion USD over the period of last two year. Due to the increasing online attacks and digital adoption, this industry is expected to generate more than $15 billion in revenue by 2023.

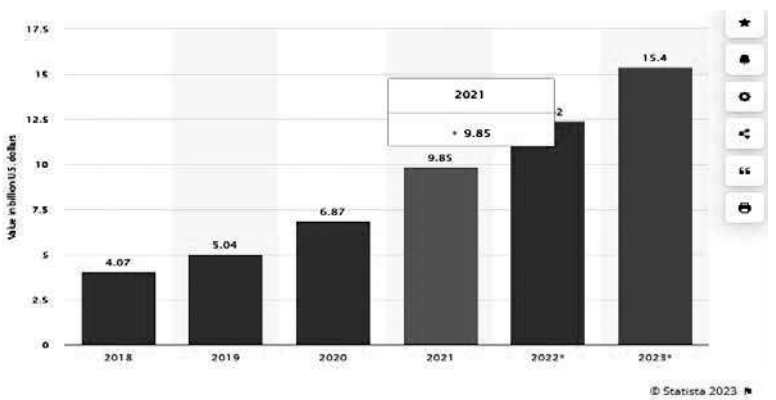


Figure 2 (Source: Statista.com)

The trilateral approach for cybersecurity supported by the World Economic Forum is:

- Prevent
- Detect
- Respond

Cybersecurity typology include platform of flexibility, coordination and clarity toward cyber stability (World Economic Forum Risk Report, 2019). The general security goal (International Telecommunication Union, 20191) includes:

- Availability
- Integrity (Genuine and Non cancellation)
- Confidentiality

1.3 Social media

Global marketing operations have undergone a transformation thanks to the development of web technologies. Many businesses use social media to connect with prospects and communicate with current consumers. This is done through streamlining and updating accounts, adding photographs and live videos, and other activities. All of this is done to target the right demographic, keep an eye on reputations, increase awareness, and build a brand community. Social media is essential in this regard, and companies are utilizing its welcoming atmosphere to forge brand connections. There have been major sectoral changes as a result of the development of consumer participation on social media.

Advertising on social networks, virtual worlds, user-generated product reviews, blogger endorsements, RSS feeds of material and social news sites, podcasts, games, and consumer-generated advertising all fall under the umbrella term of social media marketing. Online market activities that compete with conventional web-based promotion tactics include SMM as a subcategory. One of the most well-liked categories of social media marketing (SMM) activities was created by Kim and Ko (2012) and advocated entertainment, interaction, trendiness, customization, and word-of-mouth marketing for luxury brands.

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Ms. Divya Sharma *Research Scholar, School of Management Studies, Motilal Nehru National Institute of Technology Allahabad, India ds2818ds@gmail.com*

Ms. Shubhi Changani *Research Scholar, School of Management Studies Motilal Nehru National Institute of Technology Allahabad, India Shubhichangani@gmail.com*

Dr. Rakesh Kumar *Assistant Professor, School of Management Studies Motilal Nehru National Institute of Technology Allahabad, India rakesh@mnnit.ac.in*

Section - II
State Initiatives

State of Telangana

Jayesh Ranjan, Rama Devi Lanka, M. Rushitha and Maurya Teja

STATE SUMMARY

Key aspects of the State's e-Governance Road Map for the next five years

The state of Telangana has been a model state since its inception when it came to adoption of digital technologies. It has enabled the adoption of these through some of the most progressive policies in India. Through the ICT Policy launched in 2021, the Government is working towards ensuring 100% digital availability of services, from the comfort of citizens' homes by 2026.

Over the next 5 years:

The government will strive to enable internet-based services for every single citizen in the state through the TFiber project and the expansion of MeeSeva. Several policy decisions have been taken to enable this.

Government of Telangana is relentlessly striving for organic, sustainable growth of e-governance initiatives in the state. As one of the leading states in the country to promote digital initiatives, Telangana aims to achieve utopian objective of governance– transparent service delivery backed by citizen convenience.

The focus to opt for low cost solutions drive the idea of using open source tools while developing solutions to decrease cost overheads. Open source tools help in reducing dependency, unlike licensed alternatives. It has always been an effort to opt for tie-ups with private sector players while building e-governance solutions to encourage startup ecosystem. However, capacity building on the technical front at the department level is also being taken up across departments to beef up the self-sustenance level. Government of Telangana also plans to collaborate with other states / UTs of India in implementation support of best available e-gov initiatives.

Examples of State level Institutional partnership plans

Government of Telangana is continuously encouraging and adopting the use of Emerging Technologies for Governance. The Government understands the potential of cloud technology in transforming service delivery to citizens. State Data Centers (SDCs) so far have been identified as core infrastructure to support various eGovernance initiatives. Similarly, Telangana's SDC has been offering hosting, disaster recovery, and other remote management services to many Departments and Corporations in the State. While the SDC has served multiple departments so far, because of the capacity constraints, there are instances in the recent past where SDC has faced challenges in scaling up and meeting the user department requirements in a timely fashion leading to application downtimes and poor user experience. As part of the Telangana's Cloud First Strategy and taking cognizance of the Meghraj Policy announced by Government of India, the Government has issued a Government Order mandating all departments to deploy their existing or new applications on Cloud except Top Secret and Secret. The Top Secret and Secret applications can continue to be hosted in their existing set ups or facilities (SDC/Dedicated Environments). A few indicative scenarios/opportunities (not exhaustive), to move to cloud identified are:

- The existing ICT infrastructure is nearing contract expiry
- Refresh or upgrading of existing applications or ICT infrastructure is required

- Capacity enhancement is required due to issues of resiliency and/or performance
- Evaluating options to lower the Total Cost of Ownership (TCO)
- Procuring new applications or ICT infrastructure

We have collaborated with various forums/government organizations and even private organizations toundertake various initiatives as described under various policies. Some few significant partnerships are listed below.

- We are collaborating with World Economic Forum for various initiatives. We are working with them onvarious initiatives which have been to boost the agriculture ecosystem while keeping the benefit to thefarmers center to everything and Medicine from The Sky. We are also working with United NationsDevelopment Program and Indian Institute of Sciences on different projects to foster the rise of use of technology in the agriculture ecosystem. We are also working with Google to enable geo-referencing of the agriculture data.
    - We are working Amazon Web Services and Azure Cloud to enable the cloud adoption framework as part of our Cloud First Strategy.
    - We have collaborated with Ministry of Electronics and Information and Technology, GE, Tech Mahindra, DSCI, IIIT Hyderabad to set up various autonomous institutions in Hyderabad.
    - In order to foster the reach of artificial intelligence solutions in various sectors we have set up Telangana AL Mission (T-AIM) in collaboration with NASSCOM, NVIDIA and IIT Hyderabad. We have also collaborated with Intel to Educated 1,00,000 students on Artificial Intelligence and have
    - collaborated with Capgemini and Wells Fargo to undertake grand challenges to boost the startup ecosystem in Telangana
    - We are working with Casper Labs to enable the adoption of blockchain and streamline the factoring in the Government transactions. We are also collaborating with Ethereum India for a hackathon to increase the enthusiasm in up-and-coming individuals towards web 3.0 technologies

Key challenges faced in eGovernance journey

Challenges faced during the e-governance journey in the statue are exploratory in nature as Telangana has been one of the pioneer states to implement e-gov initiatives in the country. As the state government-initiated initiatives in collaboration with private sector, skill gap in technical expertise among the govt. officials is visible. Training sessions are being conducted to bridge the skill gap. Operational challenges come underway while making incremental / radical changes in the existing setup. Such challenges are documented in SOP and addressed as per the mentioned steps. Infrastructure upgradation based on real time consumption is a difficult task. Hence, forecasting on infrastructure requirement is a gradual yet continuous yet improvement process. Services provided through MeeSeva are bound by strict SLAs. SLA monitoring and implementation are officials driven and hence are under continuous improvement mechanism.

RESULTS INDICATOR

A few Beneficial Outcomes

RTA Fest (Friendly Electronic Services of Transport Department): This initiative aimed at providing transport department services to the citizens of the state through m-gov initiative, TApp Folio.

This initiative uses emerging technologies such as AI, ML and Big Data makes RTA Fest one of the key initiatives with high accuracy in identification mechanism. Service delivery is instant and the same can be accessed anytime, anywhere though TApp Folio 24*7.

RTA Fest has successfully completed ~1L transactions since its inception, i.e., Jul'2020.

Accolades / Demonstration: The scope and the impact of FEST has been validated in several occasions as it was the winner of CSI e-governance award (facilitated by Computer Society of India), 2020 and Digital LokSabha Award, 2021 (facilitated by Indian Express) under Artificial Intelligence category. The project was explained to the honourable Members of Parliament (MP) as part of the technology session organized by LokSabha Secretariat in July 2021.

PLCS: (Pensioner Life Certificate through Selfie) is another initiative delivered through TApp Folio.

This initiative, like RTA FEST, uses RTDAI (Real Time Digital Authentication) using emerging technologies like ML, AI etc for highly accurate real time identity authentication.

The target audience of this initiative are state level pensioners who can use this service through TApp Folio 24*7.

The initiative has received widespread recognition with ~1.5L users using this initiative since its inception in Jul'20.

Agriculture and Farmer Welfare: We envision Telangana as a prototype state to bring a digital revolution in India's Agri-sector, and thereby improve the lives of our farmers.

A unique Public Private Co-Operation (PPC) Project called Saagu Baagu has already been initiated with 2 AgriTech consortiums comprising a total of 8 AgriTech startups across the value chain. The project is in partnership with World Economic Forum and seeks to sustainably deploy AgriTech solutions with a focus on boosting farmer incomes using new age technologies. The target of first cohort is 50,000+ farmers in the next 2 years. The crops under focus are chili and Groundnut across 4 districts

II. Commercial pilots have also been launched with 6 best startups in their respective fields across 5 AgriTech solutions. The solutions shall solve the problem of labor shortage esp. during peak durations and thus ensure timely interventions by the farmer. These solutions would also result in streamlined procurement, increased exports, and fair value realization for farmers.

- Seed Traceability (Blockchain)- To ensure fake seeds don't reach the farmer
- Smart Irrigation Management (IoT)- To ensure optimum soil moisture level leading to higher yields and efficient utilization of water and enable sustainability
- Rapid Soil Nutrient Testing (IoT)- To enable the farmers with soil test reports within a day and allow government to have a more accurate geo-tagged soil health map of the state
- Farm Automation (Robotics)- To enable farmers with automatic weed control, fertilizer spraying and cotton picking system
- Objective Quality Assaying & Produce Grading (AI)- To objectively grade Paddy/Rice and Red gram and therefore remove any human error.

III. Hara Bahara was undertaken as India's first aerial seeding based reforestation program in partnership with Hyderabad based startup named Marut Drones. In Monsoon 2021, 12,000 hectares of forest land across 31 districts was seeded with 50

lakh seeds.

Common service delivery

Any departmental service that is supposed to be onboarded on MeeSeva platform needs active participation / collaboration from IT E&C dept. (Implementation arm) and the concerned department (facilitating arm). PoC (Point of Contact) is chosen from the concerned department for facilitation of onboarding of services. Inter departmental collaboration facilitates smooth onboarding of services and facilitation of knowledge / raiing sessions on technical aspects of the service post onboarding of the services.

Apart from the MeeSeva platform, the state has fully embraced the SeMT and SPMU teams. These teams report directly to the ITE&C Department, but work across departments for their digital solutions. They take up work directly from the core planning level to implementation doing all the ground work to ensure the planning for the execution is well taken care of.

E-Governance best practices of the state

The state has put in constant efforts to enable all departments to provide services to citizens the best way possible, with the quickest resolution and delivery times. Through policy interventions, we have created a platform for ease of communication and service delivery between the service providers the public interface providers. The following factors have helped Telangana achieve the some of the best service delivery times and quality.

- Real time communication through digital platforms between departments and officials in charge of Service Delivery
- Usage of real time communication platforms like WhatsApp for quick and easy resolution of issues.
- Usage of agile methodology during the entire lifecycle of the initiative

ENABLER INDICATOR

e-Governance enabling processes

At a state level, Telangana is fully embracing the SeMT and SPMU teams that together form the ICT Teams. Each team lead is presented with a team and set of departments to work with as ICT nodal officers. Through this channel, we have been able to ease the process of digital service procurement and advisory. They undertake strategic planning, provide project consultancy, project developmental support and guidance for the entire duration of projects.

They also take care of the following processes to make it easy for the departments:

- Programme Management
- Financial Management
- Technology Management
- Change Management **State**

level initiatives towards Capacity building for eGovernance

In house training sessions are regularly conducted for department officials under capacity building program with sole focus on building technical expertise, ensuring knowledge transfer and providing handholding support, if needed.

Emerging technologies relevant for the State

The Emerging Technologies (ET) Wing, a dedicated vertical, was set-up as a first-of-its-kind initiative in the country within the ITE&C Department of the Government of Telangana. With an aim to achieve Telangana's vision to become the leader in

emerging technologies, ET Wing works towards Ecosystem Development and Government Adoption of 8 emerging technologies viz: Artificial Intelligence, Blockchain, Cloud, Drones and Robotics, Internet of Things, AR and VR, SpaceTech and Additive Manufacturing. It has two key objectives:

- To facilitate the development of conducive ecosystem for emerging technologies in Telangana, ET Wing takes an initiative to do the following activies-
- Development of Actionable Policy Frameworks- ET Wing has come up with 9 policy frameworks that are centered towards the 8 emerging technologies

AI Policy Framework	IoT Policy	Cyber Security Policy
Blockchain Framework	Space Tech Framework	E-waste Management Policy
Drones framework	Cloud Adoption ramework	Open Data Policy

- Setting up of Autonomous Institutions

Telangana AI Mission	E-Waste COE	Blockchain District
Cyber Security COE	National Center for Additive Manufacturing	

- Identification of Usecase and Innovative Solutions- We are working with various departments in different domains such as agriculture, law enforcement, mobility, healthcare, supply chain, environment to identify usecases and brainstorm solutions
- Leveraging emerging technologies to enable better governance and improve citizen service delivery There are 35+ active projects across various domains that leverage these emerging technologies involving different partners that work towards enabling a better governance and improve citizen service Delivery

Specific gap areas – Policy level, process level, Technology level that State plans to pursue and Improve

Through the study performed during the preparation of the 2nd ICT Policy of the state, we have identified the following areas of improvement to enable holistic growth for the state.

- Digitally Empowered Citizens: Year after year, Telangana has been adjudged as a leader in promoting tech adoption and providing citizens with the best of digital services. However, the Covid-19 pandemic has given us the opportunity to explore digital solutions to the most critical requirements that the citizens have. With the progress that the world is making on the digital front, it is imperative for the state toprepare citizens for this day and age. Equipping citizens with digital skills and supporting them with the required digital infrastructure is going to be the foundation stone for improving the lives of the citizens. The ITE&C department has strategized a multipronged approach to achieve it.
- Digital Government: No government service that the citizens would intend to avail would mandate inperson presence unless a physical test or inspection is required. Telangana has set benchmarks for citizen services, leveraging technology to provide contactless, paperless and presenceless citizen services. The government will strive to make the digital transformation, and be more accessible, efficient, and accountable. Officials will be digitally upskilled and smart governance tools will be used to optimize the utilization of resources and enhance service delivery. An omnichannel feedback system will be in place to ensure the service delivery is citizen-centric and decision-making is completely data-driven.

- Innovation and Entrepreneurship: Innovation and Entrepreneurship are the backbones for the development of a fast-growing economy like Telangana to increase self-reliability and propel employment generation. Telangana has established world-class infrastructure and organizations over the past 6 years, the prime focus going forward will be to strengthen the ecosystem, develop a skilled talent pool, improve market access, and facilitate a funding environment to make Telangana the hotbed of innovation and start-ups. Hence, Telangana will also have special focus on developing a strong ecosystem for public impact-based start-ups.
- ICT for Development: We, at the Government of Telangana, believe that technology's most important impact is to solve the problems of society than being a mere enabler. The COVID-19 pandemic has opened up several opportunities and unmasked the ways in which technology can be used to enhance the living conditions of citizens. The state will leverage technology as a lever to address challenges and develop data-driven solutions in the space of social, environmental, health, education, and livelihood among others.

Shri Jayesh Ranjan, *Principal Secretary to Govt. of Telangana, Information Technology, Electronics & Communication (ITE&C) Department secy_itc@telangana.gov.in*

Ms. Rama Devi Lanka, *Director-Emerging Technologies, Officer on Special Duty, Information Technology, Electronics & Communication (ITE&C) Department, osd_itc@telangana.gov.in*

Ms. M. Rushitha, *Project Head-Emerging Technologies, Information Technology, Electronics & Communication (ITE&C) Department, lead-etproj-itc@telangana.gov.in*

Shri Maurya Teja, *Consultant to the Government, Information Technology, Electronics & Communication (ITE&C) Department, maurya.teja@auctusavisors.in*

State of Gujarat

Nitin V. Sangwan, Shraddha Jani and Foram Bharatkumar Modi

STATE SUMMARY

Key aspects of the State's e-Governance Road Map for the next five years

Gujarat has been one of the frontline State in the implementation of e-governance policies & projects in India. Independent agencies have rated Gujarat as one of the most e-prepared State in the country. State Govt. has adopted innovative / progressive policies for promotion of e-governance in the State.

Gujarat is an aspiring leader with e-readiness Initiatives with the IT Policy. Gujarat is a frontline State in the implementation of e-governance policies & projects and setting up of key infrastructure for E Governance.

Gujarat has been a leader in setting up of core ICT infrastructure like State Wide Area Network (SWAN), State Data Centre (SDC) and eGRAM - Common Service Centres (CSCs) as well for use of advanced technologies like GIS and mobility solutions, to provide smart Governance to its citizens and businesses. Below are the Stat's e-Governance Road Map for next five years:

- To make all public services available to citizens at their doorstep via new-age electronic media and to ensure the efficiency, transparency, and dependability of such services at the lowest possible cost.
- To make all government services accessible online anywhere, anytime.
- To make public service delivery paperless, faceless, and cashless within a stipulated timeline, thus enabling the citizens to easily avail of all government services.
- To make proactive delivery of services to citizens by process reengineering
- To make digital infrastructure as a Core Utility to Every Citizen
- Digital Empowerment of Citizens
- Initiatives for e-Government that are innovative and result-driven
- Enhance the portfolio of citizen centric services
- Ensuring optimum usage of core Information & Communication Technology (ICT)
- Adoption of niche technologies in e-Governance applications and leveraging usage of emerging technologies in citizen service delivery
- Usage of more agile implementation models

Key focus areas for next five years

- Improving Service Delivery Channels
  - Contact Less Public Service Delivery & Integrated Service Delivery
  - Single Sign-on
  - Single Service Delivery Portal
  - Development of Intelligent Chat-Bots
  - Digital Verification of Documents
  - Proactive Service Delivery
  - Jurisdiction free access to services
  - Multiple Payment Option for Services

- Centralized Integrated Common Dashboards for Districts and Departments for performance evaluation

- Improving Service Delivery Channels
- Use of Emergent Technologies in Government
- Improving transparency and accountability in Government System
- Minimizing Regulatory Compliance and Government Process Re-engineering for ease of Public Service Delivery
- Establishing Centralized Call Center for Centralized Grievances submission and redressal
- Connected Government
- Participatory and Democratic Governance
- Capacity Building
- Review and Audit

Key challenges faced in eGovernance journey

Challenges:

- Existing government process which are not compatible with the online solutions
- Lack Internet connectivity in rural area.
- Lack of IT & Non-IT Infrastructure
- Lack of digital Literacy and awareness

Steps taken:

- Administrative Reforms and Government Process Re-engineering for smooth implementation of e-governance projects service
- Gujarat State Wide area network & Bharat net pahse1 & 2 (GFGNL) projects made sure that internet connectivity is available in all government offices including all Grampanchayat of the state.

RESULTS INDICATOR

A few Beneficial Outcomes

Revenue Department:

i-ORA (integrated Online Revenue Applications)

- With an objective to increase transparency, reduce the interface between landowner and Revenue Authorities and fasten the dispensation of the application, integrated Online Revenue Applications (i-ORA) – Single Window of the Revenue Services has been launched. This historic, revolutionary change in Revenue Services made the entire system citizen centric and transparent.
- Earlier, conversion of Agricultural land for Non–Agricultural (NA) purpose was a time-consuming and tedious process. Prior to final approval, physical file of the application required opinion/approval of more than 17 various departments/authorities.
- Under the revised process, applications can be made with just 1 document – Affidavit. No other documents such as copy of land records, other details etc. are taken from the applicants.
- To increase transparency, reduce the interface between landowners & Revenue Authorities and fasten the dispensation of applications, on 23rd August 2018, Revenue department has launched Integrated Online Revenue Applications (i-

ORA) – Single Window System of the department in 2 districts (Ahmedabad & Gandhinagar). Post successful run of the pilot project, it was launched across all District Collector offices of Gujarat in December 2018.

- Garvi (Automation of Administration of Registration, Valuation & Indexing in Gujarat)
- Garvi is a web based application that provides the services to the citizen to submit the details regarding the document for registration of Document and online facility to pay the Stamp Duty and Registration Fee
- Online facility of P.D.E (Public Data Entry) using which party can submit the details (Party Names, Property Details, Stamp Duty paid etc.) regarding the document to Sub Registrar Office for registration of Document.
- E-Payment System is facility to provide online pay the Stamp Duty and Registration Fee.
- Online Facility of Appointment Scheduler to provide available time slot for Registration Document to the parties. • Application provide facility to search property, get index2copy & document copy and find Jantri rate.
- Online Facility of Information regarding Rate of Stamp Duty and Registration Fees and find Approximate Market Value of the property.

Read less Health Department

Germis (Gujarat Epidemic Research Management Information System)

The pandemic (COVID-19) is deeply affecting our lives around the globe. The gaps between the existing procedures, medical resource availability, medical needs, and medical infrastructures are clearly evident. It is important that the authorities should have a continuous review system where they can analyse and come up with pandemic response plans.

A GERMIS System is needed to check the spread of the virus, its associated diseases, and mortality. Implementing Gujarat Epidemic Research Management Information System with new procedures that can estimate the demand for medical resources such as hospital beds, ventilators, emergency transport vehicles, etc. can help authorities to take an appropriate decision.

GERMIS is a mobile/web-based application. It is developed to provide real-time information to the government and citizens about Covid report, hospitals, RTPCR tests, vaccination centres, oxygen cylinders, and more.

Education Department

Gyankunj

- The initiative of "Gyankunj" project has been launched by the Hon'ble Chief Minister of Gujarat on 5th September, 2017 - Teacher’s Day to accelerate the efforts of
- Objectives:
- To enhance classroom interactivity through advancement in teaching-learning process for Teachers and Students
- To reinforce teaching, learning and evaluation process with use of technology
- To make ease of understanding for each unit of curriculum in classroom itself by
- using technology as a medium
- Facilities at Classroom under Gyankunj Model:

- Projector, IR Camera / Interactive Whiteboard / Interactive Panel , Laptop, Speaker
- Udayam Congent
- UDAYAM COGENT is a common platform for academic and academic administrative services to support all the stakeholders of higher and technical education institutions and universities of the State of Gujarat.
- It supports single sign on interface for all the services. It provides various teaching - learning and assessment tools and learning resources to faculty members and students.
- It supports seamless communications between Institutions and admin offices enabling effective management of resources of government. Easy and time effective implementation of state and central government policies.

Common service delivery

Digital Gujarat (https://www.digitalgujarat.gov.in/)

- Digital Gujarat: GoG has developed Digital Gujarat Portal to extend the reach of e-Services to all citizens through Web & Mobile application.
- More than 110 Citizen centric services from different department are available on DG Portal.

Digital Seva Setu (https://digitalsevasetu.gujarat.gov.in/)

- Services being made available every day in all the Villages through e-Gram centres
- Launch Date – 8th October, 2020
- GPs – 2400, Services - 22
- Current
- GPs – 14053
- Services - 317
- CM Dashboard
- Visual insight of more than 3000 indicators of 20 sectors of all the state government departments
- Monitored effectively by Hon'ble Chief Minister at a glance

ENABLER INDICATOR

e-Governance enabling processes

Gujarat is committed towards promoting faster and inclusive growth in the IT/ITeS sector.

The IT/ITeS Policy (2022-27) focuses on attracting investments and generating employment across the State along with propelling growth through incentives and facilitation. The Policy will enable an innovative ecosystem, establish a robust infrastructure and further develop the state's IT talent pool. The Policy will reinforce various elements of the IT/ITeS ecosystem and introduce support for co-working spaces to establish Gujarat as a 'destination of choice'.

Vision

- To transform the IT landscape of Gujarat by becoming one of the leading States in terms of world-class IT infrastructure, availability of high-skilled resources and innovation in Emerging Technologies.

State level initiatives towards Capacity building for eGovernance

As part of IT - ITes policy 2022-27, The Government shall endeavor to upskill the

graduate students and working professionals of the state to expand their knowledge and skill sets across emerging technologies by incentivizing them. AS part of IT policy-2022, The Government will incentivize the beneficiaries for successfully completing globally recognized courses in Information & Communication Technology (ICT) through Direct Benefit Transfer (DBT) up to a maximum of INR 50,000 per course or up to 50 per cent of the course fee, whichever is lower.

Specific gap areas – Policy level, process level, Technology level that State plans to pursue and improve

Security operation center (SOC) is proposed to detect, analyze, and respond to cybersecurity incidents using a combination of technology solutions and a strong set of processes. Security operations centers are typically staffed with security analysts and engineers as well as managers who oversee security operations. SOC staff work close with organizational incident response teams to ensure security issues are addressed quickly upon discovery.

Security operations centers monitor and analyze activity on networks, servers, endpoints, databases, applications, websites, and other systems, looking for anomalous activity that could be indicative of a security incident or compromise. The SOC is responsible for ensuring that potential security incidents are correctly identified, analyzed, defended, investigated, and reported.

Shri Nitin V. Sangwan, *Director, Directorate of ICT & e-Governanace, Department of Science & Technology, Gujrat, directorit@gujrat.gov.in*

Smt. Shraddha Jani, *Deputy Director, Directorate of ICT & e-Governanace, Department of Science & Technology, Gujrat, ddict5-dit@gujrat.gov.in*

Shri Foram Bharatkumar Modi, *ICT Officer, Department of Science & Technology, Gujrat, icto53-dit@gujrat.gov.in*

The State of Himachal Pradesh

Mukesh Repaswal and Rajeev Sharma

STATE SUMMARY

Key aspects of the State's e-Governance Road Map for the next five years

The State of Himachal Pradesh is speedily progressive in the field of e-Governance. e-governance being the application of information and communication technologies to transform the efficiency, effectiveness, transparency and accountability of informational and transactional exchanges within the Government of Himachal Pradesh, between the State Government and Government agencies of National, State, Municipal & Local levels, citizen & businesses, and to empower the citizens through accessibility & use of information.

Some key benefits, the State of Himachal Pradesh has achieved through e-Governance are improved quality of service, time-bound G2Cand G2B service delivery, cost-effective services to the citizens through various media like web- portals, mobile applications, secure internet & payment gateways etc.

The State has also been profited by the it. eGovernance can be used effectively to achieve the vision in light of the business imperatives. Key Information Technology imperatives for e-Governance beneficial for this State are:

- Adoption of standards and policies for various technology components
- Shared database across multiple departmental applications
- High reliability on hardware and communication
- Training department employees on various technologies
- Increased faith of the citizens in Information Technology upto the root level of governance i.e Panchayats etc.

The State has achieved the above benefits through an optimal application of ICT infrastructure, the overall framework for e-Governance fully ensures that its rchitecture components are extensible and scalable to adapt to the changing environments. The State's e-Governance framework is increasingly moving towards centralized architecture where the government employees & the citizens are able to access the applications over a secure channel using browsers as their front end and citizens and businesses over internet.

Objective

The Citizens, businesses and other entities of Government are able to interact with the Government "When and Where" they want

Delivery of Government services to its citizens and businesses through varied access channels as internet, telephone, kiosks and Toll-free call centers etc.

The State of Himachal Pradesh is a hilly state. The State has a different terrain and hence the needs of the residents are also a bit different. The eGovernance services interface are designed according to the needs of the citizens rather than focusing on the needs of the departments.

The State's e-Governance architecture is fully able to handle all the requirements of various Government departments, corporations & boards and has evolved over years to incorporate the changing needs and requirements of each of these departments, boards & corporations.

Common components of Himachal Pradesh's Government's IT infrastructure should be provided in a shared fashion to all departments and agencies

Improve the experience of citizens and other stakeholders interacting with the State Government

The State of Himachal Pradesh ensures that all IT implementations as Himachal Online Seva, State Data Centre & its enhancement, HIMSWAN (Himachal Pradesh State Wide Area Network), Mukhya Mantri Seva Sankalp Helpline 1100, Chief Minister Dashboard, Online Parivar Register, Litigation Monitoring System, Aadhaar (UIADI), MyGov, eoffice, CSC SPV, Lok Mitra Kendra are in line with the overall e-Governance architecture of the state of Himachal Pradesh.

In the current environment each department within the State as the Himachal Road Transport Corporation (HRTC) etc. are evolving its concerned IT solution based on its own need and strategy considering the big picture of service delivery to various stakeholders. Further the IT solutions developed have online transactions capabilities also but most of the services being offered are more in the form of Information Dissemination, Form services and payment capabilities. The State has its own Integrated Command & Control Centre setup in Shimla & Dharamshala Smart Cities.

The envisaged architecture is providing multiple eGovernance services through various online channels which are being delivered seamlessly through a single point of access. This single window service delivery mechanism is adopted under 'EoDB 'which is integrated and spans across all departments and Government structures of the State. The aim is being to eliminate the need to understand the Government structure and to focus on the departments to avail the provided services.

The judiciary of the State is also online and having its own solution as per the needs of the citizens.

Green-Governance is the major achievement of the State. The eGovernance initiatives of the departments result in paperless services resulting in less carbon footprints. The services are cashless as well.

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Pradesh State Wide Area Network), Mukhya Mantri Seva Sankalp Helpline 1100, Chief Minister Dashboard, Online Parivar Register, Litigation Monitoring System, Aadhaar (UIADI), MyGov, eoffice, CSC SPV, Lok Mitra Kendra are in line with the overall e-Governance architecture of the state of Himachal Pradesh.

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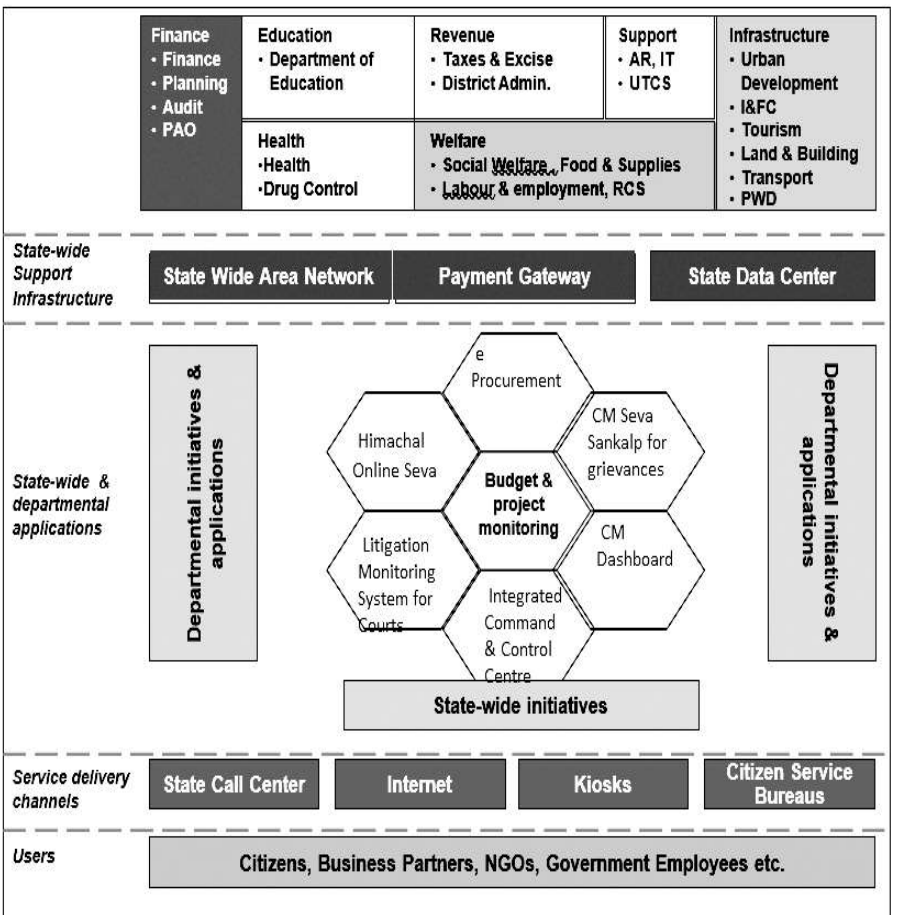

eGovernance road map of the State

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Examples of State level Institutional partnership plans

The eGovernance drive is supported via integration with Digital Locker, National Land Records, Parivar Register, Lok Mitra Kendra's etc. Himachal Online Seva is also supported through the PSG act (Public Service Guarantee Act). The Himchal Online Seva also known as e-District is also linked with Public Service Guarantee (PSG) Act of Himachal Pradesh to ensure timely delivery of services to the citizens. At the same time, the State Government has developed a portal named as 'Himachal Forms' and is available at http://himachalforms.nic.in. It is a Forms Repository having 50 Online Forms (including Forms pertaining to e-District Services) and 245 Fillable Forms. It acts as a single point source of information about all types of forms of organizations of Himachal Pradesh Government, which are required by citizens, business enterprises, employees, students to get benefit of Government services, transact any business, legal or regulatory purposes.

The State is also having its own IT Policy, ROW (Right of Way) Policy and Drone Policy. Similarly several eGovernance initiatives of the State are also having their own Security policy and privacy policy.

Key challenges faced in eGovernance journey

- In-efficient communication system in the Departments
- Lack of automated process in the Departments
- Computerization in silos at various Departments which is creating a bottleneck in sharing data with each other office.
- Partial automation of few services
- Most of the applications are developed by the own department, therefore, no Centralized repository of Master Database is present.
- Delay in turn-around time
- Lack of Infrastructure availability
- Lack of IT trained staff

RESULTS INDICATOR

A few Beneficial Outcomes

The Administration, agriculture, forests & environment, citizen-centric, social-welfare & grievance redressal services, EoDB (ease of doing business), eprocurement, education, training & employment, energy, water, food & civil supplies, health & well-being, housing, urban & rural development & transport, law, judiciary & police, revenue, finance & audit are also being covered parallelly.

Similarly, the major Stakeholders of eGovernance in the State are-

- State Department of Information Technology, Government of HP
- All Districts e-Governance Society

- Lok Mitra Kendra (CSC)
- CSC SPV's, SUGAM centres.

Common service delivery

The Lok Mitra Kendra's, SUGAM kiosks and the CSC kiosks and the cyber café's are the present common service delivery through resource sharing between departments as per the State level policies.

E-Governance best practices of the state

In the State, the significant practice of e-Governance serves as: a. Better service delivery to citizens b. Ushering in transparency and accountability c. Empowering people through information d. Improved efficiency within Governments e. Improve interface with business and industry f. Cost-effective and time-bound services.

ENABLER INDICATOR

e-Governance enabling processes

The idea that eGovernance is an object and defines the States of this country simply as facilitators or instruments of it. The internal transformation of a government into a Digital government is a new way of management of affairs, introducing positive transformational processes in management and the structure itself of the organization chart, adding value to the procedures and services provided, all through the introduction and continued appropriation of information and communication technologies as a facilitator of these transformations. The State is having its own RoW (Right of Way) Policy and IT Policy. The Public Service Guarantee (providing G2B and G2C services in a time-bound manner) is also unique in its own way. Similarly, the eGovernance initiatives are also having Privacy Policy and Security policy as per the initiatives requirement.

State level initiatives towards Capacity building for eGovernance

The State Level initiatives are also progressive towards capacity building. During the various stages of project development and deployment, various departments organize workshops for various stakeholders of the project. The stakeholders are also consulted for System Study, Process Re-engineering, Gap analysis, improvement area as well as effectiveness of the project. Video conferences, radio jingles/advertisements are also organized with various stakeholders from time-to-time and for user awareness. All the stakeholders and actors involved in the delivery of services also take active participation in Application UAT and all the recommendation/suggestions are incorporated in the application before final roll-out.

Emerging technologies relevant for the State

Various eGovenance applications are being developed using open-source tools, customized Java, JSF based form builder.

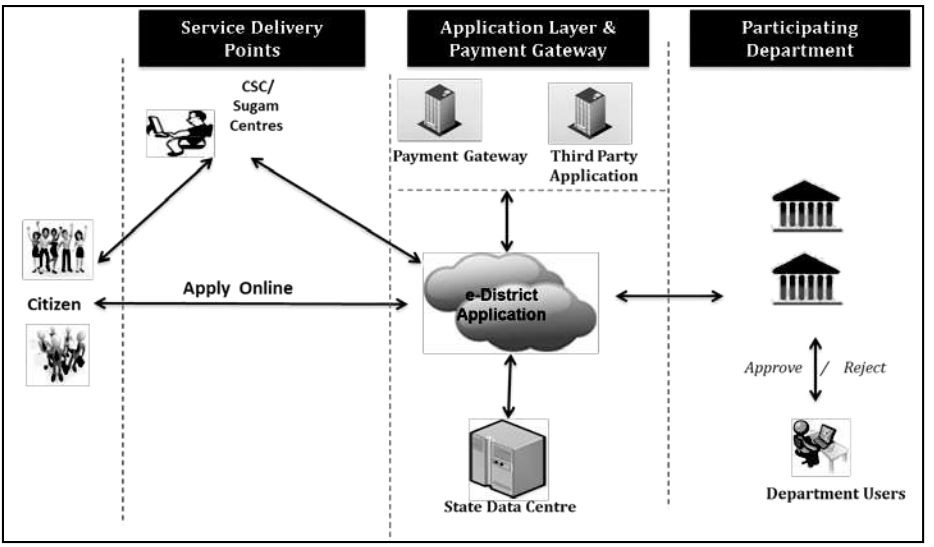
Unique features are listed below:

- Use of Open- Source tools and platforms
- Meta-data based applications- In certain eGovernance applications, the forms are created using said form builders which is also considered as a good product.
- Customizable e-Forms without programming - Any modification of fields in the form can be done from administration console. New application forms can also be created through administrative console and for that purpose field type, caption,

validation etc all can be selected from the dropdown available.

- Workflow Based System– eGovernance applications have workflow-based system. The entire process starting from verification of applicant details with the help of adhar, digi locker etc. are available within the eGovernance applications. It indicates that the approving/verifying authority may get the details of applicant verified against every request without coming out of the application which facilitate quick action on the submitted application and promotes the usage of eGovernance. All the business rules are defined through the workflow system and application routing takes place as per the roles defined. Any modification in workflow may be done through the GUI available in workflow system. Application may be configured as per the user department requirement. Various eGovernance initiatives are implemented to fully automate the service delivery and remove manual intervention.
- Maintenance of Audit Trail – The online eGovernance applications hosted at the State Data Centre are audited through the Third Party Auditor as well as at the department level also. All audit trail is maintained in the system and who, when, what etc. can be seen from the system.
- Two-way communication between applicant & department –A two-way communication process has been implemented in eGovernance in this State i.e., the eGovernance system of the State are having its own grievance redressal system to maintain the communication between the Government and the Citizen.
- SMS facility for any updation of application status – The eGovernance architecture is such designed that Application status may be tracked online or through mobile by sending SMS's or calling given toll free numbers and status of the applied service shall be sent back. Similarly, at every stage SMS's are being pushed for any update. If inadvertently wrong information is pulled from the Database, an alert message is displayed to applicant about mismatch of information in the era of eGovernance.
- Similarly, Departments can verify the authenticity of information from the linkages provided and the record displayed from the Database.
- Integration with Adhar, Digi Locker, Pariwar Register, Birth & Death Records – Similarly, e-Governance applications are integrated with Adhar, Digi Locker, Parivar Register etc. too and wherever such details are to be provided by applicant, the same may be selected from the Adhar, Digi Locker, e-Pariwar database and added to the applications. As we all know in most of the revenue certificate services, details of Land Records are to be provided by the applicant. In such scenario, family details mentioned in the Land Record (i.e. father's name) may be verified in the Pariwar Register before issuing the certificate.
- Integration with CSC's, LMK Portal & Payment Gateways – Payment Gateways and internet banking (credit cards, debit cards) have been integrated to facilitate online payments .Teh eGovernance initiatives are also integrated with LMK and eWallet of CSC & for facilitating VLEs (Village Level Entrepreneurs) to pay through their wallet and getting door-step delivery of eServices.
- In-built verification of applicant's credentials – Online verification is also done at Department level. Wherever possible, providing of supporting documents with application has been removed and online verification has been facilitated.

- An example of electronic service delivery of mechanism-



Shri Mukesh Repaswal, *Director IT, State Department of IT, Himachal Pradesh, dirit-hp@nic.in*

Shri Rajeev Sharma, *Additional Director IT, State Department of IT, Himachal Pradesh, dirit-rajeev.sharma@hp.gov.in*

SECTION - III
eGovernance Projects
Award of Excellence

DMF chhattisgarh online portal

Directorate of Geology and Mining, Govt. of Chhattisgarh & National Informatics Centre Chhattisgarh State Centre

Jai Prakash Maurya and Pratik Chandrakar

PROJECT OVERVIEW

Objectives:

- Enforcement of DMF guidelines
- Issuance of digitally signed Administrative Work Orders.
- Technical sanction and Geo Tagging of proposed work location
- Releasing funds with the Administrative Sanction
- Online Fund demand from work agencies
- FTO based Online fund transfer to work agencies
- Dual Digital signature on FTOs for the payments to work agencies
- Multiple modes of payment (like NEFT, RTGS, ECHALLAN)
- Centralized data repository for effective monitoring and analytics
- Capturing Geo-Tagged images for work progress
- Monitoring of work progress and Fund Utilization.
- Auto Reconciliation of funds with Treasury and Banks
- Enhancing paper-free transactions
- To make departmental work more transparent and better service delivery.
- Budget and Annual Plan.
- District DMF portal for each district.
- Helps to maintain the ratio of 60:40 for the allocation of funds in Directly and Indirectly affected areas respectively.

Scope of the Project:

- Functional Scope

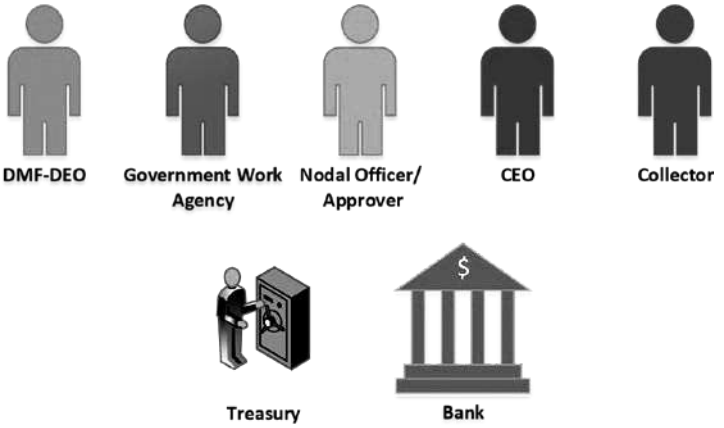
  The Government agencies/DMF DEO proposes the new work by entering the details of the work & submits the form. The submitted form is verified under the Nodal Officer's dashboard & after verification, the work proposal is forwarded to the Managing committee. The work, approved by the managing committee is sent further to Governing council for approval. The approved work proposal with the sanctioned amount is sent for draft creation to the DEO who prepares the draft for Administrative Sanction (AS), and forwards the same to the nodal officer. The draft of Administrative Sanction is verified by the nodal officer & sent forward to CEO recommending a suitable action. Now, the CEO verifies the draft & may recommend releasing the fund with the Administrative Sanction. The recommendation is forwarded to the Collector of the District for final approval. The Collector digitally signs the AS and FTO to release the amount.

- Geographical Scope
  - The DMF Portal has been implemented in the entire state of Chhattisgarh.

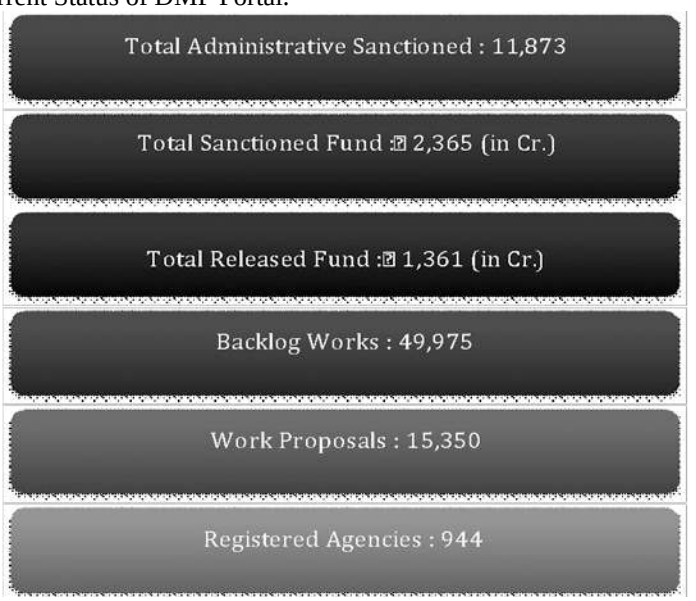
- Each district has a dedicated setup of DMF.
- Six Nationalized banks (including private banks) have been on-boarded on the DMF portal to cover the entire state and based on the branch availability and services, districts can choose the bank as per their choice for the DMF payment account.

- Intended Benefits:
  - The process of work proposal and its approval has been re-engineered and simplified.
  - Releasing of Fund is completely online and additional funds can be released only on the request of work agencies. Additionally, DMF may demand the UC (utilization certificate) with the fund demand before releasing the installment.
  - Multiple payments can be released in a single FTO (up to 100 transactions), which saves lots of man-hours as compared to the manual cheque-based system.
  - FTO based Online payment results in faster settlement and reconciliation. Additionally, the introduction of Echallan mode payment helped in quicker settlement with Treasury and RBI.
  - Work agencies can view the status of their Fund Demand in a transparent manner.
  - All approved documents are digitally signed along with embedded QR codes (except FTO) so that anyone can verify the orders by scanning them.
  - E-governance has brought accountability, transparency, accuracy, and efficiency to the system.
  - Real-time monitoring of ongoing works of department people at all concerned levels has been possible.
  - Geo-Tagging of work and work progress images has helped to monitor the work progress.
  - Monitoring of legacy work has also been incorporated into the portal.
  - Availability of UC and CC.
  - This system resolves many problems which were created by the geographical distance between the stakeholders. Now, all data and information of the whole state is available online for quick decision-making.
  - Digital record keeping requires less physical storage space, is ease of generating reports, easy to back up, keeps safe in case of fire or theft, and captures and accesses records on one go from different devices.
  - Multiple banks for Payment Accounts.
  - Error-free settlement of funds with the work agencies as the work agency has to submit their receiving account. The request for activation of receiving account is submitted to DMF, only after the digital signature by the respective agency. Additionally, Treasury Heads and DDO codes are verified from Treasury's online system through APIs.

- Stakeholders:



- Current Status of DMF Portal:



Hardware/Software

- Front End - ASP.net 4.7, Web API 2.0, Bootstrap, Jquery
- Database - MariaDB 10.4.6
- Additional Tools: NIC DSC Signer App (EDS), CaaS (Captcha as a Service)

Certification (Certifying Agency)

Yes, Security Audit Certification has been received from cert-in empanelled vendor AAA technologies ltd.

Disaster Recovery and Service Continuity

- Near DR has been configured for the database. In case of the failure of the primary database, entire services can be resumed with Near DR with Active Failover whereas the Application is hosted under Load Balancer.
- Far DR has also been configured with NDC.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	Brief service description with benefits	Volume (Nos) of Services year wise		
		2020-21	2021-22	2022-23 (upto date of nomination)
No. of Work Proposal	Agency proposes new work entering the details of work & avails the approval online.	497	10365	6460
No. of Administrative Sanction	Sanctions of work proposed by the agency are also digitally signed by the Approvers which takes only minutes to approve.	257	7105	4300
No. of Fund Demand	Number of Fund Demands raised by work agencies.	5	7313	7307
Amount of Fund Demand	Accumulated Amount of funds raised by agencies	0.19 (in Cr.)	709.46 (in Cr.)	770.48 (in Cr.)
No. of Work-in-Progress	Real-time updates entered by agencies on completion of work (% based)	1	536	880
Released Amount	Online FTOs approved by the DMF officials.	0.095 (in Cr.)	642.59 (in Cr.)	716.73 (in Cr.)
No. of Payment Transaction	No. of payment transactions completed successfully.	3	6995	7324
No. of FTOs	No. of FTOs initiated by all the Districts	3	3303	3472
No. of Backlog work entries	Offline work proposals entered by District's DMF offices	9987	1569	192

Implementation

The following list is the category of e-services with their targeted goals & achievements:

- New Work Proposal: 100%. Only online-received proposals are accepted.
- Administrative Sanction: 100%. Digitally signed Administrative are issued and works of amount more than Rs. 2,365 Cr. have been issued.
- Fund Demand by Agency: 100%. Additional funds can be released only against the online fund request.
- Fund Released: 100% target achieved. So far more than Rs. 1,360 Cr. has been released.
- District Portal for Each District has been created.

Improvements / Enhancements

- Dual DSC on FTO: Earlier DMF used to have DSC for FTO from the collector only, now from this year onwards, an addition has been made regarding DSC for FTO where CEO will also sign the FTO digitally after which it will be finalized & forwarded to the collector for approval.
- District rolls out: District rollout started on a Pilot basis from Durg -Raipur, after the successful execution; started for all districts.

- Anticipation of Approval: As per DMF rules collectors have the permission to approve any work of a certain capacity with prior approval of Governing Council. To accommodate such works, the portal has an option for Anticipation of Approval through which the nodal officer can forward the proposal to the collector for issuing Administrative Sanction.
- Geotagging of photos under Work Progress.
- Reconciliation with Treasury for Generating Acknowledgment receipt.

Improvement to be rolled out for next year:

- Mobile App for Work Progress.
- Implementation of DMF Portal 2.0 on the SPA framework.
- Amendment in Administrative Sanction.
- Plotting work and progress in GIS Map.
- Integration with Government's Sandes Platform for notification and alert service.

ENABLER

Processes Re-engineered

The government process has been Re-engineered and necessary government orders have been released to effect the following:

- The process of receiving work proposals has been re-engineered and only online acceptance is allowed.
- FTO-based online payment to work agency instead of offline payment.
- Auto generation of Payment receipt after reconciliation with Treasury and Bank.
- Dual Digital signature on FTO so that CEO and Collector both can sign the payment file for additional verification.
- Incorporation of ECHALAN mode of payment in FTO.
- GIS Tagging of Approved Works.
- Geo Tagging of progress images for effective monitoring and Geo Fencing.
- Online Technical Sanction.
- QR-based administrative sanctions can be verified using mobile app.

Technologies

- Use of Digital signature for administrative sanction, fund transfers & agency's self-declaration to make it authentic.
- Use of CaaS for Captcha, token-based API authentication & authorization for added security features.
- NIC E-mail & SMS alert for OTPs, Payment confirmation & work approval
- Integration with various banks & Chhattisgarh Treasury for effectual fund transfers to the agency.
- Geotagging of work images for acknowledging the status of work-in-progress.

VALUE INDICATORS

Learning's for sharing

- One of the learnings from this initiative is to involve every stakeholder from the concept stage. The department has conducted many consultative workshops

to design the system which actually helped all the stakeholders to own the system.

- Unless the department uses any online system as a single source of truth for monitoring its own employees' work, the implementation of the system will be difficult. A dedicated DMF Section has been set up at State Level which, closely monitors the activity and takes necessary actions.
- Availability of Bank Branch was a concern which was resolved by adding six nationalized banks, so that district authorities can choose the bank as per branch and service availability.
- Transparency in Audit & Action Plan, Budget.
- Using Dual Digital Signature for payment was one of the key challenges, also due to large diversity, it was very hard to make use proficient in using DSC. To overcome these, an in-house developed DSC utility was customized and integrated with the portal.

Digital Empowerment

DMF Portal: an e-Governance initiative, amending Government through empowering technologies:

- FTO-based Payment system, curtailing the use of papers & creating a paper-free transaction.
- In the legacy system, the CEO and Collector jointly signs the cheque to issue payment, to incorporate the same on digital payment Dual Digital Signature on FTO has been introduced.
- Bilingual portal as per the compatibility of users.
- In legacy system, reconciliation of Government payment takes lots of time and additional work has to be done by the respective DDO. To reduce the overhead and speed up the process, integration with Treasury has been done and Acknowledgement is auto generated after reconciliation.
- Email and SMS alerts.

Green e-Governance

The services under DMF Portal hold a productive approach to developing a paper-free digital environment for all the beneficiaries. Implementing digital signature-based documents, delivery of information via. E-mail & SMS using mobile apps etc. are the attempts in sustaining Green e-Governance.

Shri Jai Prakash Maurya, *Director, Directorate of Geology and Mining, dgm.cg@nic.in*

Shri Pratik Chandrakar, *Scientist-C, National Informatics Centre, pratik.chandrakar@nic.in*

Faceless/Contactless Services under eTransport Project

Ministry of Road Transport and Highways, Govt. of India & National Informatics Centre, New Delhi

Mahmood Ahmed and Joydeep Shome

PROJECT OVERVIEW

Objectives:

Transport Mission Mode Project (eTransport MMP) is driven by the Ministry of Road Transport and Highways (MoRTH) and executed by NIC. The project has four major components viz.

- Vahan: It provides a complete range of G-G, G-B and G-C services related to Vehicle Registration, Permit, Taxation, Fitness and allied processes.
- Sarathi: It is a one-stop work flow-based solution and totally web based centralized online application for the issuance of various types of licenses by the Transport Department.
- eChallan: It is a comprehensive solution for Traffic enforcement.
- Pollution Under Control Certificate: PUCC application is designed to connect all Vehicle Pollution Checking Centres which issue Pollution Under Control Certificates to vehicles as per Motor Vehicle Act.

As per new Central Motor Vehicle Rules (CMVR) provisions, enhanced focus is laid on citizen facilitation and convenience. Following the CMVR coupled with advancement in technologies, it is envisaged to elevate relevant online services under eTransport project completely faceless (contactless). This has been achieved through a mix of innovative technology and business process reengineering, along with extensive customisation in the flagship Vahan, Sarathi applications.

In effect, Faceless Services will enable citizens to avail the various transport related services in a completely online, contactless manner, from the comfort of their homes.

Key features and benefits of Faceless services:

- Completely Online Contactless Transport Services.
- No need to visit RTO at any stage of application- payment, document collection, etc.
- Leverages technologies and functionalities like Aadhaar authentication, eKYC, AI based facial recognition.
- e-Sign system, leading to faster verification and approval of documents and applications.
- After application approval, final documents dispatched by post to citizens.
- For selected services, approval is automatic and final document is downloadable.

As of today, Vahan offers 25 faceless services while Sarathi offers 28 Faceless services. Continuous efforts are going on to provide more and more services under eTransport project through Faceless mode.

Hardware/Software

Combination of Java Technologies including Java Struts framework with PostgreSQL, Spring Hibernate, Artificial Intelligence (Online proctoring).

Certification (Certifying Agency)

Yes. The security audit of eTransport website has been completed by a CERT-In empaneled auditor.

Disaster Recovery and Service Continuity

The performance of eTransport applications and services is ensured through centralised hosting at National Data Centre in

- Delhi and Bhubaneswar
- DC- NIC, Shastri Park
- DR- NIC, Bhubaneswar

The NIC Cloud (at NDC) provisions VMs, Security, Load Balancing, Licensing, etc. requirements on on-demand basis.

A dedicated DR facility of NIC helps in achieving optimum operational performance and high system availability. A Disaster Recovery Site is in place in a different seismic zone than the Data Centre.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	Brief service description with benefits	Volume (Nos) of Services year wise		
		2020-21	2021-22	2022-23 (Upto date of nomination)
Hypothecation Termination	Hypothecation termination refers to an application for making an entry of termination of agreement of hire purchase, lease or hypothecation agreement in the certificate of hypothecation	2,77,655	4,41,418	2,68,072
Transfer of Ownership	When a vehicle is sold, the name of the purchaser is noted as the registered owner in place of the previous registered owner and the process is known as transfer of ownership	35,355	3,16,686	2,54,812
Learner License	Service for applying for Learner's license	NA	27,98,577	21,36,084
Renewal of Driving License	Service for renewing expired Driving License	NA	12,09,111	5,99,135

Implementation

Vahan

Currently, 25 services under Vahan have been made Faceless and while these services are being adopted by States gradually, they are running successfully in 12 States. Delhi and Gujarat are leading with 17 and 16 Faceless services respectively. More than 21 lakh transactions have been done through Faceless services.

Sarathi

Currently, 28 services under Sarathi have been made Faceless in 17 States with Delhi, Gujarat and Punjab leading with adoption of 15,14 and 13 Faceless services

respectively. Around 80 lakh transactions have been done through Faceless services.

Improvements / Enhancements

Following features have been introduced:

- Completely Online Contactless Transport Services.
- No need to visit RTO at any stage of application.
- AADHAR based authentication and e-KYC of the applicant.
- e-Sign system, leading to faster verification and approval of documents and applications.
- After application approval, final documents dispatched by post to citizens.
- For selected services, approval is automatic and final document is downloadable.

Following services have been implemented in Vahan in the last one years:

- Additional LTT (TO Case)
- Alteration of Motor Vehicle
- Change of Address in RC
- Dealer Issue/Renewal of Trade Cert.
- Duplicate Permit
- Fresh Permit
- Hypothecation Addition
- Hypothecation Continuation
- Hypothecation Termination
- Issue of Duplicate RC
- Issue of NOC
- Non-Use Intimation
- Online Check post
- Online Tax
- Postal Fees
- RC particulars Against Fee
- Registration Certificate Fee
- Renewal of Permit
- Renewal of Registration
- Smart Card Fee
- Retention of Registration No
- Special Permit
- Temporary Permit
- Transfer of Ownership
- Transfer of Permit
- Transfer of Permit (Death Case)

Following services have been implemented in Sarathi in the last one year:

- Cancellation of NOC
- Change of Address in CL
- Change of Address in DL
- Change of Address in LL
- Change of Date of Birth in DL

- Change of Name in DL
- Change of Name in LL
- DL Extract
- Endorsement to drive Hazardous Materials
- Endorsement to drive in Hill Region
- Issue International Driving Permit
- Issue of Conductor License
- Issue of Duplicate CL
- Issue of Duplicate DL
- Issue of Duplicate LL
- Issue of Duplicate PSV Badge
- Issue of Learner License
- Issue of Learner License for AEDL
- Issue of NOC
- Issue of PSV badge to a Driver
- LL and AEDL
- Renewal of CL DL

Services planned to be implemented in coming year:

- Vahan
  - Duplicate Permit
  - Renewal of Permit
  - Renewal of Permit Authorization
  - Duplicate Fitness
- Sarathi
  - Change in Photo & Sign in LL
  - Information on LL (Extract)
  - Updation of Mobile Number in LL/DL/CL
  - Change of Date of Birth in DL
  - Change of Photo & Sign in DL
  - Issue of DL for Defence
  - AEDL for Defence DL Holder
  - Temporary PSV Badge to a Driver
  - Change of Address in CL
  - Change of Biomatrices in CL
  - Change of Name in CL
  - CL Extract
  - Issue of Temporary Conductor License

ENABLER

Processes Re-engineered

Situation prior to Faceless services:

- Crowded RTOs.
- Long timelines, multiple visits, tedious process.
- Tedious paperwork for citizens.
- Lack of transparency.
- Difficulty in implementing social distancing due to crowd.

Assessing these challenges, AADHAR based authentication & eSign, e-KYC of the

applicant and Artificial Intelligence have been employed for providing seamless and contactless services.

Situation post implementation of faceless services:

- Completely Online Contactless Transport Services.
- No need to visit RTO at any stage of application.
- e-Sign system, leading to faster and reliable verification and approval of documents and applications.
- After application approval, final documents dispatched by post to citizens.
- For selected services, approval is automatic and final document is downloadable through Parivahan portal.

Technologies

A highlight of the faceless service is the integration of the Artificial Intelligence based face recognition feature for authenticating the applicants specifically in the case of Learner License (LL) Test. Application uses AI-based facial recognition tool and Aadhaar database to ensure candidate credentials are correct. Additionally, there is a feature of Online proctoring through video capturing (AI Video processing) of the applicant taking the LL test.

Aadhaar is a well-established and universally accepted authentication mechanism and fulfills the criteria. The case of Aadhaar implementation gains strength from the recent MoRTH notification, wherein several States have requested for implementation of Aadhaar based faceless services.

Following is the list of technologies used:

- Aadhar based service eKYC and authentication via OTP.
- API based Integration with external agencies for data real time access and always in-sync ecosystem.
- AI-based facial recognition
- Online proctoring through video capturing.

People

The various features/ functionalities brought about by the Faceless services have been a welcome change, and there has been little to zero resistance, primarily attributed to:

- Penetration of smart phones and computers to every corner of the country, coupled with improved internet connectivity.
- Notification of CMVR provisions by the Ministry of Road Transport and Highways for enhanced focus on citizen facilitation and convenience.
- Strong implementation support from higher authorities in many States.
- Competitive spirit among States for providing greater citizen facilitation.

VALUE INDICATORS

Learning's for sharing

Before implementation of Faceless services following challenges were encountered by citizens:

- Crowded RTOs
- Long timelines, multiple visits, tedious process
- Tedious paperwork for citizens
- Lack of transparency
- Difficulty in implementing social distancing due to crowd

Learning from this challenges Faceless services were introduced.

To this end extensive customisations have been done in Vahan, Sarathi applications to

enable Faceless operations. Technologies like Aadhaar Authentication, eKYC, eSign, AI based Facial Recognition have been leveraged for faster adoption and facilitating seamless process.

This has resulted in elimination/minimization of RTO Footfalls, documentation and other procedural requirements for the various transport services (except for a limited number of services).

Benefits of a Faceless Service:

- Expedites ease of service delivery for citizens.
- Enables transparency in operations.
- Achieves improved efficiencies in service delivery lifecycle.
- Minimizes Red Tapism and Corruption.
- Enhanced ease of doing business for transporters and other stakeholders.
- Faster delivery of services.

Digital Empowerment

Digital empowerment starts with access to the digital world. It includes the ability to confidently participate in the digital world, and reaches its desired goal when citizens can voluntarily, proactively, and creatively use the services without trudging the offices of the Government.

Faceless services are a step towards the same where citizens are empowered to avail transport services through online medium as and when required without the need to visit the RTOs.

Example: Application for Learner's License

The applicant can apply for and obtain Learner's license online from comfort of their homes. To ascertain the identity, applicant's Aadhaar is authenticated along with AI based Facial Recognition through the system. During the test, applicant is further monitored through AI based proctoring solution. Once the test is successfully cleared by the applicant, Learner's license is auto approved and can be downloaded from the portal without visiting the RTO.

Green e-Governance

- The Faceless services have been precisely created to enable a paper-less services in Vahan and Sarathi.
- Complete process is online with no need to visit RTO. For availing services, the required documents can be uploaded online and upon verification documents like Learner's license, Permit etc can downloaded through the system.
- The services need very less infrastructure of its own, as it is integrated with other databases for sharing/ receiving data through APIs.
- Documentation is reduced significantly or eliminated, resulting in substantial reduction of paperwork.

Mr. Mahmood Ahmed, *Joint Secretary, Ministry of Road Transport and Highways, mahmood.ahmed@nic.in*

Shri Joydeep Shome, *Deputy Director General, National Informatics Centre, joydeep@nic.in*

Enabling Responsive Governance through Grievance Resolution

Chief Minister's Office, Govt. of West Bengal & National Informatics Centre West Bengal State Centre

P. B. Salim, Debmay Chatterjee and Mainak Mukherjee

PROJECT OVERVIEW

Drifting from traditional development paradigm, the State Government conceived the Project for action oriented public listening. A robust back-end user interface connecting 139 departments at the state level with 23 Civil Districts and 28 Police Districts and 4330 sub offices at Sub District level, has been developed under constant vigilance and supervision of the highest state administrative authority.

Attainable: The web application enables the ease of lodging grievances anywhere and anytime (24x7). A citizen can lodge a grievance via BSKs, phone, SMS, or email, seeking redressal of their issues.

- To ensure user convenience, multiple channels of communication are in place with several closer access points to make comprehensiveness of reach of faceless services including Online services, Pull/Push SMS, Email and dedicated Helpdesk.
- Utmost care is taken so that the services are provided in a comfortable environment through streamlined processes and committed, trained & motivated workforce.
- It is portable across all the browsers and provides a system generated unique registration number for each grievance. This web application has an easy grievance tracking facility by complainant name/ mobile no./ lodged date etc.
- Seamless data transmission among the various administrative units (Depts. / Offices/ Sub-Offices).
- Automatic triggering of SMS to stakeholders including status update.
- Dynamic color-coded dashboard facilitating easy monitoring and review.
- OTP based two factor authentications for accessing the portal providing convenience and security to users.
- Role based functionality and data access for better management in redressing grievance.
- Testimonials on various facets of grievance redressal are uploaded as good practices and easily accessible for replication in different domains of governance.
- Mandatory feedback before disposing grievance and classification of disposed grievance for undertaking in GPR and providing implementation level suggestions.

Making public service delivery more inclusive and transparent, this e-governance initiative, while redressing grievance within set service level, is continuously analyzing the public grievance/ feedback/ suggestions to provide meaningful insights. The data measures policy prescriptions and interventions of responsive governance, with the motto, "No one left out, No one left unheard."

This project relied on three pillars. Firstly, a comprehensive platform for lodging grievances pertaining to government programmes and its service delivery. Secondly, enabling people's access to the government through various new initiatives. The data

collected from the grievance help in formulating various outreach campaigns. 3561 Bangla Sahayata Kendras have been set up across the State coupled with government outreach campaign called Duare Sarkar being organized twice a year for delivering public services in camp mode. Thirdly, intensive analysis of data thus collected to understand public perceptions and gaps in government policies help in formulating policy and procedural modifications. Duare Sarkar & Paray Samadhan initiatives have benefitted more than 6.2 crore people till date, Duare Ration has benefitted more than 1 crore people, Pathashree scheme resulted in repair and construction of 14416 km roads. Bangla Sahayata Kendras works to bridge information gap experienced by citizens and facilitates them to obtain service online through digital interface. BSKs help people in getting all citizen-centric services free of cost, saving travel time and the cost of visiting government offices multiple times. In quantitative terms, the portal has resolved more than 11 lakhs grievances and 7.3 crores services have been delivered from the kiosks of the 7.8 crores service requests registered for disposal from 3561 BSKs across the State. BSK operators are found to have facilitated more than 1.94 crores services related to Registration for COVID-19 Vaccination followed by 1.1 crores services related to Universal Health Insurance (Sasthya Sathi), 91 lakhs eKYC seeding of Aadhar with ration card and 53 lakhs service requests for ensuring Food Security (Khadya Sathi) etc. For more details kindly refer to: https://cmo.wb.gov.in/writereaddata/CMRO/Programme%20and%20Policy%20Brief.pdf

Hardware/Software

Comprehensive Public Grievances Monitoring Platform is developed as web enabled application and hosted in the State Data Centre (SDC) with a robust infrastructure. The stakeholders access it through web browser (client application). The project is developed with ASP.NET 4.5 as Frontend and MS SQL Server 2014 as Backend Database. Database is mounted on Windows Server 2012.

The related ICT solution also constitutes of Java Script, CSS, Open-source reporting library iTextSharp, SMS gateway, Android based Java Application, Adobe Flash Player, IIS Web Server 7.0, XML and Service Oriented Architecture (SOA).

The platform is accessible through web browsers from PCs, Smart Phones as portal designed on responsive architecture. As the developed system is web based and deployed at a central location, it is easily accessible by all the stakeholders, anytime and anywhere. The platform is designed in such way so as to allow flexibility to scale up horizontally or vertically based on future needs and requirements of stakeholders. Stakeholders can navigate through any device accessible to them, wherever they are using a Windows/Mac/Linux PC, Apple iPad or an Android phone – Online. The contents are rendered to the stakeholders through web browsers in the form of html/html5, PDF, multimedia file formats (picture, video files). Messages/system alerts & process tracking information are served via SMS through integration with WB SMS Gateway.

Certification (Certifying Agency)

Comprehensive Public Grievances Monitoring Platform is developed & deployed as per guidelines for Open Web Application Security Project (OWASP). It is hosted at State Data Centre (SDC), and it is made available at https://www.cmo.wb.gov.in. As per SDC policy, the platform is made live only after getting Cyber Security Clearance Certificate from CERT-In empaneled agency Digital Age Strategies Pvt. Ltd.

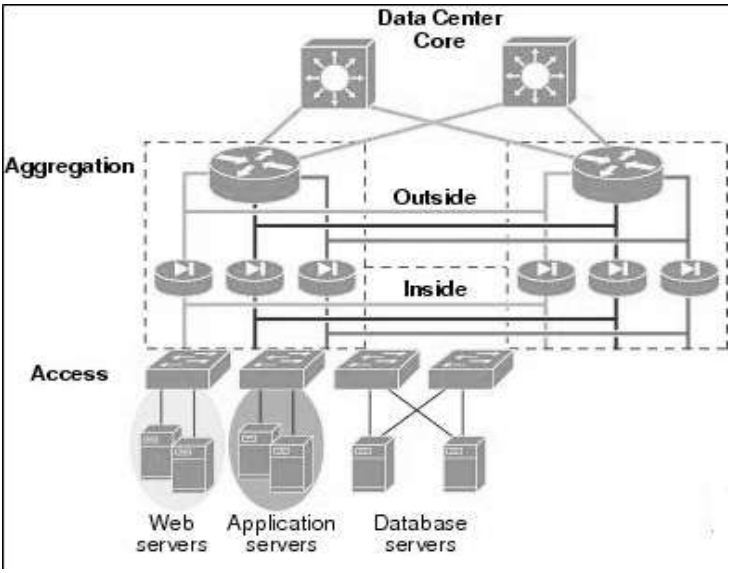
The major features of SDC are Storage Area Network (SAN), Rack based Infrastructure, Automated Backup & Restore, State of art Security, High Speed Redundant Internet Connections ensuring high availability and quick scalability.

The platform data is co-located in SDC servers in a highly secured environment, where

all the security policies are strictly adhered to. N/w Monitoring S/w (NMS) is in place. Firewalls and anti-virus Servers are functional to protect application & database against virus & hacking.

The portal uses standard Web technologies and techniques such as secure sockets layer (SSL), HTTP redirects, cookies, JavaScript and strong symmetric key encryption (MD5 Hashing) both in code level & database level, role-based access to deliver the service. All HTML and URL outputs are encoded.

It is security-audited initially by CERT–In empanelled agency Digital Age Strategies Pvt. Ltd. to ensure that it is not vulnerable to emerging application security threats. For faster processing needs and security measures, the platform is developed to allow view-based access control.



Besides, in the organizational level, following measures are taken:

- Chief Minister's Office has defined security roles and responsibilities to demarcate which employee needs to have access or modification rights to the information.
- Access control list is maintained, allowing the administrator to control stakeholder access.
- User credentials are sent to the users through SMS at his/her registered mobile number. Besides, the system follows password policy as prescribed by NIC Cyber Security Division.
- Internet security programs (antivirus software) are installed on each computer. Scheduled updating of antivirus software is mandatory.
- Regular training programs for user awareness on cyber risks are conducted.

Disaster Recovery and Service Continuity

PCs & peripherals, network equipment and internet connectivity are covered under extended AMC. The PWD IT team on site limits system downtime. The data server is maintained by State Data Centre, which has a dedicated Disaster Recovery facility

with DR sites located in Kolkata. Asynchronous replication over WAN using FC-IP protocol and seamless connectivity with DR site over 34 Mbps leased line minimizes any negative impacts to operations. All hardware equipments are maintained by in house IT personnel on a regular basis and in case of any emergency or disaster situation the service can be continued without any hassle. A dedicated team of Software developers and Software Support Personnel are involved in regular as well as emergency maintenance of the portal.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	Brief service description with benefits	Volume (Nos) of Services year wise		
		2020-21	2021-22	2022-23 (Upto date of nomination)
Grievance Redressal	Public Grievance Redressal	380044	192542	10353
Social Welfare Pension	Social Welfare grants (during pandemic), old age Pensions, Widow Pensions, Handicap Pensions etc.	5,09,104	14753	441

Implementation

Keeping in mind the lack of IT capability in the-then scenario and to ensure the adaptability of reengineered system, the department decided to follow the Gartner's 4-phase e-Governance model.

In the first phase, the roll out was done specific to a few key department and districts. Based on the feedback and live testing, a frequently asked questionnaire was designed which aided other offices to use the portal with ease. A dedicated team was assigned the task of handling queries and replying in time. Best practices like verification of latitude-longitude, sharing documentary evidence etc. derived from the first phase testing, were adopted. The real-time MIS module was tested for, and accordingly changes were made in the prescribed format to include more variables. The concept of assigning a nodal officer under the supervision of HoD to each office, ideated from discussions held with stakeholders.

The team at grievance cell makes outbound calls to the petitioners to check for data insufficiencies. Thereafter, the grievance is forwarded to the concerned Head of the Department. Based on the requirement, the HoD's forwards the grievance to the sub offices. The sub-office takes appropriate measures and submits the action taken report (ATR) to HoDs.

The HoD reviews the ATR and it is found to be conclusive in nature, then it is forwarded to the grievance cell for disposal. The team at grievance cell makes outbound calls to the complainant to assess the quality of grievance resolution and obtain feedback. Based on quality conformity, the grievances are disposed with one of the pre-formatted closure reasons and archived for further use. At every step of grievance redressal, status update is provided to the petitioner via SMS.

Internal evaluation studies as well third-party evaluation are periodically conducted to

ensure the set standards are adhered to. Automated status reports pertaining to weekly grievance disposal are shared with the stakeholders for better monitoring and course corrections. To evaluate the quality of grievance resolution, outbound calls are made to complainants for obtaining feedback. Gaps in service delivery are mitigated with the help of periodical reviews and qualitative assessment of grievance disposal.

The inputs received from grievances are used to design further outreach initiatives. The project insights helped the State government in formulating various outreach campaign like

- Duare Sarkar (Government at doorstep),
- Paray Samadhan' (community problem resolution),
- 'Duare Ration' (Public Distribution System at doorstep)
- 'Pathashree' (construction/ repairing of roads)
- Sneher Paras (Special assistance for stranded migrants during COVID 19 lockdown),
- Karma Bhumi (portal to collaborate between Job Seekers and Employers in IT/ITeS sector aftermath of COVID 19 lockdown).

During Covid-19 pandemic situation, the initiative assisted nearly 40 lakhs people in providing food and shelter and travel assistance to 20 lakhs during lockdown and 419 people during Ukraine crisis. During Super Cyclone 'Amphan', this portal handled more than 30,000 grievances pertaining to house damages, food and medical needs.

For more details kindly refer to:

- https://cmo.wb.gov.in/writereaddata/CMRO/Case%20Studies.pdf
- https://cmo.wb.gov.in/writereaddata/CMRO/Newspaper%20and%20outreach.pdf

Improvements / Enhancements

During the last 1 year the third (with 79464 camps) and fourth leg (55629 camps) of the Duare Sarkar Camps were successfully executed. More than 1.5 crore people visited the camps and registered their service requests. More than 1.2 crore applications were received out of which around 1.1 crore services were delivered during the campaign itself.

23 lakhs applications related to Lakshmir Bhandar (monthly assistance to all woman members of the household below 60 years), 12 lakhs health cards, 15 lakhs Aadhar card related assistance, 25 lakhs applications related to Bina Mulya Samajik Suraksha (schemes to benefit the unorganized workmen, free of cost) were processed.

9871 camps were held to take up community level issues through the Parae Samadhan Campaign, wherein almost 5 lakhs visitors turned up to get their issues addressed.

The project aims to increase the size of manpower and hardware resources by more than double in order to further improve the speed and quality of grievance disposal. The increased team size will aim to dispose the This will enable disposal of grievance on the very day it is received from stakeholders thereby reducing turnaround time.

ENABLER

Processes Re-engineered

Process Reengineering initiative through ICT

Besides redressal of grievances, the inputs from the public are constantly analyzed and used for process re-engineering of different flagship schemes of the government with

policy prescriptions and implementation level suggestions. These data analytics are shared with the policy makers and implementing authorities for conceiving various micro-schemes for including the excluded, making welfare schemes inclusive and dynamic.

The reengineering initiative involved the implementation of Information Technology enabled solutions for departmental processes. It was ensured through this platform and implemented with the technical assistance of National Informatics Centre.

G2C Services

- Robust Grievance lodging mechanism
- Availability of information related to administrative process flows for services rendered.
- Pendency checker and service request status information through the web and SMS services.
- Identify, design and implement massive outreach programs.
- Intelligently tweak existing programs for better reach and faster execution.

G2G Services

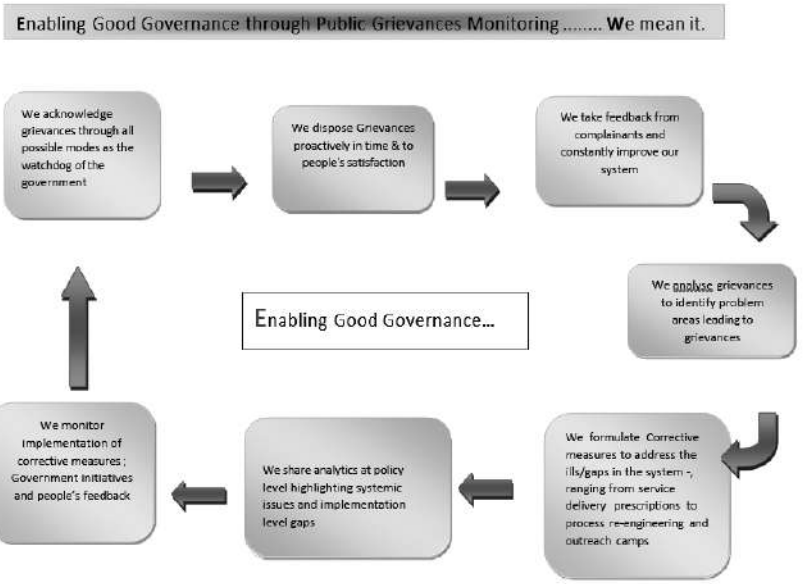
- Use of tools in data aggregation for administrative intervention and policy formulation.
- Streamlining and systematizing Inter-departmental and Intra-Departmental information resulting in increased efficiency in Administration, cutting down response times and delivering better services.
- Dynamic dashboards for officers for monitoring of pendency and traceability of grievances across the hierarchical set up for fixing up responsibility and accountability.
- Digital archiving of documents & information.
- Easy & error free record maintenance and data retrieval.

Specific Areas Re-engineered

The specific areas where processes have been re-engineered are:

- Workflow based System for Upload Grievance Data
  - Data from Multiple sources are collected and stored for validation.
  - A system has been developed for uploading data incorporating AI data validation.
  - Uploading of relevant documents.
  - Uploaded data are available in a common pool for forwarding.
- Workflow based System for Forward Grievance Data
  - Data from the common pool are analyzed and forwarded to corresponding offices.
  - The forwarded data are stored in the common pool of an office.
  - Office forwards the data to sub office for action taken report (ATR).
- Workflow based System for Achieve Redressed Grievance Data
  - ATR from the office is forwarded to CMO Grievance cell.
  - After successful redressal of grievances, they are closed and achieved.
  - Generation of Grievance Id. & Acknowledgement.
  - Auto-SMS to the Complainant acknowledging receipt of Grievance.

- Auto-SMS Alert to Officer-In-Charge with which Grievance is related.
- Auto-SMS sent to Complainant informing Action Taken



Technologies

The base of the initiative is big data managed with AI based algorithms, developed using python with Anaconda data frame. Initially data was managed with advanced excel technology but with increased volume, AI based data sanitation systems were adopted. Besides resolution of grievances within defined service levels, data analysis was carried out through ICT enabled Digital platform at https://cmo.wb.gov.in.

It involved steps like

- Data collection
- Data analysis
- Data modelling
- Data interpretation
- Data presentation.

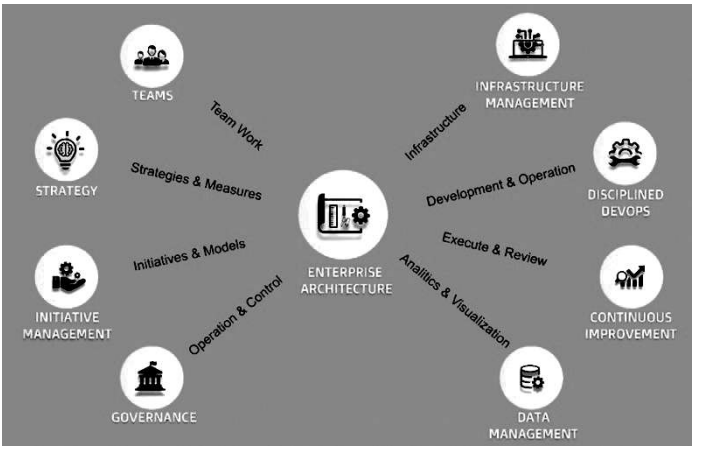
The analysis can be further broken down into subcategories like statistical analysis and diagnostic analysis of closed grievances. Descriptive analysis drew insights from past data by re-modelling it in ways which would make it more meaningful. Department wise or district wise analysis of grievances presented a synoptic over-view of performance.

The diagnostic analysis used insights gleaned from statistical analysis to identify patterns in the grievance data. This helped the analysts to use patterns embedded with older data, to solve current challenges. The analyst could draw conclusions from the disposed data set by selecting different samples. Disposed grievances which were homogeneous in nature are analyzed thoroughly and then conclusion are drawn, aiding in prescribing thus policy or implementation level changes. For more details kindly refer to: https://cmo.wb.gov.in/writereaddata/CMRO/Strategy%20Document.pdf

People

The success of a project in not only dependent on developing a good technology

enabled solution, but also in ensuring that the solution is citizen centric and the stakeholders reap benefits from the outcomes.



The project team recognized the importance of regular communication with all the stakeholders to understand their expectations and also to engage them for using its varied features. The project based its approach and methodology on the principles of USAGE that involved:

Uniformity	Uniform interpretation of law & procedures
Simplification	Simplification & Standardization of Backend & Frontend processes
Accessibility	Services at the doorsteps of Citizens– any time any where
Good Governance	Robust framework for enforcement activities and revenue reconciliation
Empowerment	Empowering the Citizens with information in transparent manner

Aligning all the Departments/ directorates, district authorities, police authorities, urban local bodies, connecting thousands of sub-offices across the State, in same footing, a Stakeholder Engagement Plan (SEP) has been in place since inception. Series of capacity building exercises were undertaken at State and District level during the initial phases of implementation of the project. Dedicated tele callers are deployed at grievance cell to answer all technical queries about the functioning of different modules of the grievance portal. Subsequently, when the module for submitting grievance from Bangla Sahayata Kendras (BSKs) (or Common Service Centres) was launched, all the Data Entry Operators (DEO) of BSKs were trained at sub-district level for providing this service to people. Further, physical/ virtual training is conducted at regular intervals from State level to discuss about new modules developed in the portal. IEC campaign through print and electronic media are undertaken to popularize the dedicated helpline number.

Capacity Building Exercises:

In the Duare Sarkar (Government on doorsteps in camp mode), BSK operators demonstrated the use of BSK portals to people and the various services on offer.

Capacity building exercises include specialized training for DEOs on cyber security, generating digital certificates, etc.

VALUE INDICATORS

Learning's for sharing

The project has been evolving in nature and necessary modifications are introduced from time to time to make it more dynamic and relevant.

First, public offices can be managed better with existing resources by judicious planning, incisive monitoring, and effective utilization of manpower resources.

Secondly, the project went deeper by analyzing root causes of grievances and thereby, highlighting interventions required to strengthen existing service-delivery mechanisms, launching pin-pointed schemes and massing outreach campaigns.

Thirdly, the response and trust reflected by citizens in the modified new system has instilled confidence that governance can be transformed and made more accountable through simple but effective interventions in analyzing citizen's but effective interventions in analyzing citizen's feedback and giving them direct access to good governance.

Fourthly, it is important to listen to people's needs and thus ground level reach becomes important to enhance ease and access of citizens to public services. This is what makes governance responsive and accessible.

Fifthly, Real time dynamic dashboards and downloadable MIS in various formats option was introduced to aid the department/district head in early detection of issues in service deliveries.

There is regular integration of citizens feedbacks into public service delivery module that is scalable and replicable across the States.

Digital Empowerment

In a participatory democratic framework, for instilling trust in the government by enabling direct people's access to connect with the highest authority, catapulted in undertaking this innovative Grievance Redressal project.

The need for the project:

- E-literacy became a primary challenge for people with minimal access to personal devices, accessibility, and internet connectivity at the grassroots, so multiple mode (through BSKs, Phone Call, SMS, email etc.) of lodging grievances helped the people from the remotest area with limited knowledge of e-literacy.
- The physical movement of files led to lost opportunities for the underserved. Monitoring public policies and grievances redressal remained a constant stumbling block.
- The historical barriers such as resources, opportunities, culture and practices, education levels, and social disparity added to a discrepancy in deliveries of public services.
- Accessibility hurdles for non- resident citizens of the state.

Use of ICT in the Grievance redressal system, Duare Sarkar and BSKs, help in classifying them as environmentally sustainable initiatives. The fact that the project is completely demand driven and by now integrated with the Government machinery, both horizontally and vertically, makes the project sustainable.

Any initiative that brings about a change, encounters resistance at various levels. This

project also faced issues like acceptability by people and an uncomfortable "go slow" approach of field level actors in the initial stages. Publicity, project's resilience during crisis situations, success stories, newspaper testimonials, massive outreach campaigns, robust and prompt feedback mechanism helped in building public trust. Alignment of all administrative units under one platform has never been an easy task. But inclusion of the Grievance Redressal Project as development mandate by the Honorable Chief Minister helped unfreeze the bureaucratic resistance.

For more details visit: https://www.youtube.com/watch?v=ylAFZT36v9M

Green e-Governance

In the present system, a grievance can be processed end to end electronically, thus ensuring green governance. All the ICT equipment's are maintained by PWD, IT on a regular basis to ensure optimum performance and increased longevity. Beside this the following measures are also taken as green computing practices:

- Purchase of energy efficient equipment from environmentally committed companies.
- Reduction in unnecessary use of energy like turning off peripherals and equipment's when not in use etc.
- The disposal process of ICT gadgets is done as per the Wet Bengal Government Rule. The West Bengal Electronics Industry Development Corporation Ltd, a PSU under the Department of IT&E, Govt. of West Bengal has been nominated as State Implementing Agency and State Level nodal Agency for e-waste management. WBEIDC is responsible for collection, segregation, recycling of e-wastes. As per the order of Honorable National Green Tribunal NGT O.A 673/2017 and A 727 / 2018 and guidance of the Department of Environment, Government of West Bengal. IT&E Dept, Govt. of West Bengal has installed e-waste bins at IT Parks in the state.

Dr. P. B. Salim, *Secretary, Monitoring & Co-ordination, Chief Minister's Office, West Bengal, pbsalim@gmail.com*

Shri Debmay Chatterjee, *Deputy Secretary, Programme Implementation and Grievance Cell, Officer, Chief Minister's Office, West Bengal, c.debmay@gmail.com*

Shri Mainak Mukherjee, *Scientist-F, Senior Technical Director, National Informatics Centre, West Bengal, mainak@nic.in*

Uttar Pradesh Chief Minister's Discretionary Fund

Chief Minister's Office, Govt. of Uttar Pradesh & National Informatics Centre Uttar Pradesh State Centre

S. P. Goyal, Vishak G. Iyer, Prathamesh Kumar and Hemant Arora

PROJECT OVERVIEW

The objective of this project is to help those families of Uttar Pradesh who need financial assistance. This assistance is provided to poor citizens and their families who require emergency medical health related treatments for life threatening Illness and also to those who have lost their sole bread earning member.

The Chief Minister's Discretionary Fund provides financial assistance to needy individuals for treatment of major ailments like cancer, cardiac surgery, kidney transplant, brain tumor, liver & multi organ failure etc. Apart from this, the main aims are:

- Assistance to helpless, handicapped, weak or destitute sections.
- Assistance to institutions engaged in social and cultural work.
- Financial assistance to the needy individuals for the treatment of major ailments.
- Assistance for the construction of non-government educational institutions
- Assistance to the aggrieved family on the death of the earning member of a poor family in accidents/major crimes/ boat sinking / snake bite etc.
- Assistance to the persons or families suffering from loss to property due to natural calamities.
- Needy people injured in accidents.
- Taking donations online for this Discretionary Fund via the same website.

This whole process of availing Discretionary Fund has been made completely online and has been built incorporating e-governance aspects which has made the whole process faster, needing fewer resources, transparent and accountable. The whole process has been transformed into an online process which has cut down the time taken from applying for this grant to getting the amount disbursed to the respective hospitals into less than 10 days. There is an app/website which is developed to easily track the application and thus, saves the citizen's time and effort. The documents and the application forms are transferred via online portal. Also, the funds are directly disbursed to the respective beneficiary/hospital's Bank Account through RTGS. The GO is issued automatically online with no separate process. The details and GO link is sent to beneficiary through SMS.

Individual WhatsApp groups have been made for the stakeholders such as Hospitals WhatsApp groups, DMs WhatsApp groups etc. so that faster resolution of technical difficulties can be done.

Geographic spread and current status:

Total number of Districts under this scheme	75 districts
Population intended to benefit (in %age)	40% of 240000000 citizens of the state
Population Actually benefitted till	1,28,572 citizens of the state

date (in %age)	(0.054%)

Hardware/Software

- The portal is developed using Open-Source Technology and hosted at Cloud.
- JAVA 1.8 and SPRING BOOT framework develop faster and easier web application and services.
- MAVEN 3.0 to improve performance, automatic parent versioning, parallel builds,
- HIBERNATE 5.0: provides a framework for mapping an object-oriented domain model to a relational database. Database: PostgreSQL database free and open-source relational database management system emphasizing extensibility and SQL compliance.
- Integrated with BANKS (Central Bank of India and State Bank of India) for accepting donation to CM Relief Fund.
- GOI. SANDES app for sending messages SMS API integration for sending SMS to various users of portal.

Tools used: STS IDE, STS is an Eclipse-based development environment that is customized for the development of Spring applications.

Certification (Certifying Agency)

- OWASP Top 10 guidelines are followed for improving software security.
- Security audit is done on every new development/updation, and vulnerability is fixed against each vulnerability reported in security audit report.
- Site is running under SSL (secure socket layer), a standard security technology for establishing an encrypted link between a server and a client.
- Postgres: Proper user access role is defined and postgres is SSL configured.
- Access of servers is done through secured VPN which provides a secure tunnel virtual tunnel. Which allows only authorized traffic.

Disaster Recovery and Service Continuity

Data is maintained at remote cloud based NIC server 'MEGHRAJ' with local backup at regular intervals and replication to avoid disaster and hence is well protected from all emergency situations.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	Brief service description with benefits	Volume (Nos) of Services year wise	
		2021-22	2022-23 (Upto date of nomination)
Beneficiaries who have availed this service	Beneficiaries registered online and their application was approved for disbursement of the required amount	22176	13587
Amount	The amount disbursed to	₹3905250365	₹2352922026

sanctioned to beneficiaries	applicant		
Amount utilized by beneficiaries	The amount utilized to treat applicant	₹891849062	₹99060549

Implementation

Implementation Model:

- All references to be forwarded online to District Magistrates of concerned districts through Integrated Grievance Redressal System (IGRS).
- All ATRs of applications received at DM / GoUP level, to be sent online to Hon'ble Chief Minister Office.
- All approvals/rejections of applications from concerned authorities in Hon'ble Chief Minister Office should be provided online and the approved applications move to higher authorities with the digital signature.
- Grant to be disbursed directly from Hon'ble Chief Minister Office to respective Bank Accounts through direct bank transfer (RTGS/NEFT) mode.
- Hospitals are given online access to provide utilization certificate, request for additional funds etc.

Situation before the Initiative:

- Before GPR, the overall time required for the process from applying for this grant to getting the amount disbursed to the respective Hospitals account used to be more than a month.
- There was lack of transparency and accountability in the process.
- Citizens were not able to track the current status of their application easily and were forced to visit district headquarters repeatedly.
- Physical application form along with all the necessary documents were handled and transferred to higher level authorities in the form of Files which resulted in wastage of manpower, time and paper.
- There was also the chance of documents being misplaced during handling.
- Opaqueness of the process and long time duration forced the applicants to send repeated application forms, processing of which again resulted in additional wastage of manpower, time and paper.
- Many a times, the citizen did not get the grant timely which resulted in deterioration of their life-threatening medical condition.
- As there were no process of reconciliation, huge amount of unutilized grants were left with hospitals in case of death of the patient due to un-timely disbursement of grant.
- Various middlemen were involved illegally which resulted in extra cost to be incurred by the poor citizen, as they were deprived of the necessary information about the whole process.
- Donation to The CM Discretionary Fund could be made only through Demand Draft or cheque which was then submitted in treasury in physical form.

Situation after the Initiative:

- After GPR, the whole process has been transformed into an online process which cut down the time taken from applying for this grant to getting the amount disbursed to the respective hospitals into less than 10 days.

- As this whole process was taken online, beneficiaries could easily track their application status via app/website.
- Due to this online process, citizens were less likely to visit their respective district headquarters thus saving their time, effort and money.
- Due to online process of movement of files, a lot of manpower, time, paper and other resources were saved.
- There is no chance of application and their respective documents to be misplaced.
- Duplicity of application forms was not an issue in this online process.
- Timely disbursement of the required grant was possible.
- Also, there is no scope of middlemen being involved in this whole process.
- Now there is an established process of reconciliation of funds released to hospitals which has resulted into returning of unutilized funds by various hospitals to CM office.
- Linking of beneficiaries to their Aadhaar made this process less likely to be misused by miscreants for getting repeated grants.
- Donation to The CM Discretionary Fund is possible via banks directly.

Improvements / Enhancements

- Integrated with DDO portal for beneficialy addition, bill generation and processing, UTR No. generation and release of funds.
- Integration with U.P. RAJKOSH through this Hospitals can return the excess amount to the govt. account.
- Integrated with BANKS (Central Bank of India and State Bank of India) for accepting donation to CM Relief Fund.
- GOI. SANDES app for sending messages.

ENABLER

Processes Re-engineered

Process Flow Before Government Processes Re-Engineered

Citizen-> Physical submission of application form and necessary documents in District Headquarters (District Magistrate) or Hon'ble Chief Minister Office-> Calling of eligibility reports by CM Office from District Magistrate -> Offline Reports submitted by Sub-divisional officers and approved by District Magistrate -> Application, report and documents were processed in physical file to obtain approval from higher officers -> list of beneficiaries with sanctioned amount against their names was generated -> Signature of Hon'ble Chief Minister was obtained over the list -> Demand drafts prepared by Hon'ble Chief Minister Office and sent to respective hospitals-> Hospital confirms grant received-> Treatment of the citizen started. Initially 12 processes were followed through physical channels.

Process Flow After Government Processes Re-Engineered

Citizen->Physical submission of application form and necessary documents in District Headquarters (District Magistrate) or Hon'ble MP/MLA or Hon'ble Chief Minister Office->Entry into online portal->Online forwarding to District Magistrate-> Online forwarding to Sub-Divisional Magistrate->Report is submitted by SDM and is approved by DM online -> Application, report and documents are processed in e-file to obtain approval from higher officers -> list of beneficiaries with sanctioned amount

against their names is generated online -> Signature of Hon. Chief Minister is obtained over the list -> Grant disbursed directly from Hon'ble Chief Minister Office to respective hospitals Bank Accounts through direct bank transfer (RTGS/NEFT) mode -> Treatment of the citizen starts.

80% of the processes have been re-engineered which has reduced the number of processes to 10 and all these 10 are online.

Technologies

- The portal is developed using Open Source Technology and hosted at Cloud.
- JAVA 1.8 and SPRING BOOT framework develop faster and easier web application and services.
- MAVEN 3.0 to improve performance, automatic parent versioning, parallel builds,
- HIBERNATE 5.0: provides a framework for mapping an object-oriented domain model to a relational database. Database: Postgre SQL database free and open-source relational database management system emphasizing extensibility and SQL compliance.
- Tools used: STS IDE, STS is an Eclipse-based development environment that is customized for the development of Spring applications.

Through API:

- Integrated with IGRS for application status tracking and bill processing via DDO portal.
- All the approved Chief Minister Discretionary Fund beneficiary related applications received at IGRS portal will show up at CMRF portal for further processing and same is available at hospital login.
- Integrated with DDO portal for beneficially addition, bill generation and processing, UTR No. generation and release of funds.
- Integration with U.P. RAJKOSH through this Hospitals can return the excess amount to the govt. account.
- Integrated with BANKS (Central Bank of India and State Bank of India) for accepting donation to CM Relief Fund.
- GOI. SANDES app for sending messages SMS API integration for sending SMS to various users of portal.

People

Government officials involved in this project were trained through webinars / Video Conferencing. What's App groups of covered hospitals and all Nodal Officers in all Districts of UP, are formed. This resulted in greater capacity building and far-reaching awareness among government officials. The communication among the officials involved is through e-portal which reduced the time and paperwork involved. Government Order was issued describing the detailed process of the online mechanism to be followed.

Individual WhatsApp groups have been made for the stakeholders such as Hospitals WhatsApp groups, DMs WhatsApp groups etc. so that faster resolution of technical difficulties can be done.

VALUE INDICATORS

Learning's for sharing

There were initial challenges faced while integration with different portal using API

which were later resolved after coordination and discussion.

From all the key learnings, key parameters were incorporated to make the process robust and efficient:

- Availability of the Service (uptime).
- Response time.

For quality check, the monitoring of service provided is done at each level.

Various technological interventions were incorporated to make the process transparent and accountable-

- Integrated with DDO portal for beneficiary addition, bill generation and processing, UTR No. generation and release of funds.
- Integration with U.P. RAJKOSH through this Hospitals can return the excess amount to the govt. account.
- Integrated with BANKS (Central Bank of India and State Bank of India) for accepting donation to CM Reflief Fund.
- GOI. SANDES app for sending messages.

Digital Empowerment

The whole process has been transformed into an online process which cut down the time taken from applying for this grant to getting the amount disbursed to the respective hospitals into less than 10 days. This makes this accessible to any citizen from any part of the state: urban as well as rural.

As this whole process was taken online, beneficiaries could easily track their application status via app/website. This makes it easier to track the status, at any point of time, from anywhere. Reduces wastage of money, paper, and efforts.

Green e-Governance

- As this whole process was taken online, beneficiaries could easily track their application status via app/website.
- Due to this online process, citizens were less likely to visit their respective district headquarters thus saving their time, effort and money.
- Due to online process of movement of files, a lot of manpower, time, paper and other resources were saved.
- There is no chance of application and their respective documents to be misplaced.

This process is this a huge step in Green E-Governance where E-Governance reduces the paper wastage and makes the process more efficient.

Shri S. P. Goyal, *Additional Chief Secretary to Hon. Chief Minister, Chief Minister's Office, Uttar Pradesh, spgoyal@nic.in*

Shri Vishak G. Iyer, IAS, *DM Kanpur (Former Special Secretary, Hon. Chief Minister, Chief Minister's Office, Uttar Pradesh), dmkap@nic.in*

Shri Prathamesh Kumar, *Special Secretary, Secretary to Hon. Chief Minister, Chief Minister's Office, Uttar Pradesh, pkprantha@gmail.com*

Shri Hemant Arora, *Senior Technical Director, National Informatics Centre, Uttar Pradesh, hemant.arora@nic.in*

eSanjeevani - National Telemedicine Service

Ministry of Health and Family Welfare, Govt. of India & C-DAC, Mohali

Govind Jaiswal and Sanjay P. Sood

PROJECT OVERVIEW

eSanjeevani – National Telemedicine Service, is an indigenous initiative of the Ministry of Health & Family Welfare, Govt. of India. A technological intervention that leverages the might of Information Technology to enable remote doctor consultations, eSanjeevani aims to extend the reach of health services to the recesses of the Indian population. It has been deployed in two modes:

- eSanjeevaniAB-HWC: A Doctor-to-Doctor telemedicine system under Ayushman Bharat Scheme of Govt. of India at Health & Wellness Centres, to provision specialised health services in rural areas and isolated communities. It was launched with an intent to alleviate the Urban-Rural divide in terms of health services. This variant operates on an efficient Hub-and-Spoke Model.
  The 'Health and Wellness Centres (HWCs)' set up at State Level act as Spokes, aligned to the HUB of Doctors (comprising MBBS/ Speciality /Super-Speciality doctors) at Zonal level. This enables a patient residing in the remotest of the places to avail quality health services by connecting him/her to expert doctors and first-rate Health Services. eSanjeevaniAB-HWC has accounted for 54,078,871 consultations so far. Currently, 102,766 HWCs are acting as spokes.
- eSanjeevaniOPD: A Patient-to-Doctor, telemedicine system to enable people to get outpatient services in the confines of their homes. This variant was launched during the peak of COVID 19, with an aim to provide safe Doctor-to-Patient consultation. Since then, it has continued to grow in demand, even in the post-lockdown scenario. People have taken well to this service, as it allows them to consult doctors from the comfort and confines of their homes, bypassing things such as: Wait time, Travel, Infection Risks, etc. Average consultation on the eSanajeevaniOPD platform is a staggering 9550/Day and cumulatively it has accounted for 8,633,457 consultations.

eSanjeevani network is operational in 36 States. Over 207,392 doctors and paramedics have been trained and onboarded. 1,122 online OPDs have been set up on eSanjeevaniOPD. Till date, around 62 million consultations have been done and daily around 2 Lakh + patients are served through eSanjeevani. By now, it has established itself as a parallel stream of healthcare services delivery.

This first of its kind, telemedicine system pursues to take forward multiple welfare initiatives of the country, be it the newly launched National Digital Health Mission, or the Digital India Initiative, the National Rural Health, and of course the Ayushman Bharat Mission. eSanjeevani is also an apt exemplification of the 'Make in India' initiative as it has been developed indigenously by the Mohali based Centre for Development and Advanced Computing (C-DAC), a Scientific Society of the Ministry of Electronics and Information Technology.

Hardware/Software

eSanjeevani is a cloud-based telemedicine system – it has been developed using open-source tools/stack. It uses third party services as well these are:

- Open-Source Stack
- Hosting – Amazon Web Services

- Video Consultations – People Link for Video Consultations (Audio-Video)
- Bulk transactional SMS Service – SMS Gateway, MSDP, GoI

T A. Technology Stack:

- Front-end: Angular 6.0 with Typescript, HTML/CSS, Bootstrap 4
- Server-end: .Net Core 2.2, SignalR, JSON, Restful API (Using JWT Token)
- Database: MySQL 8.0.23
- Security: JSON (JavaScript Object Notation) web technology is used for signed content using JSON data structures including claims to be transferred for authentication. Claims in JWT (JSON Web Token) are encoded as a JSON object that is signed & encrypted using HMACSHA security algorithm.

Hosting:

eSanjeevani has been deployed on MeitY, GoI approved secured Amazon Cloud (Amazon Web Services), the application is scalable and secure. The servers are in Amazon's data Centre in Mumbai.

- Infrastructure as a Service (IAAS) for the following workloads:
- 8 Application Servers with configurations (4 vCPUs 32GB RAM) are load balanced with a round robin algorithm with sticky sessions being configured.
- 2 SNOMED Servers with configurations (LINUX, Apache Tomcat) - 8 vCPUs, 3.1 GHz, 32GB RAM.
- CDN Services are consumed with POPs across the country to reduce latency of the static and dynamic content of the application.
- DynamoDB services are being consumed to validate the user login sessions.
- Platform as a Service (PAAS) for the following workloads:
- DynamoDB – NoSQL Database
- Database Services RDS-Managed Service (MySQL) –
- RDS-Master (32 vCPUs, 128GB RAM) for all Read-Write requests.
- 2 RDS-Read Replicas (32 vCPUs, 128GB RAM) for Read Requests from specific application Modules
- RDS-Read Replica (32 vCPUs, 128GB RAM) for Read Requests Reporting
- Storage Bucket: 4.7 TB
- Amazon Simple Storage Service (Amazon S3) is an object storage service that offers industry-leading scalability, data availability, security, and performance. We are storing scripts, backup data, cfg templates, logs, reports, docs.
- Software as a Service (SAAS) for the following workloads:
- WAF Security:
- REDIS:
- CloudWatch:
- IAM, Security Groups
- VPN Gateway
- Logging Services
- Application Performance Monitoring

Video Conferencing: Video Consultation (Audio-Video, full-motion, full colour) is enabled through – People Link's services (Hyderabad-based).

Bulk SMS Services have been enabled using SMS Gateway of MSDP, GoI & NIC, GoI – to send OTPs, notifications, and alerts to users.

Certification (Certifying Agency)

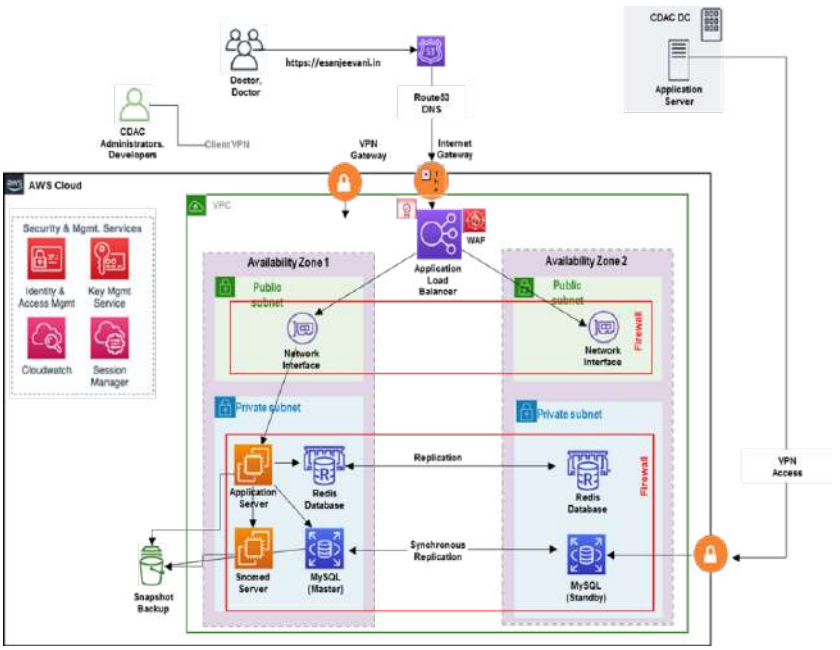
The process to make eSanjeevani complaint with the best Cyber Security practices is currently underway and the formal certification is expected very soon.

Disaster Recovery and Service Continuity

For a disaster event based on disruption or loss of one physical data center, a highly available workload in multiple Availability Zones within a single AWS Region has been implemented to help mitigate against natural and technical disasters. Continuous backup of data is ensured within this single Region to reduce the risk to human threats, such as an error or unauthorized activity that could result in data loss. Backup with point-in-time recovery is available through the following services and resources:

- Amazon DynamoDB backup
- Amazon RDS snapshot

Each AWS Region is comprised of multiple Availability Zones, each isolated from faults in the other zones. Each Availability Zone in turn consists of one or more discrete physical data centers. To better isolate impactful issues and achieve high availability, workloads partition across multiple zones in the same Region has been done. Availability Zones are designed for physical redundancy and provide resilience, allowing for uninterrupted performance, even in the event of power outages, Internet downtime, floods, and other natural disasters. The implemented architecture for this is depicted in the image below:

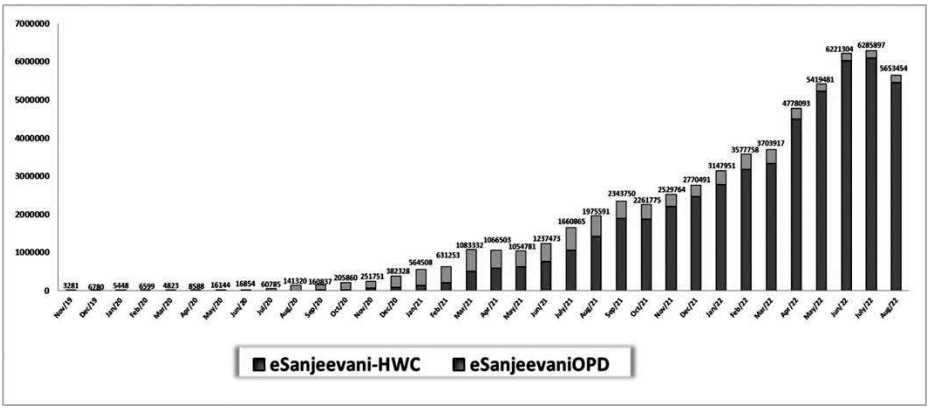


eSanjeevani is built using world class, robust, and state-of-the-art IT infrastructure. It is deployed on cloud and has disaster recovery centres in different seismic zones of the country with the purpose of safekeeping of data at multiple points, in case any unforeseen situation may arise.

Since its launch, the downtime of the service has been negligible. It assures an uptime of at least 99.5% which goes on to prove the round-the-clock and perpetual availability of the service, thus proving that the service is not vulnerable to any natural disaster or unforeseen situation. On the contrary, it will aid the country in these situations by giving people access to uninterrupted healthcare facilities.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes



Name of e-Services	Brief service description with benefits	Volume (Nos) of Services year wise		
		2020-21	2021-22	2022-23 (Upto date of nomination)
eSanjeevaniAB-HWC	Doctor to Doctor teleconsultation modality	Please refer attached graph	Please refer attached graph	Please refer attached graph
eSanjeevaniOPD	Patient to Doctor teleconsultation modality	Please refer attached graph	Please refer attached graph	Please refer attached graph

Implementation

eSanjeevani is being implemented in Hub & Spoke model at 1,55,000 Health & Wellness Centres (HWC) under Ayushman Bharat (AB) Scheme world's largest health insurance plan. It has already been operationalized at 102,808 HWCs and over 207,392 paramedics and doctors have been trained and onboarded. At present it is operational in 36 States/UT in Pan India level.

Improvements / Enhancements

Improvements/ enhancements specifically rolled out during the last one year:

- Integration with populace scale applications like AarogyaSetu
- Integration with DVDMS/eAushadhi system for real time availability of generic drugs at HWCs
- Push ePrescription in third part healthcare system for home delivery of medicines in State of Andhra Pradesh & Gujarat
- Integration of diagnostic devices
- ABDM (M1& M2) integration

Improvements/ enhancements planned to be rolled out during next one year:

- Micro Services architecture based eSanjeevani 2.0
- Unified application (HWC & OPD)
- Multilingual
- Follow up process enabled
- ABDM integration (M3)
- UHI integration.

ENABLER

Processes Re-engineered

Key processes re-engineered were:

Numerous Government processes were re-engineered through eSanjeevani. The primary process re-engineered was transforming a real face to face in person consultation into a virtual remote teleconsultation. This massive transformation was affected by meticulous deliberations and studying the existing processes. The guiding philosophies those enabled the process re-engineering were 1. remote consultations must mimic traditional face to face in person consultations at an OPD. 2. To encourage patients to use this virtual medium it was decided that the entire process must be public centric and user friendly. 3. Since eSanjeevani pertains to telemedicine that is health information the system must be safe and secure and must ensure appropriate privacy and confidentiality.

Automation was used to re-engineer a process to reduce patient waiting time. Patient's Time between registering and actually entering into a consultation with the doctor was managed creatively. As per the re-engineered process after registering the patient was not held in the system, a SMS based notification system was enabled that invited the patient to log in into the system only close to his / her turn thereby saving lot of time.

Standardisation in use of clinical nomenclature lead to simplification of analysis of health-related information by policy makers and health administrators. SNOMED CT (Systematised Nomenclature of Medical & Clinical Terminology). This not only simplified the use of eSanjeevani the power of SNOMED CT lead to analytics and medical insights and also facilitated data driven decision making besides making the system interoperable in various ways.

Technologies

eSanjeevani - National Telemedicine Service is an enterprise wide system that has enabled paradigm shift not only in the way health services are delivered but also in a manner as they are availed. Data Analytics in basic form enabled patients to save time and also enabled health administrators to plan deputation of doctors on the system. The potential of Social media was tapped appropriately, posts are being regularly tweeted, video tutorials and adverts have been created for people to understand the platforms. Medical Internet of things have further enriched the system by interfacing it with an integrated diagnostic device that runs / conducts Point of Care tests and Rapid diagnostic tests and populates patient record wirelessly.

People

C-DAC, Mohali applies such an approach that it allows for immediate execution of the project. (Turnkey approach)

Doctors and Paramedics are trained on dates that are convenient to them. The eSanjeevani's Technological support team instructs users as well as Master-Trainers (remotely) on the Demo application. After training, a dry run is conducted with dummy patients for around a week to ensure that the users are familiar with eSanjeevani. The profiles of users are then created on eSanjeevani (production server).

Nomination of State Admin/State Nodal Officer for Telemedicine at Health & Wellness Centres/Hub/OPD is also done and a list of health facilities, ready for operationalisation of telemedicine is shared with C-DAC Mohali.

The expertise and calibre of the people at the ground zero (C-DAC in this case) has

been for the smooth functioning of the service.

Ofcourse, needless to mention, without the support of the government, the reach and success of the service would not have been possible. The popularity and gained credibility of eSanjeevani was a result of the Top-Down effect of the Ministry of Health & Family Welfare, Govt. of India approach wherein IT favourable policies, market conditions, rules were framed combined with the leadership of the elected representatives as well as the Bureaucracy.

VALUE INDICATORS

Learning's for sharing

World over, healthcare delivery systems have been grappling with numerous challenges. Key challenges are shortage of human resources and shortage of hospitals and beds. Besides this, the Indian healthcare delivery system is facing another serious challenge of uneven distribution of health services in rural and urban areas, based on the populace residing. According to the 15th Finance Commission Report, 1 allopathic doctor in India caters to at least 1511 patients. A major reason that can be attributed to this statistic is that the presence of doctors is heavily skewed on the side of Metro and big cities. This had generated a kind of healthcare asymmetry due to which the vast population residing in the rural areas had to suffer. Over two-thirds of the Indian populace resides in rural areas, whereas over seventy percent of healthcare facilities are set up in urban parts of the country.

As posited by experts, telemedicine is a powerful IT application that can address some of these longstanding issues and democratise healthcare.

Accordingly, eSanjeevani has been able to address the following challenges that were faced before the deployment/implementation was initiated:

- The Indian government had launched guidelines for telemedicine solutions on March 25, 2020. eSanjeevani was to be launched under those guidelines. It required utmost prudence and diligence to launch the service by confirming to the rules and not going haywire.
- Since eSanjeevani was to be used countrywide, the workflows and govt. processes were designed in such a way that they were valid across the country. Hence finalising the workflows was the first of the pre-deployment challenges.
- The Health & Wellness Centres were not only to be readied before initiating the deployment, but the users too had to be trained on using eSanjeevani. Hence visits were scheduled and multiple rounds of training were planned and conducted jointly with respective State Health Departments to prepare the non-IT savvy paramedics to use eSanjeevaniAB-HWC. Amongst these tasks, the most challenging was to help the non-IT literate paramedics to learn eSanjeevani's usage.
- The team had not handled any deployment on a national-scale, hence the team had to learn from numerous aspects like scalability and cloud hosting.
- The scalability had to be done at a rapid pace as there was an intent to quickly ward off the threat posed by the pandemic by enabling remote consultations. Therefore, the workforce had to be on a war footing to meet with the challenge ahead.

In terms of best practices, the entire National Telemedicine Service can be identified as 'Best Practices'. eSanjeevani – National Telemedicine Service can stake the claim

to be the first public facing cloud based population scale healthcare IT system in the country. Cloud Hosting, Scalability, Data Safekeeping, removing 'Nonvalue adding activities/Removables' like Travel, Wait Time, Paper Work, etc. by intervention of IT are just some examples of these practices.

As eSanjeevani has been designed in a modular form and is hosted on Cloud, it not only makes the application easily replicable, but also ensures customisations and quick deployments as per requirements with considerable ease.

Owing to the fact that it's an innovation, It has already been replicated.

- A dedicated portal for serving defence personnel and their dependents i.e. Services eHealth Assistance and Teleconsultation i.e., SeHATOPD has also been developed on the same lines as eSanjeevani, using eSanjeevani Telemedicine Technology.
- A National Telemedicine Network for the People Living with HIV has been developed for National AIDS Control Organisation (NACO).
- A telemedicine platform for the ex-servicemen has been developed by the Ex-Servicemen Contributory Health Scheme Ministry of Defence.

Pertaining to innovation in the Healthcare Sector, leveraging the might of IT and technology, eSanjeevani through innovative and novel processes has been able to address the longstanding issues prevalent in the Healthcare delivery system. These are:

- After eSanjeevani was set up and rolled out, the patients could not only consult doctors and general physicians in the confines of their homes but could also consult super-specialists through contactless, safe and secured medical consultations.
- This intervention has enabled patients in rural areas and isolated communities to get health services from a doctor/specialist without having to travel to far off places (or without having to travel at all) and without having to spend time and money;
- The initiative is helping to keep secondary and tertiary level hospitals less frequented/crowded, by providing an access to doctors/specialists accessible to rural patients through their local Sub-Centres(SC)/Primary Health Centres (PHC) i.e. Health & Wellness Centres.
- eSanjeevani has streamlined the process and made it more efficient as patients now get to see a doctor/specialist within minutes. Patient's waiting time has been reduced to less than 15 minutes.
- eSanjeevani has led to the creation of health records (electronic) at the grass-root level as well.

Digital Empowerment

eSanjeevani is a telemedicine platform and is available to one and all regardless of the Geography, Demography, and ofcourse, being free-of-cost, it ensures financial Inclusion.

There exists Inequality and Inequity in terms of healthcare services with regards to Rural and Urban India, Rural India being at the poorer end of the spectrum. eSanjeevani democratised healthcare by leveraging the might of IT and empowering every single citizen of the country to access quality healthcare through telemedicine. eSanjeevani has enabled rural citizens to avail medical consultations from doctor/specialist without spending time and money to see a doctor/specialist in far-off cities. The following scenarios can concretely justify these claims:

Earlier, in rural areas, a patient would need to travel to the doctor in Primary Health Centre (could be as far as 30kms) or to a specialist in a District hospital (could be as far as 100kms).

Post-deployment, eSanjeevani has enabled patients in rural areas and isolated communities to get medical consultation from a doctor/specialist, locally, without having to spend time and money to travel to a district/tertiary hospitals.

In order to consult a doctor/specialist, a patient need not to wait at hospital OPDs for hours.

eSanjeevani has now streamlined the process. The patients now get to see a doctor/specialist remotely within 15 minutes.

The intervention aims to bridge the rural-urban, digital health divide. eSanjeevani empowers the populace of the country to access health services remotely. The main stakeholders/ beneficiaries of this initiative being:

- Citizens of the country, including those who are residing in rural and isolated areas and were so far not privileged to have a secondary or a tertiary health facility nearby.
- Doctors and Healthcare workers.
- Health Administrators and Policy Makers who are committed to ensure the provisioning of health services to the populace of their region.

Green e-Governance

eSanjeevani rolls out the service purely through ICT then empowers beneficiaries to use them on their own gadgets, devices. Hence, there is absolutely no creation of any hardware or ICT-based material in the rollout and implementation of the service.

Shri Govind Jaiswal, IAS, *Director, Ministry of Health and Family welfare, Govt. of India, govind.jaiswal@ias.nic.in*

Dr. Sanjay P. Sood, *Associate Director, C-DAC Mohali, spsood@cdac.in*

Works MIS Web Application for Jal Shakti Department

Jal Shakti Department, Govt. of Himachal Pradesh & National Informatics Centre Himachal Pradesh State Centre

Amitabh Avasthi and Ajay Singh Chahal

PROJECT OVERVIEW

Background and Area of operation:

The Department of Jal Shakti, Govt. of Himachal Pradesh is headed by the Engineer-in-Chief at Shimla, has offices throughout the State and the Department has a very important role in rural water supply and sanitation, as almost 90% of the State population lives in rural area.

The Department carries out the construction and maintenance of works of different schemes under the following sectors:

- Rural & Urban drinking water supply schemes
- Installation of hand pumps
- Irrigation schemes
- Flood Protection schemes
- Sewerage System

The drinking water supply is a very important issue in the present times in the light of increasing health awareness among the citizens and their expectations from the Government to provide safe drinking water. Though there is lot of improvements in various areas, availability of water and that too safe drinking water, both for human beings and the cattle has become a major problem due to scarcity of water sources and the increased levels of the pollution where water sources are available. The various activities being carried out by the department are listed below:

- Design/ Estimation of various Projects/ Schemes under various Sectors
- Construction of various drinking water supply schemes / Irrigation schemes / Sewerage schemes / Flood Protection works under various programs
- Monitoring of Water quality to ensure safe drinking water.
- Installation / maintenance of Hand pumps
- Monitoring of Physical & Financial progress of various schemes/ Projects under different Sectors
- Maintenance of various schemes under various sectors monitoring of legal matters, court cases etc.
- Establishment matters related to Departmental personnel, accounting, budgeting, office expenditure, stores, inventory etc.

Objective:

- Works MIS application is web-based and work flow based application software that can be accessed through the web browser. The software and database reside on a central server rather than being installed on the desktop system and is accessible over a network. https://iph.hp.nic.in is the URL to access web-based Works MIS application of JSV department. Various modules in this software, has been developed, covering the working of all office levels of the department. The objective of the application (Works MIS) is to automate the processes of

Jal Shakti Department to achieve the following goals:

- To identify and suggest an appropriate Government process re-engineering model.
- To identify systems enabled mechanism that reduces and substantially removes redundant processes which otherwise delay flow of information among various stakeholders
- To identify and suggest an appropriate technology model that is both user friendly and which withstands the tough field conditions.
- Induction of transparency and accountability in operations
- Electronic security and control of confidential data
- Dissemination of information as per public requirement
- MIS for easy monitoring and quick decision making.
- Improving efficiency in Government administration by fixing responsibility
- Improve decision making in view of better reporting mechanisms on funds utilization
- To help carry various analytical studies by providing the data instantaneously
- Significant reduction in manual records/register maintenance
- Elimination of duplicate and inconsistent record keeping
- Reduce the dependency
- Support the organization in meeting its business and legal requirements • Better implementation of Schemes
- To Provides cost effective service and quality of the same
- To provide a friendly, speedier and efficient interface

Short Comings of the Manual System

- Redundant processes
- Absence of Proper Procedures
- Difficulty in monitoring
- Delay in execution of schemes
- Lack of Transparency
- Lack of Accountability
- Unnecessary Excess Paperwork
- Difficulty in maintaining up to date Records
- Repetitive efforts
- Wastage of Time, Money and Efforts
- No standardization and uniformity of the working methodology Advantages of the WORKS MIS System
- Web-enabled and workflow-based system for automation, standardization and uniformity of the working methodology
- Simple to execute and menu driven with various help messages
- Enhanced search features to query by selecting known parameters
- A friendly, speedier and efficient interface
- Dynamic search engine which generates several number of reports on a single mouse click
- Auto upward compilation of reports and queries

- Online Administrative Approval and Expenditure Sanction (AA and ES) of schemes at various levels
- Online Technical Sanction of Schemes at various levels
- Providing transparency on Department Activities to higher officials
- Reducing the dependency
- Dashboard driven user interfaces
- Authorized login for Stack holders
- Easy data feeding and avoiding of duplicate entry
- On-line budget, demand and passing of bills
- Yearly physical targets for effective utilization of funds
- Online measurements and auto generation of abstracts
- Online Receipts & Payments
- Online Contractor Registration
- Online issue and closing of Measurement Books
- Automation of Measurement Books, with mobile app based offline data collection directly from the field where the scheme or work is being implemented
- Online generation of contractor bills
- Auto Online compilation of Monthly accounts
- Online Indents and Issue of Material
- Online Store Inventory
- Physical, Financial and Pictorial progress and monitoring of works
- Online Uploading and monitoring of Inspection reports for various schemes
- Online generation of water bills
- Interface for the public to pay their water bills online using payment gateway
- Interface for the public to apply for new water connections followed by tracking the status of the same
- Transfer of online accounts data of Divisions to the Office of Accountant General, thereby removal of manual intervention to take the account to the office of AG every month
- Online submission of periodic returns of the department, online, followed by upwards compilation of entered return data, to higher levels
- Designing of the rising main and pumping machinery estimates for Lift irrigation and Lift water supply schemes
- Integration with "e-Procurement" e tendering system
- Web Application supplemented with Mobile Apps

Current status: The system is being used by all the offices of the department, wef April 2018

Key Stake Holders:

- JSV Department
  - Online issuance of Administrative Approval and Expenditure Sanction (AA & ES) of Schemes
  - Online issuance of Technical Sanction of Schemes
  - Online Work agreements

- Online electronic Measurement Books (eMB)
- Saving of Govt. time, effort and money in generating running bill/contractor bill online, on the click of mouse
- Online generation of sub-divisional and divisional account on the click of mouse
- Online compilation of Inventory, automatically from the entered Goods Receipt and the issuance of material corresponding to the approved online indents
- Online monitoring of court cases
- Online submission and monitoring of various departmental returns
- Online monitoring of physical, financial and pictorial progress of schemes and works
- Online uploading and monitoring of inspection reports
- Online availability of budget for the department
- Central repository of departmental data readily available 24x7

- Contactors
  - Easier contractor registration/renewal and up gradation
  - Quick issue of material to the contractor due to online raise of indent, followed by online approval and issue of material against this online indent
  - Transparency in generation of contractor bill/running bill
  - Quick generation of contractor bill/running bill followed by payment
  - Online generation of Identity card to the contractor
  - Less litigations
- Citizens
  - Apply online for new water connections, followed by online approval by the department and online tracking of status of online application
  - Online payments of water bills
  - Online submission of grievances, related to Inflated bills, followed by on line response from the department
  - Online submission of complaints with photograps, related to wastage of water, followed by on line response from the department

Service: G2G (Government to Government) and G2C (Government to Citizen)

Hardware/Software

The works MIS is a workflow and role based web application. It is hosted over IIS, has database in MS SQL server 2008. The application has been developed in asp.net using SSRS and High charts.

This application has been developed by the National Informatics Centre, HP State Centre, Shimla (HP), free of cost and has been hosted over at the NIC, servers.

Certification (Certifying Agency)

The web application has been audited for security in a third-party security audit undertaken by AAA Technologies on 28th February 2020. The url of this application is https://iph.hp.nic.in

Disaster Recovery and Service Continuity

This application is hosted at the NIC web servers. Daily, weekly, fortnightly and monthly backup of data is taken by the NIC network group. A copy of these backups

is also being kept in NIC Pune data centre.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	Brief service description with benefits	Volume (Nos) of Services year wise		
		2020-21	2021-22	2022-23 (Upto date of nomination)
Agreements Online	● 24x7 availability of data ● Transparency ● Digitization of the ● Agreements ● Data can be recovered in case the agreement data is lost, stolen or damaged	33,201	38,811	15,386
Measurement Books online	● All the measurement related data digitized ● The flow of Measurement book is fast compared to the manual flow ● Running Bill/ Contractor bill is generated automatically, in a transparent and speedy manner ● Enables the Jr. Engineer to take the latest snapshots of the work site and upload it along with measurements ● Reduces the chances of errors ● Reduces the work pressure of Jr. Engineer ● Brings transparency in the system ● Reduces the chances of litigation ● Data can be recovered in case the Measurement book is lost, stolen or damaged ● 24x7 availability of data	3,405	3,347	1239
Contractor's Registration online	● Hassle free registration ● Identity card issued to the contractor ● Unique ID issued to the contractor	1,261	1,415	492
Contractor's Bill Online	● Reduction of manual labor ● Reduces the chances of errors ● Transparent processing ● Fast payment to the contractor ● Reduces the chances of litigation ● 24x7 availability of data	32,937	40,802	26,700

Store Inventory Online	● Online Goods receipt ● Online raising of indents followed by online approval/rejection and issuance of items requested ● Real time monitoring of status of goods at stores. ● Online generation of monthly stock account ● 24x7 availability of data	24,525	26,704	12,208
AA & ES of schemes online	● Online convey of AA& ES to the sub-ordinate offices immediately ● Easy monitoring ● Amount cannot exceed the allocated budget. ● 24x7 availability of data	455	517	95
Technical sanction of schemes online	● Online convey of technical Sanction to the sub-ordinate offices immediately ● Easy monitoring ● Amount cannot exceed the allocated budget. ● 24x7 availability of data	514	572	90
Uploading of Inspection reports of schemes online	● These inspection reports can be viewed and monitored online ● Action to be taken can be conveyed online by the higher authority ● 24x7 availability of data	25	88	40
No. of Online applications submitted for New Connections	● Consumers can apply online for new water connections, followed by one processing of this application, by the department. ● Consumers can apply on 24x7 basis	6,427	23,021	7,897
No. of Consumers, who paid their water bills online	● Consumers can pay their water bills, online through payment gateway ● Consumers can pay their water bills online through this portal and HP water bills mobile app on 24x7 basis	16,546	37,000	23,021

Implementation

Works MIS has been implemented in all the fileld offices of the department.

Improvements / Enhancements

Enhancements carried out in the software in last one year:

- Works MIS has been customized for use by the office of Engineer-in-Chief (Project Management unit), Jal shakti Vibhag, GoHP for execution and monitoring of various schemes funded by NDB (New Development Bank)

- Works MIS has been customized for monitoring of targets set and targets achieved by various field offices of the department against Jal Jivan Mission of GoI.
- HP Water Bills, Android based Mobile App was developed to facilitate the consumers of this department with providing an up to date record related to water bills generated by the department, receipts of water bills paid by the consumer, complaints lodged by the consumer related to inflated billing and wastage of water followed by action taken by the department. It also facilitates the consumer to apply online for new water connections followed by tracking of the latest status of this application.
- Developed Ease of doing Business (EODB) dashboard under citizen area.
- Customised various modules of the web application, as per feedback from various field offices of the department.

Enhancements planned for the next one year:

- Works MIS is being customized for use by the office of Engineer-in-Chief (Project Management unit), Jal shakti Vibhag, GoHP and subordinate offices, for execution and monitoring of various schemes funded by ADB (Asian Development Bank)
- Interface to be provided for the contractors to view, update and verify the measurements and material consumption related to their works/agreements, after online entry of the same by the concerned Junior Engineer. After verification of this data by the contractor, this data will be accessible to the Assistant Engineer for further processing. The contactor bill will also be visible to the contractor after verification by the Assistant Engineer.
- Dashboards at various levels to be upgraded by using Power BI, Data Analytics Tool of Microsoft Corporation.

ENABLER

Processes Re-engineered

ICT processes

- Standardization of forms and procedures
- Reducing the usage of paper
- All JSV offices linked together with central solution concept
- Discontinuation of manual AA/ES, Technical Sanction, Inspection report, Potential creation return, Potential Utilization return and GI Pipes return

Non-ICT processes

- Centralized solution for all government departments
- Unique code for every scheme throughout the state
- Unique code for every work throughout the state
- Unique contractor id being generated for new contractor during registration.
- Every contractor blacklisted by an IPH office, appears as blacklisted throughout all the IPH offices in the state.
- Integrated with budget data of Finance department, HP.
- A desktop/laptop based web service and Android Tablet/Smartphone based app developed for the Junior Engineers to enter the Measurement Book data into these applications and upload this data into the central database on availability

of Wi-Fi / Internet connectivity.

- All the monthly account reports (more than 20) are generated automatically on the click of the mouse, after the entry of payment and receipt vouchers.
- Auto generation of stock account based on the issue of material in response to the raised indents.
- Online Issuance of Administrative Approval and Expenditure Sanction
- Online Issuance of Technical Sanction
- Online upload and monitoring of Inspection reports.
- Online generation of Contractor bill based on the MB (measurement book) data uploaded and the RSOQ (Revised Schedule of Quantity) entered corresponding to a work.
- Online transfer of Monthly account of IPH division to AG office being transferred online.
- Online generation of water bills, enabling the generation of SMS to the consumers, thereby facilitating them to pay these bills online.
- Facility provided for the citizens to apply online for the new water connections, followed by online approval from the department.
- Integrated with e-Procurement application for e-tendering.
- Integrated with the VLC package being used in the office of Accountant General, Shimla, allowing them to pull the monthly accounts data of all the divisions and include into the VLC package data.

All these processes have been successfully incorporated and are being used successfully by the user department.

Technologies

Electronic Measurement Book: Measurement related data is recorded by the Jr. engineer of the department, in Measurement book (MB) manually, and it was a challenge to digitize this data with the main data, as this data plays a major role in generation of the contractor bill, against which the payment is released to the contractor. Moreover, the site of various works where this data is recorded are very remote and there is no internet connectivity in these places. So, the following approaches were adopted to synchronise this MB data with the central database:

- DTS (Data Transfer Service) Web Service: This utility helps the Junior Engineer, in recording the data related to the measurements and material consumption at site in MS-access file in offline mode, since there are connectivity issues at sites where the works are going on. This utility can be used on a laptop or desktop. It helped the Junior Engineers (JE's) of the department to digitize, the measurement book data. Earlier JE's had to use calculators, to make calculations. Now they make entries directly into the electronic MB, which then gives the result of complex calculations, which helps in saving a lot of time. This data is uploaded to the central database, from their office/sub-divisional office/ Division office, wherever the internet connectivity is available.
- App for Android based Smart phones and Tablets: This app has been developed for recording of data related to the measurements and material consumption at site, since there are connectivity issues at sites where the works are going on. This data is uploaded to the central database whenever connectivity becomes available and data has been recorded using this Electronic MB android app . It

helps the Junior Engineers (JE's) of the department to digitize, the measurement book data. Earlier JE's had to use calculators, to make calculations. Now they make entries directly into the electronic MB, which then gives the result of complex calculations, which helps in saving a lot of time. Moreover, it is easy to carry these handheld devices (Android smart mobile phones and tablets), to any location wherever the works of departments are going on. It also helps the Jr. Engineers to take the snapshots of this work and synchronize these photographs along with the geo positional coordinates.

Dashboards: Dashboards have been developed, according to the requirements specified by the Engineer-in-Chief, JSV department, which helps him/her to monitor the various activities, which are very important and needs timely intervention. Dashboards helps the higher levels officers of the department, to monitor various hectic and time consuming activities of their subordinate offices easily, on the click of mouse.

Social media platforms used to popularize the project.

- This software was made popular by providing its link in the official web portal of the department.
- By providing training on this software to almost 99% of the staff employed in the department.

People

Leadership support:

- Department has appointed a Nodal Officer (IT) of the level of Executive Engineer. He acts as a mediator between the department and NIC
- Periodic incremental trainings on various modules of software are held for the employees of department.
- New appointees joining this department are provided with training on various modules of this software.
- TSP's (Technical Support Persons) on contract, have been deployed by the department in all the divisions, circles, zone and head office of the department.

Management of change:

- The monitoring of this software is being done by the Secretary (IPH), GoHP
- Department has appointed a Nodal Officer (IT) of the level of Executive Engineer. He acts as a mediator between the department and NIC.
- Whenever any change or any new requirements are to be incorporated into the software, the requirements are sent to the Nodal Officer (IT) of the department, who after checking the authenticity and feasibility of requirement, get in touch with NIC.
- Capacity Building:
- Regular up gradation/ refresher trainings on various modules of works MIS web application, are provided to the departmental users at Zones.
- Hands on trainings on various modules of Works MIS are being provided to various officers and officials of the department using this software.
- Support is being provided to the various offices of department, by NIC HP State Centre, Shimla, between 10:00AM to 5:00PM, on all working days, on telephone and e-mail.
- TSP's (Technical Support Persons) on contract, have been deployed by the

department in all the divisions, circles, zone and head office of the department.

- New appointees joining this department are provided with training on various modules of this software.

VALUE INDICATORS

Learning's for sharing

Technology choices

- ASP.NET technology is one of the best technologies available for developing online systems

Implementation strategy

- It is better to implement big projects like Works MIS in phased manner rather than implementing them in one go.

Challenges

- People who were provided with hands on training on this software, either retired or were transferred to some other office level.
- Non seriousness of some of the employees, who were trained to use this software.

Digital Empowerment

People living in this state converse only in two languages i.e., Hindi and English. Since literacy rate of our state is very high (about 87%) and the work of this department was being done in English only in manual process, so there was no request received from this department , to use this software in bilingual form or to incorporate Hindi language in this software.

Usage of this web application by all the offices of the department will help the department in saving a sum of ₹ 14.21 crores per annum.

Green e-Governance

This software enables the Jal Shakti Department to move towards green governance as it encourages the users to work on this software in online mode. It also helps in generation of various types of data reports online, data is submitted at lower levels which is auto compiled at higher levels based on their requirements. It helps in saving lot of paper usage by the department, thereby helping in saving more trees. Moreover, monthly accounts data is also being transmitted to the office of Accountant General in online mode.

Yearly Saving of A4 Pages in all the JSV Sub-Divisions in the state	48,000 sheets
Yearly Saving of A4 Pages in all the JSV Divisions in the state on Running Bill	2,55,600 sheets
Yearly Saving of A4 Pages in all the JSV Divisions in the state on monthly Account	1,70,400 sheets
Yearly Saving of A4 Pages in all the JSV offices in the state on Inspection Report	24,480 sheets
Total no. of A4 pages Saved per year by the department by using the Online Agreement module	1,52,880 sheets
Total no. of A4 pages Saved per year by the department on the Measurement books printing	51,00,000 sheets
Total no. of A4 pages Saved per year by the department by submitting	97,66,656 sheets

various types of online returns	
Trees are being saved per year by using this e-Governance initiative by the department of Jal Shakti	1807 Poplar trees
Total Saving in of the department in terms of paper, postage, fuel and employee cost during a year (by using this web application)	₹14,21,48,016 (₹14.21 Crores)

Shri Amitabh Avasthi, IAS, *Secretary, Jal Shakti Department, Government of Himachal Pradesh, iphsecy-hp@nic.in*

Shri Ajay Singh Chahal, *Deputy Director General and State Informatics Officer, National Informatics Centre, Himachal Pradesh State Centre, sio-hp@nic.in*

National Generic Document Registration System (NGDRS)

Department of Land Resources, Ministry of Rural Development, Govt. of India & National Informatics Centre, Pune

Sonmoni Borah and Ajay Madhukar Joshi

PROJECT OVERVIEW

About the Project: 'Document Registration' is one of the key components of Digital India Land Record Modernisation Programme (DILRMP) which is coordinated by Department of Land Resources (DoLR), Ministry of Rural Development (MoRD) and implemented by State Governments.

The 1908 Registration Act is basis for Document Registration in India and each state has adapted it with state specific requirements. This is an integral part of the Revenue system, which leads to registration of deeds (Articles), including mutation and updation of land records. This process also includes assessment of Stamp duty as per the Stamp Act, which is a state subject.

Objectives:

NGDRS aims towards One Nation One Platform contributing to Digital India e-Governance initiative and improving Ease of Doing Business (EoDB) and Ease of Living in the country. This would be implemented as a configurable, reusable and modular solution to promote citizen empowerment in online registration process, including property valuation and stamp duty payment.

- To progress towards 'One Nation One Software' for registration of documents & properties under the aegis of Digital India Land Records Modernisation Programme (DILRMP).
- To 'Empower citizens' by enabling property valuation and online document submission.
- To provide document registration services with leveraging modern technology to the people using standard procedures, in specific time frame and the transparent manner. • To enabled a 'flexible and configurable system' that can meet dynamic needs of various stakeholders.
- To focus towards 'achieving reduction in land disputes' through increased efficiency and transparency in the processes.
- To achieve single 'Source of Truth' for the registration related information.
- To successfully avoid siloed applications and promote 'interoperability and integrated' systems since different states were using different applications for different capabilities and these systems were not integrated to provide the larger point of view.

Scope Functional:

- Built on open-source platform using latest technologies, the application has eased citizens to apply for registration online and take prior appointments. The entire process, right from applying for registry, property valuation, from calculation to payment of stamp duty, registration fee and other applicable fees has been made online, thereby eliminating the need of repeated visits to the sub-registrar offices.
- Being a solution, which can satisfy all the stakeholders, NGDRS provides the

flexibility to the states to quickly conduct an analysis, understand and gather the requirements, configure and implement the solution at state and district levels. This allows the department to easily automate the process of document registration to increase the service delivery quality and efficiency.

Scope Geographical:

Number of states implementing NGDRS is 17 (47.22% of total 36 Indian States/UTs). Mandate is to cover PAN India by 2023.

Organizational Coverage: All Registration Offices under the control of Office of Inspector General of Registration and Stamps of State Governments.

Key Stakeholders:

NGDRS is a collection of people, process and technology involved in delivering the document registration services to the stakeholders. There are 6 business roles or stakeholders involved in the processes which can be categorised into two types: Internal and External Stakeholders.

- Internal Stakeholders- State IGR, Registry Offices
- External Stakeholders- Central Ministry/ DoLR, External Departments/ Institutions/ Banks/ Authorities, Citizens/ Individual Applicants, Advocates/ Deed Writers.

Intended Benefits:

- Transparent process of registration and stamp duty collection.
- Efficient Services to Citizens with cost-effective solution; grievance redressal and feedback mechanism for citizens.
- Seamless Information Flow (Departmental Applications and 3rd Party Applications).
- Better Services to Government Departments.
- Reduced time and convenience of registration for citizens.
- Secured Data
- Centralization of the back-office management of the department.
- Dashboard for senior authorities for monitoring the outcomes and analyzing the performance or challenges faced by SROs. Assistance in taking the corrective and preventive measures.
- Data sharing with important government authorities/stakeholders like Income tax department.
- Data sharing with Auditors for financial audit.
- National dashboard for handy statistics

Current Status:

With the visionary mandate & policy of Government of India - One Nation One Software - NGDRS has been on-boarded by 16 states of the country during the period 2018-2022. This has started a new era in the process of registration of documents. 4 upcoming states are in the User Acceptance phase.

Hardware/Software

Application development and deployment:

- Server-side Programming Language: PHP (5.4.16)
- Server-side Framework: CakePHP (2.4)
- Client-side Programming Language: HTML (5), CSS (3.3.6), JavaScript

(Browser Dependent), jQuery (2.2.3) Client-side Framework: Bootstrap (3.3.6)

- Relational Database: PostgreSQL (13)
- Web/ HTTP Server: Apache (2.4.6)
- Dashboard - ???? any .js (-)
- Java Technology Stack: OpenJDK (jdk-8u291-linux-x64)

Application development: IDE: Netbeans (8)

Infrastructure:

- Server Operating System: RHEL (7.9)

Application Testing:

- Toolname with version - Mantis 1.1.0a2

Following integrations with external systems are achieved from NGDRS through the use of web services and APIs. For data sharing between NGDRS and an external system, Web service URL along with user credentials, request and response parameters are shared by respective states:

- Integration with Land Records or Record of Rights, also for eMutation
- Integration with Aadhaar services for eKYC
- Integration with NSDL for PAN verification
- Integration with State Virtual Treasury, eStamping, GRAS, eChallan, eRegistration for online payment, verification
- Integration with banks - SBIePay, HDFC, Axis Bank - for online payment
- Digital Locker: Deed storage service for citizen
- Integration with urban local bodies for property tax
- Integration with State City Industrial Development Corporation, State Housing Authorities, Private builders
- SMS integration for OTP and alert messages
- Integration with Bhunaksha to view digitized cadastral maps.
- Data sharing with Income Tax Department and other inter/ intra departmental applications.

Certification (Certifying Agency)

Cert-in empaneled Certifying Agency: AAA Technologies Limited

Site Name: National Generic Document Registration System for Bihar state

Website Security Audit Certificate Number: AAA/WAC/20220209

Date of issuing Audit Certificate: July 5th, 2022

Issued by: Anjay Agarwal, Chairman & Managing Director, Place: Mumbai

Address: 278-280, F Wing, Solaris -1, Saki Vihar Road, Opp. L&T Gate No. 6, Powai, Andheri (E), Mumbai – 400072

Email id: info@aaatechnologies.co.in

Disaster Recovery and Service Continuity

High Availability (HA) and Disaster Recovery (DR) strategies are framed to address non-functional requirements, such as performance, system availability, fault tolerance, data retention, business continuity, and user experience.

These strategies are translated into a deployment model while providing the solution.

Following Best practices are followed in identifying the DR strategy:

- Identify the criticality of Data & Application

- Selection of DR Site
- Selection of Replication Methodology
- Assessment of Bandwidth Requirements
- Disaster Recovery as a Service (DRaaS)
- Documenting DR Plan (roles and Responsibility, governance, SLA)
- Validating DR Readiness
- Using Cloud Environment for DR
- Government Laws and Regulations on DRS

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	Volume (Nos) of Services year wise		
	2020-21	**2021-22**	**2022-23 (upto date of nomination)**
Appointments	779809	1080488	520591
Registered Documents	729002	1161806	570774
Revenue Collection	₹396517.93 Lakh	₹663393.31 Lakh	₹350358.96 Lakh

Implementation

Phase wise launching and roll out of NGDRS has been achieved in following 17 State Governments during 2018-2022 as per the schedule proposed by Ministry/ Department:

- Phase I: 2017-2018 – 2 States - Punjab, Jharkhand
- Phase II: 2018-2020 – 7 States/ UTs - Andaman and Nicobar Islands, Dadra and Nagar Haveli, Goa, Himachal Pradesh, Manipur, Maharashtra, Mizoram
- Phase III: 2020-2022 – 4 States/ UTs - Chhattisgarh, Jammu and Kashmir, Ladakh, Tripura Phase IV: 2022-2023 – 4 States - Bihar, Assam, Meghalaya and Uttarakhand

NGDRS Status Map available at URL - https://ngdrs.gov.in/NGDRS_Website/ngdrs-progress.php

Recognition at National level:

- Digital India Awards 2020- Silver Award conferred upon the project for Excellence in Digital Governance
- Data Quality Challenge 2020, Bronze award, NIC, MeitY
- Prime Minister's Award for excellence in Public Administration 2021 presented to NGDRS project in April 2022.

Name and No. of Channels for Service Accessibility: Mobile, Website, Govt. Office, CSC, Deed writers, Advocates

Improvements / Enhancements

Improvements/ enhancements during last one year:

- The innovation made in the existing processes has fulfilled the requirements of the stakeholders in a better way.
- Digital capacity building of the stakeholders and beneficiaries has enabled them

to take full benefits.

- Public delivery system is made more responsive, transparent and efficient - Complete removal of under and overvaluation of Properties.
- Process re-engineering has helped time saving and citizen-friendly approach.
- Web-based generic solution has provided access from anywhere.
- Legacy data is managed in accordance with the current data through e-search.
- Single source code and database has provided a generic solution for the creation of National Registry database

Future plans include:

- PAN India Implementation of NGDRS by March 2023
- Society/ firm Registrations
- Data exchange module for GST & RERA
- Data Exchange with Reserve Bank of India for Housing price Index
- Block chain component for property registration & land records to check records of rights (ROR)
- Data Analytics
- Integration with Judicial Courts
- Integration with Prohibited land e.g Defence, Railway, Mines, Forest etc.
- Mobile App

ENABLER

Processes Re-engineered

Extent of Process re-engineered:

- eGovernance application delivers document registration services to the people using well defined procedures, within specific time frame and in a convenient and transparent manner; to achieve seamless sharing of information and data interoperability.
- Generic software with single application created as an instance with state specific parameters.
- Flexible system that satisfies dynamic requirements of all stakeholders

Process re-engineering was an integral part when the project was envisaged. The process reengineering included both ICT and non ICT segments. The first non ICT process was the mandate decided by DoLR to standardise the registration process across the country. Thereby issuing necessary notifications and finalising the resources for the project take off. This also included all IGRs workshops, circulating questionnaire to all stake holders, identifying gaps bringing gap analysis on record. Digital Inclusion has been rightly considered while implementing the mentioned initiatives. After the base work the ICT re-engineering started with preparation and finalization of System Requirement Specifications (SRS). The major ICT-enabled process re-engineering took place in the following areas as compared to existing prevailing practices across the states. Prior appointments for document registrations – For Citizens (document submission and appointment):

During the entire process of questionnaire, demos, discussions, and gap analysis it was found that many nonvalue-add activities are not required. Efforts have been taken to eliminate those. Secondly, the intervention of advocates/deed writers is kept to a

limited purpose. Online payments have brought transparency in the payment system as valuation and tightly coupled. With technology being one of the major enablers, it is ensured that registrations and delivery of documents to the parties happen faster in comparison to the conventional methods.

Citizen experience with GPR: Average time taken for one complete transaction: reduced from 45 minutes to 15 minutes.

Technologies

- Enterprise Architecture approach: An enterprise architecture framework titled "Document Registration System Enterprise Architecture Framework (DRS EAF)" has been developed with the India Enterprise Architecture (IndEA) Framework as the starting reference point guide. The methodology and standards for DRS EAF are taken from IndEA in order to address the diversity and variations that prevail across the States/ UTs on account of various languages, processes, formulae and formats, and thereby achieve a sustainable document registration ecosystem for all States/ UTs of India.

  This enterprise architecture thinking was adopted while designing and developing 'National Generic Document Registration System (NGDRS)'. Thus DRS EAF provides a holistic view of the document registration system, its capabilities to deliver the services from different viewpoints and helps to enhance the comprehensive solution through standards and guidelines.
- Open-source technology: Affordable, flexible, sustainable and reliable platform adopted.
- Developed as a Product: Software replication with minimum customization & maximum configuration approach; Business rule engines, dynamic menus, screens, form fields, alerts and messages, Unicode based multiple local language compliant.
- Facilitates role based flexible authentication & authorization.
- Cloud enabled application: Hosting on virtual servers; Storage and network resources assigned dynamically.

People

Capacity Building and Awareness Training on NGDRS has been a strength and asset-based approach to improving the competencies and carry out functions more effectively. The states were made to realise the importance of capacity building and training and attempts were made to train officials and functionaries on NGDRS.

- Presentations and Software demonstrations to State IGR and State NIC teams.
- VC based regular meetings with state teams on change requirements and discussions.
- User interactions and support during state instance configuration and user acceptance testing.
- Master Trainers Training sessions.
- Periodical progress review meetings with State Secretaries and Senior authorities

Success criteria established include:

- Building awareness about the significance and vision of document registration among all the participants/ stakeholders
- Obtaining feedback on specific aspects

- Providing a clear, consistent representation of the vision and goals/ objectives
- Educating all stakeholders on their roles and responsibilities
- The state IGRs are required to adopt or tailor the performance management system in their respective state, define the target KPIs and measure the actuals. The variations were analysed to identify the corrections and improvement opportunities,
- Enabling government to achieve its objective of better collaboration and seamless data and information sharing between & within departments thereby providing effective business services to its stakeholders.

VALUE INDICATORS

Learning's for sharing

- All the States and UTs of India have different processes, handling techniques, languages in document registration operations but the major building blocks (structures, functions, value streams, and capabilities) would be common, reusable, and configurable across the States and UTs.
- Some of the States that are currently implementing their state specific solutions or partially automated systems are being encouraged to quickly conduct an analysis, understand and gather the requirements, configure and implement the national level solution.
- State IGR departments are made aware of the ease in automating the process of document registration to increase the service delivery quality and efficiency.
- By on-boarding NGDRS, States will participate and contribute in building the integrated view of document registration at the Ministry level.

Best Practices:

- Standard procedures followed throughout the implementing States.
- Accommodates all variations/ gaps prevailing across the States.
- Cost effective solution with improved efficiency and transparency achieved in the document registration process.

Configuration under the control of the State Registration Department which includes workflow processes, property valuation rules, fee and exemption rules, property rate chart, user roles, and authentication types.

- SMS and email-enabled alerts related to transactions on property.

Digital Empowerment

How did we work with stakeholders? :

- Central Ministry / DoLR: Progress review meetings, support for monitoring integrated view of registration system at national level.
- State IGR – State Department of Registration and Stamps/Collector/ Revenue Authorities: VC demonstrations, questionnaire, gap analysis, project proposal, rule engine management, hosting environment setup, pilot and statewide roll out, change management.
- Registry Offices -Sub Registrar's office, District level Registrar's office : VC discussions, feedbacks, workshops, trainings, user site visits, support for instance creation and configuration, acceptance testing, implementation support.
- Citizens of the state: Empowering citizens in online registration process,

feedbacks, helpdesk support.

- Advocates / Deed Writers: VC based trainings, helpdesk support.
- External Departments/ Institutions/ Authorities–State Land Record Department, Town Planning Department, Income Tax department, Banks : VC discussions for inter and intra departmental system integration, testing and live release.

Impact Assessment:

- Citizens have found user friendly and comfort in the system and process of Registration under NGDRS.
- The Advocates/ Deed writers found the system and process under NGDRS better. The reasons reported were transparent system of NGDRS, easy to understand and incorporate all relevant information and timely registration of documents.
- The data base of citizens for the property has been improved and found instrumental in reduction of frauds.
- There is increased percentage of Registration cases per day/ per month over the period at SROs.

Green e-Governance

NGDRS software provides the revenue collection and other details of implementing States/UTs which reduces the burden of paperwork. This may promote the Green e-Governance.

Shri Sonmoni Borah, *Joint Secretary, Department of Land Resources, Ministry of Rural Development, jslr-dolr@nic.in*

Shri Ajay Madhukar Joshi, *Senior Technical Director, National Informatics Centre, Govt. of India, amjoshi@nic.in*

Godhan Nyay Yojana - CG Government

Chhattisgarh Infotech Promotion Society, Department of Electronics and Information Technology, Govt. of Chhattisgarh

Sameer Vishnoi and Neelesh Kumar Soni

PROJECT OVERVIEW

Brief overview of the Project in terms of Objectives:

Godhan Nyay Yojana is one of the Hon'ble Chief Minister's Flagship Scheme. Godhan Nyay Yojana is one of its kind concepts implemented only in the state of Chhattisgarh. The project is an enabler of financial upliftment for the majority rural population of the state. The project involves purchasing Gobar (Cow-Dung) to provide the economic benefits to the cattle rearers. The programme focused on a sustainable and integrated farming system approach focused on water management, composting for soil health, animal husbandry and sustainable agriculture on backyard kitchen gardens. Building gothans - a kind of day care centre for animals - is being promoted under the programme. Unlike the Direct-cash transfer scheme, in this 'Godhan - Yojana', the state government would procure cow dung at ₹ 2 per kg. from the farmers and cattle rearers of the state which will lead to income as well as employment generation initially in the rural pocket later across the state.

Initiative and how it addressed the requirement:

Chhattisgarh is the first state in India to implement. The Godhan Nyay Yojna, which is the Flagship Scheme of Government of Chhattisgarh. "Godhan Nyay Yojana" is one the best example of "Digital Governance", "Digital Innovation" and "Agri Innovations". Till now approximately 3.94 Lakh Unique Cow-dung sellers are registered in the system and the state has purchased 78.47 Crore Kg Cow-Dung till now using the Digital system. The Cow-Dung purchased is used to produce Compost (Vermi + Super + SuperPlus) of approximately 23.93 Crore Kg which is valued at around Rs.19.56 Crore Kg and is sold via the digital system.

Scope - functional and geographical:

Data collection tool to collect all relevant data, Data Analytics, Data Mining & Data Processing for Future use DBT (Direct Benefit Transfer of all related beneficiaries), The beneficiaries of this digital initiatives are MSMEs and local seller of cow dung. This initiative was helpful in starting a business and generating employment. This project also involves work undertaken for Gauthan Multiactivity & Aajivika Parbandhan (GMAP) for financial upliftment.

Key stake holders – intended benefits and current status:

Key Stack Holders: Farmer (Cow dung Sellers), Self Help Group (SHG), Gauthan's.

This scheme connects all districts, blocks and departments which encourages active participation of common public and the state. It generates employment and business for the public including villagers.it generated business for ladies also. Which directly enhances the income generation of rural areas. Good production of vermicompost which eventually increased best breed of crops and helped farmer to earn benefit due to good production of crops. The objective of the scheme is to make cow rearing economically profitable and prevent open grazing in the state as well as help tackle the problem of stray animals on roads and in urban areas.

Yes, Received State & National Level Awards and Recognitions in "GODHAN

NYAY YOJNA" Chhattisgarh State Project eGovernance initiatives Awards are:

- National Elets Innovation Award.
- Skoch Gold Award.
- Technology Sabha Award

This is One and Only State Start Unique Services to provide business & employment to village farmers & women, cattle owner.

The state has achieved many goals through a single scheme. Chhattisgarh farmers by selling cow dung bought laptops for their children to attend online classes during the COVID-19 pandemic. Others from the state paid the educational fees from Gauthan's earnings, built their own house and freed their mortgaged land. After developing these cowsheds in rural industrial parks, the production of manure will increase. Along with this, if there will be other economic activities in Gauthans, then their business will increase.

Benefits:

- Crop protection, increase area under double cropping.
- Leveraging the Self-Help Group model and increase in their income.
- Improving soil fertility.
- Ensuring the availability of organic compost in rural areas.
- Increasing usage of organic compost.
- Increase in income of cattle rearers.
- 45.98% are female to get additional income from cow dung selling.

Current Status:

The entire process of cow dung collection, vermi compost creation and payment distribution has been digitized through Godhan Nyay yojana. The digitization has helped in maintaining centralized data and avoid any leakages. Moreover, the entire process is managed smoothly with required actions can be implemented based on collected and displayed data.

Status is increasing as per daily transaction of farmers showing interest in selling Cow Dung to make compost to increase quality of food crops from best quality of compost. Till now approximately 3.84 Lakh Unique Cow-dung sellers are registered in the system and the state has purchased 78.47 Crore Kg. Cow-Dung till now using the Digital system. The Cow-Dung purchased is used to produce compost including (Vermi + Super + Super Plus) of approximately 23.93 Crore Kg. which is valued at around Rs.19.56 Crore Kg. and is sold via the digital system.

Hardware/Software

Deployed in Platform: Web Application & Android.

Web Application:

- Language: PHP with Laravel FW.
- FrameWork: Laravel Framework.
- Web Application Server: Apache 2.4 Hosted in Server: Window Server 2019 AntiVirus: Trends Micro.
- DataBase Used: Maria DB 10.4.13

Web Security: SSL & Hosted in secure zone of State Data Center (SDC) Std. ISO/IEC 27001:2013. Web & Android Audited By: MQAS/2020-21/41 CERT-IN Empaneled Agency.

Android App:

- Language: Java
- Database: SQL lite
- Hosted In: Google Play store

Certification (Certifying Agency)

Web & Android Audited By: MQAS/2020-21/41 CERT-IN Empaneled.

MAVERICK QUALITY ADVISORY SERVICES PRIVATE LIMITED, CERT-IN Empaneled (MQAS)

Web Application is free from OWASP 2017 Top 10 (any other known) vulnerabilities and is safe for hosting. 123 Radhey Shyam Park, Sahibabad 201005, UP, India Worldwide CMMI Institute Partners, ISO9001:2015, ISO27001:2013 and ISO20000:2011 Certification Body, REP PMP Certification, CERT-IN Empaneled http://www.mqasglobal.com

Maverick Quality Advisory Services (MQAS) worldwide CMMI Institute Partner specializes in providing tailor-made integrated process solutions aligned with the business context of the client in the area of system and software engineering covering products and services.

We are registered member of NASSCOM, Worldwide CMMI Institute Partner, ISO9001,27001,20000 Certification agency, ZED certification agency and R.E.P PMI USA.

- CMMI Appraisals - Have CMMI HMLAs DEV, CMMI HMLA SVC and CMMI LAs for DEV, SVC and PCMM
- ISO Certification Audits - Provide integrated services for ISO 9001:2015, ISO 27001 and ISO 20000 accredited by NABCB, QCI
- CERT-IN Empanelled for Security Audit covering OWASP top 10 vulnerability, VAPT.
- ZED Assessments – Carry out inspection engagements under the ZED scheme
- Specialized trainings - Project management, estimation, metrics, SLA management, CAM, Service continuity, Six sigma green and black belt, ITIL
- Extensively trained and qualified consultants having diversified international and multi-disciplinary implementation and model experience of over 30 years.
- Have done CMMI assignments in USA, India, Taiwan, Malaysia, Saudi Arabia, Lebanon, China, Amsterdam, Poland, Spain, Indonesia, Thailand, Philippines, Sri Lanka, and Vietnam

Disaster Recovery and Service Continuity

The backup server in addition to Main server is maintained in state data centre. The backup server is acting as a Disaster recovery and for service continuity.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	Brief service description with benefits	Volume (Nos) of Services year wise		
		2020-21	2021-22	2022-23 (Upto date of nomination)

Gauthan Creation	Gauthan is Center to hold cows and a place for cow dung collection. Gauthan center is controlled by Group of People, they are called' Gauthan Committee'.	5183	7151	8807
Cow Dung Seller (Farmer) Registration	Farmer are register in Gauthan to sell Cow Dung Gauthan initiate the payment to Cow Dung Seller (Farmer)	246040	313075	394445
Self Help Group"(SHG) Registraion	● Gauthan's have Group of womens that called "Self Help Group"(SHG). ● Gauthans Committee and SHG is Procuring Cow Dung from Farmers (Cow Dung Sellers). ● SHG decompost a Cow Dung and makes it Compost. Society Sells Compost to Compost Buyers	6676	9332	12038
Payment	● System Calculate Data for payment in Every Fortnight. ● Every Fortnight Honorable Chief Minister Releases Payment in single click to all related beneficiaries (Cow Dung Sellers, SHG, Gauthan Samitis, bank & Society) through banks DBT Process. ● Bank processes & generates payment to all beneficiaries involved in the program and upload the response of the payment for real time monitoring of the payment. ● Every Fortnight Honorable Chief Minister Releases Payment in single click to all related beneficiaries (Cow Dung Sellers, SHG, Gauthan Samitis, bank & Society) through banks DBT Process.	89.53/- Crore	228.82/- Crore	327.05/ Crore

Implementation

Till now approximately 3.84 Lakh Unique Cow-dung sellers are registered in the system and the state has purchased 78.47 Crore Kg. Cow-Dung till now using the Digital system. The Cow-Dung purchased is used to produce compost including (Vermi + Super + Super Plus) of approximately 23.93 Crore Kg. which is valued at around Rs.19.56 Crore Kg. and is sold via the digital system.

- Convergence with IGKV and NGOs for training SHGs, Gothan Committee.
- Ensure production, quality testing and processing of vermicompost.

- Conducting pilot, implementation, regular monitoring & handholding support.
- Convergence with State Rural Livelihood Mission for training of stakeholders.
- Convergence with Forest, Horticulture, Urban Development, Sericulture, and other departments for sale of compost.

Improvements / Enhancements

Improvements/ enhancements specifically rolled out during the year such as:

Year 2020-2021:

- Cow Dung Seller (Active): 165453
- Purchase Cow Dung from Active Seller: 39.46 Crore KG Amount To Purchase Cow Dung: 78.92 Crore Rs.
- Compost (Vermi+Super+Super Plus) Production Quantity:1.55 Crore KG. Compost Sell (Vermi+Super+Super Plus): 1.04 Crore KG.

Year 2021-2022:

- Cow Dung Seller (Active): 109616
- Purchase Cow Dung from Active Seller: 21.27 Crore KG Amount To Purchase Cow Dung: 42.55 Crore Rs.
- Compost (Vermi+Super+Super Plus) Production Quantity:15.88 Crore KG. Compost Sell (Vermi+Super+Super Plus): 10.39 Crore KG.

Current year 2022-2023:

- Cow Dung Seller (Active): 156309
- Purchase Cow Dung from Active Seller: 18.00 Crore KG Amount To Purchase Cow Dung: 36.00 Crore Rs.
- Compost (Vermi+Super+Super Plus) Production Quantity:6.48 Crore KG. Compost Sell (Vermi+Super+Super Plus): 8.11 Crore KG.

As per above year wise planned to be rolled out during next one year.

ENABLER

Processes Re-engineered

The entire process of cow dung collection, Vermi compost, Super Compost, Super Plus Compost creation and payment distribution has been digitalized through Godhan Nyay yojana.

Technologies

Data collection tool to collect all relevant data, Data Analytics, Data Mining & Data Processing for Future use DBT (Direct Benefit Transfer of all related beneficiaries), Covering all required security aspects.

The entire process of cow dung collection, vermi compost creation and payment distribution has been digitized through Godhan Nyay Yojana. The data analysis and Knowledge management application, Internet of things (IoT) and other related technologies is happening in the backend on the collected data, and it is displayed on dashboard through parameters such as Farmer registration, Gauthan created, Quantity purchased, Quantity sold, Payment, that enabled achievement of outcomes etc.

People

Agriculture department was trained on the Godhan Nyay Yojana process along with

Web application and Android application. Timely training is conducted as per request from department.

VALUE INDICATORS

Learning's for sharing

The entire process of cow dung collection, vermi compost creation and payment distribution has been digitized through Godhan Nyay yojana. The digitization has helped in maintaining centralized data and avoid any leakages. Moreover, the entire process is managed smoothly with required actions can be implemented based on collected and displayed data.

Digital Empowerment

Chhattisgarh Department of Agriculture was trained on the Godhan Nyay Yojana process along with Web application and Android application. Timely training is conducted as per request from department to CHiPS Department.

Green e-Governance

The entire project is green initiative with recycling of cow dung to create a useful vermi-compost which is used in foodgrain production.

- Check on open grazing and stray cattle.
- Crop protection, increase area under double cropping.
- Improving soil fertility.
- Ensuring the availability of organic compost in rural areas.
- Increasing usage of organic compost

Shri Sameer Vishnoi, *Special Secretary & CEO CHiPS, Chhattisgarh Infotech Promotion Society/Department of Electronics & IT, Govt. of Chhattisgarh, ceochips@nic.in*

Shri Neelesh Kumar Soni, *Jt. CEO (BM) CHiPS, Head SeMT, Chhattisgarh Infotech Promotion Society/Department of Electronics & IT, Govt. of Chhattisgarh, neelesh.soni@semt.gov.in*

Jal Jeevan Hariyali Abhiyaan Portal

Rural Development Department, Govt. of Bihar & Digital Government Research Centre, National Informatics Centre Bihar State Centre

Rahul Kumar, Niraj Kumar Tiwary and Shailesh Kumar Shrivastava

PROJECT OVERVIEW

Jal Jeevan Harilyali Mission has been established under the Rural Development Department, Govt of Bihar to look after the implementation of Jal Jeevan Hariyali programme of the state government in mission mode. Jal Jeevan Hariyali is a multi-stakeholder programme to address the climate change concerns by accelerated implementation of 11 target interventions in the area of water harvesting, rejuvenation of water bodies, plantations, installation of solar panels, nursery creations and use of alternative and organic farming techniques. The various categories of schemes under this mission mode programme was being executed by 15 different departments of Govt of Bihar with Rural Development Department as Nodal Agency. The role of Jal Jeevan Hariyali Mission was to work towards ensuring time-bound delivery and monitoring of specific outcomes in this programme which was spanning across 15 departments.

Prior to the development of "Jal Jeevan Hariyali Abhiyaan" portal all the line department were implementing the schemes assigned to them and using different systems for monitoring the same, which has resulted difficulty in providing an integrated reporting and monitoring mechanism. There was no proper mechanism to identify the location of the schemes, therefore it was the need of hour to bring all this schemes to a common GIS platform for the purposes of better monitoring and administration. There was also the need to allot unique structure ID to all such schemes of climate conservation.

"Jal Jeevan Hariyali Abhiyaan" portal has been developed to look after the physical & financial progress of all these schemes being implemented by all the departments. A web-portal interfaced with State Spatial Infrastructure and Mobile App has been developed which has resulted in the collection of data at source along with the geo-location so that every climate conservation can be allotted a unique inspection ID and some attributes can be allotted to them. Once the structure is identified, it is assigned to particular based on the nature of the work that can be carried out on the identified structure. A unique is also allotted to the structure and further monitoring of works undertaken.

Objectives:

The objective of the project is to mitigate the adverse impacts of climate change through mission mode accelerated implementation of 11 categories of following targeted intervention:

- Identifying and removing encroachments from public water bodies, reservoirs, etc.
- Restoration and rejuvenation of public water bodies such as Ponds/Tanks/Aahars/Payeens.
- Identification and renovation of public wells.
- Construction of soak pits/recharge pits and other water conservation structure near public wells and hand pumps.
- Construction of check dams and water conservation structures near small

rivers, drains and water storage structures in hilly areas.

- Construction of New Water Resources. Channelling/delivering water from the rivers having surplus water to the water deficit areas.
- Roof Top Rain-Water Harvesting Structure.
- Developing nurseries and massive afforestation.
- Adaptation of alternative agriculture, drip irrigation bio-farming and other new techniques.
- Promoting use of solar energy and savings on energy.
- Jal-Jeevan-Hariyali awareness campaign.

Stakeholders:

a) Rural Development Department; b) Minor Water Resources Department; c) Environment Forest and Climate Change Department; d) Public Health Engineering Department; e) Education Department; f) Agriculture Department; g) Urban Development and Housing Department; h) Panchayati Raj Department; g) Energy Department; h) Animal Husbandry and Fisheries Department; i) Water Resources Department; j) Information and Public Relations Department; k) Revenue and Land Reforms Department; l) Building Construction Department; m) Health Department; n) District and Block Administration; o) People of Bihar

Scope:

- Identification and GIS Mapping of Government and Private Structure (Waterbodies, Building, Nurseries, Land for Plantation, Well, Handpumps etc.) in which any one of the given categories of schemes can be implemented.
- Verification of the identified "Structures" through the Remote Sensing and Capturing of attributes related to physical status of the structures, like functional, non-functional, encroached etc.
- Creating "Geo-Boundaries" of water bodies.
- Mapping of Schemes (under predefined eleven components) with the "Identified Structures".
- Monitoring and capturing the physical progress of the work through mobile-based application.
- Generation of "District Ranking Report" against each of the Eleven Components of the Jal Jeen Jariyali Mission.
- Providing MIS interface for the Department to generate various reports.
- Providing Citizen Interface in the mobile app to locate and report any issue with Schemes and Identified Structures.
- Empowering community, individuals with current knowledge on availability & accessibility opportunity related to waterbodies in rural area.
- Enabling behavior change to people / Gram Panchayats through different tool of communication and creating the impact.
- Creating demand of "Nursery Creation - Didi Ki Nursery Scheme in the community and mobilizing SHGs women to avail / access the services, thus impacting on income / behavioral aspects.
- Capacity building of official members and about successfully implementation of "Jal-Jeevan-Hariyali Mission"

- Creating a robust IT system to cover processes under these schemes and facilitate transparent information flow between different stakeholders of the scheme.

Geographical Boundaries:

The project has been fully implemented in entire state covering all districts of Bihar.

- 38 (Thirty-Eight) Districts of Bihar
- 534(Five Hundred Thirty-Four) Blocks of Bihar
- 8463 Panchayats of Bihar
- 1.14 lakh Panchayat Wards
- Citizens of Bihar State through Web Site https://www.jaljeevanhariyali.bih.nic.in/ and Mobile App "Jal Jeevan Hariyali"

Intended Benefits:

- Holistic development and institutional management of water resources infrastructure with greater public participation.
- Effectively counter the challenges of water scarcity being faced by the State by constructing/reviving ponds, weir/check dams and Ahars/Pynes spanning across 534 blocks in all 38 districts of Bihar.
- Unified register of all the schemes undertaken by all the departments to assist in integrated monitoring of Physical and Financial Progress.
- GIS layers of Waterbodies and Government Structures.
- Proximity based analysis of Schemes.
- Focus on renewable sources energy to reduce dependency on conventional energy sources.
- Recharge the groundwater by rejuvenating waterbodies.

Current Status:

- The Jal Jeevan Hariyali Portal has been developed and hosted at https://www.jaljeevanhariyali.bih.nic.in/.
- The Mobile Application "Jal Jeevan hariyali" is developed and published at playstore https://play.google.com/store/apps/details?id=bih.in.jaljeevanharyali. This Mobile App has interface for both Official Users and Citizens.
- The Jal Jeevan Hariyali Portal has been integrated with State Spatial Data Infrastructure. All the Ahar/Pyne, Wells, Hand-pumps, waterbodies, government building and plant nurseries has been mapped on GIS platform.
- Presently 4, 06,178 schemes has been registered on the portal out of which around 3, 50,165 schemes worth Rs.7, 703.93 crore are complete and 56,013 schemes worth Rs.1, 358.01 crore are under development.
- Capacity Building Programme has been conducted in the all the Districts for Field Formations and all the 15 department for departmental users. & The programme has received an extension for next 3 years from the year 2022 onwards.

Hardware/Software

H/W and Software Specification	**Name of H/W and S/W**
Servers & Desktop	High End Blade Servers, Local servers, Desktops Hosted

	at NIC Mini Cloud Patna
OS	Windows Server 2012
DBMS	SQL Server 2008, SQL-Lite
Web Server	IIS 7.0 and more
Framework	.Net framework 4.5, Java
IDE Software	Visual Studio 2019, Android Studio
Reports	HTML 5 based reporting
SMS	Mobile Seva of DEITY and NIC SMS Gateway
Mobile App	Android based Java Application
Unicode Support	Indic IME
Video Player	HTML 5

Certification (Certifying Agency)

The application has been audited by CERT-IN empaneled vendor Codec Networks Pvt. Ltd.

Disaster Recovery and Service Continuity

To keep the data and application safe and ensure service continuity the applications are hosted in State Data Centre Bihar. The SDC provide cloud environment on virtual servers. Streaming replication of database has been setup which also acts a resource for reporting database. The daily incremental backup is scheduled and full back up of database is being taken every fortnight. The Bihar SDC is a STQC certified datacenter and continuous security and performance audit of Data Centre is being carried out as per standard operating procedure. The Bihar SDC has created DR with Microsoft Azure Cloud. The websites along with required software are made available in DR site so that in case of failure of DC the DR site can automatically be made active. The management of DR Site is done by a group of specialist technical officers of IT Department, Govt. of Bihar.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	Brief service description with benefits	Volume (Nos) of Services year wise		
		2020-21	2021-22	2022-23 (Upto date of nomination)
Verification of Water bodies (Pond/ Aahar/ Pynes etc.)	Identification of Public/ Private water bodies with details of area, local landmark etc.	24692	37469	28680
Verification of Wells	Identification of Public/ Private wells with details of area, local landmark etc.	47649	28352	10943
Verification of hand pumps	Identification of Public/ Private Hand-pumps with details of area, local landmark etc.	406957	295099	134522

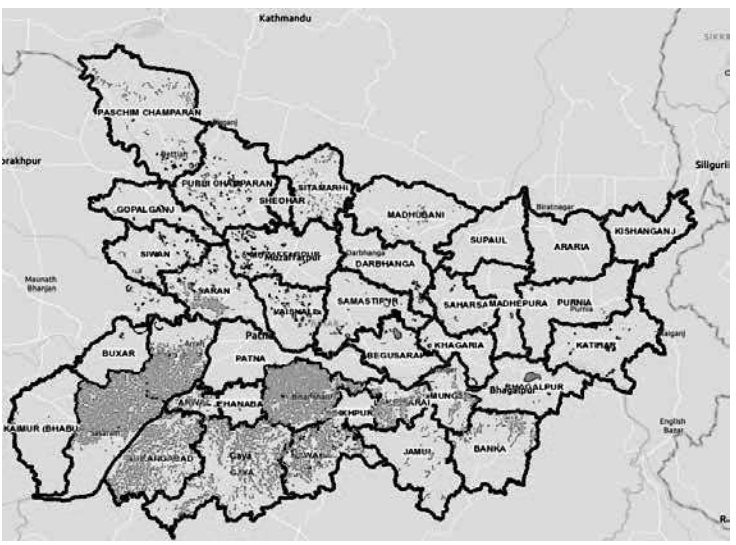
Verification of nursery	Identification of nursery with details of area, local landmark etc.	0	518	341
Verification of Government Buildings	Identification of government buildings with details of area, local landmark etc.	3091	1035	14345
Online Entry of New Schemes	Scheme Identification, Approval by GP committee and estimation of scheme.	154165	61666	41869
Official Approval	Official Identification and approvals	154165	61666	41869
Approval for Working and progress of scheme	Inspections of progress Details	2850 Cr	3870 Cr	984 Cr
Online Query, SMS alert and Reporting Service	Query, SMS Alert and Reporting for all levels of Applications	1.54 Cr	12.15 Cr	15.10 Cr
Feedback & Grievance from Citizen Login	Feedback and Grievance on scheme.	362	973	696

Implementation

The application has been fully implemented in entire state covering all districts of Bihar.

- 38 (Thirty-Eight) Districts of Bihar
- 534(Five Hundred Thirty-Four) Blocks of Bihar
- 8463 Panchayats of Bihar

The entire project activities are being carried out using this application only and using any other medium of reporting is not acceptable to the authorities.



Functionality:

- Panchayat wise physical survey/inspection of structures related to JJHM.
- Capturing of encroachment status, operational status and other basic details such as area, geo-location and photograph of the structures.
- Verification of captured structures using various method such as remote-sensing data for waterbodies and Wells.
- Removal of encroachments by District Administration and updating the Portal.
- Creation of schemes for renovation/rejuvenation as per the mandate of JJHM.
- Allocation of schemes to the department based on the attributes of the structures.
- Phase wise scheme inspection and reporting by field functionaries.
- Financial progress reporting by departments.
- Reporting of overall progress and department rankings for monitoring.

Delivery channels

- SMS Alert
- Online Enquiry
- Mobile App
- Helpdesk and Kiosk
- Call Centre Support

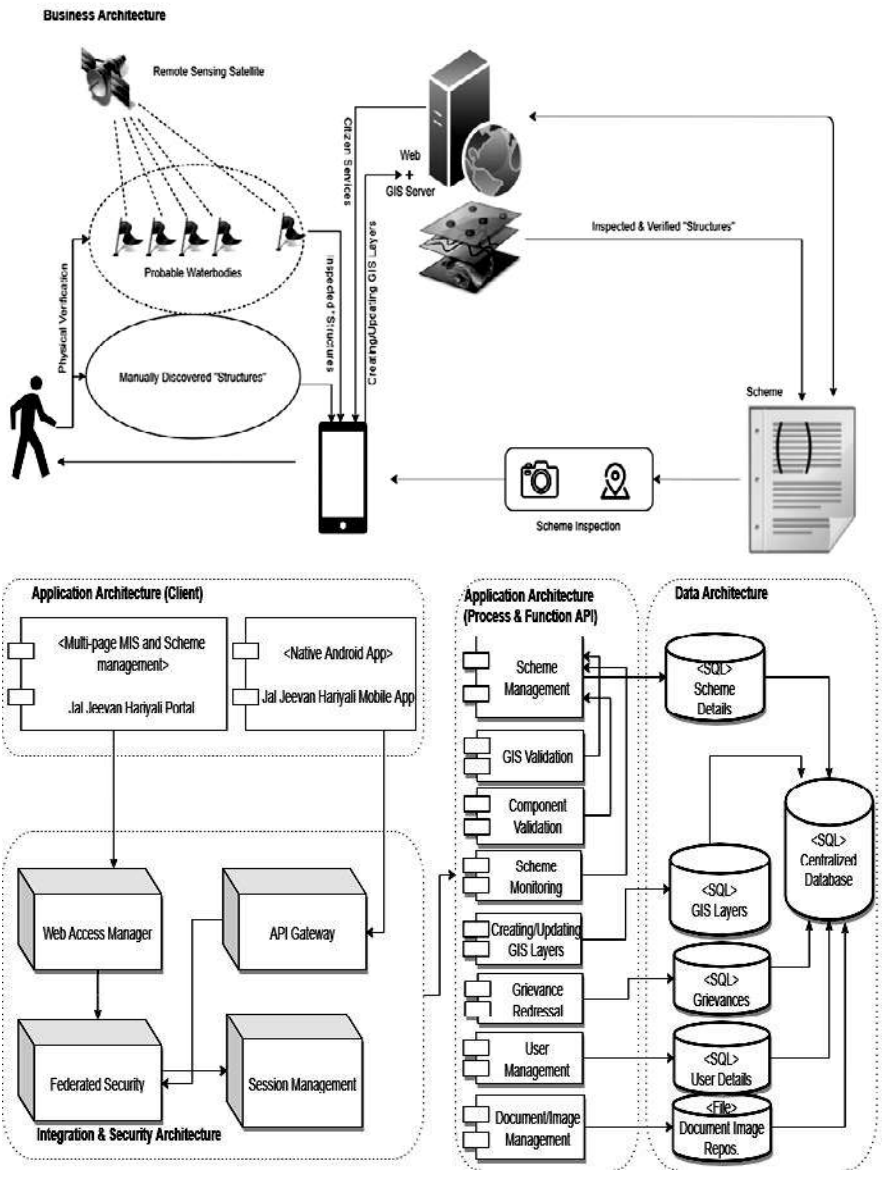
Category of stakeholders

- State Administration
- District Administration
- All the department of Bihar Government
- Citizen of Bihar

Mobile Application:

Solution Architecture:

Solution Architecture of "JAL JEEVAN HARIYALI"



Improvements / Enhancements

Improvements/ enhancements specifically rolled out during the last one year:

- GIS based reporting of the structures up to Panchayat Level. Color coding of different category of structures to represent coverages in a particular geographical boundary such as Panchayat, Block, District and entire State.
- Department-wise district ranking report on the basis of ten identified components.
- Measurement of structure based on GIS polygons captured.

Improvements/ enhancements specifically rolled out during the next one year:

- Linking of payments as per the physical progress of schemes.
- Mapping of linear / rectangular plantation layers with State Spatial Data Infrastructure.
- Department wise fund utilization reporting as compared to allocation and actual expenditure.

ENABLER

Processes Re-engineered

- Online structure Identification, geo-tagging, attribution and verification using Mobile Application and Remote-sensing maps.
- Automatic creation of GIS Layers after verification of structures based on the type of structure identified such as Waterbodies, Plantation Land and Buildings etc.
- De-duplications of schemes and structures by using Geo-location enabled application and assignment of Unique ID.
- Online mapping of schemes with structures, scheme creation and approval.
- Integration of all the schemes executed by different departments on a single platform.
- Inspection and monitoring of physical and financial progress of Schemes through Mobile Apps.
- Online monitoring and reporting mechanism.
- Grievance/Suggestions from Citizens using Mobile App

Technologies

- Workflow Management System with separate roles defined for each stakeholder.
- Three tier architecture for data, application and middleware management.
- Web and Mobile based integration framework.
- GIS mapping of Locations for Spatial analysis of services.
- Mobile based application for online reporting and access of status.
- SMS Integration for alerts.
- API integration for mobile applications.
- Mobile Application Development for Hybrid Platforms.

People

Capacity Building:

The capacity building programs has been conducted regularly for all the participating departments. Initially a set of master trainers were trained and then the training program has been conducted physically at every department, district and block level. The video conferencing-based training has also been conducted time-to-time in order to keep the stakeholders updated about new features and releases into the system. During the implementation phase the training program was taken as a massive exercise and interactive training materials have been prepared to keep the users interested. Master trainers at every block has been identified who imparts training to all the users.

Leadership and Support:

To ensure an effective implementation of Jal Jeevan Hariyali Project, the leadership support has been provided for:

- Making Policies for adoption of JJHM as a solution.
- Setting up long-term scope and targets.
- Providing project oversight, direction and guidance.
- Change management & Process re-engineering.
- Regular review of the project.

Leadership and support teams are available at following levels to ensure smooth functioning and sustainability:

State Executive Committee:

This is headed by Development Commissioner as President with Additional chief secretary / The Principal Secretary/ Secretary of all the 15 participating departments, Member secretary of Bihar State Pollution Control Board, State Mission Director-cum- Chief Executive Officer– JEEViKA, The Commissioner, MGNREGA, One Representative from NABARD, One Representative from G.M. Railway, One Nominated representative from NHAI, Mission Director, JJHM as Member Secretary of GoB. This Committee body takes policy decision for Jal-Jeevan-Hariyali Mission related activities and citizen centric services.

State Project Core Team:

Additional Secretary cum Mission Director, Rural Development Department, Government of Bihar and NIC, Bihar has notified officers as Project Members of project team. This also have members from administrative officers etc. who advices and assist during project implementation. This team is supported by a team of hired programmers well versed in adopting online web applications, mobile applications and provides technology implementation of the Project. This teamwork under overall supervision of Deputy Mission Director, Bihar.

Project Steering Committee:

In order to support project, a group of resource persons has been created who work at State HQ level and oversee progress of project and ensure smooth operations at field level. A PMU cum ICT cell has been created with hired manpower and domain experts at department level. These people have been trained on using application by NIC team. These people not only co-ordinate with field formations such as Panchayats, blocks and districts but also interact with field formation for collecting data. In addition, the PMU/ICT cell motivate decision makers to use ICT in decision making process and create ICT enabled environment for planning and monitoring. Regular meetings are being conducted to ensure smooth functioning of ICT initiative.

District/Block/Panchayat Level:

District and Block level functions are overlooked by DDC and BDO of the respective district and blocks. The representative from every department is nominated at district and block level to look after the implementation of the project. The team works in overall control of District Magistrate of concerned District. The team works also with close coordination with Jal-Jeevan-Hariyali Mission team.

VALUE INDICATORS

Learning's for sharing

The application is one of its first kind which has used latest technologies to bring multiple stakeholders on a single platform and facilitated a unified monitoring and execution mechanism. The usages of GIS based technologies and Mobile Application has resulted in a more transparent system and avoided redundancy in creation of

schemes. The Mobile application also made possible the collection of data at source with the help of field functionaries with little or no IT awareness. This application presents an example of how technological intervention can be effective in simplifying the processes and smoothening the execution of government functions. The key takeaways from Jal-Jeevan-Hariyali Application are:

- Every application targeted at rural population must use a mobile first approach.
- GIS based technologies should be used for proper identification and geo-tagging of the schemes and Online Digital Verification.
- Application should be designed only after simplifying the operating procedures.
- Bandwidth constraints in rural areas can be addressed with designing the application which works in offline mode and supports deferred updates.
- Rollout supported by proper capacity building and workshops makes wide acceptance of system very effective.
- SMS alert helps to deliver information at different stages of application lifecycle.
- API based integration framework and Service Oriented Architecture need to be used for designing new systems.
- Reliability and availability of the system must be ensured.
- Responsive and supportive implementation team is needed.
- This application can be replicated across India as all the states are now executing such schemes under "Jal Jeevan Mission" umbrella of Govt. of India.

Digital Empowerment

- Creation of GIS Layers and GIS based monitoring mechanism.
- Unique identification number allotted to every scheme.
- Mobile/Web based multi-channel service delivery.
- Bilingual (Hindi and English) and Unicode supported user interface.
- Conversion of manual into electronic processes.
- Collection of data at source using mobile devices.
- User-friendly and transparent process for stakeholders.

Green e-Governance

- The end-to-end activity related to the project is being handled in electronic mode. All the stages right from the scheme identification to scheme closure are being covered using Mobile Application and the data is synchronized on Servers.
- Citizens also can use the same Mobile application for filing suggestions/complaints.
- The approval process is also done in online mode through the web-portal and no paper is being generated.
- The entire reporting system is online and role based reporting mechanism has been created.
- Most of the communications are being done through e-Mail and SMS.
- The capacity building exercises are being done in online mode.
- All orders, circulars and notification related to the schemes are being published on the portal itself.

- All the training materials, guidelines and user materials are available on the portal in electronic form.

Shri Rahul Kumar, IAS, *Mission Director, Rural Development Department, Govt. of Bihar, md-jjh-bih@gov.in*

Shri Niraj Kumar Tiwary, *Scientist E, National Informatics Centre, Bihar State Centre, nk.tiwary@nic.in*

Dr. Shailesh Kumar Shrivastava, *Scientist F and Head, DGRC, National Informatics Centre, Bihar State Centre, sk.shrivastava@nic.in*

GeoReach (Geomatics based Rural Roads Enterprise Application for Connecting Habitations)

Madhya Pradesh Rural Road Development Authority, Govt. of Madhya Pradesh & National Informatics Centre Madhya Pradesh State Centre

Tanvi Sundriyal, Vikas Sharma and Vivek Chitale

PROJECT OVERVIEW

The up gradation of Rural Roads under 'MP Rural Connectivity Project (MPRCP)' funded by WB/AIIB is an ambitious scheme of the State for providing dustless connectivity to Rural populat on. This scheme involves black topping of about 4.500 small roads of total length of 10.510 Km scattered at remote locations through 75 Project Implementation Units (Plus). World Bank (WB) & Asian Infrastructure Investment Bank (AIIB) insisted on intense quality checks during construction. pragmatic billing procedures and faceless approach for payments to vendors (Contractors). Requiring major changes in set procedures. in a nutshell; Whole process was to be re-engineered. Major challenge foreseen in the implementation of this project was the management and monitoring with such huge amount of datasets residing in papers, the monitoring of such works at field level, head office as well as at WB level through traditional way was difficult given the pre-project scenario.

Orthodox procedures for Works Payments to the contractor involves manual inspections of site by Engineers, Manual and lengthy billing procedures, tedious procedures of taxation and deductions, cheque settlements etc. With the introduction of GeoReach portal, everything came together at the fingertips with no complexities.

GeoReach system (G2G, G2B) facilitates role-based access to Web-based interface for:

- Verification of Packages/roads
- Road Inspection (Road Registration and stage passing inspections)
- Authorization of Maximum Spending Limits (LOC) to Plus
- Online bill generation for machinery/mobilization advances
- Online RA bill generation based on SSoR/BoQ (Bill of Quantities)
- Generation of Release vouchers
- Bill processing and generation of digitally signed scrolls
- Package termination/completion
- Digital payment through PFMS
- Provision for deviations in cost (with and without cost escalations)
- GIS
- Physical Progress Monitoring
- Query/reports
- Tracking by Contractors
- Independent State Quality Monitors (SQM) Inspection Process (includes creation of Road assignments, its random allocation to SQMs, ATR handling etc.)
- User registration and administration by departmental admin

PRRDA officials (at Hq, as well as PIIJ level), Contractors, SQCs. SOMs and World Bank Officials are key stakeholder.

Intended Benefits

- It’s an e-Governance model which brings transparency, re-engineering &

reforms in existing processes.

- Re-orientation from Discretion-based system to a uniform transparent & standardized process oriented system.
- Infrastructure creation (Construction of road) is a significant thrust area with expenditure outlay of more than Rs 7000 Cr. Efficient & effective monitoring facilitated by the system has brought huge savings on State exchequer in addition to savings on efforts & time.
- Around 23,000 inspections are conducted and Rs. 2700 Crores have been paid to contractors.
- There is drastic reduction in number complaints being received at higher level in regard to non-payment, delay in payment and poor condition of roads.
- It has brought overall transparency in road construction process thus has diluted nexus between Field Govt. Officials & Contractors and enabled higher-ups to take suitable actions.
- Availability of an IT-driven system has facilitated monitoring of construction activities by World Bank team and timely reimbursement of expenditures raised by the department.

Being used by all the PIUS of the state for execution and monitoring construction of more than 4350 roads covered under MPRCP project.

Hardware/Software

GeoReach system has been designed and developed using scalable architecture of Open-Source Technologies. It is fusion of innovative technologies Open Source, Remote Sensing, GIS, Cryptography, Mobile, Messaging and Mail.

- Application Development Technologies: Java, JSP, Servlet, Bootstrap Framework, Jquery, CSS.
- Development Frameworks: Spring MVC
- Development Environment: Eclipse IDE
- Database Platforms: MS SOL Server
- Web Platforms: Tomcat, SFTP Server
- Security: SS/TLS, DSC, Cryptography
- Reporting Platforms: Jasper Reporting Framework
- GIS Platforms: Google HRSI/Remote Sensing
- Digital Signing platform: NICDSign

Certification (Certifying Agency)

Yes, formal certification has been obtained with respect to Cyber Security from Secure Eyes Techno Services Pvt. Ltd. Bangalore.

Disaster Recovery and Service Continuity

In view of importance of data and functional dependency, a disaster recovery (DR) plan for GeoReach has been prepared and implemented using state-of-the-art technology, currently two DR sites of GeoReach are active. One at IDC Bhopal and other at NDC Hyderabad. The GeoReach data synchronizes at two locations simultaneously using database mirroring facility. There are multiple web servers which work together under NLB. These servers are synchronized on regular interval by automated process. It ensures high availability, safety and reliability of data and application during failure/ maintenance.

A system has been devised which checks the functioning of all components including DR and sends SMS alert/ notification during failure to the concerned group members for immediate remedial action. The virtualization environment helps to meet heavy

load during financial year end. This DR setup is frequently used during maintenance for smooth operations and business continuity. It ensures proper functioning of DR setup and satisfies the service continuity plan.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	Brief service description with benefits	Volume (Nos) of Services year wise		
		2020-21	2021-22	2022-23 (Upto date of nomination)
RA bill generation	Online generation and submission of Running Account bills by the SOC which are very complex in nature. Its automation ensures accuracy in calculations and thus timely processing and payment.	1206	616	338
Machinary/Mobli sation advance bill generation	Online generation and submission of Machinery /Mobilization advance bills by the contractor.	05	12	04
Voucher generation	Facilitates generation of vouchers against bills RA/Advance bills and Release voucher against deductions made from these bills for its release back to the contractor. It maps payment details with contractor's bank account. It is signed digitally on fly and sent to PFMS for direct payment into contractor's bank account.	1909	1077	500
Scroll generation	Facilitates generation of scrolls for vouchers of RA/Advance/Release through system. It maps payment details with contractor's bank account. It is signed digitally on fly and sent to PFMS for direct payment into contractor's bank account.	1835	1071	491
Pre-Project Inspections	Pre-Project Inspections is carried out for registration of roads through uploading of Geo-tagged photographs on every km of every road. It helps to verify its real existence as well as	206	291	214

	alignment on the ground.			
Stage passing Inspections	Stage passing Inspections are carried by field staff at various construction stages. Grading given in these inspections controls processing of next stages.	1532	911	505
SQM Inspections	Road Inspections submitted by the SOMs in definite time frame on monthly basis along-with 10 geo-tagged photographs as evidence.	337	286	165
Completion certificate generation	Package completion certificate is generated through system which ensures its accuracy, authenticity and timely availability to the contractor.	113	111	38

Implementation

Project is being executed in every PIU of the Authority, every payment to the contractor is routed through the portal.

Improvements / Enhancements

During last one year: Module for physical progress of the roads, Issuing Completion Certificate through portal. Enhancement in reports used by World Bank for monitoring & reimbursement purposes, scheduler for transfer of roads for DLP maintenance.

For next year: Migration of database from SQL server to Postgres.

ENABLER

Processes Re-engineered

- All the contractors related to the scheme are on boarded and registered with associated details by maintaining unique ID of each contractor thus eliminating duplicity and preserving the data.
- Bill Of Quantities of every work which along with accepted rates of successful bidders are exported from GePNlC and imported directly to GeoReach to ensure complete correctness of billing process and removal of anomalies.
- Bank credit limit authorization to all PICS are prepared and generated intelligently by the system with minimal human efforts thus ensuring greater financial control.
- Major challenge in handling variation in quantities of scheduled items and addition of extra items within and beyond sanctioned cost in item rate contracts are completely revived through GeoReach, now the process IS restructured in such a way that it is faster and easier.
- Reimbursement process may be termed as one of the biggest achievement of this project. Since the lUFRs are generated through the system, MPRRDA has been successful in getting reimbursement claims of the previous month before clostng of the current month.

- Generation of monthly schedules for inspection by 2nd Tier independent Quality Monitors (SQMs) is now being facilitated through GeoReach thus making it automated and free from human intervention.
- GeoReach facilitates automated and smooth transition of completed roads to eMarg for payment and monitoring during maintenance phase thus achieving safe keeping and supervision of complete life cycle of every road.
- Complete revamp of payment process through GeoReach with application of DSCs and integration with PFMS.

Technologies

- GeoReach Seamlessly Integrated with PFMS (Public Financial Management System O/o Controller General of Accounts. Ministry of Finance) through XML based data exchange in compliance with the integration protocols of PFMS.
- Used NICDSign, a micro services architecture based DSC signer utility for digital signing of Payment Scrolls.
- Use of SSL to ensure secure transmission of data.
- Used API for DSC CRL database verification and validation.
- Use of GIS technology to have holistic view of all MPRCP roads, optimized packaging of roads, distance/area calculation etc.

People

Training of MPRRDA Hq staff (CGM Finance, Nodal officers. administrator etc.), PIU staff (Genaral Manager, AM/Sub Engineer, Account Officer), State Quality Consultants (SQCs), State Quality Monitors (SQMs) & Contractors.

Refresher courses are also organized for field staff.

VALUE INDICATORS

Learning's for sharing

During execution of the project, following challenges were faced and then converted into opportunities for betterment of the existing process:

- Completion certificates of projects were issued offline which were sometimes not aligned with the GeoReach data, in response to this issue, generation of Completion Certificates were started from GeoReach itself.
- Earlier allotment of districts to SOMs was MS excel based which got later transformed into completely automated and randomized through GeoReach.
- After construction of a road, it goes into maintenance phase. The transition between construction and maintenance phase was very crucial in maintaining the life cycle of a road. This transition is also automated between the softwares.
- Payments to the contractors were completely made digital using integration with PFMS.

Digital Empowerment

Empowerment to the Contractors:

Contractors are able to apply online for mobilization/machinery advances. Payment of these advances, bill amounts or release vouchers is directly made to their account through PFMS. Bank Details & Payment status can also be checked through their login.

Empowerment to the Field Engineers:

Field engineers are now able to upload inspection reports online, earlier they used to go through a tedious process of bill preparation, now they are empowered with an electronic platform to ease their work. Nearly 4000 users are successfully on boarded to GeoReach.

Green e-Governance

- Implementation of GeoReach has drastically reduced or eradicated use of papers during bill preparation, inspection reports etc.
- Frequent travelling due to mandatory physical presence has completely zeroed down to faceless approaches which results into lower carbon emission.

Smt. Tanvi Sundriyal, IAS, *Chief Executive Officer, Madhya Pradesh Rural Road Development Authority, ceomprrda@gmail.com*

Shri Vikas Sharma, *Task Manager, Madhya Pradesh Rural Road Development Authority, tm.mprrda@gmail.com*

Shri Vivek Chitale, *Senior Technical Director & ASIO, National Informatics Centre, Madhya Pradesh State Centre, vc@nic.in*

Innovative Assessment Tool – NICler

Department of School Education, Govt. of Chhattisgarh & National Informatics Centre Chhattisgarh State Centre

S. Bharathi Dasan and A. K. Somasekhar

PROJECT OVERVIEW

NICler is an innovative assessment tool from NIC for conducting MCQ based quiz in a normal class room, **without any electronic device in the hands of the students.** Assessing students through Multiple Choice Questions (MCQs) is being used for decades. But, in a government school class room of 40 students, to capture students' answers, either we should do paper-based assessment or each student should have an electronic device on their hands to answer the given question. But, giving an electronic device to each student is a costly affair. This project uses ArUco markers and OpenCV to capture students' answers to a MCQ without any electronic device in the hands of the student. Teacher only needs an Android smart phone and should install NICler App designed for this purpose.

In a class room students are given NICler IDs (shown in the picture) pasted on some hard paper. NICler IDs are nothing but normal print outs of ArUco markers. Students can answer to a MCQ by placing the NICler ID in proper position and showing to the teacher. Teacher through NICler App can capture the answers from more than 20 feet distance by identifying the position of the NICler ID. This helps teacher to capture all the students' answers to a MCQ in a few seconds. The data will be synced to the server. Server creates a learning profile of the student to enable teacher use adaptive teaching method to each student. Questions are displayed through a projector wherever projector is available. But many government schools do not have projectors. Then teacher has two options, one is to write the question and options on black board. When teacher opts for black board questions, system automatically gives questions and options without pictures. But, writing questions on the black board is painful to the teachers. Hence, audio-based questions have been designed which can be played in a class room using Bluetooth speaker. This is very cost effective tool as it costs Rs. 20/- for a 40 student class per year and best suitable for state government run schools which are large in number (40, 000 in the state) and have budget constraints.

NICler app uses OpenCV and ArUco marker technology. The app can recognize an ArUco marker which is at more than 20 feet distance to read the number stored in the ArUco marker and the direction of the ArUco marker to find out the student answer. This is an innovative application of ArUco markers and OpenCV.

Objectives-

- To provide cost effective technical platform to conduct MCQ quiz in a class room and capture all students' answers without any electronic device in the hands of the students
- To introduce gamification techniques to make assessment more entertaining and thus improve students' engagement in the class room.
- To capture student wise question wise data for data analytics without entering a single data item by the teachers.
- To provide students' learning profile to the teachers through data analytics of the captured data to teachers so that teachers can use adaptive teaching

methods

- To encourage voluntarism and peer participation in the class room practices by conducting NICler based quizzes.

Hardware/Software

Server – Windows server 2012

Programming Environment – Android, Microsoft Dot Net

APIs – Microsoft Dot Net

Open-source Tools – ArUco markers from OpenCV, Python

Database – MariaDB

Certification (Certifying Agency)

Yes, Security audit is under process & SSL certificate has been implemented.

Disaster Recovery and Service Continuity

Yes. Backup is taken transactional and full, on daily basis. Mirror server is maintained locally. Business can be re-started in an hour's time in case of serous hardware failure.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e Service	Brief service description with benefits	Volume (Nos) of Services year wise		
		20-2021	2021-22	2022-23 (UPTO DATE OF NOMINATION)
Students benefitted	Students from 6th to 12^{th} who have participated in NICler based quizzes.	-	12000+	20, 000+
Quizzes conducted	NICler based quizzes conducted	-	400	1, 000
Questions created	Questions for different chapters based on learning outcomes.	-	40000	10, 000

Implementation

NICler is currently used in 175 Swami Atmanand Government English Medium Schools (SAGES). Department of School Education has decided to use NICler based quizzes for remediation for students and it is under implementation. NICler is implemented in Department of Technical Education, Chhattisgarh in all Government Polytechnic and Engineering Colleges. NICler will most probably rolled out in the states of Punjab, Karnataka and Maharashtra.

Improvements / Enhancements

The initiative is implemented in the last one year only

ENABLER

Processes Re-engineered

- Conducting MCQ quiz in a class room is completely re-engineered. Earlier it

was on paper either using OMR or manual correction. Now, it is through NICler IDs

- The gamification techniques to motivate students, participate in the quizzes have been carefully designed by experts.
- NICler quizzes have been accepted as formal assessment during slip tests
- A traditional practice in any type of quizzes is to give prizes to the rankers say first, second and third. It doesn't really motivate last 20 percentile students to work more as they don't have any chance of getting recognized because they cannot be rankers**. So it has been re-engineered**. NICler offers random gifts to one **lucky winner** out of **the students who have answered correct** after every question. It provides chance of getting recognized to even last 20 percentile candidates if they can answer some questions correct. That ultimately motivates every student to work more to get recognized.

Technologies

- NICler uses ArUco marker recognition Machine Learning model available in OpenCV package. An Algorithm has been developed to find out the direction of the ArUco marker placed for capturing students' answers (A to D).
- Micro Services have been developed to communicate between NICler and other application servers.
- Data Analytics used to create student learning profile by analyzing the data captured through NICler.

People

Dr. S. Bharathi Dasan, Secretary, Department of School Education – Leadership and change management.

Mr. T. N. Singh, State Informatics Officer, NIC – Technical Guidance and Consultation.

Dr. Narendra Dugga, Mission Director, Samagra Shiksha – Implementation.

Mr. A. K. Somasekhar, Sr. Technical Director, NIC – Innovation, Architecture and Design.

Dr. Yogesh Shivhare, Additional Director, SCERT – Content Support and implementation

Dr. M. Sudhish, Assistant Director, Samagra Shiksha – Implementation support and content creation.

Ms. Lalita Verma, Scientist – 'B', NIC – Team Lead for Technical Development.

Mr. M. Muralidhar, Mr. Deepak Shrivastava, Mr. Yogesh Peter Graham, Mr. Kishor Kumar and Ms. Gargi Pandey – Technical Development.

VALUE INDICATORS

Learning's for sharing

- ArUco marker technology can be used to capture user's choices without any electronic device with the user.
- While designing technical interventions, especially in education, should include gamification techniques.
- One of the learnings from this initiative is to involve every stake holder from the concept stage. The department has conducted many consultative

workshops involving teachers, students, DEOs and subject experts from SCERT to validate the idea.

- The current technology allows multimedia processing and hence, e-Governance applications should see beyond Text and Image based applications.

Digital Empowerment

- The application is so designed that the user interface can be changed easily to any language. However, NICler app is to be used by teachers in educational institutions and hence, English has been made primary user interface.
- NICler app has been optimized to work in different types of smart phones.

Green e-Governance

The initiative converts paper based MCQ quizzes to paper-less. Hence, saves tons of papers.

Dr. S. Bharathi Dasan, IAS, *Secretary, Department of School Education, Govt. of Chhattisgarh, secybgovtcg@gmail.com*

Shri A. K. Somasekhar, Sr. Technical Director, *National Informatics Centre, Chhattisgarh State Centre, som@nic.in*

Award of Appreciation

Electronic Transaction Aggregation & Analysis Layer (eTaal 2.0)

National Informatics Centre, New Delhi

IPS Sethi and O. P. Gupta

PROJECT OVERVIEW

eTaal 2.0 project is based on the principle: "**You can MANAGE effectively what you can MEASURE**". The key objectives of the eTaal 2.0 portal are as follows:

- Provides quick consolidated view of eTransactions through eGovernance applications
- Measures number of eTransactions performed by various eGovernance applications on a near real time basis
- Act as an indicator of scale of services being delivered to the citizens
- Provides quick analysis of transactions in tabular and graphical form on various filters such as service, time-period, State/Department, or geography
- Enables the Ministries/Departments implementing eGovernance projects generate real-time view of the impact of their projects and take remedial steps or interventions where needed
- Aggregates e-Transaction count from applications integrated automatically using Web Services technology
- Provides drill down capabilities to view the details of eServices and eTransactions across Central and State Projects till State/District-levels
- Compares the performance amongst the States

eTaal is a platform for dissemination of e-Transaction statistics of National and State level e-Governance Projects including Mission Mode Projects. It automatically pulls the e-Transaction data from applications integrated with it using Web Service technology and facilitates quick analysis of transaction data for the user.

Key Stakeholders:

- Central Ministries/Departments
- State/UT Governments
- CSCs
- Citizens/NGOs
- Academic Institutions/Researchers
- Smart Cities

Intended Benefits:

- Comprehensive view of eServices and eTransactions data
- Comprehensive State Portal for State project teams to evaluate the performance of their projects
- BI Analysis providing the quick view analysis of the data
- Healthy competition amongst the States

Hardware/Software

Name of the Product/Project	Application Framework	Data Base	Web Service	Other Specifications
eTaal	Microsoft .NET Framework 4.5	Microsoft SQL Server 2017	Pulling of eTaal data from client-side server	1. **OS -** Windows Server 2016 2. **Web Application -** ASP.NET with C# 3. **Server -** IIS10.0 4. **Antivirus** - Trend Micro 5. **Firewall** - Intrusion Prevention system (IPS), ISA 2006 WSUS

Certification (Certifying Agency)

Yes, Project has successfully cleared Security Audit requirements of NIC.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Service	Brief e-Service description with benefits	Volume (Nos) of Services year wise		
		2020-2021	2021-2022	2022-23 (Up to date of nomination)
Total No. of eServices integrated with eTaal Portal	To facilitate the view of eServices being delivered across the country, Service Directory has been developed. The eService directory provides the details of eGovernance applications delivering the service along with the details of spatial spread for a given service. It helps citizens to find state level services grouped under a standard service.	129	154	126
Total No. of eTransactions reported on eTaal Portal	Monitoring and tracking of the progress of various initiatives using Business Intelligence Tools is incorporated as part of eTaal 2.0, which can help the Government in decision making	5306.54	7205.94	10444.30

Implementation

- 21 Central Ministries
- 36 States & UTs

Improvements / Enhancements

eTaal Dashboard is an Electronic Transaction Aggregation & Analysis Layer that provides a real-time aggregated view of eServices and eTransactions for all the eGovernance projects across the nation. The dashboard automatically pulls the eTransactions statistics from integrated applications using Web Services technology and facilitate quick analysis and better decision making by the stakeholders.

Electronic Dashboard established by GoI for providing a real-time aggregated view of volume of eServices being delivered across different agencies of the central, state and local governments in India.

eTaal Dashboard displays the number of 'end-to-end electronic transactions' as the indicator for measuring the performance of G2C, G2B and B2C e-Services:

- Layer providing consolidated view of eTransactions through eGovernance applications.
- Perform analysis of eTransactions data received from various applications with drill down capabilities and performance comparison with other States.
- Aggregate eTransactions from applications integrated automatically using Web Services technology.
- Tabular and graphical analysis of eTransactions data
- Enable Ministry/Department/ State/ UT to have consolidated view of eTransaction statistics & visualize their utilization status

Enhancements and Improvisation being done in eTaal Portal:

i. Provides quick consolidated view of eTransactions through eGovernance applications
ii. Measures number of eTransactions performed by various eGovernance applications on a near real time basis
iii. Act as an indicator of scale of services being delivered to the citizens
iv. Provides quick analysis of transactions in tabular and graphical form on various filters such as service, time-period, State/Department, or geography
v. Enables the Ministries/Departments implementing eGovernance projects generate real-time view of the impact of their projects and take remedial steps or interventions where needed
vi. Aggregates e-Transaction count from applications integrated automatically using Web Services technology
vii. Provides drill down capabilities to view the details of eServices and eTransactions across Central and State Projects till State/District-levels
viii. Compares the performance amongst the States

ENABLER

Processes Re-engineered

eTaal Dashboard displays the number of ‘end-to-end electronic transactions’ as the indicator for measuring the performance of G2C, G2B and B2C e-Services.

- **Layer** providing consolidated view of eTransactions through eGovernance applications.
- Perform **analysis** of eTransactions data received from various applications with drill down capabilities and performance comparison with other States.

- **Aggregate** eTransactions from applications integrated automatically using Web Services technology.
- Tabular and graphical analysis of eTransactions data
- Enable **Ministry/Department/ State/ UT** to have consolidated view of eTransaction statistics & visualize their utilization status.

Technologies

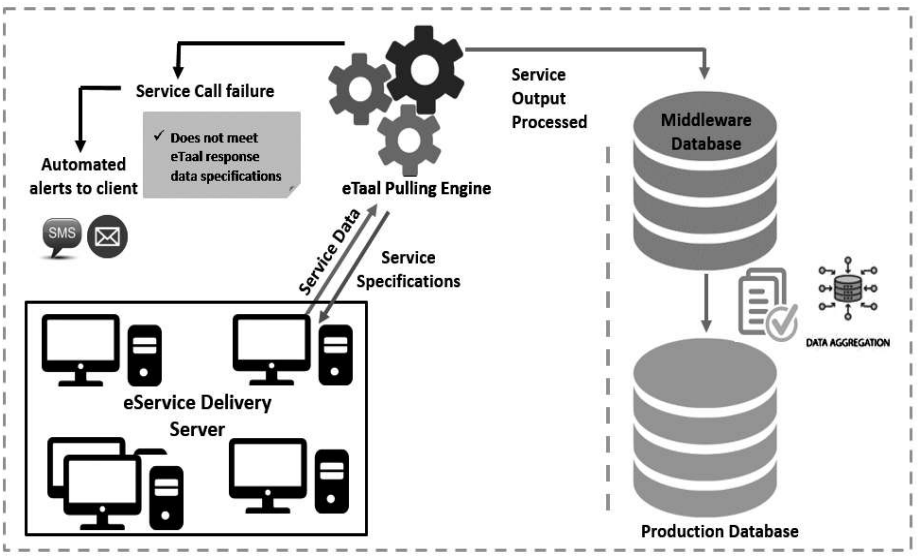
Key Components

1. **Dashboard Server Connector (DSC)** runs as a service on Central Server and acts as watchdog to pull the eTransaction count from various servers located at State and Centre
2. **Dashboard Client Connector (DCC)** runs as a service on the servers providing the eTransaction count
3. **eTaal Portal -** Web portal that provides dashboard view

Technology Stack-

1. **Database -** Microsoft SQL Server 2017
2. **Application Framework -** Microsoft .NET Framework 4.5
3. **OS -** Windows Server 2016
4. **Web Application -** ASP.NET with C#
5. **Server -** IIS10.0
6. **Antivirus** - Trend Micro
7. **Firewall** - Intrusion Prevention system (IPS), ISA 2006 WSUS

Data Pulling Mechanism



Use of NLP, Artificial Intelligence in implementation of Interactive Chatbot

People

Management of change is handled by PRSG Committee

VALUE INDICATORS

Learning's for sharing

- BI Analysis representing the data from various State Projects
- Drill-down facility enabling the view of eServices and eTransactions up to granular level

Digital Empowerment

- Language Translator for the website
- Digital Accessibility through Mobile App and Web Portal

Shri IPS Sethi, *Scientist-G, National Informatics Centre, MeitY, Govt. of India, sethi@gov.in*

Shri O. P. Gupta, *Scientist-E, National Informatics Centre, MeitY, Govt. of India. op.gupta@nic.in*

AUDITONLINE

Ministry of Panchayati Raj, Govt. of India & National Informatics Centre, New Delhi

Alok Prem Nagar, Inder Pal Singh Sethi, Seemantinee Sengupta, Adesh Chand Gupta, Ankit Pandey and Surender Kumar

PROJECT OVERVIEW

AuditOnline, is one of the technological advancements (Government Domain) facilitating audits of government departments and Panchayati Raj Institutions. It has also significantly simplified the financial and scheme-based audit of accounts at all three levels (District, Block, and Village) of Panchayats, and the Line department by Auditors (State AG/LFA). Envisaged to cater to both internal and external audits as per the state-specific audit manuals, its architectural capabilities serve the purpose of maintaining past audit records of the auditee with an associated list of the auditors assigned and audit team involved in the act whilst setting out as an impeccable tool for Audit, improvising transparency & accountability.

Objectives:

- The Central Finance Commission devolved huge amounts of grants to rural local bodies administered by the panchayats. Under the 14th Finance Commission, grants to the tune of Rs. 2 lakh crores were provided to the gram panchayats (GPs). It was therefore imperative that the fund flows up to GPs be tracked and the expenditure incurred is monitored periodically.
- The 15thFinance Commission in its recommendation has expressed concerns over the unavailability of audited accounts at the local body level and to overcome the same, the Ministry of Panchayati Raj (MoPR) along with the National Informatics Center (NIC) as a technical companion, conceptualized and developed an application called AuditOnline, a holistic mechanism capturing the entire workflow from capturing the entire gamut of an affair at the planning stage to monitoring the various stages of work documenting audit process on a real-time basis, henceforth strengthening the financial management system in the Panchayats.
- Information/ Data Flow before AuditOnline: As the audit process flow varies for each State, the information flow also varied hence there was a need arising for a configurable application to track and manage minute instances occurring in the Audit process lifecycle.

The audit process had a multi-directional information flow before the process got re-engineered because of the following:

- People-centric manual intervening process,
- Traditional paper-based approach,
- Heavily time-invested process,
- No traceability about Gram Panchayats with completed Audit,
- Accountability and Transparency of the Audit process were very limited,
- Yearly report generation and its management was a tedious task

Scope of Audit Online-

Audit Online is a configurable platform enabling states to customize their internal and external audits to comply with the Comptroller and Audit General of India's (CAG) defined standards and guidelines.

Short-term goal:

- To make it more perceptive for both scheme-based and non-scheme-based i.e., financial audits through AuditOnline software.
- To ensure that all the granted schemes (Central and state level) are implemented, we will conduct Risk-Based Audits for all the following across the country:

  Rural Local Bodies (RLBs)

  Tribal Local Bodies (TLBs)

  Central Line Ministries.
- Digital Signature enablement to ensure integrity and authenticity of reports getting generated out of the system.
- Others may be included gradually based on the feedbacks and policy changes/new guidelines by authorities.

Long-term goal:

- To enhance the portal's aptness, we will utilize the latest emerging technologies and tools such as Data Analytics, Artificial Intelligence, and more.
- Big Data Analysis for all recorded observation data to introduce a para bank for better exhortation.
- Visualization Dashboards for selection of GPs for Audit

Audit Online has now reached the lengths of on-boarding 90% of the states and still going strong. Currently, the Statistics tell us the data otherwise

Applications Statistics:

AuditOnline Status			
Auditing Period	**2019-2020**	**2020-2021**	**2021-2022**
No. of Registered Auditors	8623	8623	8623
No. of Registered Auditees	259375	259375	259375
No. of Audit Plans created	134389	201492	41208
No. of Observations Recorded	1202929	1820945	113336
No. of Audit Report Generated	116200	167144	7535

(Note: above figures are as on 30 August 2022 and are changing in real-time)

Geographical Scope- AuditOnline		
Entity Count	**Total Present**	**Total Engulfed**
National level – No of State/UT(s)	38	total 26 (jammu and kashmir, himachal pradesh, punjab, uttarakhand, haryana, rajasthan, uttar pradesh, bihar, sikkim, arunachal pradesh, manipur, tripura, assam, west bengal, jharkhand, odisha, chhattisgarh, madhya pradesh, gujarat, maharashtra, andhra pradesh, karnataka, goa, kerala, tamil nadu, telangana
State/UT level- No of District(s)	664	250 + and counting…
District level- No of	6684	2200 + and counting…

Block(s)		
Block level- No of the village(s)	255462	178999 + and counting…

Key Stakeholders Involved are:

- State Administrator (PR Department)
- State Audit Department/ Local Fund Audit Department/Govt. Line Department
- District local fund audit/ District Audit Office/Govt. Line Department office
- Auditors
- Gram/Block/District Panchayat/Govt. Line Departments (Auditees)

Intended Benefits

- Drastic Reduction in Audit Cycle time
- Eliminate Data Entry and Consequent Errors
- Empower Team
- Enhance Efficiency
- Data Analysis

Current Status:

AuditOnline inception was supposed to bring forth coherence and accountability at the grassroots level in Panchayati Raj Institutions and, it did indeed. In its interim report, the 15th Finance Commission emphasized making audited accounts available and AuditOnline was then proposed exceptionally to be extended to other schemes in relevance to Panchayats.

AuditOnline scaled up the transparency amongst the Panchayat levels and helped towards the betterment of the auditing process. Application empowers its users with a simple step-by-step procedure to achieve the audit process, basis the requisites of the states, ensuring that even the complicated tasks become easy to perform.

Hardware/Software

Hardware, Software, Middleware	
Source Code Technology	OPEN SOURCE
Development Framework	SPRING
Database	POSTGRES SQL,
Secure Socket Layer (SSL)	Status- Valid
	Issuer- Let's Encrypt
Server	Physical: Dedicated High-End Blade
	Web Server: Hardware Load Balance
	Application: Apache Tomcat, version 7.0.27
Operating System (OS)	Red Hat Enterprise Linux (RHEL), version- 7.9 (Maipo)

Certification (Certifying Agency)

Yes, the certification has been obtained with the following details:

Cyber Secured

Entitled Authority	Cyber Security Group, Application Security Division, National Informatics Center.
Auditor Agency	CERT-In empanelled auditor AAA Technologies Pvt Ltd
Audit Performed	Website Audit - Third Party
Audit Type	Security
Certificate Issued	From Auditor Agency: AAA/WAC/20200210
	From NIC: NIC/CSD/TA/7866
Application Specifics for Audit Application Name:	Application Name: AUDITONLINE (Facilitating audit in Government
	Website URLs: https://auditonline.gov.in/staging/
	Environment Details: SPRING 5.2.7

Disaster Recovery and Service Continuity

The critical response team including external contacts of software vendors and existing internal staff is there to bring the systems back online, with their disaster recovery roles and responsibilities understanding, and training. Although there are multiple production servers for backup which are hosted at the National Data Center with 24x7 correspondence availability from Data Center support, if in case any disaster occurs, and the services go down then it shall be dealt with proper caution.

Scenario 1: If it happens to be a small-scale disaster due to which the services go down then the team shall follow the standard procedure and will refer to the near DR backup located intra-city (Delhi).

Scenario 2: If it happens to be a large-scale disaster and the services go down then the team shall consider the Far DR setup (Pune) for recovering the damages done and the estimated time for same will be 2 days.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Service	Brief e-Service description with benefits	**Volume (Nos) of Services year wise**	
		2020-2021	2021-2022
Audit Plans	The audit plan is a set of detailed procedures that describe the process to be performed to assess risk at the financial statement and assertion level. Benefits: 1. Configuration definition for Internal/External Audit, 2. Create the Audit process and freeze its flow, 3. Determine Categories/ Subcategories, 4. Elucidate Report Templates, Fact sheets, and case records, 5. Audit Team constitution, 6. Audit Intimation and scheduling,	201492	41208
Observations Record	The auditor can examine both legal and practical terms when reviewing records. This helps them to deliver an audit report detailing record retention or possible destruction, as well as recommendations for additional audits. Assessment Benefits:		

	1. Provide evidence about the Performance of the entity or the process followed, 2. Helps in determining the Relevance and reliability of the generated evidence, 3. Evaluation of the completeness and accuracy of the information supplied for an audit, 4. Ensures the judgment and the opinion provided are attained to their intrinsic nature,		
Audit Report	An auditor's report is a formal opinion issued by either an internal or external auditor as an assurance service, which you can use to make decisions based on the results of the audit. The first paragraph sets forth the responsibilities of the auditor and directors. The second paragraph contains the scope, stating that a set of standard accounting practices was the guide. The third paragraph contains the opinion of the auditor. Benefits: 1. It may help in the legal requirement to get audited accounts, 2. Helps in maintaining the management (Auditee) integrity to their stakeholders, 3. Provides an objective way to track the progress of your audit work and much more.	167144	7535

Implementation

Stakeholders:

1. Ministry of Panchayati Raj, Government of India
2. State Panchayati Raj Department
3. State Audit Departments/ Local Fund Audit Department
4. District local fund audit/ District Audit Office and equivalent
5. Auditors at different levels
6. Panchayati Raj Institution (Auditees)

Audit Online application is implemented across the country in all the States that adopted it to carry out their Audit at varied Panchayat levels. In the year 2020 when the application was launched, with a less target of 25% of PRIs were provided to all the states under the 14th finance scheme and which was achieved by the states in time.

Then later for the next financial year (2020-2021) a target of 100% was determined under the CFC for their schemes and which is in progress as of now but capable for any scheme or schemes.

Geographical Coverage- AuditOnline		
Entity	Total Present	Total Engulfed
National level – No of State/UT(s)	38	27
State/UT level- No of District(s)	664	250 + and counting…
District level- No of Block(s)	6684	2200 + and counting…
Block level- No of the village(s)	255262	178999 + and counting…

Improvements / Enhancements

Rolled Out Improvements/Enhancements:

1. Developed Dashboard has been improvised for better data insights.
2. Audit schedule Approval module enhanced.
3. Few of the Visualization Dashboards have been prepared (others need to be configured after having a discussion with DLFA)
4. Reports at various levels enriched for geographical level insights.
5. Integration with the Accounting module for accounting data transparency at the grassroot level. District Local Fund Auditor (Auditors) will have access to eGramSwaraj accounting module and Local Government Directory for handling actual department hierarchy within the state.

Planned Improvements/Enhancements:

6. DSC/e-sign inculcation for generated report authorization and overall data integrity value addition.
7. Improvised Action Taken Module (ATR): Module management and reports.
8. Data recorded in Dynamic forms (Fact Sheet) to date to be curated for Analysis at different levels (state/ZP/BP and equivalent)
9. Generated Report Deletion Module Development at the state level.
10. Language vernacular: Application supporting regional languages
11. Para Bank Inculcation: best identified Recorded Observation to be made available for variable use CSeGA-2022 Project Category Nomination
12. Mastering of Observations category / Sub-Categories for recorded /recording of observations
13. Enhanced version of Audit Recorded Observation Report: Analysis based on Top 5-10 highlighted observations/ recorded observation at state/DP/BP level
14. Audit Status Module Enhancement and more.

ENABLER

Processes Re-engineered

Parameter	Before Audit Online	After Audit Online
Audit Approach	All the activities included in the audit process were paper-based decision-making.	This system is a transition from a Paper-based model to a web-based online system. However, the system is also configurable to facilitate the generation of the final report on paper for ease of understanding and proper action-taking, if required.
Audit Processing	The entire process of Audit from the formation of the audit plan, entry and exit conferences with the Auditee, preparation of audit report and intimation to the Auditee, Auditee Response, and eventually follow-up of audit observations was manual, and paper based.	There is no offline processing of information now. Everything is online as per the process flow. Now, the entire process of Audit Planning, Formation of the Audit team, Allocation of the auditee, Process Task/workflow, approval process, and Report generation is automated i.e. All transactions are moved electronically from one level/actor to another level/actor as per configurations. Decision making since planning to follow up, Monitoring, and Evaluation are online
Reformation	The audit process had a	The auditing process is transformed digitally,

done: - Process - Information Flow -Business model - Data Analysis	multi-directional flow of information before the process was re-engineered since the entire audit cycle was manual and therefore was subjected to: • People-centric manual intervening process, Traditional paper-based approach, • Heavily time-invested process, • No traceability about Gram Panchayats with completed Audit, • Practices including repetitive and unnecessary tasks were followed, • Accountability and Transparency of the Audit process were very limited, • Monitoring challenges were arising gradually, • Yearly report generation and its management was a tedious task	making it configurable with the AuditOnline application as per the respective state's hierarchal process flow. The information flow is streamlined by the app utilizing a plethora of business logic implemented while refraining from the dissemination of the data. • Audit as a process is reformed and made online (web based), • Effective Monitoring and Management of all entities involved in Audit made feasibly. • Transition from time investing process to timely achievable process, • 100 % transparency throughout the process with all data records available in the public domain, • Enriched efficiency with external file attachments and system-based notifications,
Exclusion of Non-Value addition activities and Inclusion of Value Addition activities	• Redundant data capturing processes, • Untimely co-ordination between Auditor and Auditee for varied needs, • sharing constraints presence, • Violation of internal controls, • Rules and regulations compliance breach, • Dependency on inputs provided by GP/BP /ZPs and equivalent	• Strengthening Financial Management by making audited accounts available, • Transactional data of accounts integrated with external System eGramSwaraj, • Performance analysis of government functionaries and official bases Audit assignment, • Facilitation of Report generation, it's sharing, getting responses upon it and follow-up, • Content Management system to share amongst each other at different levels, • Request Requisition incorporated,
Information Accessibility Improvisation	Paper-based information is harder to access due to the following constraints: 1. Storage Location, 2. Lack of Information/ Record Management, 3. Bureaucratic processes/ approvals,	Modern technology brings inspection and information accessibility to one's tips, with digital Audit you have: 1. Access from anywhere, 2. Availability is 24/7, 3. Structured Management of Data/records, 4. Back-up and Security of Data to the utmost level,

	4. Availability of Records, 5. Security Concerns,	5. Transparent system,
Reports	Final Audit Report of an entity	Consolidated Data Reports on Dashboard: 1. Final Audit Report GP/BP/ZP wise 2. Audit Plans created Report 3.Recorded Observation Report 4. Number of Registered Auditors 5. Number of Registered Auditees Login-Based Reports: 1. Intimation Letter pendency Report 2. MIS reports mentioned above are also made available on geographical-based and hierarchical level-based logins

Technologies

The well-thought architecture has led to analyze the business capabilities against strategy, digital transformation, and in proposing the technological advancements that are needed to meet its envisaged goals.

Data Analysis shall now bring forth the best of the application to what we have curetted so far in terms of data since now the system has a quantum of data which is entered in all these years passed, just to start with few key points envisaged on data analytics are–

- Para banks implementation post analyzing recorded data in the system to replicate the language of legalities utilized in the auditing process and to minimize data entry.
- Integration with different online data sources available to avoid in-person meetings held by auditors for pre-audit information gathering.
- Consolidation of data at different levels to induce better insights.

And because we also have focused on Auditonline knowledge management (audit-related data management) aspect, it has also allowed us to enable periodical enhancements in terms of technology, feature additions to keep up with the diversified needs of the end users.

People

Capacity Building:

- A major step towards the realization of the goal of more effective governance is the development and improvement of government capacities at all levels of the workforce – local, state, and national therefore to keep pace with AuditOnline emergence and speedy developments, it was essential for us to build a citizen-centric approach to spread out the same and bring forth everyone on the same page for AuditOnline digital advancements.
- Capacity Building Training (CBT) is held at regular intervals to date,
- Functionality and operability explainer tutorial videos are developed for all,
- SOPs and User Manuals are produced, updated, and shared as and when required bases,
- Workshops and Training sessions are also held based on as and when requests are received, The basic level of training is imparted to the officials of the Department of respective states on the pre-production server on how to act on different tasks assigned to them. Besides this, training is also conducted at

regular intervals to make them aware of the latest enhancements in the system.

- No of training delivered: > 100+
- No of trained personnel: > 1,450+

Leadership Support:

Shri Mr. Reddy, Principal Secretary, Excise and Taxation Department, Government of Kerala supported starting up with the phase of information and requirement analysis to envision a framework solution that can be adopted across varied panchayat levels based on the Central Finance Commission requirements.

Later in 2018 after its successful run in Kerala, under the supervision of **Shri Mr. Ajay Singh, Chief Controller of Audit, (MoRD)(MoPR)** it got further level enhancement and refinement as an application.

Once when the application rolled out on April 15, 2020, then it was **Shri Khushwant Singh Sethi**, **Joint Secretary, MoPR** who took over as the stakeholder for the application leading it towards what it is now in coordination with the team comprising NIC officials and other deputed resources.

Now under the mentorship of **Shri A. P. Nagar, Joint Secretary, MoPR** application is progressing.

Management of Change:

To on-boarding into system by any state, we have designed Pre-requisite formats, sought after for the purpose of identifying the Organization and its structure and to develop an audit process, and audit report template, based on the shared details.

Although we are defining every set of parameters based on the user's requirements, if there is any change request of any kind then we follow the below approach internally:

- Identify Scope: we evaluate the change requests to determine whether they affect or benefit the overall project scope.

- Risk analysis and Quality Check: the change requests are evaluated by the team for the risk they pose and for the changes not to affect the data quality of the system or its overall defects we properly analyze the impacts of those changes.

- Communications: Any change request must be communicated on time and with detailed needs to the concerned stakeholders at the appropriate time only.

Post addressing the aforementionedfactors after having several discussions with MoPR, we then classify the priorities of the change requests and move forward to achieve them all in time.

VALUE INDICATORS

Learning's for sharing

Challenges and Opportunities Identified:

- Onboarding of states on the application basedon their varied tier structure followed,
- Integration with Accounting module of eGramSwaraj,
- Use of traditional methods for task management and information sharing,
- Lack of training and awareness of the latest tools and technology to hasten task performance,
- Presence of learners/participants in multiple, disparate locations,

- Lack of regular updates in the methods & structure of training and information delivery,
- Creating Department structures of states for Auditing entities on LGD,
- Application enrichment to cater state's diversified needs in accordance with CAG guidelines,
- Capacity building and training of functionaries and officials in states,
- The application controls, which include input, processing, output, and master file controls, are set up for an audit client over its computerized accounting system.
- Auditors may use computer-assisted audit techniques (CAATs) to test and assess the dependability of the auditee's computer-based accounting system.
- Since it is a software product hence it is always evolving and which is majorly on the bases of feedback received, requirement changes from the competent and continuous effort applied internally towards the overall betterment of the product.

Outcomes to share:

1. e-Forms development:

Earlier, the entire process of Auditing was manual. After the implementation of Audit Online, there is no offline processing & dissemination of information now, everything is online as per the process flow and user's specific needs.

2. Business Process Re-modeling:

The entire process of traditional Audit has been re-engineered. The repetitive and unnecessary activities of manual processes have been removed from the workflow. Now the process is narrowed down to the following cores which are consolidated into four modules or a 4-steps approach:

Step 1 Audit Configuration: (One-time Process)

- Define configuration for Internal/External Audit
- Define & Freeze the Audit process and its flow
- Define Categories/Sub-categories
- Define Report Templates, Fact sheets, and case record

Step 2 Planning:

- Create an Audit Team,
- Assign the Auditee to the team
- Audit Intimation & Scheduling

Step 3 Audit Process:

- Carry out Audit Process (Observations Recording, Fact checks, accounting checks, etc.)
- Report drafting and Auditee response

Step 4 Follow-Up:

- Action Taken Report (ATR process)
- Generate and share Final audit reports (Drop, Include, and follow up)

Earlier, all the activities included paper-based decision-making. But now, this system is a transition from a Paper-Based to a web-based online system and is also configurable to facilitate the generation of a final report on paper for ease of understanding and proper action taking.

Digital Empowerment

Auditonline application is the vision of MoPR following up with the mission to streamline auditing and to make audited accounts available in a timely manner to the central finance commission and is developed in coordination with NIC the technical companion.

AuditOnline is progressing day by day enriching itself and surpassing its limitation every year which is precisely due to the feedback received and requirements getting generated from the end user pertaining to different Languages, demographic, and cultural diversity.

Empowered Departments and Local bodies:

- Panchayati Raj Institutions,
- Rural Local Bodies (RLB),
- Program Implementation Units,
- State Audit Departments in India.

In workable, we may say 'One Nation One Software' for scrutinization.

Green e-Governance-

- To address the problems plaguing the existing system, a decision was taken to migrate the audit process from the existing "manual paper-based system" to an "Online ICT-based Auditing System" hence AuditOnline not only to facilitate the auditing of accounts but also to provide provision for maintaining audit records that have been carried out.
- 'AuditOnline' is an open-source application developed. It is a scalable application to caters maximum ways of auditing mechanism.
- AuditOnline as a project has resulted in the computerization of the entire audit-related
- activities of the Rural Local Government, Tribal Local Government, and State Government Departments and the system is capable to track every activity right from the onboarding of the State to the point of rendering audit information to the government as reports.

Shri Alok Prem Nagar, Joint *Secretary, Ministry of Panchayati Raj, ap.nagar@gov.in*

Shri Inder Pal Singh Sethi, *Scientist G / Deputy Director General, National Informatics Centre, Ministry of Electronic and Information Technology, sethi@gov.in*

Smt. Seemantinee Sengupta, *Scientist G / Deputy Director General, National Informatics Centre, Ministry of Electronic and Information Technology, ssengupta@nic.in*

Shri Adesh Chand Gupta, *Scientist F / Senior Technical Director, National Informatics Centre, Ministry of Electronic and Information Technology, ac.gupta@nic.in*

Mr. Ankit Pandey, *Scientist B / Systems Analyst, National Informatics Centre, Ministry of Electronic and Information Technology, ankit.pandey94@nic.in*

Mr. Surender Kumar, *Scientific/Technical Assistant-A, National Informatics Centre, Ministry of Electronic and Information Technology, surender.kr95@nic.in*

PSC SoFT - Public Service Commission Software for Transformation

HP Public Service Commission & National Informatics Centre Himachal Pradesh State Centre

D. K. Rattan, Ajay Singh Chahal and Sanjay Sharma

PROJECT OVERVIEW

Objectives:

The objective of PSC SoFT is to provide a comprehensive and integrated online ICT solution for the core functions of the State Public Service Commission (PSC), with configurable business processes, workflow, formats, messages, language and interactions with stakeholders. The stakeholders include the PSC Administrative and IT officials, State Administrative Departments, Examination Centers Officials, Applicants and Citizens. The solution aims to provide transparent, accountable and trustworthy services in selection of right candidates for the right positions and serves as a decision support system for the PSC Management and Authorities.

Scope:

The functional scope includes multiple software modules, which are, Departmental Requisition, Direct Recruitment, Promotional Recruitment, Recruitment/Promotion Rule, Applicants Registration, Help Desk and CMS website. The geographical scope is hosting of the PSC SoFT at Himachal Pradesh State Data Centre for implementation in HP PSC and available to stakeholders and applicants all over India for recruitment in Himachal Pradesh Government. The application is being offered as configurable productized software to all other Commissions in country and multiple demonstrations and interactions have been held with almost all Commissions of country to take forward the replication process.

Key stake holders:

Stakeholders of the software and its eco system are:

- PSC Authorities/Officers/Officials
- Government Departmental Officers
- Applicants/Candidates/Citizens
- Examination Centers Staff
- State Public Commissions for other States in India

Benefits:

- Reduced departmental requisition processing time for vacancies and other matters
- Reduced candidate selection time for vacancies
- Bilingual interface with local language support
- Efficient, transparent, accountable, secure paperless operations
- Cost reduction and Technology standardization
- Configurable and customizable processes, workflow and formats for every document
- Configurable final selection procedure based on reservations of all kinds
- One time registration (OTR) of candidates with single dashboard for all their requirements

- Online helpdesk module, integrated with the OTR system
- Reduced applicant queries and grievances
- Application Submission in minimum time as per eligibility of registered candidates
- User friendly and Simple Interface for Applicants
- Vacancies, Results, Exam date notifications to Applicants, Citizens through Mob-app
- Integrated, single source of data collection
- Covers major functions of the Commission including end-to-end examination processing
- Maximizes benefits to applicants/citizens and Government

Current Status:

The PSC SoFT has been implemented in HP PSC since June 2020 and 2.9 Lakhs applicants/candidates have registered and 2.3 Lakhs created their profile along with documents uploaded and 61 thousands recruitment applications received for various vacancies advertisements and 82 departmental requisitions are in process, out of which process for 43 requisitions/recruitments are completed.

Hardware/Software

At Data Center level for hosting application:

HW: Three web servers with load balancer set up and one database server with always on feature.

SW: Windows OS, MS SQL Server 2017.

MW: IIS web server, dot-Net MVC framework, High-charts.

Third party tools: SMS/ Email/ Payment gateway.

At Client level for accessing the application:

Desktop computer system with internet connectivity with web browser and smart mobile phone with internet connectivity.

Certification (Certifying Agency)

Yes, the software system along with integrated software/gateway components has been cyber security audited in March 2022 by CERT-IN empanelled vendor AAA Technologies Pvt. Ltd. The software is based on the Enterprise Architecture Framework and has won the Open Group Award also for the same.

Disaster Recovery and Service Continuity

PSC SoFT has been hosted at robust and reliable IT infrastructure set up at State Data Centre, Himachal Pradesh at Shimla with disaster recovery (DR) set up for services continuity/availability, so that software and eco system is capable to stay online in case of disruption of any kind such as power outage, fire, flood, building civil work, any kind of natural disaster, cyber-attack etcetera at primary location/data-center. The infrastructure is scalable and can be scaled up or scaled down as per user/client load on the application, making optimum use of ICT resources required at any point of time. The business and service continuity plan is in place to mitigate any risk arising out of any odd situation and ensuring service availability 24x7 to all stakeholders/citizens.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Service **Brief e-Service description with benefits**		**Volume (Nos) of Services year wise**		
		2020-21	**2021-22**	**2022-23 (Upto date of nomination)**
Candidate/ Applicant One Time Registration (OTR)	Applicants to register/ create-profile and upload documents once, if required may update. Avoids last date/ movement panic/ mistakes	124698	176001	72038
Applicant Applying for Post/Vacancy	Applying for post/ vacancy is instant, as steps are only choosing Post and paying Fee which avoids last date rush/ load/ processing	58463	118670	70733
Requisition by Department	Requisition submission/ status/ recommendation available online	160	140	42
Applicant Attendance at Exam Center	Decentralization attendance reduces process time	8821	51106	2610
Help Desk	For addressing Applicant/ Citizen queries	Total 67 09 Resolved 6135	Total 7835 Resolved 7335	Total 5435 Resolved 4235

Implementation

The PSC SoFT has been hosted at HP State Data Centre and has been implemented in Himachal Pradesh Public Service Commission to its full extent of 100% and covers access/ availability to all stakeholders 24x7.

Improvements / Enhancements

After post rollout of PSC SoFT in June 2020, some enhancements are suggested by HP PSC after May 2021 by gaining experience and knowledge of post implementation scenarios, these are also incorporated and implemented in the software system. Some of these are rolling back Requisition flow after final approval, changing examination center after issuing of Admit Card, Updating applicant documents/information after last date of applying.

The PSC-SoFT has the potential for replication in other State Public Service Commission, by hosting it locally in the Government data center. Most of the business processes and functions are configurable and hence replication will not take much time. A demo site is created for the desiring Commissions so that they may get to know the various functionalities of this software.

Some Enhancements like change in application form by admin, merge requisition in live advertisement & reassigning of requisitions and change in exam centre by administrator are suggested by HP PSC in 2022 and these features will be incorporated in the software system. And 2 mobile apps will be developed for Applicants/Candidates functions and administrative function of PSC management. The smart mobile phones are handy devices and have very high density as compared to desktop computers and stakeholders and citizens feel convenience to use mobile phones and mobile apps. Statistical MIS reports are available to software Admin for better management and carrying out efficient operations, screen for some of these are mentioned below

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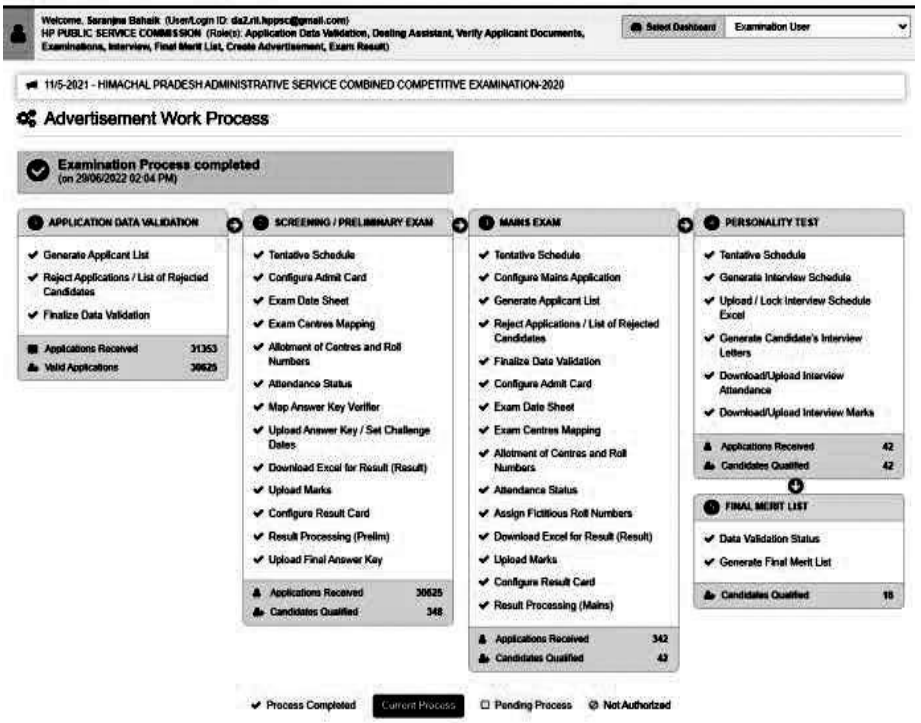
ENABLER

Processes Re-engineered



The process re-engineering has been done for various process and sub process during the design and development of PSC SoFT. All processes and sub processes were automated and the following processes were simplified/ standardized as outcome of process re-engineering.

Requisition Processing Flow Management

- Examination Types and Stages Configuration and Management
- One Time Registration option for candidates
- Online Help Desk
- Departmental Promotions Process Management
- Recruitment and Promotion Rules Process Management

Technologies

PSC SoFT is based on Enterprise Architecture framework which provides a strategic context for efficient and optimized business operations and development and evolution of IT systems in response to constantly changing needs of business processes environment. Therefore, Public Service Commission Enterprise Architecture Framework (PSC EAF) has been designed and developed before design and development of PSC SoFT. The PSC EAF enabled opportunity to understand, optimize and re-engineer workflow and processes of the State Public Service Commission from holistic organizational view to end users from a fragmented legacy of processes (manual & automated) into an integrated, holistic and complete environment. The PSC EAF has been designed and developed using IndEA Framework, as IndEA is the Government of India Enterprise Architecture Framework for adoption by Government Organizations in India

People

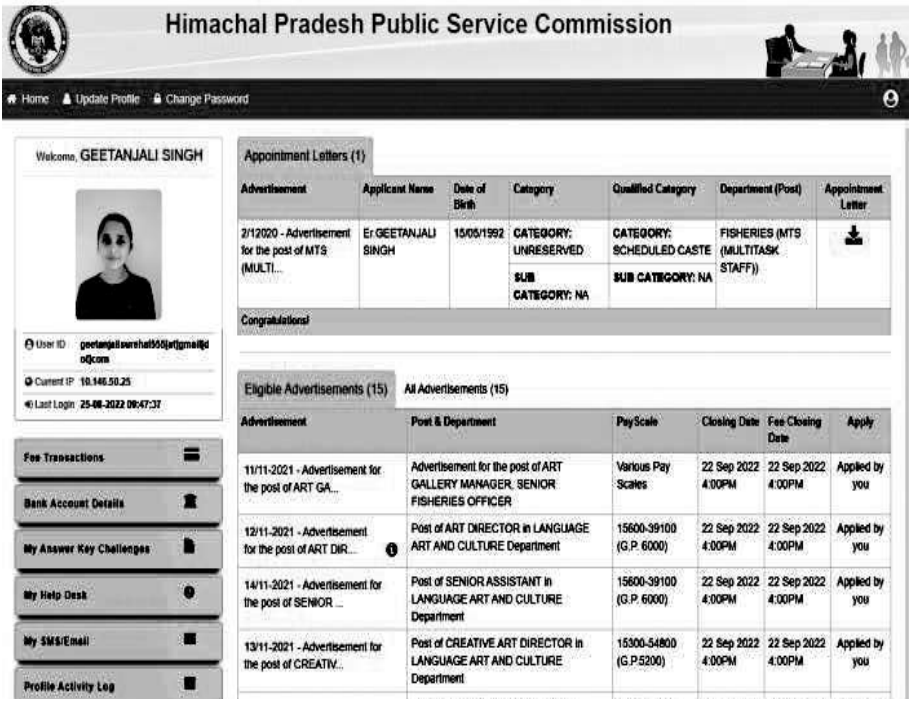
Capacity building of all stakeholders has been done before and during the rollout of PSC SoFT respectively. The HP PSC officers and employees were trained in various sessions. Similarly all Departmental employees with reference to Departmental Requisitions were trained in separate training sessions. The staff of various examination centers are trained with respect to attendance of candidates/ applicants appearing in the examinations as and when new examination center is allocated/ assigned for some examination/ test. For Applicants a short video has been prepared for one time registration (OTR) and Applying for a Post/ Vacancy advertisement and Help Desk module is available in the software system for addressing/ resolving their queries/ doubts. And standard and highly user friendly and easy to use and navigate user interface has been designed, so that applicant can use the software system very easily.

VALUE INDICATORS

Learning's for sharing

At conceptualization and project proposal stage, the objective was to design and develop the software system. But during the system study and analysis stage it was thought that before design and development of the software system, the enterprise architecture should be developed to have holistic view of the proposed system and guidelines for future sustainability of the software and complete eco system. So this innovative idea was agreed upon and enterprise architecture framework was designed and developed before proceeding to software systemdesign and development. The PSC EAF was designed and developed which in turn mitigated the challenges which

might have cropped up during other phases of the software life cycle like planning, analysis, design, development, capacity building, rollout and implementation etcetera. Another learning is that Commissions have a tendency to carry out modifications in recruitment process and earlier Commission's IT officials were used to carrying out database-based changes at different stages after completion of preceding processes. Therefore, providing a software-based system is another learning. Challenge is mainly training the employees in complete switchover from paper-based system to paperless system**.**



Digital Empowerment

The e-Governance initiative PSC SoFT is not a system where all beneficiaries of any Government scheme to be included mandatorily in spite various barriers in the society and system. But even then the PSC SoFT have above features/functions because it has been designed and developed as configurable software system for various business processes, work flows, formats and parameters. And can be configured for local language support for all stakeholders and applicants. Similarly, can be configured for amount of fee to be charged to various category of applicants and can be zero as decided by the PSC authorities or State

Government. Therefore, both financial inclusion and local language configurable features are available in PSC SoFT to enable digital empowerment to all stakeholders. HP PSC allows fee exemption for female candidates and candidates from specific categories. Candidates can get their forms filled through Common Service Centres also in case they have any issue of not having IT means to register/ apply for various posts.

Green e-Governance

Himachal Pradesh Public Service Commission

Admit Card

Advertisement for the post of SENIOR ASSISTANT

1. Please ensure to bring this Admit Card at the Exam centre. 2.Candidates will not be allowed to leave the examination hall till examination time is over. 3. The Schedule of the Exam will remain unaltered even if the date of Exam is declared a public holiday.

Roll Number	57007
Application Number	1290
Candidate Name	MANGAL SINGH THAKUR
Applicant Category	UNRESERVED
Applicant Sub Category	-
Centre Address	Gurukul Senior Secondary School , Near Red Cross Building, Dharamshala, Himachal Pradesh 176215

Affix copy of your passport size photograph which has been scanned and uploaded in the application form

Sr No.	Date & Time of Exam	Test Examination	Q Booklet Series	Candidate's Signature	Invigilator's Signature
1	2	3	4	5	6
1	22/09/2021 10:00 AM to 11:00AM	GENERAL KNOWLEDGE			

1. Please ensure to bring this Admit Card at the Exam centre. 2.Candidates will not be allowed to leave the examination hall till examination time is over. 3. The Schedule of the Exam will remain unaltered even if the date of Exam is declared a public holiday.

1. Please ensure to bring this Admit Card at the Exam centre. 2.Candidates will not be allowed to leave the examination hall till examination time is over. 3. The Schedule of the Exam will remain unaltered even if the date of Exam is declared a public holiday.

The online software system instance of PSC SoFT has been hosted at Himachal Pradesh State Data Centre by HP PSC and available to all stakeholders using internet connectivity at their local end. The mobile app is also available at Google Play store to all stakeholders. At Data Center level, all green computing practices are being followed with respect to use and disposal of ICT infrastructure equipments and components, as per guidelines of Government/ Regulatory Body. And in this eco system stakeholders are not in control of HP PSC, therefore they must be following green computing practices as per guidelines from Government and Regulatory Bodies pertaining to their geographical limits with respect to ICT gadgets and hardware components. The entire solution is paper-less, with uploading of scanned copies of supporting documents/certificates in place of photocopies which also directly helps in Green eGovernance

Shri D. K. Rattan, IAS, *Secretary, HP Public Service Commission, Himalchal Pradesh, hppsc-hp@gov.in*

Shri Ajay Singh Chahal, *Deputy Director General and State Informatics Officer Himachal Pradesh, Officer, National Informatics Centre, MeitY, Himachal Pradesh State Centre, ajay.chahal@nic.in*

Sanjay Sharma, *Officer, NatScientist-F/ Sr Technical Director, Naional Informatics Centre, Himalchal Pradesh State Centre, sanjaysharma@nic.in*

eOffice - Chandigarh Administration

National Informatics Centre Chandigarh UT Centre

Rekha Chandna and Leela Dhar

PROJECT OVERVIEW

Objectives:

- To improve efficiency, consistency and effectiveness of government responses.
- To reduce turnaround time and to meet the demands of the citizens charter.
- To provide for effective resource management to improve the quality of administration.
- To reduce processing delays.
- To establish transparency and accountability.
- Less paper office
- To provide cost effective e-storage facility
- Environment friendly, eco-friendly office

Scope:

eFile work can be mainly categorized into Government to Government(G2G) transactions. While decision-making is an important collaborative process involving multiple stakeholders, the file movement process has been central to it for decades. It is this file movement process that eOffice seeks to automate and streamline.

- Scanning and diarization of inward letters: Incoming correspondence need no longer be tracked through manual registers. eOffice facilitates scanning of receipts and their conversion into a format suitable for further processing in eOffice.
- Digital signatures: Once converted to electronic form, the system ensures that receipts are 'sent'
- and 'delivered' securely. Digital signatures are used to authenticate users.
- Route files to appropriate authorities: eOffice creates an electronic environment that replaces the paper file system. It has features that allow selection of the next recipient in the workflow.
- Set due dates and reminders: The sender of a document can request the receiver to respond by a certain date and also trigger reminders before and after the due date.
- Search and view files: Since files are maintained electronically in a central repository, eOffice provides users the facility to search files based on recipient, subject, and other keywords.
- Identify pending files and receipts and their pendency
- Identify special files (e.g., VIP references, Parliament matters)
- Generate reports on file creation and movement

eOffice is deployed and maintained locally at State data centre, UT Chandigarh Administration and Disaster Recovery servers are at SDC, Pune. One single instance having url https://eoffice.chd.gov.in caters to all the departments of Chandigarh Administration. So files/receipts can be sent with in branch, office, department or even

across the departments.

Key Stake holders:

All the departments, sub-departments of UT Chandigarh Administration including boards and corporations. There are 65 departments in total. Chandigarh Administration has got eOffice license of 5000 active users.

Intended benefits:

- e-Office brought a vision to achieve a simplified, responsive, effective and transparent working of all departments and offices of Chandigarh Administration.
- Enhanced transparency
- Increased accountability
- Role based access
- Assured data security and data integrity
- Transformed the Administration's work culture and ethics
- Promoted innovation by releasing staff energy and time from unproductive procedures
- Saving of lots of paper in office correspondence
- Automatic Data Retention & Digital Backups
- Strengthened Document Security & Confidentiality
- Very helpful even in work from home days during Covid pandemic with the help of WebVPN. Rather many department heads actually noted its true potential.
- One single instance caters to all the 65 departments, subdepartments, boards and corporations under Chandigarh Administration.

Current Status:

- Departments on-boarded : 52
- Total users: 4107
- eReceipt created till date: 458679
- eReceipt movement till date: 1170473
- pReceipt created till date: 207553
- pReceipt moved till date: 738945
- eFile created till date: 118078
- eFile moved till date: 743018
- pFile created till date: 85911
- pFile moved till date: 690352

Hardware/Software

- Operating System used – 64 Bit Linux(RHEL 7.x or RHEL 8.x)
- Web Server Apache - HTTPD 2.4.6
- Database - PostgreSQL 12
- Frontend PHP Based Applications - Portal Dashboard, KMS, CAMS etc.
- Java Based Applications- eFile, EMD, ADMIN, etc.
- PHP-FPM, JDK & Tomcat
- OpenSSL, OpenLDAP, Open Office/Libre Office, Fonts, Wkhtmltopdf etc. third-party applications

Certification (Certifying Agency)

Yes. Cyber security clearance has been obtained by NIC eOffice team from NIC Cyber Security Group, Application Security Division (Ref ID: NIC/CSD/IA/15416)

Disaster Recovery and Service Continuity

- eOffice application disk-based data is continuously in sync with the backup server located in local data centre. For disaster recovery (DR) eOffice data is also in sync with remote server located at Stae data centre, Pune.
- eOffice database server data is replicated using streaming replication (SR) to slave server setup in local data centre. For disaster recovery (DR) purpose one slave server is also setup at State data centre, Pune.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Service Brief e-Service description with benefits			Volume (Nos) of Services year wise		
			2020-2021	2021-2022	2022-23 (Upto date of nomination)
eFile service of eOffice for File Management System is being used by 52 departments of Chandigarh Administration having 4107 users.	eReceipt Created	PUCs are created as eReceipts where browsing or uploading of scanned document is mandatory. Electronic receipt comes with a symbol E	48312	96187	73346
	eReceipt Moved	Once the eReceipt is created, it is further moved electronically from one employee to another. No physical copy of dak is required for further movement.	145400	465260	262072
	pReceipt Created	There are certain category of dak which is to be sent physically like financial bills etc. or we can use it just for tracking. Uploading of the scanned document is not mandatory.	45144	64823	42734
	pReceipt Moved	It is physical tracking of the letter marked from one seat to another. Here it is just for tracking the movement to maintain the history but physical copy is required to be marked	154503	279228	197810

		as received.			
	eFile Created	These denotes the number of electronic files created by the departmental users. For creating eFile we choose Non-SFS option i.e. the user has to select the available heads for the nomenclature of File. Complete noting, drafting is in electronic mode.	9283	32481	14156
	eFile Moved	This denotes movement of electronic file for further noting, drafting and approval etc.	111076	349098	255167
	pFile Created	These denotes the number of physical files created by the departmental users. For creating pFile we choose Non-SFS option i.e. the user has to select the available heads for the nomenclature of File. These files are only for tracking purpose and putting the scanned PUCs 16813 21688 18022 CSeGA-2022 Project Category Nomination Page 6 are not mandatory.	16813	21688	18022
	pFile Moved	This denotes movement of physical file for tracking and accountability so that file history can be maintained.	155933	218553	193070

Implementation

Currently eoffice is implemented in 52 departments of Chandigarh Administration out of total 65 departments. Most of the big departments are already done like Home department, Chandigarh Housing board, Engineering department, Urban planning, Chandigarh Municipal corporation, Govt. Medical College and Hospital, Chandigarh Police HQ, Director Higher education etc. More than 80% work is already accomplished and we will be covering the remaining departments in a short span.

Improvements / Enhancements

- DSC usage has been implemented by various departments during last one year.
- LDAP based authentication is replaced by latest SSO Parichay platform of NIC.

- Geofencing has been implemented and eOffice access is restricted to NIC network only.
- Web VPN issued to users for eOffice access from other outside NIC network.
- Email and SMS alerts have been configured for eFile movement.
- Many departments heads have made it mandatory that they will accept only eFile and no other physical file/PUC.

Next course of Action:

- eOffice will be implemented in all 13 pending departments of Chandigarh Administration.
- eSign implementation is also under process.
- Departments will be convinced further for minimal usage of physical file/pReceipt so that full features and utilization of eOffice can be achieved

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ENABLER

Processes Re-engineered

- Enhance transparency – files can be tracked and their status is known to all at all times
- Increase accountability – the responsibility of quality and speed of decision making is easier to monitor.
- Assure data security and data integrity.
- Provide a platform for re-inventing and re-engineering the government.
- Promote innovation by releasing staff energy and time from unproductive procedures.
- Transform the government work culture and ethics.
- Promote greater collaboration in the work place and effective knowledge management.
- Save paper, Time and Money
- Enhanced Productivity
- Assured data security & Integrity
- Transparency and Accountability
- Quick decision making

Technologies

- Parichay Integration where the application authenticates you through a two-step authentication process where a user needs to provide a secondary factor of authentication along with the password.
- Digital Signatures on Noting and DFA
- Provision of eSign is there in the application but MoU with CDAC is under consideration with Chandigarh Administration.
- MIS Reports
- Knowledge Management System which enables users to create and manage electronic documents that can be viewed, searched and shared.
- Direct Email diarization
- SMS and Email integration
- Collaboration and Messaging Service - CAMS

People

For any successful project, people involved should be well versed with the technology and procedures. For capacity building we followed the steps as:

- We held one to one interactive session with Secretary/Department head for presentation and then go ahead schedule.
- Department head nominates Nodal officer and Local Admin for eOffice implementation.
- At least four five sessions with each department Nodal Officer and Local Admin for NIC email id creation through eForms, Employee master data, File Masters and Organisation master creation.
- During data collection, an orientation session is conducted for all the employees of the department and department identifies 2-4 master trainers depending upon the total strength of the department.
- An elaborative training sessions on eFile is done in batches as per the strength of the department and availability of the conference room capacity to train each and every employee.
- Till now 52 departments are covered consisting of 4107 eOffice users.
- Helpdesk no.s and Anydesk sessions are provided for day to day issue resolving

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VALUE INDICATORS

Learning's for sharing

- A Project Implementation Unit should be constituted with members from NIC and the department.
- The project coordinator from the department should have clear understanding of the organisation, its people and the various processes. He or she should also enjoy the support of the management as well as the workforce.
- The project coordinator should have excellent problem solving abilities and meaningful decision making powers.
- The project coordinator should have the vision to identify the short term goals to earn the confidence of the workforce as well as set the path for achieving the long term goals.
- The team members and the project coordinators should work closely to clearly understand their roles and the objectives of the project.

Digital Empowerment

- We can do noting and drafting in English, Hindi or in any other state language with the help of built in editor or choosing the virtual keyboard also.
- Ready to use built in templates for DFA and noting are provided to the departments as per their requirement.
- Provision of both send and sign and send button is there so that below Superintendents/Sr. Assistants, receipts and files can be sent without DSC also

Green e-Governance

- eOffice is a very good example of green e-Governance as it saves lots of paper. As per the Green IT Initiative, A paper by Shri. Virendra Singh (IAS – Maharashtra), an average document is photocopied 19 times. Paper files get

doubled every 3.5 years and Paper usage in an average office grows 22 percent a year and doubles every 3.3 years. With the help of eOffice we are simply trying to reduce the unnecessary paper wastage.

- Direct email diarization further reduces the paper wastage.
- To restrict printing, role-based permission for file printing is given to the users.
- Offices can be maintained neat and clean with less space required for file cabinets and store rooms

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Ms. Rekha Chandna, *Scientist-E, National Informatics Centre, Chandigarh UT Centre, rekha.chandna@nic.in*

Ms. Leela Dhar, Scientist-E, *National Informatics Centre, Chandigrah UT Centre, ld.thakur@nic.in*

T-Chits (Blockchaining the Administration of Registered Chit Funds)

Information Technology Electronics and Communication Department, Govt. of Telangana & Office of Commissioner & IG (Registration & Stamps), Govt. of Telangana

Jayesh Ranjan, Rama Devi Lanka, and Rahul Bojja

PROJECT OVERVIEW

Chit funds are key instruments of financial inclusion for millions in India, especially for those who do not have access to formal institutions like banks and NBFCs. But the chit fund system is susceptible to fraud, with news reports claiming that between 1.2 to 1.4 lakh crores of public money are lost to various chit fund schemes. Upwards of 350 scams, impacting 15 crore families, across 17 states were identified targeting primarily low-budget investors by several Chit Fund companies.

It is understood that the root cause for these frauds is that the Regulators, whose role is to oversee whole-system compliance and to protect the interests of individual Subscribers and Organizers, have few human resources to administer and monitor the activities happening at a mammoth scale, where INR 18549.12 Cr+ of savings of 10,08,300+ subscribers (mostly from lower income groups) are rotated per annum in Telangana alone. One office will be handling about 2Lakhs subscribers' data worth about 200 Crores of money every Month.

Blockchain, due to its inherent characteristics of immutability, trust, and transparency, can be used to address many of the challenges discussed above such as cash movements, reporting, auditing, and potential fraud from the parties including foreman and subscribers. A blockchainbased network of chit group registries will create immutable transaction records. These records would act as Credit Profiles of these subscribers, which can be used to allow them access to the formal financial system. The platform will capture transactions, verify the data, and enable smart and secure transactions to allow an automated and trusted financial transaction between all parties.

The solution can also reduce underwriting time from 30+ days to 3-4 days, introduce real-time audit capabilities, and standardize and automatically enforce rules of the Chit Fund Act (1982) to regulate the chit business.

The project has been successfully implemented and the following is the progress we achieved in numbers:

1473+ Chit fund companies; 14 Regulator Offices; 4 Nodes; 198K+ Transactions; 17315+ Block height; 22830+ Groups; 1M+ Subscribers; ₹1530 Cr+ per month;

The impact of implementing T-Chits in the state of Telangana can be broadly categorized into three levels.

For Subscribers / Citizen centric:

Since the entire system is on a secured, permission based, blockchain network; the following outcomes can be envisaged

1. Citizens can validate or verify the credentials of the chit fund companies before registering or subscribing to the chit funds.
2. The system now has the capabilities of registering a group with verified subscribers. This gives the confidence to participating members that the group is

valid.

3. Complete transparency in the process and way of doing Chit funds – from registering to disbursing the money.
4. Subscribers are assured the safety of their money (because the system enforces to deposit the respective money into a separate account and not use it for other activities) in cases where they have not taken from the company.
5. Choose to opt in to share his information to valid entities in the network.
6. Better service because of increased operational efficiencies.
7. The credit profiles of these participating subscribers (mostly from the middle and lower middle class) can be built that helps them to avail other financial services.
8. The chits are also used as a credit instrument by many SMBs (Small and Medium Businesses). Bringing in efficiency and transparency in the system would reinforce the trust in the product and would encourage more businesses to avail this type of credit, which in turn would help in the growth of the economy.
9. Is assured of the security of the chit group he is participating in.

For Regulators / IGRS department of Telangana:

Following are the few benefits that the officials from the Registrar of Chit offices are experiencing

already:

1. Monitoring of Chit Fund company compliances has become easy.
2. The regulator now has access to the real time view of the entire chit fund activities at the state level. A dashboard which shows, the number of applications pending, total auction turn over, number of groups running in the state. They can drill down to the minutest details of the group like how much money is yet to be disbursed in a particular group in a particular branch of a particular company across the state.
3. Violations raised by the system are very useful. No need of manual monitoring about violations saving many man hours of work.
4. All ARC offices have become cashless and the payments are handled only online.
5. Various health parameters vis-à-vis total auction turn over, number of violations, pattern of the business, compliance index and many other things at the company level can be monitored now in real time and take proactive steps to mitigate future risks.
6. Standardization across the board because of automated rule engine.
7. Use of blockchain tech kind of reduces the audit compliances because the system is driven by consensus policy where the parties programmatically agree before a transaction is done.
8. Grievance redressal has become very easy and transparent across the network.

For Foreman (Chit Fund Companies):

All foremen who are running a registered Chit Fund Company will be part of this blockchain network directly. This network is designed to cater to different types of Foremen both for individuals, companies and partnership firms alike.

Hardware/Software

Web Servers, App Servers, REST API, My SQL, Mongo, Block Chain

Certification (Certifying Agency)

- Multiple steps have been taken to ensure the T-Chits application is compliant with security principles at various levels of the application.
- The network formed through the solution would be protected through proper firewall rules. Only the required ports will be exposed to a public network. Also, only HTTPS would be enabled for all the web requests so that the requests data passing through the network would be encrypted
- Microservicece application security restricted using standard JWT token with OAUTH2 authentication and authorization mechanism
- Data in the Application layer would be secured with role-based access (RBAC) mechanism. The access levels to the data in the system can be defined based on the ROLEs of the application user
- The data stored in the Blockchain system would be encrypted with the latest encryption methods so that only the party having secret keys can decrypt and understand the data.

Disaster Recovery and Service Continuity

Application has been hosted and running on AWS cloud and DR is taken care of for continuity of services.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-ServiceBrief e-Service description with benefits	Volume (Nos) of Services year wise	
	2020-2021	2021- 2022(till Date)
ChitTransfers	113461	86688
MinutesFiling	194562	176087
Form7	3763	3875
Service Request	14069	18737

Implementation

Implementation Status in Telangana:

1473+ Chit fund companies, 14 Regulator Offices, 4 Nodes, 198K+ Transactions, 17315+ Block height, 22830+ Groups, 1M+ Subscribers, ₹1530 Cr+ per month. The system can identify the different business patterns establishing the factors for the proper health of Chit fund activities. Moving from a paper-based system to paperless, cashless, and presence systems has increased operational efficiency, and reduced the carbon footprint enabling easy document management.

Improvements / Enhancements

Earlier in the paper mode, one regulator was responsible for administering the Chit fund (close to about 100+) offices managing about 200K subscribers' money. Administering the chit-fund process in that old way was beyond inefficient. The current T-Chits system not just eliminates this burden of administration but also works proactively to identify different patterns and raise flags to alert the regulators.The numbers mentioned in the above point take care of all the activities.

ENABLER

Processes Re-engineered

Access to financial services in India is dependent on many parameters, especially for

those with little access to formal institutions like Banks and NBFCs. ROSCAs* (Rotating Savings and Credit Associations) / Chit funds are key instruments of financial inclusion in India. They offer simple access to finance for millions of people across India. Many low-budget investors are however susceptible to misinformation and fraud. A recently published article** from a reputed newspaper in India reports that between 1.2 to 1.4 lakh crores*** of public money is lost to various schemes. Upwards of 350 scams, impacting 15 crore families, across 17 states were identified targeting primarily low-budget investors by several ROSCAs / Chit Funds.

This solution/application is the true first of its kind in India. Unlike many other common e-governance projects, this project is focusing on improving the financial inclusion of the citizens who are participating in the Chit fund process.

This innovative solution has replaced the old/ancient way of reporting and administering the chit fund process. The administrative process reforms brought in by the Govt of Telangana in this space are unique and exemplary because of two reasons.

One; It has used one of the best-emerging technologies (blockchain) to reimagine the business process and Two, It stands as an example to be emulated across many states where Chit Fund administration is a challenge.

Today in Telangana, close to a MILLION chit fund subscribers are already protecting their interests in the investments made by them in the registered Chit fund business. The subscribers now have access to a fair and transparent way of grievance redressal which is effectively resolving many pending issues with the registered Chit fund companies.

Technologies

T-Chits leveraged,

- Foundational technologies like **Blockchain** to address many of the challenges that reduce the Information, Interaction and Innovation frictions (high fees, cash movements, reporting, auditing and potential fraud from the parties including foreman and subscribers).
- **Microservices architecture.** There would be multiple services developed, deployed, and managed independent of other services. The microservices architecture gives flexibility to scale up or scale down of the system as and when required.
- **User AuthN and AuthZ:** All users of the application require proper authentication and authorization through this module. It defines the roles and responsibilities of each user of the application.
- **Workflow Process Management:** This service provides workflow engine to process chit applications. All the approval/review actions would be assigned to designated users either foreman or regulator based on the use case. These workflows are flexible enough to modify for specific foreman/regulators.
- **Chitfund Act rules (Core):** All the business validations relating to each application processing would be taken care according to Chitfund Act 1983.
- **Payment Gateway:** Payment Gateway service is responsible for integrating the application with the payment services. The payment services could be any Wallets like T-Wallet or any other payment gateway.
- **Grievance Management:** This module responsible for handling the grievances from Foreman or subscriber.

- **Blockchain Network:** The Blockchain network acts as platform all the services mentioned in this section. A private Blockchain network would be formed with all relevant stakeholders of the business. Each relevant party would participate in the network formation to make all the transaction trustworthy and transparent. To start with Blockchain network would be formed with two nodes namely Foreman Org and Regulator Org. The foreman organization would share their transactions details with regulator org using shared ledger concept of Blockchain.
- **Analytics and Reports**: The data stored in the system will be used for generating analytics and report relating to the business. These analytics should help the regulators to identify regulatory concerns and understand trends of business. The reports should help in understanding the health of the business. There could be reports relating to regulatory audit as well.

People

Since the entire system is on a secured, permission based, blockchain network; the officers and other stakeholders involved had to undergo several rounds of training to ensure smooth usage of the application.

The Assistant Registrars in each district and their offices needed to undergo training to understand the underlying technology and security aspects of the same.

The non-government stakeholders involved had to undergo a separate set of training activities and support stages. Chit Fund companies had to be taught how to fill up the application forms for the being part of this application. The subscribers are empowered and can now access a fair and transparent way of grievance redressal which is effectively resolving many pending issues with the registered Chit fund companies.

VALUE INDICATORS

Learning's for sharing

The officials from the ARCs indicated that the system is helping them to monitor the entire process efficiently as indicated below:

1. Monitoring of Chit Fund company compliances has become easy.
2. Minutes filing and monitoring of monthly reporting has been automated by the system.
3. Voucher Details and separate account details compliance is automated by the system.
4. Violations raised by the system is very useful. No need of manual monitoring about violations saving many man hours of work.
5. All ARC offices have become cashless and the payments are handled only online.
6. All the legacy data migration is done making the entire chit fund reporting activities digital. No more offline activity in any ARC Office now.
7. Verification and Document management of the Details submitted by the foreman have become easy
8. Various health parameters in the Chit businesses can be monitored now in real time and take proactive steps to mitigate future risks.
9. Standardization across the board because of automated rule engine.
10. Imposing fines are automated and hence the compliance is also increased**.**

Digital Empowerment

Today in Telangana, close to a MILLION chit fund subscribers are already protecting their interests in the investments made by them in registered Chit fund business. The subscribers now have access to a fair and transparent way of grievance redressal which is effectively resolving many pending issues with the registered Chit fund companies

Green e-Governance

The system can identify the different business patterns establishing the factors for the proper health of Chit fund activities. Moving from a paper-based system to paperless, cashless and presence less systems have increased the operational efficiency, reduced the carbon foot print enabling easy document management

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Shri Jayesh Ranjan, *Prl. Secretary to Govt, Information Technology Electronics and Communication Department, secy_itc@telangana.gov.in*

Ms. Rama Devi Lanka, Director & OSD to Govt., *Information Technology Electronics and Communication Department, osd_itc@telangana.gov.in*

Shri Rahul Bojja, *Commissioner & Inspector General, Registration & Stamps, comm-ig@igrs.telangana.gov.in*

National Achievement Survey 2021 Digital Platform

Department of School Education & Literacy, Govt. of India, Central Borad of Secondary Education (CBSE), National Council of Educational Research and Training (NCERT) & National Informatics Centre, New Delhi

Jai Prakash Pandey, Manoj Kumar Srivastava, Indrani Bhaduri, Abhishek Kundu, Saba Akhtar and Prabhat Mishra

PROJECT OVERVIEW

Objectives:

National Achievement Survey (NAS) is a nationally representative large-scale survey of students' learning undertaken by the Ministry of Education, Government of India. NAS gives a system level reflection on effectiveness of school education. Findings help compare the performance across spectrum and across population in order to find the desirable direction for improvements.

Scope - functional and geographical:

National Achievement Survey-2021 is scheduled on 12th November 2021. The National Council of Educational Research and Training (NCERT) has developed the Assessment Framework for gauging the competencies attained by the students vis-a-vis learning outcomes. The Survey goes beyond the scorecard and includes the background variables to correlate student's performance in different learning outcomes vis-a-vis contextual variables.

This national level survey was conducted by the Central Board of Secondary Education (CBSE) as Assessment Administrator for Grade 3, 5, 8 and 10 students of State Govt. schools, Govt. Aided schools, Private Unaided recognized schools and Central Government schools. The Survey will be conducted in a monitored environment in the sampled schools. Sampling Design for NAS 2021 intends to support the predefined and agreed objectives of the national assessment, NAS 2021 intends to provide information of what India's students know and can do in key grades and subjects at national, state, district and school type. Selection of sampled schools is based on UDISE+2019-20 data. Therefore, the States, Districts used for drawing of the samples for NAS 2021 is exactly as per the UDISE+2019-20.

Key stake holders –

- Ministry of Education (MoE): Co-ordination, guidance, funding: Overall monitoring of NAS project through a Steering Committee constituted by the Ministry.
- NITI Aayog: Advisory Support
- Central Board of Secondary Education (CBSE): Assessment Administration: delivery of NAS in sample schools through nominated Actors (functionaries), planning, confidential printing & delivery, logistics, training for all (except FIs) and conduction of examination on 12th Nov 2021.
- National Council of Educational Research and Training (NCERT): Assessment Developer: Development of assessment framework for target grades, Item testing, piloting, translation, finalization of competency-based item for Achievement test, preparation of background questionnaire.
- National Informatics Centre (NIC): ICT Intervention and Automation: NAS-2021 website & web application development for School Sampling &

verification, Resource deployment, management & monitoring during the conduct of NAS examination, assessments of correlational effect of various subjects /teacher / school / parent social background etc. on education achievement, hosting of NAS Report cards (District and State Report cards). Centralized data center for NAS.

- UNICEF: Technical Support

Intended benefits and Current status:

- Single Day Administration of high-volume survey
- Effective Monitoring and information network
- Efficient central, state, and district level coordination
- Machine-based deployment ensuring fairness and objectivity
- Language wise Mapping for delivery of NAS
- Integrated framework with hierarchal control of data flow
- Role-based functionality, online nomination, online letter of appointment

Hardware/Software

1. **Application Development Environment – Software**
   - Java Spring / Struts Framework
   - Angular 8 or above
   - Highcharts / D3 Chart
   - iText
   - Apache Spark
2. **Operating System – RHEL 7.0**
3. **Database – PostgreSQL, MongoDB**
4. **Deployment Platform**
   - Linux Sever Platform
   - Apache 2x Server
   - PostgreSql Server database
   - Log4j

Certification (Certifying Agency)

- Certificate No: A3S/ASAC/2223/0012
- Issue Date: May 10th, 2022
- Company Name: Net Prophets Cyberworks Private Limited
- Application Name National Achievement Survey (NAS)
- Site URL: https://nas.gov.in
- Test Site URL: http://nas21.inroad.in/
- Security Testing Start Date: 24th March 2022
- Security Testing End Date: 9th May, 2022
- Partner: A3S Tech & Company

Disaster Recovery and Service Continuity

The Disaster Recovery and service continuity is managed in the NAS Platform via deployment of backup server at different geographies. The real time data storage is disseminated nation-wide with data streaming at different locations to maintain the serve continuity.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Service	Brief e-Service description with benefits			
		2020 - 2021	2021-2022	2022-23 (Upto date of nomination)
nas.gov.in	NAS Centralized Portal is developed to facilitate an end-to-end management of NAS survey it acts as a convergence platform of NAS Digital services for example National, States & UT's, Districts Report Card, Feedback management, Gallery, NAS Team details and, NAS Admin i.e. NAS application etc.			
nas.education.gov.in	Web application is an interactive software program which may run on the internet browsers, facilitate the integration and exchange of data. The application with login access to functionaries and role-based functionality for managing the resources, activity monitoring, reporting and documentation etc. Extensive training and capacity building was developed for the field operatives using short and self-narrative videos in blended mode. For hassle – free and fair conduct of NAS, an integrated framework with operational salience was in place. The survey was conducted in a monitored environment.			
Mobile application	The Mobile application was also developed that depicts the overall outcomes of the NAS 2021 at Districts, States and National Level.			

Implementation

It was envisaged that automation via the digitization of processes may be done to avail the real-time status to authorities for monitoring and actionable. For the implementation of the NAS digital portal, the application with login access to functionaries and role-based functionality for managing the resources, activity monitoring, reporting and documentation etc. Extensive training and capacity building was developed for the field operatives using short and self-narrative videos in blended mode.

The overall achievement is very significant Out of 735 targeted Districts, the NAS-2021 was conducted in 720 Districts on 12th November 2021 barring 12 districts of Tamil Nadu and 3 districts of Andhra Pradesh due to natural calamity. Results of these 15 districts of Tamil Nadu and Andhra Pradesh has been interpolated as per the result of the rest of districts of respective states.

Improvements / Enhancements

The improvements and enhancements specifically rolled out for, Capacity Building and Awareness & Communication in the present NAS Digital Platform. Further,

reports are released in form of survey outcomes on this platform.

ENABLER

Processes Re-engineered

- The offline data collection system got replaced by the online data capture system for functionaries i.e. State Nodal Officers, District Nodal Officers, Observers and Field Investigators etc.
- Lack of accountability due to the absence of an audit trail got improved because of the online data capture system for each process supported and facilitated instant decision making for the Higher officials.

Technologies

The major emerging technology-related initiatives are given below:

1. Data Analytics is used to manage a significantly large size of data collected from POST NAS survey. Data analytics is leveraged to extract meaningful insights, such as hidden patterns, unknown correlations, etc. from the data pertaining to learning Outcomes across India.

2. Image Pre-processing is going to be used to read physical forms filled in regional languages at the grassroots level, and then convert them into Hindi/English. The work is currently in progress, to leverage Tesseract, for performing Optical Character Recognition i.e. to read image and convert accordingly into the text.

3. Apache POI is used as API in the NAS Digital Platform for the creation, modification, and visualization of MS Office files using Java programs. lt is an open-source library by Apache Software Foundation to design or modify Microsoft Office files using Java program.

4. Spring Boot is used for API creation in UDISE+ ecosystem which makes it easy to create stand-alone, production-grade Spring-based

Applications that you can "just run".

5. Postgres SOL DB: PostgreSQL, also known as Postgres, is a free and

open-source relational database management system emphasizing extensibility and SQL compliance. It is used in NAS digital platform for the management of relational databases.

People

The 2021 NAS survey is vital in three aspects:

•It is a more expanded survey compared to 2017.

•The contextual importance of the survey (considering the COVID-19 pandemic)

•All organizations from central govt. to state govt. including Individual institutions associated with school education were benefited in terms of Decision making. Also, NAS data is very useful for students, parents, teachers, and research institutes at the national and international levels.

VALUE INDICATORS

Learning's for sharing

The project had several challenges related to data authenticity & quality. Following are the challenges along with solutions which became learnings:

- The offline data collection system got replaced by the online data capture system for functionaries i.e. State Nodal Officers, District Nodal Officers,

Observers and Field Investigators etc.

- Lack of accountability due to the absence of an audit trail got improved because of the online data capture system for each process supported and facilitated instant decision making for the Higher officials.
- Earlier the training and capacity building use to happen physically and manuals were handed over to the field level functionaries but through digital content and video tutorials in present information impart and dissemination has eased out manifolds.

Digital Empowerment

Digital Empowerment in education is the ability to locate, organize, understand, evaluate, and create information for using digital technology. It is the basic knowledge of digital medium, to utilize the technology of internet, smart phones, computer tablet. It is the introduction of information technology in every sector of the economy to empower people in education sector. Presently, in the pandemic situation the provision of online training and knowledge imparting has been explored which was earlier catered through physical trainings. Steps taken to address these indicators are as follows:

- Application Integration with UDISE Plus Ecosystem for sampling of schools was done
- Postal data for deployment of Observers and Field Investigators was utilized
- Outbound dialers, SMSs and Emails were used extensively for information dissemination related to alerts and notifications released by several stakeholders.

Green e-Governance

Digitalization through Application & Visualization platform has reduced the paper bill significantly and the availability of digital reports at district, state, and national levels led to a reduction in carbon footprints.

Shri Jai Prakash Pandey, *Director, Department of School Eduction & Literacy, Ministry of Education, jppandey.irps@gov.in*

Shri Manoj Kumar Srivastava, *Director (PE), Head NAS CELL, Central Board of Secondry Education, dir-pe@cbse.gov.in*

Prof. Indrani Bhaduri, *Head NAS CELL, National Council of Educational Research and Training, director.ncert@nic.in*

Shri Abhishek Kundu, *Scientist-D, NIC school education division, Ministry of Education, New Delhi, abhishek.kundu@nic.in*

Mr. Saba Akhtar, *Scientist-F and HOD, NIC School Education Division, Ministry of Education, New Delhi, saba@nic.in*

Shri Prabhat Mishra, *Scientist-C, NIC School Education Division, Ministry of Education, New Delhi, mishra.prabhat@nic.in*

Parag Dairy

Pradeshik Cooperative Dairy Federation Ltd., Uttar Pradesh & Uptron Powertronics Ltd.

Kunal Silku and Kumar Vineet

PROJECT OVERVIEW

PCDF has come up with a unique initiative to market its milk and milk products to the customers by making use of technology. On the other hand, it has also strived to provide rural employment opportunities and also to ensure nutritional security among the rural SHG families.

The Scope, Stake holders, intended benefits and current status can be illustrated as below: -

- First stake holder are the urban consumers who consume packaged milk and milk products such as Ghee, Curd, sweets etc. The objective of this initiative is to ensure that the urban consumers can easily get information about various Parag products available in their vicinity. They can also order the products online if the milk booth falls within a distance of 5 km from the address provided. If the booth is present, then the customer can order available products can pay online on the portal or App. They can also choose to pay "Cash on Delivery". Fresh products will be delivered next day between 8 AM to 10 AM. In case no booth is present in the 5 km vicinity, in that case, the customer will be able to see the GPS location of all the booths present in the district and then may choose to physically visit any such booth for making purchase. However, in this scenario, home delivery is not available currently as the existing setup does not charges any extra money as delivery charge. May be in future, a decision might be taken to either open more booths to cover the gaps or to allow adding of delivery charge if the distance is more than 5 km. The ultimate objective is to facilitate and educate the customers about healthy, adulteration free and government-backed milk and milk products which are of superior quality, in order to ensure health and value for money for the customers.
- The second Stake holder are the rural women of SHGs who have been made as Parag Rural Marketing agents. They have been authorized as rural agents of Parag who will make door step sales of Parag products among the rural folks. Even in rural areas many products like ghee, milk powder etc are consumed in processed form. Currently they purchase the goods from market at MRP. Now with this initiative, they can purchase the goods from a SHG from their own village and help in improving the employment and financial security of the poor SHG family. Also, the SHG might choose to pass on some of the margin to the rural consumer to enhance her business. The SHG women and their family members can also self-consume products which they are getting at discounted agent price. This will ensure nutritional security for such families. Also, all their functionality is available on the paragdairy.com portal and App. Through this portal/app, they can order products for themselves and can also see the delivery schedule. Payments can also be made by them on the portal itself.
- The third Stake holders are the Milk Unions. This initiative has provided them a new avenue to market their Parag products among new customers. It has reduced their customer acquisition cost and enhanced their profits. The milk

unions of UP are not in very good financial health. They are incurring losses owing to high fixed cost and low handling of milk. The handling of milk is low because they have limited customer base and they are not able to run advertisements of their products. Due to lack of advertisement, the customers are unaware about the superior quality of Parag products and are buying low quality private dairy products just because such dairy owners invest lot of money on advertisement. Through this intervention, the milk unions are now able to use social media to popularize the portal and get entry to a whole new set of new age urban customers who prefer home deliveries and online payment as against physically visiting the booths for making purchases. Also, this is a unique facility provide by very few dairy companies. This initiative is earning profits for the milk unions and slowly reducing their distress. Ultimately this enhances the condition of the milk farmers of UP and ensures better livelihood for them.

- The Fourth Stake holders are the "Parag Mitra" that are involved in the process of house hold marketing and home delivery. Each Parag Mitra has been given a 5 km radius as their marketing area. These Parag Mitra are supposed to undertake house hold marketing of the Parag products wherein they will visit big housing societies, restaurants, resorts, hotels, marriage lawns etc. and apprise them about Parag products and try to get one time or subscription-based orders. For every order generated by them, they will get a share in the profit. So, their effort directly translates into higher payouts. They perform this extension activity from 10 AM to 5 PM. Thereafter they return to see all the orders that have either been generated by them, or have been self-generated by customers in their area. Next morning from 8AM to 10 AM they supply all these orders. This unique delivery strategy ensures minimum expenditure on home delivery. Because of this strategy, we are able to provide products to the customers at no extra cost and also are able to provide a share of profit to the Parag Mitra. The Parag Mitra have been facilitated by a App which helps them in tracking the orders received, getting products from the assigned pickup point and later making delivery and entering happy code of customer to close the transaction.
- The Fifth Stake holder are the various distributors and agents along with the booth owners involved in the process of supply chain. With this intervention, their working has come online. Now they are able to order their requirement in real time and also make online payments. The demands are also seen by the milk unions in real time and effective arrangements can be made. Due to this system, even higher authorities are able to monitor various activities and ensure complete transparency and effectiveness. Real time inventory present at various milk unions and at various shops can also be monitored and production planning can be accordingly made. So overall it has facilitated all the people involved in the process.

All these initiatives have been carried out by the Parag Dairy portal. The portal has been made live in April 2022. In its 5 months of working, it has added 37000+ customers who have purchased Parag products worth more than 4 crores. For this supply chain to be maintained, 213 Parag Mitra have been added. Also for rural extension work, 78 SHGs have been roped in.

Hardware/SoftwareWindows server 2019 data centre edition

AWS Active directory using for User login and FSX

FSX (using for data share between multiple nodes)

ALB is using to manage the load across multiple nodes.

Created ASG to create/delete new server as per lod cross 80% for more than 5 min.

SQL Server: Sql server 2014 Enterprise.

Advanced Firewall From AWS Server

Certification (Certifying Agency)

Yes, Certification has been obtained from Cert-In Empaneled Company named Innovador Infotech Pvt. Ltd..

Disaster Recovery and Service Continuity

Following steps are in place for Disaster recovery and service continuity

1. Advance Backup System (off Site)

Daily Database Back up For Last 30 Days in S3 Bucket (Amazon Cloud Storage) Daily File Backup for Last 30 Days in S3 Bucket (Amazon Cloud Storage)

2. Server Snapshot

Daily Complete Server Snapshot for last 7 days

3. Document Restore process

In case of disaster whole protocol for restoring backup are in place and roles are defined from Team leader to server administrator.

4. Server Audit

Audit has been done by internal team and external Audit Agency.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Service	**Brief e-Service description with benefits**	**Volume (Nos) of Services year wise**		
		2020-2021	**2021-2022**	**2022-23 (Upto date of nomination)**
Customer Registration	This e-Service is for milk unions to monitor Customer wise day to day sale of Milk and Milk products. This facility help milk unions to get clear vision of which product is in high demand in the market thus helps in earning profit.	-	-	37389
Milk and Milk product Sale	This e-Service is for milk unions to monitor Customer wise day to day sale of Milk and Milk products. This facility helps milk unions to get clear vision of which product is in high demand in the market thus helps in earning profit.	-	-	4.05 Crore
SHG Registration	Women SHGs are roped in as rural marketing agents for sale of parag products in rural areas. This e-Service provide SHGs to purchase parag products online from milk	-	-	78

	union. Portal also provides delivery schedule when their order will be delivered by milk union			
Parag Mitra Registration	Parag Mitra involved in house hold marketing and home delivery are facilitated by an App to track the order received, assigned pickup point and delivery destination. For every order generated they get share in the profit.	-	-	213
Agent/Distributors Registration	With this e-Service distributers/Agents involved in supply chain has become online. They can place demand of parag products to milk union online and can also pay online. This ensures transparency in the system and making monitoring and production planning more effectively by milk unions	-	-	220

Implementation

The biggest challenge after making the portal was to popularize it among masses. For that a target of 10,000 customers in 6 months and 20,000 in 1 year was kept. However, it is a matter of great pride, that in a small span of 5 months only, 37000+ customers have registered themselves on the paragdairy portal. Though no specific sales target were fixed, the portal has been able to do business of more than Rs 4 crore. This has been possible due to the energy of 213 Parag Mitra who have not only home delivered the products but also marketed the products. Social media has also helped us in achieving this feat. Currently the portal is operating in all major cities of UP where Parag booths are available. Also, with the addition of 78 SHG members, marketing has also reached rural hinterland.

Improvements / Enhancements

During last 5 months of operation, efforts have been made to collect the GPS locations of parag booths. Currently we have collected the entire GPS locations of those booths who are acting as the pick-up point for our Parag Mitra. Those booths also cater to the 5 km radius around them. However, in addition to them there are many other shops also which sell parag products along with other brands such as various kirana shops etc. In second phase, in next 1 year the plan is to get the GPS location of all such stores also on the portal.

Also in last 5 months, we have been successful in creating supply chain for all our pickup points. Parag Mitra have been at the cutting edge of this effort. However currently the Parag Mitra have been appointed by the corresponding Milk Unions. Going forward, we are trying to get the private players associate with us and appoint Parag Mitra and share in the profits generated from increased marketing. For that RFP has also been prepared.

Together with this, currently we are doing home delivery on next day morning as we have taken a decision to not pass on the extra cost of transportation to the customers. But there can be such customers who might need the products immediately and they will be willing to pay the extra amount for that. This mechanism is next in line to be developed.

ENABLER

Processes Re-engineered

Before this initiative, the marketing efforts being made by PCDF were very rudimentary. Some of the key mechanisms followed were as below:-

1.Milk Unions made distributors in offline mode. Those distributors made agents who use to have physical shops. Such Physical shops were given Parag license and were authorized to sell Parag products. These shops operated in old style brick and mortar system.

2.There was no digital knowledge available about various Parag booths present in the city. If any customer wants to know if any Parag booth is present nearby, there was no means to know.

3.No information on types of products being made under Parag brand was available. The customer had no means to know which all products were made by Parag.

4.The agents and distributors used to place order offline. They were unsure as to when the products will arrive and every time, they had to communicate with the milk unions over phone. This was troublesome both for the milk unions and for the distributors.

5.Payment was also made offline and lot of accounting was to be maintained.

6.Since the system was offline, GM of milk unions and officials at PCDF were not able to monitor the marketing initiative. Due to this, complacency was creeping among staff.

To solve these issues and to present a modern face, the cloud-based e-portal was conceived. After this portal

getting live, all of the above issues were rectified.

1. Now, Customers have got a new means of purchasing Parag products along with the old-style brick and mortal shop mechanism. Now they can order the Parag products online using the Paragdairy.com portal and app.
2. In this portal, the GPS locations of all the Parag booth are fed. So now the customers can not only see those stores but can also navigate to reach the stores if they wish to make purchases.
3. Information about all the Parag Products are now present on the portal. The customers can check the product type, product cost, and availability of a particular product online.
4. The Agents and Distributors have also been given login and now they can raise their demand online. Also, the milk unions can also monitor the products in inventory and can accordingly assign the consignment which can be tracked online. So now no physical communication over phone is needed.
5. The entire payment system has gone online. Now both the customers as well as the distributors/Agents can make online payments. Even for COD(cash on delivery) mode, its MIS entry is made and all associated accounting is handled by the portal. It has greatly reduced the burden on the milk unions.
6. With proper MIS reports, now monitoring is possible at all levels. Also now the milk unions can communicate with other unions also as they can see the inventory of other milk unions also and can raise demand. Now each activity of marketing staff is being monitored and no laxity is possible at the lower levels.
7. SHGs have been added for the first time. Before this mechanism, the Parag

marketing was confined to the booth system. But now with this portal and mechanism in place, Parag has entered a whole new world of Rural marketing which is based on direct marketing strategy in place of shop-based marketing strategy. Even without having any physical store in rural areas, through this mechanism, Parag has been able to sell its products. It will go a long way in making PCDF and milk unions profitable.

All these Re-engineering measures which have been achieved by automating the old processes, standardizing the accounting and other work flows and by simplifying the processes has helped in enhanced effectiveness. Also it has led to customer satisfaction and increased profitability.

Technologies

Paragdairy.com uses technology to simplify the process of finding the Milk & Milk Products through portal & Mobile application in nearby locality upto 5 km radius of pickup points.

Paragdairy.com platform is taking leverage of cloud computing platform AWS to perform complex Artificial Intelligence and Machine learning algorithm.

Platform uses its advanced match-making algorithm to search for the nearest pickup points who matches the user's requirements and is available at the given date and time.

Advance Google Analytic has been implemented. Order booked & paid including delivered at customer door point are being stored and sent to data analysis team for review.

Whole traffic, order booking, payment and delivery and other challenges are reviewed to make user experience smooth along with finding new opportunities to cater.

The platform has also got prediction engines to help it predict products sales in different pockets.

Keeping this information in mind, supply chain & delivery gaps are meeting & planned as per the future expectations

People

This mechanism has helped the administrators at milk union and at PCDF by providing them the requisite datasets to take various marketing linked decisions. Now with the frequency of sales of various products available at their fingertips, proper marketing strategies can be devised. Also by knowing which booths are most frequently visited, proper management of such booths can be ensured.

Change Management has also become data driven. Now the authorities have data sets to support their decision of discontinuing any product line. Also, if some members are not working properly, they can now be removed based on empirical data.

It has also led to capacity building of our in-house staff. They have been given training to use the online portals and app. Even the Parag Mitra have been trained to operate the app as all their working is through the app only. This digital literacy is not confined only to this portal. By receiving this knowledge, they have been enabled to make use of all other digital platforms also such as social media platforms and mail platforms.

VALUE INDICATORS

Learning's for sharing

The first challenge was the resistance to adopt to the digital platform. The milk unions were in their comfort zone working in the old style brick and mortar system of marketing. Effort has to be made to sensitize them about the benefits of online digital

platform. Since many of the employees were also having digital illiteracy, they have to be given proper training. But once the people realized the power of this mechanism, which was resulting in enhanced profitability for the organization, they all got behind the initiative.

The second challenge was how to popularize this portal as milk unions had little money to run any kind of advertisement campaign. It was here that the direct marketing strategy of Parag Mitra came to their rescue. Each Parag Mitra was given a target to visit at least 50 households in a day and tell the people about this portal and this initiative of government. If any help was sought by the customer in creating his account, Parag Mitra also helped in that. It was only because of this out of box thinking that in a small span of 5 months, 37000+ customers created their account on the portal even when no formal marketing ads were run. To support the efforts of Parag Mitra, social media was also used to best of the ability.

Usage of GPS locations of stores was a disruptive technology. Any customer who made his account entered his GPS location of the address. With that location, the system itself triangulated the nearest store and linked his orders to that store. The Parag Mitra associated with that store could see the order made by the customer and was supposed to supply it next day by receiving goods from the store. This mechanism also ensured that the nearest store must lie within 5 km of customer. If no such store was available, the customer was notified that currently home delivery is not available in their area. However they were shown the physical listings of stores along with the distances and the customer was prompted to visit the store physically.

The display of details about various Parag products can be categorized as best practice. Now full transparency is ensured and the customer is not only able to know real time availability of products but can also read about the health and other benefits along with calories of various products. This mechanism help the customers take informed and healthy choices.

Digital Empowerment

Few of the features developed in paragdairy.com portal which ensures ease of access to all kinds of customers are as below:-

1. The paragdairy.com portal has been developed in bi-lingual format, being available in both Hindi and English language. In this manner it has tried to address the language barrier.
2. The enabling mechanism of Parag Mitra handholding urban customers have ensured that even such consumers who are not able to create account and place order on their own are given some basic training and even first order can be placed by Parag Mitra himself.
3. Facility of Cash on Delivery (COD) has also been made available so that those customers who have limited financial inclusion or are not comfortable in using net banking or online payment mechanism are not discriminated and they can seamlessly use the platform.

Green e-Governance

E commerce portal is cloud-based software in which no server or any additional computer hardware is being used. Consumers can also access the portal through smart phones in which no additional e-waste is being generated.

“Pradeshik Co-operative Dairy Federation Ltd” with its technology Partner is following up E-waste (Management) Rules & 2016 Compliant. As a result, it would reduce paper usage significantly.

The staffs, officers and the Stakeholders are being made aware and educated about E-waste and Green initiatives, encouraging e-mail communications with different stakeholders. All the transmission through the Portal is being done through automated E-mail and mobile SMS processes.

As a policy, the Government of Uttar Pradesh has already initiated excellent efforts towards green e-governance. All state government departments are working in that direction and follow the necessary guidelines issued to that effect.

Shri Kunal Silku, *Managing Director, Pradeshik cooperative Dairy Federation Ltd., Uttar Pradesh, md.pcdf@paragmilkup.in*

Shri Kumar Vineet, *Managing Director, Uptron Powertronics Ltd., Lucknow, uptronpowertronics2008@gmail.com*

Quick Pass - Centralized Digital Pass Issue System for Septage Collection, Transportation, Disposal and Payment

Thiruvananthapuram Municipal Corporation, Kerala

Binu Francis

PROJECT OVERVIEW

Scientific disposal of waste water is one of the mandates of the Corporation. ThiruvananthapuramCorporation has a STP, with 107 MLD capacity at Muttathara, constituted under KSUDP. It have a networkof 620 Km and 53000 connection. The network covers 43 ward fully and partially. Now 60% of the capacity (STP) is utilised.

The coverage density of the city Corporation is 6000 person per km square, but in the core city density is in between 15,000-20,000 per person per kilometer square. Since, many of the septic or antiseptic, which leads to the contamination of surface water.

Since, more than 85% of the building, are not covered with sewage connection, the septage tanks onemptied through private tanker lorries. This septage are emptied, unauthorisedly, to waterbodies andother public places like drain, storm water drain, paddy field etc, which directly, contaminate water bodies and inturn affect the health of the general public.

There are more than 50 private tankers, with in the city, to carry out the activity and collect huge amount from the public.In order to return the grievance of the public and to control the emptying of waste water (septage) in water bodies, unauthorisedly, Corporation of Trivandrum decided to implement the project, through e-plant form.

Objective of the project

- To legalise the septage collection, transportation and processing system in Trivandrum Municpal Corporation
- To prevent dumping of septage waste collected from households in public places and water bodies
- To regulate the pricing structure of septage collection service and prevent exploitation of the general public by truck operators.
- To improve the standard of living of people involved in septage collection service and to help them earn a livelihood via legal means.
- To replace the manual system with a digital platform making it easier for the general public to use and to ensure that service delivery is done on time with proper quality.
- To make the entire operations fully transparent and implement necessary monitoring mechanisms to supervise the operation of the system.

The dumping of septage waste was a serious issue haunting Thiruvananthapuram polluting its water bodies and public places. Being home to quite a few rivers and lakes, the city is rich in water resources which are being actively used by the population for daily activities. The lack of systematic processes for collection of septage waste (black water) had caused the evolution of a parallel illegal network of trucks owned and operated by criminal elements who had no regard to effects of pollution or to the rules and regulation related to the same. This mafia was so strong that even elected representatives had a hard time dealing with them.

This project aimed at providing a central digital platform which can be used for regulating and monitoring the trucks and service providers who are collecting septage

waste and to ensure scientific disposal of the collected waste. A bylaw was officially passed by the Corporation Council after much discussion and interaction which detailed the processes to be implemented in this regard. The septage waste treatment facility of the Corporation at Beemapally was upgraded to allow trucks to dump the waste easily. Two backup dumping locations (decanting stations) were also identified to be utilized in case of emergencies. The corporation empaneled the vendors who wanted to provide the service and based on the licensing conditions they were required to make their trucks scientifically capable of storing and transporting septage waste. The trucks were fitted with IRNSS based AIS140 GPS devices and data was fed tocorporations servers in real-time. Inspections were done on the trucks which were aptly painted and licenses were issued to suitable ones. The licensing and related processes were done via a digital platform which could be accessed by the vendors and officials.

Once the vendors were empaneled, a digital booking portal was put up for allowing the public to request waste collection service. The portal was linked to the public mobile app for the corporation named Smart Trivandrum. The app acted as a hub which provided a public platform for the users who needed the service. The payment related to the service was totally digital and was collected using multiple payment gateways. A call center which operates 24 X 7 was also setup which had trained officers who would receive calls from both public and service providers and sort out any issues which they faced. The call center has necessary man power,hardware and software to handle multiple calls concurrently. The booking portal also had a full swing administration area which could be accessed by the call center and officials. All information about the trucks, bookings and service delivery was presented to the users by the system in an informative way for effective decision making. The GPS data was presented in map interface for real time monitoring and automated systems were put in place to monitor the data and to find out if any malpractices are made. The system uses a scheduling algorithm and allocates each booking to a truck based on its priority. The algorithm is designed to adjust the allocation so that all drivers get bookings evenly.

The service providers were given a mobile app which alerted them about any new bookings allocated to them and provided a digital pass for moving the waste. The QR code-based pass can be scanned and information about the truck can be seen by officials. Once the truck reaches the plant, the operator at the plant will scan the QR code and takes a photo of the truck as proof of service completion. The plant and decanting stations are also fitted with ANPR cameras which are integrated with the system. So whenever a truck arrives at the plant, the system will get the information. Once service is completed, the service charge will be transferred to the service providers account digitally without any physical file movements.

The system was very successful and public opinion was totally positive. The corporation's own trucks were also linked to the system there by making it a total solution for septage waste movement. The truck drivers and workers were given regular training on scientific waste movement and precautions to be taken. Necessary gears and uniforms were supplied to them regularly. This capacity building exercise has empowered the service providers and presently they have taken more responsibility towards waste movement without causing pollution. This social reformation brought about by the digital system has put in place a permanent framework for eliminating the serious issue of pollution of water bodies with septage waste.

The service delivery time-line and quality has improved many folds since the implementation of the project. It took days or weeks for the end user to get the service earlier and presently it takes only hours.The operations which took place only at night mainly due to the illegal nature of the service was shifted to day time fully since the system was in place. Also the end users are provided with real time information on what is happening on their booking via the Smart Trivandrum mobile app. The details of the vehicle and driver who is assigned to execute the work, the time-line of each activity and other relevant information is available at the fingertips of the user. Moreover, the citizens had no way to complain against issues in quality or other aspects or service earlier. Now they can contact the call center or post their complaints via the online grievance redressal system which will be monitored and rectified on time. **Software for centralised coordination**

The key component of the architecture of the system was the central software which acted as the command and coordination centre connecting all the stakeholders to a single point. This acted as the brain of the system and allowed data transfer between various other connected systems.

Mobile app for drivers

The truck drivers were given an android mobile application which they can install in their own phone. The communication between the central system and drivers happens via this app.

Public app for end user

The general public were provided with a mobile application which can be used to book the service. The status of the booking was available to them in real time via this app. Thus the central system could communicate with the end users via this app.

Septage Call Centre Service

The call centre was equipped with hardware and software for high call volumes. It could receive concurrent calls from multiple lines via a software component which was further integrated with the central system.Thus the call centre executive could see the relevant information related to the caller like current and past orders, tickets etc on the screen when a call came in. A mobile number 9496434488, A lan number 04712377701 and a septage central complaint number 14420 are attached to this call centre.

IRNSS based AIS140 AIS140 GPS

The trucks were fitted with AIS 140 GPS devices which were directly integrated to the central system via HTTP protocol. The device fed the data in predefined format which allowed the system to determine the realtime location of the truck.

Geofencing of plant

The treatment plant and the decanting stations were geotagged and the GIS information was fed to the central system. Based on this data and the data from the GPS device fitted in the truck the system could monitor and identify when a truck arrives at a decanting station.

ANPR Camera integration

The plant was fitted with automatic number plate recognition cameras and was integrated with the central software. The ANPR system identified the number of any vehicle which came to the plant and fed the data to the central system. This information was used to identify the trucks which arrived at the plant

Service Delivery Channels

The below following channels are used to book septage from the public

Public mobile app for end users

The general public were provided with a mobile application which can be used to book the service. The status of the booking was available to them in real time via this app. Thus the central system could communicate with the end users via this app.

Web Portal for Public

The general public were provided with a web portal which can be used to book the service. The status of the booking was available to them in real time via this website . Thus the central system could communicate

with the end users via this system.

Call Center, Akshaya center and Direct Booking Center

The call center was equipped with hardware and software for high call volumes. It could receive concurrent calls from multiple lines via a software component which was further integrated with the central system.Thus the call center executive could see the relevant information related to the caller like current and past

orders, tickets etc on the screen when a call came in.Also they support and help for direct booking service.

- The system houses various mechanism to ensure inclusion of all classes of citizens as follows:
- Online booking and digital payment for anyone who has access to Internet and online banking
- Akshaya center-based booking for anyone who do not have internet access but has online banking
- Bank challan-based cash payment option for anyone who do not have online banking
- Free booking option for officers for citizens who are financially backward
- Special subsidy for BPL citizens who are eligible

Hardware/Software

The system is developed using fully open source technologies. The backend system and APIs are developed in PHP and Zend Framework. The system uses PostgreSQL RDBMS as the database backend.It is running in a Linux based cloud server utilizing apache as the server software. The mobile components are developed using Ionic framework which is a hybrid framework based on Angular JS.

Certification (Certifying Agency)

The system has been Security Audited & Assessed as per CERT-IN Guideline & OWASP Standard. The Site & Application was found fit and safe for hosting a under continuous monitoring and observation by Authorized Authorities. The Application/Site is fulfilled the criteria as per CERT-IN Security norms. The penetration test was conducted by Mirox Cyber Security's certified security engineers.

MIROX CYBER SECURITY & TECHNOLOGY PVT LTD

4th floor, Nila, Technopark

Trivandrum Kerala- India

Disaster Recovery and Service Continuity

The disaster recovery strategy planned for the system involves a two-pronged approach involving technology and another involving the stakeholders. While every possible precautions are taken to prevent downtime or failure of the central system,

regular automated backup services are utilized for getting the data backup to be stored safely. In case of a total system failure, this backup service can bring up the system online in a new server within two to three hours.

The stakeholders have been trained to switch to manual operation to handle emergency cases which may come up during such downtime. The call center will act as the binding force in such situations and a command and coordination cell will be opened in the call center to coordinate the activities. Necessary directions will be given to the operators and public as needed to prevent chaotic service delivery and requests. Streamlining of operations will be done by the cell until the system is operational

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Service	Brief e-Service description with benefits			
		2020-2021	2021-2022	2022-23 (Upto date of nomination)
Septage Tanker Booking Service	● Total Amount Collected: 14.82 Cr, ● Total Trips Completed till 2022 : 42654 trips ● Total Septage Qty Collected :18.69 Cr Litre ● No of Trucks Registered: 33 Trucks ●Thiruvananthapuram Corporation Income :3.54 Cr ●Amount disbursed to tanker lorry owners: 6.85 Cr ● Amount remitted as GST :1.17C	11165	14118	17371

Implementation

The implementation aimed at bringing all operators in the Thiruvananthapuram Municipal Corporation area and nearby 11 grama Panchayats under a single umbrella and to regulate the septage collection from households and institutions. The targeted goal has been achieved 100% and all septage movement in the city is now being done via the system only. Any illegal activity will be identified and the vehicle detained by the health squad of the Corporation. There is no reported complaint from the public regarding the dumping of septage waste in a water body or public place since 24 months from the implementation of the system.

Improvements / Enhancements

Apart from providing the service within the geographical area under Thiruvananthapuram Corporation, due to the quality of the service delivery, the corporation began receiving requests from nearby local bodies falling outside corporation limit. Last year the system was modified to include such bookings from outside the corporation area. This proved to be more challenging as the distance to be covered by the trucks and more complex coordination was required. Moreover the treatment plant was within the limits of Corporation and there was strong local resistance against bringing septage from outside corporation limits to the plant. The elected representatives met with local people multiple times and brought them on-

board by ensuring scientific disposal of waste and also improvements in the facilities at plant so that the byproducts of treatment will not cause any issues to the local people. This service also was highly successful and provided additional income to the truck drivers who were more than happy to be part of it.

In the next coming years, the system will be expanded further to include more local bodies in the district and to replicate the same model under the system by including the treatment plants in other locations. This will allow enrolling of more trucks and to provide service to wider geographical area efficiently.

ENABLER

Processes Re-Engineere

Booking

The booking was done manually and details were kept on registers earlier. The system offered multiple ways to bring booking via online modes and the data was stored digitally. Booking could be done by the public via app or website. The officers could receive booking at their respective offices and also booking could be done via call center or Akshya Centers.

Payment of service charge

Earlier the payment of service charge was done in cash after service delivery. The truck drivers collected the money at the customer location which led to increased friction between the customers and drivers regarding the rates. This process was modified and the rates were published beforehand and the end users could make the payment online. No cash transactions are involved which made the system fully accounted for.

Release of payment to operators

Earlier, the corporation could release a payment only by using a manual file movement process which caused much delay in processing any payment. But in this system, the detailed calculations on how much money is due to each driver is done by the system and is reported to the implementing officer. The officer verifies the data and instructions is given to the bank to transfer the money directly based on this report. Since there is only minimal involvement of the officer, the processing of payment is very fast and the process was setup to release the payment once a week regularly.

Technologies

Software for centralized coordination

The key component of the architecture of the system was the central software which acted as the command and coordination center connecting all the stakeholders to a single point. This acted as the brain of the system and allowed data transfer between various other connected systems.

Mobile app for drivers

The truck drivers were given an android mobile application which they can install in their own phone. The communication between the central system and drivers happens via this app.

Public app for end users(Smart Trivandrum Mobile App)

The general public were provided with a mobile application which can be used to book the service. The status of the booking was available to them in real time via this app. Thus the central system could communicate with the end users via this app.

Call Center

The call center was equipped with hardware and software for high call volumes. It could receive concurrent calls from multiple lines (30 Lines) via a software component which was further integrated with the central system. Thus the call center executive could see the relevant information related to the caller like current and past orders, tickets etc on the screen when a call came in.

The central govt short code 14420 as Helpline number to register complaint sregarding unsafe practices being adopted for cleaning and maintenance of septic tanks and sewers are also linked with the same call center

AIS140 GPS

The trucks were fitted with AIS 140 GPS devices which were directly integrated to the central system via HTTP protocol. The device fed the data in predefined format which allowed the system to determine the realtime location of the truck.

Geofencing of plant

The treatment plant and the decanting stations were geotagged and the GIS information was fed to the central system. Based on this data and the data from the GPS device fitted in the truck the system could monitor and identify when a truck arrives at a decanting station.

ANPR Camera

The plant was fitted with automatic number plate recognition cameras and was integrated with the central software. The ANPR system identified the number of any vehicle which came to the plant and fed the data to the central system. This information was used to identify the trucks which arrived at the plant.

People

Elected Representatives

The leadership and initiative from the elected representatives, council and the Mayor of Trivandrum corporation was a major component in the success of the system. From passing the bylaw to involvement in areas where public support is needed, they did a great job in both understanding the importance of the system and in communicating it to the public. The stringent stands taken by the council in dealing with the illegal operators who polluted the water bodies is commendable.

Officials

The movement of the operating mechanism of septage management from a file based manual system to a digital system was very well accepted by the officials involved. The capacity building trainings conducted for the official in this respect was a huge success and many significant suggestions and improvements were brought forward by them to fine tune the system. Once they understood the effectiveness and the speed at which actions could be taken, the officials were keen to bring in more protocols under the system. During the initial stages, the health officials strongly patrolled the city to detect and detain any illegal operators which ran parallel to the system.

Plant Operators

The plant operators who acted blindly before the system came in were very keen to be part of the system. They learned to use the mobile app to scan the QR code and to get the information on the trucks load.

Truck Operators

The truck operators are the class of stakeholders who were changed by the system the most. From illegally operating at night fearing the police and official machinery, they were empowered to work professionally in day time using scientific methods and to dispose of the waste collected properly at the plants. They were trained to work using proper gear and uniforms and to use the mobile app to access necessary information.

Call center executives

The improvement which came about to the call center executives in the last two year is immense. The training given to them has allowed them to work as a team and has brought a few to the forefront as team leaders. They are now capable of handling any situations which arise in the system using the experience they gained over the time.

Thiruvananthapuram Municipal Corporation	1. Hon Mayor 2. Secretary 3. Health Officer 4.HealthSupervisor-Project implementing Officer 5. Health Inspector 6. Jr Health Inspector 7. Call Centre Staffs
Technical Advice & Monitoring: Kerala IT Mission, SeMT,Kerala Startup Mission	Sabarish K (Head, E Governance at Kerala State Informat Technology Mission) Nishanth S R(SEMT) Varun G,Technical Officer ,KSUM

34VALUE INDICATORS

Learning's for sharing

The main points which the project brings up are as follows:

1. Any project requires public support and unless the public is not involved, the implementation is not going to be successful
2. The elected representatives can bring in public support if they are convinced of the benefits of the system
3. Teamwork between officials and elected members is keystone for success of such projects
4. Decision making should be done by an automated software system with no or minimal human involvement. This helps to keep the blame on the system rather than on any one person and helps in preventing bending of rules by powerful forces.

Financial transactions should be always made online and for anyone who does not have the capability to do online transaction assistance should be provided to empower them.

Challenges faced

- A digital platform was necessary to run the system but there were no comparable systems as far as we could look for. There was no proper working model in the country in a similar social and cultural environment for reference.

- A proper bye-law was not available so as to bring the entire digital system under a legal framework
- The septage treatment plan was operated by KWA and only two sewerage lines were connected to it. The plant operated under bacteriological processes for treating the septage waste. They were less confident to open the plant for the corporation registered truck operators owing to concerns regarding dumping of non-organic waste like oil etc causing damage to the processing systems.
- Once the system was launched, booking was bare minimum as public awareness was very less. They were not ready to book through the online system as the corporation's own manual booking service took two to four weeks to deliver the service. So they preferred private players who did the work overnight.
- The public also had concerns in providing payment prior to completion of service delivery. This was mainly regarding possible delay refund in case service is not given
- The major portion of the operation was managed by the illegal booking truck drivers operating from various parts around the city and outside the district. Most of the truck operators were not familiar with mobile apps and other technology gadgets.
- The behaviour of the truck operators to public was very rough and lots of complaints regarding overspeed and rash driving came up in the initial stages
- They were not ready to run under an organised system as the fee charged by them was very high compared to the corporation fee. Also, they had no guarantee that they would get their payment from the corporation on time.
- The cost fixed by the corporation council was not acceptable to the existing truck operators due to the large difference in margin
- The truck drivers were not allowed to collect payment directly from the customer but in the initial stages they collected some amount illegally by misleading the customer
- The GPS device and other vehicle documents were not properly maintained by the truck operators
- Police and other enforcement teams unnecessarily blocked the operation of the septage service during the daytime and harassed the operators for various purposes.
- Even after launching the system in full swing, parallel illegal septage service operated during night time. They have their own methods to provide pilots to the septage carrying vehicle and for signalling the presence of enforcement teams.

Overcoming the challenges

- The Thiruvananthapuram Municpal Corporation council passed a detailed bye law for the operation of the system. All the activities related to septage collection, transportation and service delivery are detailed in the bye law. The bye law was formulated after multiple rounds of detailed discussions with various stakeholders including KWA sewage management team, technical staff of KWA treatment plant,corporation septage service operating staffs and officers, private truck operators, residents associations and public

representatives, various elected representatives and technical staffs of SeMT and IT mission officers.

- As mentioned above the truck owners were not willing to register under the service initially and various meetings were conducted with different truck owners to resolve the situation. The corporation had to forcefully include half of the vehicles operating in the city initially to start operations. Also, strict monitoring and hefty fines were imposed to prevent illegal operations. Gradually operators found it far better to operate under the system both financially and socially.
- System was set up to provide payments to operators weekly without delay. This increased the confidence of the truck operators. All the payments are directly paid to the truck operator's bank account on a weekly basis (every Wednesday). The operators are not required to come to the corporation office and all the tracking data are available via their account in the online system. Document and bill submission facility is also available in the account.
- Various IEC activities were arranged during the implementation during the initial stage to increase public awareness about the system. Training programmes were arranged for councillors and corporation staff on various aspects of the system. FM and radio advertisements, social media campaigns, newspaper articles and regular newspaper advertisements through major Malayalam newspapers were utilised to publicise the advantages and operating mechanism.
- Corporation provided additional staff to KWA for plant discharge operation. Also, installed CCTV surveillance cameras inside the plant to monitor the entire operation of the truck operators.
- A call centre was set up at the corporation office and recruited staff was trained for the operation of the help desk. The booking related doubts, customer feedback, other customer queries , doubts of vehicle operators all are cleared with the help of this help desk. Any possible delay in service is duly informed to the customer and corrective actions will be taken to ensure service delivery. Also email, mobile app push alerts and SMS messages are sent at regular intervals to keep the customer aware of the progress of the service.
- If any report of illegal payment collection by operators is received, prompt enquiry is conducted by the corporation. If the operator is found guilty, he will be disabled and the next digital pass will be sent to the vehicle only when he returns the illegally collected money to the customer.
- Various levels of training were given for each truck operator. A WhatsApp group was formed for ease of communication and group messages were sent on a real-time basis to keep them updated about any important information.
- The personality and behaviour improvement training was provided for truck operators to help them improve customer service. Strict action is taken against the truck operators if any complaints are generated from the public.
- Vehicle overspeed issue was blocked by fitting the trucks with speed governor and also, they are tracked using GPS speed reports taken at regular intervals. If the speed is above the prescribed speed the vehicle will be disabled and further digital passes will not be issued to it.

- GPS device connectivity and other document validity are checked automatically through the system and the pass is issued only when all the documents are valid
- The Hon Mayor directly convened the meeting of all enforcement departments and strict instructions were given to the enforcement officers regarding unnecessary checking and harassment of legal registered trucks.
- Parallel night operation of illegal trucks was blocked using a special monitoring squad formed in the corporation and additional patrols implemented during the night time in the city. If a vehicle is caught huge fine is imposed to vehicle owner and other legal remedies will also be taken as applicable.

Digital Empowerment

The system houses various mechanism to ensure inclusion of all classes of citizens as follows:

1. Online booking and digital payment for anyone who has access to Internet and online banking
2. Akshaya center-based booking for anyone who do not have internet access but has online banking
3. Direct Office booking for anyone who do not have internet access and online banking facility.
4. Free booking option for officers for citizens who are financially backward
5. Special subsidy for BPL citizens who are eligible

Green e-Governance

Mr. Binu Francis, *Secretary, Thiruvananthapuram Municpal Corporation, Kerala,* tvpmcorpn@gmail.com

Comprehensive Integrated Suite for Local Bodies Elections in Haryana

State Election Commission, Haryana & National Informatics Centre Haryana State Centre

Dhanpat Singh, Deepak Bansal and Mahendra Pal Kulshreshtha

PROJECT OVERVIEW

Objectives of the Project:

a. To uphold the transparency in the state Local Bodies Elections in conduct of free & fair elections by way of inclusion of ICT (Dashboards /Web Portals/MIS and help lines)

b. Speedy & real time dissemination of information to the public and election functionaries/District administration.

c. Eliminate duplication of efforts by integrating with other state wide applications like HRMS through APIs for utilizing employees' data.

d. Enabling centralized databases and web enabled applications for activities like Voter lists preparation and duty assignment to eliminate inconsistencies and irregularities in data and processes along with bringing uniformity across the state.

e. Develop Mobile apps (For data updating from fields and dashboards) wherever suitable for ease of operations and secure data management.

f. To ease the government functionaries/local Administrations/ State Election Commission involved in whole of the election process of state Local Bodies by way of procedural reforms and using best ICT practices and monitoring tools.

g. To carry out the data analytics & data mining on the basis of details of nominations, contesting & winning candidates specially in the Panchayat Elections which includes (Zila Parishad/ Panchayat Samities/ Sarpanches/ Panches

Scope - functional and geographical :

The products suite implemented throughout the state in ULB Elections held in the month of May'2022 covering all MCs wards for electing ward members and presidents and also in earlier PRI-2016 elections throughout the state of Haryana by building and implementing modules as given below:

Products Suites functionalities comprises following web based integrated modules & applications

1) Preparations of voter list and Ward marking as per delimitations decided by the state government for various state elections of local bodies

2) Launching of Voters Helpline for the use of voters in the state

3) Web portal to capture nomination of the contesting candidates

4) Preparation of ballot paper based on the data captured via nomination Dashboard

5) Election Duty Management System (EDMS) for deployment of polling staff on booths during poll process

6) Counting Duty Management System

7) Live Poll e-dashboard for poll process monitoring up to every booth level

8) Android based Mobile App to Sector Officers/Magistrate deployed in field to update Live Poll Dashboard

9) Android based Mobile app for Communication plan to administer the Poll process

10) Result Declaration e-Dashboard.

11) MyGP (Meri Gram Panchayat) Mobile App (Flutter) for Data Updating/ Data Analytics/ Dashboards/Communication Plan and available on Google Play Store

12) Video Conferencing solution of NIC for regular meetings between SEC and District/Field Staff.

Geographical Scope – (State of Haryana)

(A) (Panchayati Raj Institution) Elections the year -2016 (Haryana)

Zila Parishad	416
Block Samities	2997
Sarpanches	6186
Panches (wards)	60436

(B) (Urban Local Bodies Elections) – May 2022 (State of Haryana)

Districts	21
MCs	46
Total wards	888
Total Nominating candidates (Through portal)	4580
Total Contesting Candidates	3550
Total Booths	1961

Hardware/Software

Framework (4.5) – Asp.Net

Language – c#

DB – SQL server 2014

Android Studio (Language Java)

Certification (Certifying Agency)

Formal certificate is not available. The audit is under process and most of the required security measures have been taken while development of the system.

Security measures at data center level have been taken e.g.:

1. The whole system is accessible only within India.

2. Certain sensitive data updating facilities have been provided through Two Factor Authentication i.e. OTP based auth.

3. MyGP (My-Meri Gram Panchayat) Mobile App (Flutter) for Data Updating/ Data Analytics/ Dashboards/Communication Plan and other G2C and C2Cpurposes available on Google Play Store and freely downloadable & facilitates to Election functionaries and public as well. OTP based authentication

4. Communication Plan mobile app will work on authorized person's mobile phone only.

Disaster Recovery and Service Continuity

Proper planning for Disaster Recovery has been done for different type of modules at different stages of the implementation process by considering various types of downtime situations. Following are the details of steps undertaken to handle various kinds of situations:

1. At Hosting Infrastructure Level:

a. The web servers have been placed in load balanced mode to eliminate single point of failure.

b. Most applications which are required to be used over NICNET/SWAN and require no public access e.g. duty assignment, voter lists preparation modules have been enabled only on Intranet to reduce the attack surface and safeguard the sensitive databases.

c. Spare database and web servers are kept in state of readiness to meet any eventuality of physical server downtime.

2. Backups and DR:

a. Considering the RTO and RPO for different modules, Different types of SQL server Backups CSeGA-2022 Project Category Nomination (Full, Differential and transaction log backups) have been scheduled on Backup Appliance of
the data center. As the whole election process is a time bound process which is started and finished within two months the time, the backs up strategy also changes depending upon the stage of implementation.

b. Daily Full Backup is scheduled and transferred to Pune Data Centre on daily basis for DR purpose. In case of any major disaster and data loss at the data center, the backups can be retrieved from Pune which is in a different seismic zone.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Service	**Brief e-Service description with benefits**	**Volume (Nos) of Services year wise**		
		2020-2021	**2021-2022**	**2022-23 (Up to date of nomination)**
Preparations of Voter lists, Ward marking & Voter Help line	Conversion of ECI voter list to local bodies voter lists as per State specific delimitation by marking wards etc. Online web enabled Voter Help Line support for the voters and general citizen to find out the details of the voter along with details of the polling booth where to cast the votes	1,62,16,555 (Voters)	183,86,682 (Voters)	1,93,31,453 (Voters in entire State)
Web portal for capturing Nominations and Preparation of Ballot papers	Web based application to capture the details of Nominations for likely contesting candidates from all Returning officers center After rejection/withdrawal and allotment of symbols, the sample ballot papers generated and data shall be accessible to the printing press where the printing of ballot			(Below stats are for MC elections 2022) Districts= 21 MCs= 46 Wards =888 Total Nominations =4580

	papers assigned by SEC Haryana			Contesting candidates =3550
Live web-based e-Dashboard for Poll monitoring and android based mobile app to update the dashboard	Poll Dashboard is implemented pre-poll and during the poll day, it is indispensable poll process monitoring application. The SEC and public is able tosee the ongoing 12 numbers of events directly on dashboard up to booth level. All 12 numbers of events are being updated in real-time mode with the help of android based mobile app to be used by Sector Officers deployed for conduct of election. It is to mention that this poll monitoring e-Dashboard has been developed and implemented by NIC Haryana not only in local bodies elections but in elections to Lok Sabha as well as Vidhan Sabha also. The software was provided to CEO Punjab, West Bengal and Uttrakhand also. Such dashboards were earlier implemented by other states through Private agencies, costed them Rs. 40 to 50 Lakhs. This in-house software has resulted in great savings for the Governments.			(Below stats are for MC elections 2022) Total Booths =1961Total Voters =1839575 Votes Polled =1295454 TotalServices/ Events on dashboard =12
Web-EDMS and CDMS	The web based Election Duty Management System (EDMS) is a centralized Poll duty assignment software EDMS which is directly integrated with the State HRMS and E-Employee software. Latest Employees data is pulled from HRMS, which is further refined through e-Employees software by updating certain election related parameters. The software has different roles for DIO, DC/DM and operators. The software is used for three stage randomization process and printing of various kinds of reports for poll management. This software has been used successfully in part three			

	elections including Lok Sabha and Vidhan Sabha elections and has resulted in great savings on time and manpower which goes into poll duty assignment. Similarly the web enabled CDMS is counting staff duty assignment software which pulls selected data from EDMS and deploys counting staff in three stage deployment process.			
Communication Plan web portal and Mobile App (Module of My GP App)	Communication Plan is very critical component during election process. As per the communication plan, the contact details of various election functionaries starting from the SEC, RO, Police personnel, Micro Observers and up to polling staff deployed on the polling booths must be available on click of a button. Direct calling features to the staff with advanced search available. To enable this, the EDMS was directly linked to the mobile App based communication plan. The authorized election functionaries at SEC and field level were able to access the communication information and were also able to call the intended person on a single click through mobile app based communication plan.	State Election Commission, All Districts and Booth level polling staff for elections.	State Election Commission, All Districts and Booth level polling staff for elections.	State Election Commission, All Districts and Booth level polling staff for elections.
e-Dashboard for Result declaration	This e-dashboard was developed and implemented to display real-time information regarding winning and trailing candidates along with details of votes received by other candidates for every seat. The data on this e-dashboard was updated directly from the counting center after each round (In case of Municipal Corporations and on one time basis in case of Panchayat wards. The data thus obtained was linked to a dashboard showing	Same as number of elected member of Panchayat.MC etc	Same as number of elected members of Panchayat/ MCs etc.	Same as number of elected members of Panchayats/MC s etc.

	details of Sarpanches/Panches etc. for each Panchayat in the state. This information was made available through a mobile App "Mahari Panchayat" in Haryanvi which means "My Panchayat". This is a unique initiative in the country where information of all elected members of local bodies are available through a mobile App.			
Mahari Panchayat (Mobile App) and now as MyGP (Meri Gram anchayat)				

Implementation

The products suite implemented throughout the state in ULB Elections held in the month of May'2022 covering all MCs wards for electing ward members and presidents and also in earlier PRI-2016 elections in whole of the state of Haryana

Improvements / Enhancements

Earlier the SMS services were used to update the dashboard from the respective PO/SO, this time the data population of the dashboard was done using android based mobile app. Two interfaces created of poll dashboards i.e. one for public and another for administration /SEC

In next roll out all the Dashboards shall be graphically enriched for making comparison in the trend of the polling with other factors as part of data analytics. Conversion of the mobile apps of communication plan and updating of poll dashboard in IOS

ENABLER

Processes Re-engineered

Under process re-engineering, lot of manual works have been dispensed with and converted into automated and transparent system by way of developing and implementation of such comprehensive and integrated suites.

a. Manual searching of voters dispensed with into ICT enabled web-based help line
b. Poll Process Monitoring has become on a single dashboard for SEC and election functionaries to administer, monitoring and also useful for public, government, media and researchers
c. EDMS-Deployment of polling personnel following all terms and conditions as per election manual
d. Mobile App of Communication Plan– to facilitates the District administration and SEC to make direct call to the various staff deployed any of the booth including police personnel and Micro observers
e. Result Dashboard – Directly updating from the counting centers and made

available to the public in real-time mode dispensing all manual system of disseminating the results of won candidates, the media persons take feed from the dashboard as single point authentic dashboard for getting speedy results.

f. MyGP (Meri Gram Panchayat) Mobile App consolidated app for all such modules for the use of public, government including elections functionaries (SEC)

Technologies

1. The SMS gateway integration was done using NIC SMS gateway for alerts and information to the stakeholders at various stages of implementation. e.g. An OTP is used to enable the mobile app on the mobile phone of the authorized Government employee.
2. Similarly SMSs are sent in case of poll booth related events during polling
3. Flutter/Android used for development of Mobile App (MyGP)
4. MyGP freely downloadable from Google Play store

People

The leadership support was provided by the State Election Commissioner himself who showed tremendous confidence in the NIC technical teams and the DIOs at grass root level for proliferation of ICT applications in the complete election process up to grass root level.

DIOs and ADIOs of NIC Haryana supported by the NIC State Election teams developed and implemented various applications in time bound manner without any hiccups. The efforts were well recognized by the SEC as well district administration.

Mass training programs including hands on trainings were conducted time to time for polling staff deployed including sector magistrates, duty magistrates, returning officers and returning officers for conduct of election process and to administer the process and its monitoring at micro level.

VALUE INDICATORS

Learning's for sharing

Enormous processes involved in conduction of any election whereas huge manpower needs to be deployed and issues of law & order, upholding transparency, free /fair processes & overall integrity are the prime requisites. Inclusion of ICT in the processes not only supports for speedy dissemination of information but also extends monitoring tools for the election functionaries. In traditional system, the whole process was cumbersome and time consuming and always be prone to errors. However, in ICT enabled system we may have keep track by way of digital foot prints and various IP and security logs.

Digital Empowerment

Whole of the suite developed in an integrated manner and developed and hosted by National Informatics Centre, Haryana State Centre without any cost levied. There were no cultural or demographic differences observed during its implementation. It is worth mentioning that live Poll dashboard was also implemented during the recently **Punjab (Vidhan Sabha) Elections held -2022** for which the **CEO Punjab highly appreciated and put on record.**

Green e-Governance

1. The project involves end to end online processes starting from preparation of voter lists to declaration of results. Most of the activities are conducted online which enables huge savings in terms of paper work which has great impact on saving the environment.
2. The meetings with district and field staff are held through Video Conferencing mode which also results in savings in terms of time and transportation movements, money which cause on environmental impact.
3. The system is hosted at NIC Haryana cloud-based data center and can be accessed through wide variety of devices which helps saving the expenditure of PCs and reduces e-Waste.
4. The Haryana Government follows the e E-waste (Management) Rules, 2016, for disposal of e-Waste. In addition, Haryana Government has a single window service for registration of e-Waste recyclers and has also published a list of e-Waste recyclers registered in Haryana.

Shri Dhanpat Singh, IAS (Retired), *State Election Commissioner, State Election Commission, Haryana, sec@hry.nic.in*

Shri Deepak Bansal, *Deputy Director General & State Informatics Officer, National Informatics Centre, Haryana State Centre, deepak.bansal@nic.in*

Shri Mahendra Pal Kulshreshtha, *Senior Technical Director (NIC) & DIO, National Informatics Centre, Haryana State Centre, Kulshreshtha.mp@nic.in*

Security Awareness in Cyber Space

Cyber Security Centre of Excellence, Department of Information Technology & Electronics, Govt. of West Bengal

Sanjay Kumar Das

PROJECT OVERVIEW

Cyber Security Centre of Excellence (CS-CoE) – West Bengal The Cyber Security Centre of Excellence has been inaugurated on Nov 2017, with a vision to ensure a robust and secured "Public ICT Cyber Security Framework" across the state through awareness generation and skill building.

The focus area in which CS-CoE showed remarkable contribution to the state are as below:

1. Training and Awareness generation
2. Cyber assurance through ICT Infrastructure Audit and Web Application Security Audit
3. Incident Response & Mitigation
4. Investigation and Forensic
5. Research and Development (R&D)

1.TRAINING AND AWARENESS GENERATION

The various stakeholders to whom CS-CoE, West Bengal has been relentlessly imparting training may be classified as below:

1. Common citizen
2. Govt. officers
3. Police and Law Enforcement Agencies
4. Teachers
5. Industry professionals
6. CS-CoE team members

- More than 10000 common citizens have been trained via Open-to-all National Level workshops and through numerous seminars on Karmobhumi, State's IT/ITeS Digital Skill Registry Platform.
- 150 senior citizens have been trained through a Cyber-Awareness Generation Programme at Swapno Bhor old age home in Newtown, Kolkata.
- Trained 2669 employees from 18 State Government departments through "On the Job Training (OJT) on Cyber Security". They were trained to identify, segregate, pre-empt, prevent cyber-threats looming over Government IT Infrastructure and reduce the effect of cyber-attacks as and when they occur.
- 6020 Panchayat level officers have been trained through Basic Training on Cyber Security and Cyber Hygiene practices in collaboration with B R Ambedkar Institute of Panchayat and Rural Development
- 65 Nodal Officers from State departments and statutory bodies have been trained through a specialised training program on Cyber Assurance.
- 100 District Project Managers and Software Support Personnel have been

trained through a week long "Training of Trainers" programme on Web Application Security Assessment (WASA) & Infrastructure Security Assessment (ISA) pertaining to public ICT infrastructure.

- 463 Government Officials have been trained in 4 batches through a 20-hour intensive online programme on weekends named the "Cyber Swadhinata Programme".
- Till now total 1200 West Bengal Police and Kolkata Police personnel have been trained through "First Responder Training (FRT)" on Cybercrime Response on triaging, reporting and handling evidence related to a cyber-crime. o Total 13 West Bengal Police and Kolkata Police personnel have been trained through "Detailed Responder Training (DRT)".
- 683 direct recruited Police personnel have been trained through "Cyber Security Orientation Training (CSOT)" on cyber-crime incident response and mitigation. o 18 Police officials from different Cyber Crime Police Stations across the State were trained through
- "Training of Police Personnel on CDR/IPDR Forensic Tools" - on Licensed forensic tools purchased and
- installed there by the CoE.
- 12 WB Police officials have been trained on advance level cyber forensics through "Cyber Forensic
- Preparatory Training" for CID Officials.
- 97 technically skilled police personnel have been trained on Security by Design through "Secure Coding
- Practice Framework".
- 7200 teachers from across the State have been trained through "Cyber Shikshak" a specially designed
- programme on Cyber Security.
- 3038 educators have been trained through a state wide programme "Online Training on Cyber Safety and
- Cyber Security for teachers/ staff/ faculties of Govt. Schools and Colleges". Later, the training module
- received more than 7000 views on YouTube channel.
- 32,000 college students from all over West Bengal have been trained through a month-long learning
- programme "Secure Bengal 2021" on secure application coding and cybersecurity.
- Awareness related activities:
- As a part of the awareness generation curriculum, CS-CoE has taken many initiatives for various stakeholders of
- the entire eco-system including common citizens. These are:
- Knowledge workshops have been organized over last three years with more than 9,500 participated from
- all walks of the Society.
- CS-CoE web portal https://cscoe.itewb.gov.in has become extremely popular with more than 3.6 lakh

- unique visitors and more than 1.7 lakh downloads.
- The CoE's social media handles and YouTube channel are popular and informative.
- Published 50+ bilingual, easy to execute advisories on prevailing cyber threat and general safety practices.
- More than 5,000 Cyber Hygiene Handbooks on English, Bengali and Hindi, published and distributed
- across the State.
- Prepared 15 animated awareness videos on different types of cyber threat.
- Designed Calendars with cyber hygiene themes and distributed 5000 copies to all over West Bengal.
- Designed and distributed 5000 copies of awareness posters and distributed across West Bengal.
- Participated in three fairs / exhibitions with exclusive stall on Cyber Security Practice wherein witnessed
- more than 47,000 footfalls, conducted 34 Quiz sessions and distributed prizes, souvenirs viz. coffee mugs,
- masks, badges, caps, T-shirts.
- Reached out to more than 1,03,000 citizens through SMS on cyber awareness.
- Reached out to more than 90,000 citizens through IVR calling on cyber awareness.
- Registered more than 1.5 Lakh Cyber Awareness pledge through CS-CoE portal.
- Conducted 50 sessions of online quiz on cyber security awareness with 10000 candidates participating and
- 500 of them receiving awards and certificates.
- Conducted Poster and Slogan competition where total 500 common citizens participated. o Hosted 2 Talk Shows (1-hour long), one in PrasarBharati Radio Channels, andother in 91.9 Friends FM Channel. The PrasarBharati channel is broadcasted to all over West Bengal reaching approximately 5 crore people while the Friends FM Channel has 42 lakhs listeners on air and a global digital reach of 1.70 crores across social media.
- Two specific mobile Apps, CyberYoddha for citizens and CyberSathi for trained police personnel have been successfully launched and presently in operation.
- Published an e-book on advisories on cyber-security.
- Published an English book named "Cyber Security – A Knowledge for safer tomorrow" and 1,000 hard copies have been distributed among system-administrators of various government offices.
- Published a bilingual (Bengali and English) Comic Book on Cyber Crimes – "Cyber-erSammohon" consisting of 12 stories on prevailing cyber-crimes. Distributed 5,000 hard copies of the book among schools,
- colleges, offices, municipalities, and old-age homes

2.CYBER ASSURANCE THROUGH ICT INFRASTRUCTURE AUDIT AND WEB

APPLICATION SECURITY AUDIT

- Security audit of Government ICT Infrastructure has commenced with WBHIDCO and till date 80 departments have been audited.
- Regular review and application security audit of all Government web-portals is done under guidance of NCIIPC and CERT-In to identify and plug vulnerabilities.105 web-applications of various departments have been audited till date.

3. INCIDENT RESPONSE & MITIGATION

- CS-CoE has developed a comprehensive Cyber Crisis Management Plan (CCMP), approved and notified by the Dept. of IT & E, to detect and perform entire crisis management for ICT infrastructure and systems (Including software, hardware, firmware, networks and web-portals, sites as well as applications including mobile ones) for all departments and directorates of Govt of West Bengal, in case of any cyber attack.
- The Security Operation Centre (SOC) is under development, which will become a single point of contact for cyber security incident reporting & coordination in the state.
- The West Bengal Cyber Security Incident Response Team (WB-CSIRT) has become operational since April 2021 and already serving Government departments, Academic Institutes and Private sector organisations as well.

4. INVESTIGATION AND FORENSIC.

- The CS-CoE collaborated with State Police Academy for conducting large scale training on Cyber Forensic investigation and conducted Cyber Forensic training for CID officials as well.
- CS-CoE has developed the 2nd State Forensic Lab for CID West Bengal and made complete installation of the advanced Forensic tools and infrastructure and imparted training on those tools.

5. RESEARCH AND DEVELOPMENT (R&D)

- CS-CoE has developed “Diploma in Cyber Security” which is approved by the All-India Council for Technical Education (AICTE) and rolled out in Polytechnic colleges by Department of Technical Education, Training & Skill Development, Government of West Bengal.
- CS-CoE has developed “Vocational Course on Cyber Security” for security guards approved by the West Bengal State Council of Technical & Vocational Education and Skill Development to be commenced from 2021-22 academic session. The aim of this course is to transform normal guards to technically security guards.
- CS-CoE has developed internship to build a team of digital taskforce (Bengal Cyber Yoddha Team) under the aegis of West Bengal Cyber Security Incident Response Team (WB-CSIRT). Cyber Yoddha Team will be responsible for scanning and testing different e-governance portals and create advisories for fixing available vulnerabilities.
- Netaji Subhas Open University has expressed their interest to collaborate with CS-CoE to deliver courses on Fundamentals of Cyber Security.
- MaulanaAbulKalam Azad University of Technology (MAKAUT) has vested Cybersecurity Centre of Excellence with the vetting responsibility for all their courses on cyber-security.

Hardware/Software

Law enforcement agencies are being trained in several aspects including identification, categorization and

responding to cyber incidents. These trainings are being imparted using latest forensic tools which include the

following:

1. EDAS for workstation
2. Mobile forensic tools – Oxygen Forensic Detective
3. NETSURF for CDR/ IPDR analysis etc.

All the Online Applications viz. Cyber Yoddha, Cyber Sathi, Event Management Portal, Cyber Skill Assessment portal are developed using LAMP (Linux – Apache – MySQL – PHP) technology stack. Mobile App version of the same has been developed using Android view of the Web portal.

For the purpose of WASA & VAPT; CS-CoE is using open-source tools like Bur Suite,Acunetix Web Vulnerability Scanner, OWASP ZAP, NMAP, Netsparker SQLMAP among others.

Certification (Certifying Agency)

All Web Application Audit & VAPT and ICT Infrastructure Audit are executed as part of Cyber Assurance Program by CERT-IN empanelled agencies.

Disaster Recovery and Service Continuity

By developing the Cyber Crisis Management Plan (CCMP) and West Bengal Cyber Security Incident Response Team (WB-CSIRT) ensured secure and cyber safe critical services like water supply, gas supply, Electricity, etc. in case of any cyber-attack

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	Brief service description with benefits	Volume (Nos) of Services year wise		
		Till 2020-21		
On the Job Training (OJT) on Cyber Security	Employees from State Government departments were trained to identify, segregate, pre-empt, prevent cyber-threats looming over Government IT Infrastructure and reduce the effect of cyber-attacks as and when they occur.	1748 employees from 11 State Government departments	2669 employees from 18 State Government departments	Target 5000
Cyber Assurance Training	A specialised training program was conductedfor Nodal Officers from State departments and statutory bodies	65 nodal officers	65 nodal officers	65 nodal officers
Training of Trainers	A week-long programme comprising District Project Managers and Software Support Personnel was conducted on Web	100 District Project Managers and Software Support	100 District Project Managers andSoftware Support	100 District Project Managers and Software Support

	Application Security Assessment (WASA) & Infrastructure Security Assessment (ISA) pertaining to public ICT infrastructure.	Personnel	Personnel	Personnel
Weekend training for Governmen t Officials	Four batches of a 20- hour intensive online programme successfully trained Government Officials.	463 Government Officials.	463 Government Officials.	463 Government Officials.
First Responder Training (FRT) on Cybercrime Response	Serving police officials have been trained on triaging, reporting and handling evidence related to a cyber-crime.	520 Police Officials.	1200 Police Officials.	1200 Police Officials.
Cyber Security Orientation Training (CSOT)	Direct recruited Police personnel have been trained on cyber-crime incident response and mitigation.	683 Direct Recruit Police Officers.	683 Direct Recruit Police Officers.	683 Direct RecruitPolice Officers.
Training of Police Personnel on CDR/IPDR Forensic Tools	Police officials acrossthe State were trainedon Licensed forensic tools purchased andinstalled there by theCoE.	118 Police officials from 31 Cyber Crime Police Stations	118 Police officials from31 Cyber Crime Police Stations	118 Police officials from 31 CyberCrime Police Stations
Cyber Forensic Preparatory Training	CID Officials of WB Police have been trainedon advance level cyber forensics.	12 Police officials from CID, West Bengal.	12 Police officials fromCID, West Bengal.	12 Police officialsfrom CID, West Bengal.
Secure Coding Practice Framework	technically skilled police personnel are being trained on Security by Design	100 officers from Kolkata Police and CID, West Bengal.	100 officers from Kolkata Police and CID, West Bengal.	100 officers from Kolkata Police and CID, West Bengal.
Cyber Forensic Preparatory Training	CID Officials of WB Police have been trainedon advance level cyber forensics.	12 Police officials from CID, West Bengal.	12 Police officials fromCID, West Bengal.	12 Police officialsfrom CID, West Bengal.
Secure Coding Practice Framework	technically skilled police personnel are being trained on Security by Design	100 officers from Kolkata Police and CID, West Bengal.	100 officers from Kolkata Police and CID, West Bengal.	100 officers from Kolkata Police and CID, West Bengal.
ICT Infrastructu re Audit andWeb Application	Continuous surveillanceon Govt. ICT Infrastructure and web portals/ applications hasimproved the safety andsecurity of	91 web-applications of 73 Government organizations.	105 web-applications of80 Government organizations	105 web-applications of 80 Government organizations

Security Audit	public servicedelivery and to maintain improved cyber safe Govt. ICT ecosystem.			
Cyber Sathi App	App designed to support police officials to provide instant help on Cyber Security	More than 1000 police officials are presently using this app	More than 1000 police officials are presently using this app	More than 1000 police officials are presently using this app
Cyber Yoddha App	App designed to support citizens on how to respond to a Cyber incident	More than 5000 citizens are using this app	More than 5000 citizens are using this app	More than 5000 citizens are usingthis app
Cyber Skill Assessment portal	Web based system toassess cyber securityskill of trained professional	More than 6000 participants have already been assessed through this Skill assessment portal	More than 10000 participants have already been assessed through this Skill assessment portal	More than 10000 participants have already been assessed throughthis Skill assessment portal

Implementation

SL. No	Item description	Planned estimate	Target achieved
1	Awareness generation on Cyber Security for Govt. Officials	2000	3000+ trained
2	Up skilling of Law Enforcement agencies	1000	1200+ skilled
3	Up skilling of IT/ITES employees of different govt. establishments	ds32500	683 up skilled
4	Tool based training for Law Enforcement agencies	250	230 trained
5	Up skilling of ICT teachers of different school/college/university	3000	7200 trained
6	Securing Web/ICT infrastructure of Govt. establishments	200	500+

Improvements / Enhancements

Cyber Assurance Programme, with the objective to make “Cyber Safe Bengal” within Cyber Safe India, created a self-sustaining model by educating the law enforcement dept., Govt. departments and common citizen about the importance of cyber security and the ways to mitigate risks.

ENABLER

Processes Re-engineered

Cyber Security Centre of Excellence has re-engineered Cybercrime response& reporting process for Law Enforcement agencies as well as for citizens. Earlier citizens used to launch their cybercrime compliant to specific cyber police stations and sometimes as it was not located in the locality of victim, citizens used to avoid complaining the incident. This in turn encourage the hackers for committing cyber-attacks. Citizens were partially aware about location and working of Cyber Police Stations of the State. Now by introducing First Responder Training [FRT] & Cyber Security Orientation Training [CSOT] CS-CoE has considerably improves response of all police stations towards a cybercrime event. Cyber Yoddha App also helped citizen to response faster for cybercrime incident. On the other hand, the online submission of complaints to Cyber Adjudicating Officers led to increased filing and disposal.

Technologies

The CoE's social media handles and YouTube channel are popular and informative and contributedin large-scale awareness generation.

People

Cyber Security Centre of Excellence has trained 5 of its officials in National Cyber Security Scholar Program, 2 of its officials in ISO 27701 Data Privacy practices, 5 of its officials in Forensic tool training. CISO, Government of West Bengal, SISO, Government of West Bengal, WB-CSIRT and many Cyber Security experts from academia, Law, Law Enforcement agencies helped WB-CSCoE since its formative stage till now which helped a lot to re-engineer the entire process.

VALUE INDICATORS

Learning's for sharing

There was little knowledge on cyber security awareness among all the govt. employees of West Bengal on how to maintain the safety of the public ICT infrastructure and identify possible threats. The law enforcement agencies (police dept) was also lacking proper basic knowledge at all level regarding handling cyber incidents.

Besides, the public / govt. portals were having too many vulnerabilities, which went unrecognized or unattended in absence of the awareness of severity of such instances among the admin and users.

Implementation of cyber security initiatives face a wide range of challenges due to a multitude of reasons. The adoption of IT in governance practices have been slow in India as a whole.Government employees had to update their skill set and abilities in order to be able to adapt to thechanges that IT brought to their established processes and way of work.

Besides the public sector, private sector and common citizen also lacked awareness regarding theimportance of cyber security. In India information and communication technology has bought internet to the hands of people are not aware of the associated risks.

Digital Empowerment

Digital Empowerment brings lot of cyber challenges to the citizens benefitted from e-Governance initiatives. Especially senior citizens & citizens below certain education level are getting attacked every day at the time of accessing e-Governance initiatives. Keeping this mind CS-CoE haslaunched special cyber security awareness generation program for school children through comic book, for general citizens through cyber

awareness training and for senior citizens through awareness campaign at old age home, holy places and also through Radio/TV show.

Green e-Governance

Green Governance is essentially about how well organizations are managed with respect to itsESG objectives. In this regard, in the field of Cyber Security, it is the Chief Information Security Officer's role to help shape the security and risk strategies. The cyber security segment of ESG covers every aspect of an organisation's security needs and lifecycle; the network, endpoints, data, cloud, services, software and hardware, and how critical data is protected.

Risk in cyber space is now counted upon as one of the highest rated environmental sustainability financial risk, that has far-reaching and long-term negative consequences for individual and organisation.

To address this issue, the initiative of "Security Awareness in Cyber Space" project was started by the Cyber Security Centre of Excellence under Department of Information Technology & Electronics, Government of West Bengal. This project highly supports and promotes Green Governance. The activities are in line with the United Nations Sustainability Goals - SDG 9:Industry, Innovation and Infrastructure; which aims to build resilient infrastructure, promote sustainable industrialization and foster innovation.

In line with that, the training programmes help the organizations take preventive measures thereby reducing the capital costs involved for rebuilding the ICT infrastructure during sudden disasters/threats. Also, the programmes are carried out on online mode. This helps reduce the necessity of physical paper work. This ensures both individuals and organizations to stay adequately prepared to mitigate the risks.

Shri Sanjay Kumar Das, *Joint Secretary, Department of Information Technology & Electronics, Govt. of West Bengal, jsit@wb.gov.in*

MC Suite of IT Applications

Municipal Corporation of Delhi, National Informatics Centre, New Delhi & National Informatics Centre Services Inc., New Delhi

Gyanesh Bharti A A Tazir, Nidhi Malik, Susheel Kumar, Rachna Srivastava and Vinay Thakur

PROJECT OVERVIEW

Objective:

The Objective of MC Suite of IT Applications is to provide State-of-the-art web and mobile based workflow system to the MCD employees to process the applications and delivery the services to the citizens. On the other hand Citizens can also avail the services online from anywhere, anytime without visiting the MCD offices.

Scope:

1. **Functional:**
   a) **Citizen Centric Services:** Online delivery of services namely submission for Property Tax Return, Registration of Birth and Death, Community Hall booking services, Licenses applications, Cremation / Burial Ground Slips, Covid-19 help lines to know the availability of beds, cremation/ burial grounds, Test & Vaccination centres etc.
   b) **Licensing Services:** Veterinary Licenses, Pet Dogs Registration, Gen. Trade / Storage Licences, Factory Licenses, Health Trade Licences, HTL Application, Hackney Carriage,

      Tehbazari, Hawking License
   c) **Public Utilities:** Town Planning approval system, Building Plan Sanction (EODB), Tracking of Garbage Vehicles (eSBM,) dashboards, Parking Monthly License Fee System, Cremation / Burial Ground Slot Availability etc.
   d) **Other Services:** Mobile App, Attendance App, MCD App, GePNIC, Horticulture Department, Farmhouse Functions etc.
   e) SPARROW ,eOffice, PRICE, LIMBS, eHospital is also implemented successfully
   f) Applications are faceless for seamless delivery of services with a payoff at the time of **COVID- 19 like pandemic**.
2. **Geographical:** The suite of IT applications presently meant for Delhi people of MCD. They can avail services from any internet point, No geographical boundaries. NRIs can also avail services using Mobile & OTP authentication. Citizen base spread over 4500+ colonies and 272 wards under 12 Zones are being serviced by the applications.

Key Stake Holders:

1. Citizens of the MCD
2. MCD officials
3. Government and non-government organizations of MCD
4. National Informatics Centre (NIC) / National Informatics Centre Services Inc. (NICSI)

5. Community Service Centers (CSC) & Banks

Benefits:

1. **Paperless System:**
   a. Eliminates manual handling of applications (No paper mode of applications)
   b. Contribution towards initiative of Green Governance
2. **Cashless System:**
   a. Integrated Online Payment Gateway System
   b. Promotion of Digital Transactions
3. **Faceless System:**
   a. Online Registration, submission of applications and getting service online.
   b. Almost No need to visit MCD offices
4. **Covid-19 complaint**
   a. Application implementing Social Distancing thus saving lives and slowing in spread of Covid- 19 like pandemics.
   b. In the testing times of Covid-19, the applications developed and launched have helped Citizens as they can apply and get the services of MCD without having a physical contact with anyone.
5. **Transparency**
   c. Starting from application submission to processing and delivery of service, the system is transparent for different levels.
6. **Minimized Human Interference due to automated processes.**
7. **Minimization of travel burdens to avail service in online mode**
8. **Beneficiary can track his application status**
9. **OTP based authentication of the right citizen**
10. **Inter applications integrations and dashboards available.**
11. **Role based Authorisation of the MCD officials for processing of application, using PIMS**

Current Status:

Three Phase of the Project have been completed; around 20+ applications have been made Go-Live. **Last Phase is progressing.**

(phase wise status is mentioned in the Section 4.2a)

Hardware/Software

Hardware:

1. NIC Cloud (MeghRaj). / National Data Centres (NDC)
2. Network Load Balancer (NLB)
3. VM have been used for hosting of applications
4. The DC site of the applications is at NDC Bhubaneswar
5. The DR site for the applications is at NDC Pune

S/W Environment:

1. OS – Linux RHEL 8.0
2. Application development environment : – Java Spring MVC framework

Database: PostGres Ver 12, Hibernate

Middleware:

1. Open Stack Server
2. VMware

Packages-integrated / deployed:

1. Apache (Httpd)
2. Tomcat
3. JDK
4. Open SSL
5. Mod SSL

Certification (Certifying Agency)

Since, all applications are hosted on NIC Cloud, Cyber Security policy of the Government of India is followed Cyber Security Group, Application Security Division, National Informatics Centre, is the Certifying Agency.

All applications are 3rd party Security Audited by CERT-In empanelled agency and verified by NIC cyber security cell.

Disaster Recovery and Service Continuity

- Infrastructures are VM Ware based.
- The DC site at NDC Bhubaneswar while the DR is at NDC Pune, all data is replicating.
- Replication from the DC to DR is done on real-time basis so that no data is lost in case the DC goes down
- Auto Alerts are received through CCC (command & control Centre) , in case any service is down
- A proper Backup Policy is in place, and routine tests for data restoring are carried out

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RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	Brief service description with benefits	Volume (Nos) of Services year wise		
		Till 2020-21		
Property Tax Return	PTR Application is an integral part of the MC Suite of IT Application, it facilitate the citizens of Delhi having property under MCD area to submit Property Returns Online. The system auto calculates the tax and Online Payment Gateway is integrated for payment of Taxes. • It facilitates citizens to easily pay property tax return without visiting MCD premises. • Similarly, MCD official	Property returns submitted 533758	Property returns submitted 914416	Property returns submitted 884323

	can use Dashboard extensively to keep track of day-to-day progress on tax payments received and use it for necessary decision making to achieve the targets. • Notice issuance U/s 123D of Property Tax • eMutation for MCD property records • GAS- General Amnesty scheme Sahbhagita Scheme for RWA and GHS residents for property tax incentives			
Registration of Birth and Death(RBD)	RBD Application is an integral part of the MC Suite of Application which covers population under MCD. It provides a Simplified, Responsive, Effective and Transparent paperless platform to citizens of all MCD to register and download Birth and Death Certificate. • RBD Application facilitates Citizens to register for Birth & Death and download certificates from any internet point thus eliminating the requirement of personal visit to MCD office. • It facilitates Change of Details in Birth/ Death Certificates, Viewing status of application and downloading the Certificate using personalized dashboard by citizens. Hospital can Register the Birth & Death of citizen and Issue certificate instantly. The same can be downloaded by citizen on their own at any time and from any internet point.	Certificates issued: Birth: 25492 Death: 13815	Certificates issued: Birth: 320202 Death: 148864	Certificates issued: Birth: 447910 Death: 80679
Licensing Applications	The MCD grants different types of Licenses viz. Health Trade License, Veterinary License, General Trade / Storage License, Factory License. • Licensing applications			

	provide a Simplified, Responsive, Effective and Transparent paperless platform to citizens of all MCD to apply for and download the various Licenses. • It also facilitates the MCD officials to do their internal processes and file dealings thereby automating the backend workflow. • Option to raise the deficiency and get the Citizen to correct it through the system is also there			
Health Trade License	• As per provisions under DMC Act, 1957, the MCD grants health trade licenses (HTL) to the traders in order to run their trades of restaurants, hotels, motels etc . • It is integrated with Unified Portal of MHA Currently DMCs are granting Health Trade Licenses to about 60 types of Health Trades.	Applications received: **122**	Applications received: **3364**	Applications received: **2629**
Veterinary License	• Veterinary department deals with Issuance of Licenses of Horse Buggies, Cattle Dairies, Meat Shops, Meat processing units etc. • The Application facilitate for online registration and payment. • Online workflow based system for processing of application • It is paperless and faceless application. System calculated fees	Licenses issued **0**	Licenses issued **4884**	Licenses issued **4702**
General Trade / Storage License	• MCD grants General Trade and Storage License under Section 417 of the DMC Act-1957. • There is a feature of 10% Random Scrutiny Selection for Officers • Online workflow based system for processing of application • It is paperless and faceless application.	Licenses issued **192**	Licenses issued **37092**	Licenses issued **46740**

	System calculated fees			
Factory License	• MCD provides License to eligible person/ organizations to establish & run factory, workshop or trades U/s 416 of the MCD Act, 1957. • This application allows Citizen Instant issuance of Provisional License on paying the system calculated fees online. • Online workflow based system for processing of application It is paperless and faceless application	Licenses issued **149**	Licenses issued **12230**	Licenses issued **12435**
Hawking Permits (Renewal)	• A hawker is a person who sells things that can be easily moved from place to place. This application deals with renewal of existing Hawking permits which involves the renewal of the existing Permit on or before or after the expiry date with one month grace period without late fee penalty.	Licenses issued **0**	Licenses issued **0**	Licenses issued **31**
Tehbazari Permits (Renewal)	• Tehbazari, a combination of two words i.e., "Teh" + "Bazari", means to utilize surface for the purpose to sell anything. This application deals with renewal of existing Tehbazari permits	Licenses issued **0**	Licenses issued **0**	Licenses issued **4451**
Hackney license	• Types of hackney carriages are referred: • Cycle Rickshaw, Rickshaw Puller, Cycle Trolley Through this application, Citizens can apply for registration as well as renewal of the different Hackney Carriages as mentioned above.	Licenses issued **0**	Licenses issued **0**	Licenses issued **52483**
Pet Dog Registration	• U/s 399 DMC Act of 1957 each Dog owner need to register Pet Dog with the MCD. • Citizen can apply for issuance of Pet Dog	Licenses issued **0**	Licenses issued **489**	Licenses issued **904**

	Registration Certificate and renewal of the Certificate through this application			
PRICE	Project Information and Cost estimation Application developed by NIC has been replicated in MCD successfully. Its first Phase has been implemented. Integration with GePNIC is in progress.	Estimates sanctioned **0**	Estimates sanctioned **2402**	Estimates sanctioned **813**
Mobile Attendance APP	During Covid-19 when biometric based attendance was stopped, a GPS enabled Mobile App for marking attendance by the MCD staff was developed and launched. More than 80K officials of MCDs registered devices and started marking attendance. Dash Board for the same is also developed and made available			officials registered **126083** Attendance Marked **38555**

Implementation

Following is the plan and achievement in respect of 30 applications

Phase 1 (completed)

- MCD unified Web Portal and
- My Services through the portal
- Property Registration, Tax Assessment, Calculation and Payment
- Registration of Birth & Death
- Mobile App. for GPS enabled Attendance with (Lat./Long and photo)
- e-Mutation Certificate Download

Phase 2 (completed)

- Health Trade License
- Factory License Application
- General Trade License
- Veterinary Trade License
- Tehbazari permits
- Hawking licenses
- Hackney Application
- PRICE for Engineering Department Estimate Preparation
- Town Planning approval system
- Community Hall Booking system and MIS

Phase 3 (completed)

- Booking-Un Booking of un-authorized construction
- eSBM
- User charges
- eOffice

- SPARROW
- NextGen eHospital
- LIMBS

Phase 4 (progressing) –

- OBPS (Online Building Plan approval) integration
- Land Estate Uploading System
- Advertisement and Parking MLF Payment System
- Asset and vehicle management system
- Municipal Secretariat Information System
- MCD Employees work Bench (integration with attendance App)
- Nursing admission
- Finance Management System
- Durg inventory (already covered in NextGen eHospital)

As on date, it can be stated that the Phase 1, 2 and 3 of the Project have been completed and the development of Phase 4 is progressing

Improvements / Enhancements

Multiple applications have been **launched in the MC suite of Application during last one year**. A table of those applications which have been launched are given below:

The applications developed during last one year are listed below:

- Notice issuance U/s 123D of Property Tax
- eMutation for MCD property records
- GAS- General Amnesty scheme
- Sahbhagita Scheme for RWA and GHS residents for property tax incentives
- eSBM
- Parking Management System
- User Charges Collection
- Booking-Un Booking of un-authorized construction

The applications to be launched within the next year are listed below:

- HealthHTL-2.0 (MCD Level)
- OBPS (Online Building Plan approval) integration
- PRICE & GePNIC Integration
- PRICE – Post Tendering Modules
- eDharti (Geo and MIS Portal) for MCD proprties
- Advertisement Management System
- Advertisement and Parking MLF Payment System

Merging of rules and processes for unified MCD

ENABLER

Processes Re-engineered

1. Single Sign On (SSO) and OTP based authentication introduced for each and every citizen to access services.

2. **GPR in PTR:** Earlier, the Citizen was dependent on the MCD official for calculation & verification of TAX, Also he was not able to pay tax for previous years. But now GPR has done and Taxpayer can pay through the newly developed system. Furthermore,since the system is online, taxpayer can pay the Tax from any internet point may take help of CSCs and does not need to visit the MCD premises at any step of the Process.
3. **GPR in Licensing Applications:** MCD provides multiple licenses such as GTL, VTL, HTL, FL etc. to the Citizens of Delhi. All these processes were manual. Hence, there was a lot of drudgery in the system leading to inordinate delays and non-standardized processes being followed across services.

   After digitalizing of these applications, the system has become standardized, workflow has been defined and all the actors in these applications are online thereby leading to a transparent and responsible system.
4. **GPR in RBD:** Registration of Birth and Death is a complex process including different stakeholders such as Citizens, Hospitals, MCD officials etc.

In the earlier system, logins of all stakeholders were not present. For e.g., Hospital officials used to do their entire process manually by filling up physical forms and submitting it to respective MCD officials.The current RBD application is a FACELESS, comprehensive workflow based application which plugs all the loopholes and creates a robust, transparent, accountable and auditable mechanism for generation of Birth and Death Certificates and keeping the records synching with legacy data too.

No data exchange / expose through e-mails or in excel sheets, only downloadable by authorized users in desired format of XML/Txt

Technologies

1. **Data Analytics:** A comprehensive Dashboard has been created for the MC Suite of Applications which can be accessed by SSO login through Parichay (NIC Platform).

   KPIs are looked in through the dashboard for better monitoring and planning. They can also check the number and duration of pending applications and hence the delivery is being improved.
2. **Knowledge Management System(KMS) :** A Document repository has been built by the team which consists of various documents of different applications such as:
   a. Policies
   b. Guidelines
   c. Process Flow
   d. Functional Requirement Specification
   e. Online Form Approval
   f. SOP
   g. FAQs
   h. User Manual
   i. Test Cases
   j. User Acceptance Testing
   k. Third Party Security Audit Report

l. Third party Security Audit Certificate
m. NIC Security Audit Certificate
n. Performance Testing Report
o. Web-Services

This Document repository bring standardization to the services and provides a better transparency and accountability mechanism to the development and implementation of the applications.

3. **Social Media Presence: Robust social media presence of MCD is present, and Social media team is also active on Various platforms such as Twitter, Face book, YouTube etc. This helps the DMCs in the following manner:**
    a. Publicising the policy and any other relevant information such as launch of a particular application/ mobile app etc.
    b. Taking Feedback of Citizens and Improving the applications basis the Feedback given by the Citizens
    c. Addressing the grievance of the Citizens who post their issues online while tagging the social media presence of the DMCs

Enterprise architecture (EA) covers mainly Application Integration Reference Model (AIRM), Security reference Model (SRM) and data reference model (DRM) and Business reference Model (BRM) : The AIRM covers integration with RGI, Banks, NSAP portal for data interoperability. Similarly teh DRM covers all about data storage, security, encryption, integrity etc which is achieved by authorization, controlled access of data, storage of data on cloud and encryption of data at rest (like aadhar No.).

People

1. **Capacity Building:**
    a. A team of 75+ technical persons with expertise in different domains have been created under the able leadership of Senior Management in both the MCD as well as NIC. This team is in charge of development, hosting and maintenance of all the applications in the MC Suite.
    b. A robust helpdesk is established with 15+ personnel which functions from 8am till 8 pm from Monday to Saturday which resolves the various issues and grievances of both the Citizens and MCD officials/ Other Stakeholders.
    c. 500+ capacity building / training / launching etc programs have been conducted for implementation of 20+ applications.
2. **Change Management:**
    a. Multiple demonstration and training sessions have been organized for field officials for different applications.
    b. Different types of supporting documents such as SOPs, User Manuals, Videos etc. have been created which help in operating the applications.

Leadership Support: Both the Senior Management of MCD and NIC have been overwhelming as they have been providing their rich experience for monitoring, progress review, in order to develop

and implement MC suite of IT Applications. Also a domain/technical expertise made available always as and when needed by the project team for doubt clearing.

VALUE INDICATORS

Learning's for sharing

Key Challenges:

1. Disintegrated organizations with different rules and processes
2. Now challenges of merging of rules and processes to synchronize with the existing databases
3. Non standardization of Backend workflow due to different processes
4. Sensitization of user department regarding the various applications Testing, and accessing as per the SOP.
5. High rates of technical manpower attrition

Best Practices:

1. Needed to develop the applications in a modular manner and not as a monolithic so that the system thus created is flexible enough to incorporate the requirements of different organizations
2. Standardization of different processes as prevalent in the different organizations
3. Properly implementation of change management so that the user doesn't face difficulties while using the applications
4. Best practices for safe and efficient services delivery in terms of payments, accessibility and verification of system generated documents have been used thoroughly

Innovative / Disruptive Technologies Used:

1. **RPA (Robotic Process Automation)/ OCR**: RPA is being implemented by doing OCR scanning of the uploaded documents by Citizens to pick up relevant data e.g. aadhar No., Name etc from the document and get it cross-checked whatever is submitted in the application form by the citizen.
2. **Chatbot/ AI**: Chatbot is being implemented along with AI to train the bot to automatically reply relevant responses to some basic questions put up by the Citizens.
3. **Vani chatbot** is also under process of implementation.

Digital Empowerment

Digital Empowerment is done through the following steps:

1. **Single Sign on /Registration for any service from any internet point:** Citizen can register for any application from any internet point, thereby eliminating the need to physically visit the MCD premises and digitally empowering Citizens.
2. **Transparency and accountability:** Complete **transparency and accountability** is maintained since:
    - All the applications are end to end digitalized and track-able from any level
    - Complete track ability is there of the application, i.e., Citizen knows where his/her application is present at any point in time,
    - Citizen can download Certificates/Licenses/ documents anytime from anywhere and "n" number of times.

- Ease for citizen in renewal of licenses/certificates etc

3. **Financial Inclusion:** Complete financial inclusion of all the sections of society is present as anyone can do the payment for any of the applications through a variety of online payment methods – Net Banking, Credit/Debit Card, UPI etc.

Information Dissemination: Since all the information is online, the same is made available to all the Stakeholders of the system including Citizens, MCD officials etc.

Green e-Governance

Various initiatives to promote Green e-Governance have been taken. Some of them are listed below:

1. **Paperless System:** No paper based applications and documents submission.
2. **Minimized Physical Visit:** Since Citizens can apply online for and get the certificates/ licenses/ pay taxes etc. online from any internet point, there is no need to physical visit MCD premises thereby reducing the Carbon emission from vehicles required for travel
3. **Digitalization of Backend workflow** thereby eliminating the physical file movement practice in the Department
4. **Covid-19:**
    a. Application of Social Distancing thus Saving Lives and slowing in spread of Covid-19

In the testing times of Covid-19, the applications developed and launched have helped Citizens as they can apply and get the services of MCD without having a physical contact with

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Shri Gyanesh Bharti, IAS, *Commissioner, Municipal Corporation of Delhi, New Delhi, commissioner@mcd.nic.in*

Mr. A A Tazir, Additional *Commissioner, Municipal Corporation of Delhi, New Delhi, aa.tazir@nic.in*

Ms. Nidhi Malik, IAS, *Director IT, Municipal Corporation of Delhi, New Delhi, director-it@mcd.nic.in*

Shri Susheel Kumar, *Scientist-G, National Informatics Centre, New Delhi, susheel.kumar@nic.in*

Ms. Rachna Srivastava, *Scientist-G, National Informatics Centre, New Delhi, rachna_sri@ nic.in*

Shri Vinay Thakur, *MD, National Informatics Centre Services Inc. (NICSI), New Delhi mdnicsi@ nic.in*

NIC API Platform

National Informatics Centre, New Delhi

Pawan Joshi and G. Mayil Muthu Kumaran

PROJECT OVERVIEW

Objectives

NIC API Platform has following objectives:

1. To set-up an ecosystem for publishing of APIs by government organizations for e-Governance application andsystems
2. To enable quick and transparent software integration with other e-governance applications and systems
3. To enable 'API first' approach, enabling an ecosystem of micro-services and related cost savings
4. To enable and promote safe and reliable sharing of information and data across e-Governance applications andsystems
5. To promote and expediate innovation through the availability of data from e-Governance, application, and systems tothe industry and public
6. To provide guidance to govt. organizations in developing and publishing APIs

Scope – Functional / Geographical

1. The platform securely integrates APIs of various domains on a common platform.
2. The platform is also integrated with API Setu platform and all the APIs are discoverable and searchable from bothplatforms.
3. The portal serves as a one stop store for developers to discover and test Government APIs on a secure platform.The developers can build robust applications faster and easier using the NAPIX platform.
4. There is high level of security authentication mechanism enabled for the integration of APIs on a common platform. The platform collaborated private as well as public APIs.
5. The platform can be accessed geographically.

Key Stakeholders

1. **Publishers** - Government bodies / State Departments
2. **Subscribers** – Government bodies / State Departments/ Public / Institutions

Intended Benefits

1. Seamlessly integrate all e-governance APIs on a common platform, assisting developers to test the APIs andSubscribe for further consumption.
2. One-stop store for developers to discover and test Government APIs
3. Ensure high availability by configuring multiple management servers and Gateway servers

Current Status (As on 08th September 2022)

1. Cumulative API Hits – 1,45,32,24,402
2. API Published – 1,054

3. Total Subscribers – 271
4. Domains onboarded - 35

Hardware/Software

Technology Stack:

1. Gateways are deployed on VMWare and Open stack Kubernetes Platform with distributed high availability and scalablearchitecture
2. Jenkins' Pipeline
3. ELK for Logs Management

Portal designed using React and Django Framework. Charts are designed using chart.js.

Certification (Certifying Agency)

https://napix.gov.in has Application Security clearance from the NIC App Security Audit Division.

Disaster Recovery and Service Continuity

1. Distributed and scalable architecture with high availability is deployed across multiple data centers with centralizedcontrol from Shastri Park Data Center.
2. Shastri Park DC Disaster Recovery (DR) setup is in progress at Bhubaneshwar DC.
3. Plan to have DR setup for each Data Centre.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	Brief service description with benefits	Volume (Nos) of Services year wise
		Till 2020-21
API Published	API Published	1,054
API Hits	API Hits	1,45,32,24,402
Total Subscribers	Total Subscribers	271
Total Domains	Total Domains	35

Implementation

1. Total 1,054 API published, 286 subscribers, 35 domains onboarded, 102+ Cr. API Hits.
2. APIs of Central Ministries, State Government Departments and NIC internal APIs such as Matra, OAD APIsare integrated on NIC API Platform.
3. Addition of Internal / External Gateways depending upon scope of APIs deployed across differentgeographical locations.

Improvements / Enhancements

Enhancements rolled out during the last one year

- Onboarding of new domains
- Integration of APIs from m-Parivahan, Jeevan Pramaan, CGHS, Higher Education, e-Courts, ICJS,TamilNilam (Online Patta Transfer) etc.
- Set-up of ELK Log Management & Analysis

- Gateway deployed on Open stack Kubernetes Platform
- Integration with API Setu Platform
- DR set-up at Shastri-Park DC (In-Progress)

Planned for next year

- Faceless onboarding of publishers
- Automation of Jenkin's Pipeline
- Designing of ELK Dashboard for publishers
- Addition of Internal / External Gateways depending upon scope of APIs deployed across differentgeographical locations.
- Plan to have DR setup for each Data Centre.

ENABLER

Processes Re-engineered

The platform provides seamless integration of APIs and allows subscribers for faceless onboarding. There is an approval process which allows API Owners to approve subscription of the APIs requestedfor consumption by the Consumer. The platform is deployed on VMware with distributed high availability and scalable architecture.

Technologies

1. Jenkin's Pipeline used for automating API movement from Sandbox to production environment
2. ELK set-up done for Log Management and Analysis
3. Gateway deployed on Open stack Kubernetes Platform

People

NIC API Management Central team regularly conducts workshops/ webinars / demos sessions forknowledge dissemination to spread awareness about NIC API Exchange Platform.

For the purpose of capacity building, videos / tutorials are also provided to the users.

VALUE INDICATORS

Learning's for sharing

API Exchange Platform manages the complete lifecycle of API from creation to retirement. The platform helps in integration of e-governance APIs on a common platform and let consumers subscribe to the APIs post discovering and testing the APIs.

Benefits to API Owners/ Publishers

1. **Unified Interface -** A unified interface to test, deploy and manage entire API Lifecycle whilemaintaining security.
2. **Authentication & Authorization** - Ensure security and level of access to available services.
3. **Event notifications** - Notify team members and users about specific events based on API Policies
4. **Mocks & Response Control** - Create and control specific test responses to enable the API development and testing process.
5. **Analytics Monitoring** - Facilitates API Publishers as well as API Consumers to

have drill down analytics in the form of visualizations. API Publishers can view analytics on API Products and APIs events for a specified time range they have published on the platform. API Consumers can view analytics on the applications they have created for consuming the APIs.

6. **Performance Monitoring** - The ability to view analytics, detailed logs and system events to better understand the performance of the APIs**.**
7. **Traffic Control** - Control access to API services by setting limits to efficiently manage load.
8. **Dynamic endpoints** - Act as intermediary endpoints, enhanced through customizable functions toenable new and complex interactions with the APIs
9. **Approval Mechanism** with the API Owners for subscribers sign up and API subscription

Benefits to API Consumers

1. **Discovery** - An easy and customizable place to catalogue APIs that *facilitates the discovery of anAPI.*
2. **Easy Registration and Testing** - Easy registration process for access to APIs & test the desiredAPIs.
3. **Documentation** - *Enables a better understanding* of the available services and *how to use* andextend them further.
4. **API updates readily available** - Immediate access to API updates and versioning becomes moretransparent and easier to consume.

Digital Empowerment

1. Subscribers can Sign-up to the platform, discover and subscribe to the APIs. Any stakeholder canbe the Subscriber to the platform after sign-up to the platform.
2. No third party is involved and there are no demographic or cultural barriers. All kinds ofstakeholders across India can access the platform.

Green e-Governance

1. APIs promotes paper-less technologies for government applications over manual paper process.
2. Discard of test APIs at Sandbox level. Jenkin's Pipeline is used for moving APIs from Sandbox to Production environment. Also, approved APIs are moved to Production.
3. NIC API Platform serves as a common platform to integrate all the APIs on the central platform. It helps in Cost Optimization by saving costs which may have been incurred on separate platforms in terms of time, efforts and manpower deployed.

Shri Pawan Joshi, *DDG, NIC, Scientist G, National Informatics Centre, New Delhi, pawan.joshi@nic.in*
Shri G. Mayil Muthu Kumaran, *DDG, NIC, Scientist G, National Informatics Centre, New Delhi, muthu@nic.in*

GPSC-iASS-Gujarat Public Service Commission - Integrated Application Scrutiny System

Gujarat Public Service Commission and National Informatics Centre Gujarat State Centre

Nalin Upadhyay, Hiren K. Thakar, Girish Kumar K. Wadhwa, Amit Shah and Arpit Parikh

PROJECT OVERVIEW

1. Secured, Safe and Transparent mode of Application Scrutiny saving lot of papers in turn treeshelping e-Green.
2. Prevent loss or damage of the documents in manual transit, increasing efficiency and saving onhuman resource, which is best utilized in other way in the Commission.
3. Individual efficacy reports pertaining to the number of application scrutiny done
4. Application can be done remotely, which was utilized in the best way during the COVID-PANDEMIC lock down.
5. Standardization of Query/Clarification document rules/timeline by different branches 2. Workdistribution policy 3. Pulling of the Applications by the Senior Authority in case absentia of anauthority.
6. Secured and Safe ease of communication via SMS and EMAIL at each and every crucial stage of an application scrutiny.

Hardware/Software

Description along with list of Open Source and Proprietary Technologies

- Web Server (Cloud):
- OS: Windows Server 2016 Standard (64-bit)

- **Database Server (Failover cluster):**
  - OS: Windows Server 2016 Standard (64-bit) DBMS: Microsoft SQL Server 2008 R2
  - Reporting: Microsoft SQL Server Reporting Service 2012
- **Web Application Development Environment:**
  - Microsoft ASP.NET Framework 4.5
- **Document Storage Environment:**
  - OS: CentOS 7.9
  - NoSQL: CouchDB 3.1
- **Certification (Certifying Agency)**
  - Consent Management, Data Privacy and Cyber Security Aspects
  - Cyber Security Aspects:

a. Security audit by Xiarch Solutions Pvt. Ltd. every year (Cert-In empaneled agencyhired by Govt. of Gujarat)

b. Hosted at Gujarat State Data Center (GSDC) cloud infrastructure in secure environment.

c. SDC team is doing vulnerability assessment and penetration testing every 6 months.

d. Yes, GSDC is ISO 27001 and 20000 Certified

Disaster Recovery and Service Continuity

IN HOUSE HANDLED BY "GUJARAT STATE DATA CENTRE" (GSDC) WHERE THE SERVER ISHOSTED.

- Hosted at Gujarat State Data Center (GSDC) cloud infrastructure in secure environment.
- SDC team is doing vulnerability assessment and penetration testing every 6 month.
- Yes, GSDC is ISO 27001 and 20000 Certified.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	Brief service description with benefits	Volume (Nos) of Services year wise				
						Till 2020-21
GPSC-IASS	NUMBER OF ADVERTISEMENTS	8	68	48	117	94
GPSC-IASS	NUMBER OF APPLICANTS	37	16361	13828	16656	11604
GPSC-IASS	NUMBER OF DOCUMENTS UPLOADED	153	125271	96139	115662	82940
GPSC-IASS	NUMBER OF QUERIES ADDRESSED	0	702	727	901	1952
GPSC-IASS-GSDC- CDAC	NUMBER OF QUERY/CLARIFICATION SMS & EMAILS ALERT	0	1688	6356		175

Implementation

- Implementation Coverage achieved in comparison to the plan / target.
- 100% Implementation Since Inception, As Manual ScrutinyProcess Is Stopped.

Improvements / Enhancements

- Regular Improvement/Enhancement As Done Immediately By Nic, Gandhinagar In Order To Deliver Ease Of Working And Additional Reports To The Recruitment Branches.
- Moreover Validations Are Placed To Eliminate Unforced Errors By The Stake Holders With Their Gradual Experience.

ENABLER

Processes Re-engineered

Information / Data Flow before Governance Process Re-Engineering

1. After the declaration of the Preliminary Result i.e. List of Eligible

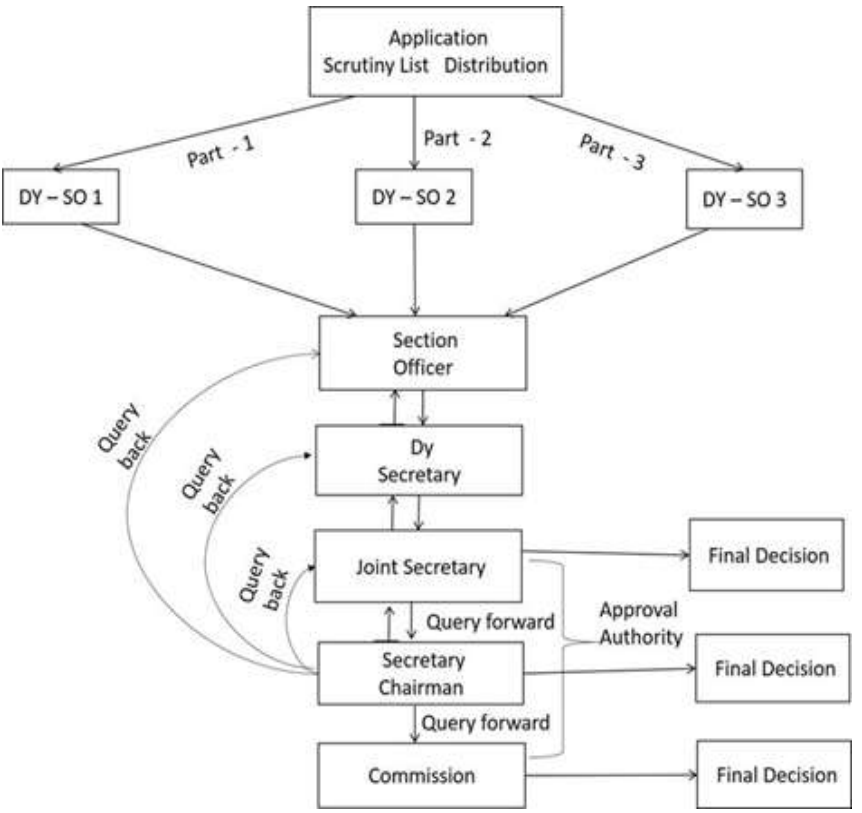
Candidates RecruitmentBranch had to inform Candidates by Post

2. Candidates in turn had to send their Documents in-person or through the post to theGPSC Office.
3. At GPSC Office Registry Branch sorted the applications respective branch-wise anddelivered them.
4. Respective recruitment branch sorted these applications according to roll number wiseand made bunches of 25 each.
5. Maintaining these sequential numbers, these files of 25 applications each were scrutinized by the Deputy Section Officer, Section Officer, Deputy Secretary, and JointSecretary.
6. In case of query these bunch of applications were moved down the hierarchy and thenagain in the upward direction on compliance with the query.
7. Postal (Manual) correspondence had to be initiated with the candidate to get thecompliance of the query.
8. List of Eligible and Ineligible Candidates had to be prepared manually by checking eachand every application.
9. A YES/NO format is prepared which is then sent to the confidential branch for the furtherrecruitment process.
10. The process mentioned above required the physical presence of the assessor/official inthe office to do the necessary work.

Information / Data Flow after Governance Process Re-Engineering

1. After the declaration of the Preliminary Result i.e. List of Eligible Candidates the list of documents to be uploaded is published on the website any time 24 X 7 from any whereduring the specific periond.
2. Candidates in turn have to upload the Documents on the web application https://gpsc- iass.gujarat.gov.in and get the receipt of confirmation that the documents are uploaded.
3. After the last date of document uploading, the recruitment branch can start the application scrutiny, during this COVID PANDEMIC, application scrutiny was done fromhome and in a few advertisements, parallel scrutiny was done i.e. the candidates uploaded the documents and that application which were successfully submitted theirapplication scrutiny was done while other candidates uploaded their documents.
4. In case of a query, the specific assessor sends a QUERY BACK remark and the candidate gets a window open for 7 days to upload the document, along with it an emailand SMS are sent to the candidate on his/her registered email-id and mobile number.
5. On compliance with the query by the candidate an email is triggered into the email-id ofthe recruitment branch informing the same and hence further scrutiny can be done without delay.
6. All the reports are generated by the system and can be downloaded in excel format andsent to the confidential branch.
7. The overall configuration and application scrutiny can be done remotely that was doneduring COVID PANDEMIC
8. Efficiency, Transparency, Dependency on Authority, Time and Place Is Removed Can Be Remotely Handled And Can Do Work Remotely.

FLOW CHART DIAGRAM



Technologies

Communication through sms and email alerts were configuredso that recruitment branches can inform the candidates about the queries to the candidates, upload documents on time. in turn when candidates addressed the query an email is triggerred to inform the section officer about the same.

Interoperability and integration aspects (integrated system, use of APIs,micro services etc.)

- digi-locker integration
- sso (single-sign-on) integration
- nic sms gateway integration
- gsdc email integration
- c-dac sms gateway integration

People

In house staff of edpcell were used to configure the application scrutiny process and the application scrutiny was done by the deputy section officer, section officer, deputy secretary and joint secretary as they were given

hands on training as the manual process was stopped. infact, we had trained the access staff removed from manual process for other works.

VALUE INDICATORS

Learning's for sharing

Details of baseline study done

1. The baseline study was done in consultation with the GPSC officials of variouscadres from Deputy Section Officers to the rank of Joint Secretary in order to. Understand the workflow, the bottlenecks wherein; the computerization of theirmanual work can really help them and the civil service aspirants (candidates).
2. Series of meetings understanding the manual workflow chiseled the present-day application iASS (Integrated Application Scrutiny).
3. Wherein the candidate had to send the physical documents through post or courier and which used to be processed (sorted) manually by the Registry branch and were given to the respective recruitment branch.
4. These Recruitment branches then used to sort it advertisement-wise and make bundles of 25 applications each arranging them in the ascending form of their allotted roll numbers in the Preliminary Test.
5. Thereafter, the actual scrutiny used to take place. Resolving the query during the application scrutiny or getting some clarification from the candidates.
6. The feedback mechanism in case of any doubts or queries was understood in relevance to the candidate's angle.
7. The overall sanctity of the application scrutiny process from both the candidate's and the GPSC aspect was understood and the thresholds were decided in order to make the application scrutiny system a unique justifying all the terms of the GPSC and transparency.

Problems identified

1. Receiving and in-warding all the physical documents manually and sorting themRecruitment Branch wise and advertisement wise. \
2. Loss or missing or damage to the documents during transit.
3. Documents or Applications received by the GPSC after the due date or time.
4. Candidate's representation that they had timely applied but non-receipt of documents due to postal delays etc.
5. Mandays (Human Resource) incurred in sorting the applications and thereby distributing the same to Recruitment Branches and these Recruitment Branchesused to sort it again in the ascending order of their roll numbers assigned in the Preliminary Test and making bunches/bundles of 25 applications each.

Roll out/implementation model

1. On the declaration of the Preliminary Result i.e. List of Eligible Candidates for Application scrutiny the document upload starting date and document upload ending date are clearly mentioned with the link of the web application.
2. The roll numbers of the eligible candidates for application scrutiny are uploaded andthe dates are configured accordingly.
3. Thereafter, the respective recruitment branch gives a list of documents that

are to beuploaded. The above processes are configured and a printout of the same is given to the respective branch to check and verify the dates and documents are configuredproperly.

4. Once, the branch checks and verifies all the details pertaining to document uploading, the advertisement is published.
5. After the advertisement is published SMS are sent to the candidates to upload thedocuments.
6. Even intermittent SMS can be sent to the candidates who have not uploaded thedocuments.
7. From the next day after the document upload date is over, application scrutiny canbe done by the respective branch. Once the DYSO finishes one application scrutiny,the application moves ahead to the account of the Section Officer, then to the Deputy Secretary and lastly to the Secretary.

Digital Empowerment

1. No financial burden, NIC Gandhinagar being a Central Government agency developed the project asan extension to our existing project of GPSC-OJAS (Gujarat Public Service Commission-Online JobApplication System).
2. Nor there was expenditure for the infrastructure or equipment.
3. From, the candidates (client/customers) point of view, they had easy access to the web application andcould upload their digital certificates/documents from across the world and from their own digital equipment (mobile/computers/ tablets etc.) without any limitation of accessibility across the world and any time (24 X 7)

Usage of Digilocker also enhanced the usage from the candidates.

Green e-Governance

1. The project was implemented with the existing infrastructure available in the office, not a singleelectronic gadget was purchased for the project.
    a. Server and Data storage was provided by Gujarat State Data Centre
    b. At GPSC office not a single computer was purchased, the project was implemented using theexisting computers.

Hence, no such new purchase that avoided e-waste. On, the contrary, huge amount paper documents sent by the candidates for application scrutiny has been totally eliminated and stopped which, has prevented paper usage and saving the trees.

Shri Nalin Upadhyay, Retd. IAS, *Chairman, Gujarat Public Service Commission, chairman-gpsc@gujarat.gov.in*

Shri Hiren K. Thakar, *Joint Secretary, Gujarat Public Service Commission, js-2-gpsc@gujarat.gov.in*

Shri Girishkumar K. Wadhwa, *IT-Manager, Gujarat Public Service Commission, itmgr-gpsc-ahd@gujarat.gov.in*

Shri Amit Shah, *Senior Technical Director, National Informatics Centre Gujarat State Centre, amit.shah@nic.in*

Shri Arpit Parikh, *System Analyst, National Informatics Centre Gujarat State Centre, arpit.parikh @nic.in*

M.P Farm Gate App

Madhya Pradesh State Agricultural Marketing Board & National Informatics Centre Madhya Pradesh State Centre

G. V. Rashmi and Musharraf Sultan

PROJECT OVERVIEW

Scope Geographical

- 259 APMCs in Madhya Pradesh.
- 7 Divisions in Madhya Pradesh.
- Mainboard, HQ at Bhopal.

Stake holders

- Farmers
- Licensed Traders
- Mandi officials
- Licensed Hammal
- Licensed Tulawati

Objective

The objective of the App is to facilitate the farmer with better option to sell the Agricultural produce at competitive market rates and ensure the farmer payment. Farmer can list crop on App (a kind of Auction). In past lots of cases reported for Mandi Cess evasion and non- payment to Farmer. Through this App Mandi Cess and Farmer, payment is ensured.

Background

During Covid Period all, the APMCs were closed then the prices of Atta and other commodities hiked in M.P due to shortage of commodities in market then Sauda Patrak (Under APMC Act) facility, which is for outside the Premises of APMC, started with help of APMC and District Administration. Later in Second wave of Covid, we have launched the Farmer Gate App (Sauda Patrak App) i.e from 23-4-2021

In this App the licensed Trader can create Sauda Patrak (Agreement among Farmer, Trader and APMC). Farmer consent is taken through OTP. When the Trader enter OTP given by Farmer then Sauda Patrak generated and then Taul (weigment) is done. Farmer can reject Sauda before Taul(weighment) .Taul is done by Licensee Tulaiyya and after Taul , Trader make payment to farmer by different modes of payment .As soon as Trader make payment, an OTP is sent to Farmer . When farmer receive the payment, then then Farmer passes OTP to trader. In this way, Bhutan Patrak (Payment sheet) is generated.

Initially the app was Trader based only, in which the trade was based on direct contact. Now, in the Re designed App farmer Registration also included which facilitates the farmer to list the crop on App. All the respective Traders can view the Listing and offer the prices to Farmer. If the farmer is ready then the trade happens. So it also provides a kind of Auction.

New Features

- Framer can Register through OTP authentication
- Farmer can sell the crop
  - By Listing their crop on App
  - Direct contact with a particular Trader
- Farmers can List their crop on App by entering Crop details ,Weight(Qtl) and Rate

- Traders can see the Listed crop of their APMCs and offer Price to Farmers
- The farmer may or may not accept the offer
- If Farmer accept offer of the trader then trader has to generate it within 48 hours
- Variety/Grade and Organic /Inorganic may be changed
- The Trader processes the Sauda Patrak and alert goes to the farmer for acceptance
- If farmer accepts the Sauda Patrak then alert/otp goes to Trader app/mobile and Sauda Patrak generated
- After generating Sauda Patrak ,Trader has to enter for bhughtan Patrak generation within 24 hours
- After payment an alert reaches on App having payment detail
- If payment credited in Farmer Bank account then Farmer has to verify by clicking option to complete Bhugtan Patrak
- After verification of Bhugtan Patrak it will be available at Mandi secretary login for verification
- After verification of Mandi Secretary, Mandi Cess will be recovered from Trader and it will be integrated with Anugya Process (NOC)

Business Rules:

- There are several time lines a per the APMC Acts accordingly the App works
- Sauda Patrak may be cancelled before Taul if the Farmer is not satisfied
- If Payment of Cess is delayed then late fee provision is there

Benefits to Farmers

- Small Farmers or others not willing to take their produce to Mandi premises, have an option of selling legally and with the protection of Mandi laws, from their house / farm based storage.
- App provides protection under provisions of APMC Act and Mandi can provide arbitration in case of dispute.
- Farmer does not have to bear the uncertainty of no sale or unable to get proper price in Mandi and either bringing back the produce or guarding it overnight.
- The Farmer has the convenience and upper hand to decide the place, time and price at which he wants to sell.
- Handling cost to bring crop to APMC is reduced and time is saved
- App helps to provide safe and protected option to farmers who are unable to come to Mandi.

Benefits to Traders

- App allows traders to buy anywhere (As envisaged in the farm laws)
- Trader has enhanced options to buy as small farmers enter the trade
- Trader got Offers from Multiple farmers (Auction like)
- Hassle free confirmations from Farmer (App option or OTP)

Benefits to Government

- It frees traders from the interference of Mandi staff.
- It captures the transactions previously unreported and increases Mandi

revenue.

- It captures the correct Agri Marketing status
- Increase in Mandi Cess

Hardware/Software

Hosting at NIC MEGHRAJ Cloud

- 1 VM(16vCPU-64 GB RAM) for DB
- 3 VMs(8vCPU) for Web Server ,NLB
- MS SQL Server 2019
- ASP.NET 4.0
- JavaScript
- JQuery
- CSS
- Windows OS
- HTML
- Jquery
- RESTful Web Services
- Android Studio
- Kotlin
- SQL lite
- APIs for M.P Farm Gate App
- SMS API Integration

App is hosted at Google Play store

Certification (Certifying Agency)

Madhya Pradesh Agency For Promotion of Information Technology (MAP_IT) Department of Science & Technology, Government Of Madhya Pradesh

SSL Certificate from Go daddy

We have done Application security Audit in 2019. We have again applied and it is in process (White box testing in process).

Disaster Recovery and Service Continuity

NIC DR Site at Hyderabad. We are in the process of Business continuity plan. For this we are doing load Testing and will soon deploy it on business continuity plan.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	**Brief service description with benefits**		**Volume (Nos) of Services year wise**
			Till 2020-21
Total Nos Sauda Patrak (Agreement)	Sauda Patrak is generated by Licensed Trader	**8,50,233**	22,245

Total Weight **(Ton) of** Sauda Patrak(Agreement)	Total Quantity Traded **(Ton)**	**35,38,605.97**	1728
Total Nos of Bhugtan Patrak (Payment sheet)	Total Payments Sheets Generated	**7,58,195**	2558 (Unique: 1482)
Payment and Mandi Cess	Trade Value **(Cr)** Mandi Cess **(Cr)**	**10,481.20** **157.19**	551

Implementation

M.P State Agricultural Marketing Board

Comparision Chart Division wise

Crop-All **No of Sauda patrak and Arrival** **Arrival-(Ton)**

S.No	Division	Arrival,Date - 01-04-2021 to 30-09-2021		Arrival, Date - 01-04-2022 to 30-09-2022		No of Sauda Percentage(%)	Arrival Percentage (%)
		No of Sauda	Arrival	No of Sauda	Arrival		
1	2	3	4	5	6	7	8
1	**Bhopal**	25055	114571.61	44895	287713.47	79.19	151.12
2	**Gwalior**	20309	80672.24	31204	154071.58	53.65	90.98
3	**Indore**	84428	320149.58	105828	491757.6	25.35	53.60
4	**Jabalpur**	35490	175487.23	59804	424660.72	68.51	141.99
5	**Rewa**	18082	74239.55	27802	138330.33	53.76	86.33
6	**Sagar**	23178	101227.9	54107	324913.38	133.44	220.97
7	**Ujjain**	32612	109469.12	37077	189294.29	13.69	72.92
	Total	239154	975817.23	360717	2010741.37	50.83	106.06

Geographical Area

- Total APMCs-259
- Implemented in all APMCs in Madhya Pradesh

Functionality

Initially it was Trader based only when it started in Corona second wave. Now it is both Farmer and Trader based

Delivery Channels

- Through App
- The other option is the farmer arrive at APMC and sell the crop.

Stakeholders

- Farmers
- Licensed Traders
- Mandi officials
- Licensed Hammal
- Licensed Tulawati

Improvements / Enhancements

- Redesigned the App
- Farmer Registration included

- Farmer Crop Listing
- Farmer Consent Option For Agreement and Payment
- A Kind of auction type platform

ENABLER

Processes Re-engineered

In the Manual process, there was a provision Sauda Patrak can be made in the presence of Mandi official outside the promises of APMC.

Now Trader can generate Sauda Patrak with consent of Farmer through OTP (Sauda Patrak and Payment) and Secretary APMC approves it online.

In manual System only mandi official can issue Anugya(NOC) but now Trader can do it with the approval of secretary APMC.

For the transformation of the Process executive orders issued and amendment done in the Rules.

Technologies

Consent of Farmer through OTP or Option in App

- Sauda Patrak is an agreement among Farmer, Trader and APMC.
- Sauda Patrak is generated by trader and Farmer consent is taken through OTP or an Option in App at farmer login
- Next when the Sauda is done then Taul is done through Licensed Tulaiyya and then payment is done to farmer by trader ,Again whether the payment received by farmer or not ,the Farmer consent is taken through OTP or an Option in App at farmer login
- when the consent of payment is received from farmer then this Sauda Patrak is visible to Secretary APMCs and after approval of Secretary Anugya can be issued by Trader.

Through whatsApp Group, Facebook, Twitter and dedicated email Account we were able to resolve the difficulties and valuable suggestions from the stakeholders. You tube channels used for training purposes.

People

Capacity building

1. Various workshop held in Bhopal where all 259 APMCs officials remained present
2. Online training through Webex
3. Technical support given through Telephone/WhatsApp group/Email etc. day to day.
4. Half-yearly/Yearly training held
5. User Manual – Booklet circulation
6. Letter/Circular issued time to time
7. Training of Trainers (ToT) Model adopted
8. Video Conferencing done through NIC for time to time with all APMCs and other stakeholders

System is supported by all the top management officers in the department, Quick decision making done

VALUE INDICATORS

Learning's for sharing

- To implement new system, the processes needs to be transformed
- All the stake holders need to be taken in confidence
- App should be compatible with devices and should operate on lower versions
- Proper Training of the Solution to the End Users
- Training of Trainers (ToT) done
- Continuous feedback from all the End Users
- Interaction with Legal Team to comply the ACT and RULES

Digital Empowerment

- Unicode Compliant
- Use of local language i.e Hindi
- every Region has certain crops ,accordingly region wise crops priorities has been set for easy to use
- Option Sharing of Bhughtan Patrak(Payment Sheet) to Gmail and Whats App in the M.P Farm Gate App

Green e-Governance

Green e-Governance is about application of Green computing practices to the domain of e-Governance. It involves adoption of environmentally friendly practices with respect to creation, use, and disposal of ICT facilities.

There are several dimensions to green e-Governance and prominent among these relate to Power and Paper consumption, and disposal of e-Waste

- System is End to End online
- Paperless

No need to maintain manual records and hence administrative cost reduces

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Ms. G. V. Rashmi, IAS, *Commissioner cum Managing Director, M.P State Agricultural Marketing Board, Madhya Pradesh, mdmandiboard@gmail.com*

Mr. Musharraf Sultan, *Technical Director, National Informatics Centre Madhya Pradesh State Centre, sultan.m@nic.in*

Online Release Orders and Billing System

Information Public Relations and Languages Department, Govt. of Haryana & National Informatics Centre Haryana State Centre

Amit Agrawal, Varsha Khangwal and Pardeep Kumar Kaushal

PROJECT OVERVIEW

Various Government organizations including departments, Boards & corporations, Agencies, Universities in Haryana submit their requests to the Director General, Information Public Relations and Languages Department, Haryana. The department is nodal agency for publishing all Government Advertisements in News Papers. Generally three types of advertisements are published.

1. Display advertisements
2. Classified advertisements
3. Tender Advertisements.

A consolidated budget for departmental advertisements is made available with DIPRL each year. But the boards and corporations have their own budgets and make payments from their own accounts.

The process of getting advertisements requests from various organizations in the form of indent, creation of media plan, Approval of the media plan and finally generation of Release Order and issuance of release orders was a manual process which had to be done through letters and physical files.

Also, There is a society under Information Public Relations and Languages Department, Haryananamed SAMVAD which processes the bills for display type advertisements of departments and display/tender advertisements for Boards and Corporations.

After publishing of the advertisements, the newspapers used to submit their bills manually. These bills were approved on physical files and had to pass through a long process including approvals at various levels, Audit, Accounts and finally files were sent to treasury department for payment of the bills to Newspapers.

In case of classified bills, the treasuries department makes payments directly to the newspapers, whilein case of Display and Tender advertisements, the treasury makes payments to SAMVAD society of theInformation Public Relations and Languages Department, Haryana. In case of boards and Corporations,the classified bills are paid by the respective Boards and corporations to the newspapers, while the display and tender advertisement bills are received through SAMVAD and paid to SAMVAD. TheSAMVAD society makes further payments to Newspapers after deducting their commission/charges, GST and TDS etc.

This whole manual process which caused delays and inefficiency in the system of release ordersissuance and delays in payment of bills to the newspapers which sometimes ran into months of delay.

Objective:

1. To fully computerize complete process of release orders, billing and payment etc. as explained above and to make whole process contact less and transparent through the use of ICT and create a comprehensive ERP for the department.

2. Process re-engineering to redesign the structure of Government advertisements to save the costs for Government.
3. Fast track the bill payments through process re-engineering, Integration of various ICT components like payment gateways, Online Government Treasuries etc.
4. Creating a comprehensive dashboard for the administration to have a visual representation ofcurrent and historical transactions through the system.

Functional Scope:

a. Role based access for various stakeholders to relevant components of complete ERPsystem.
b. Receiving advertisement requests from various Government organizations online.
c. Online Generation of media plan based on the requests received.
d. Online workflow for approval of the media plan and generation of release order for NewsPapers.
e. Sending online release orders to the selected Newspapers through online system withoutany manual intervention.
f. SMS based intimation to newspapers and departments.
g. Submission of bills online by the Newspapers.
h. Workflow based approvals, passing and auditing of Bills.
i. Online tracking of release orders and bills.
j. Online payments through treasury/SAMVAD to the newspapers.
k. Creation of various reports through the system which were generally maintainedmanually or in excel formats.

Geographical Scope:

1. National Level.

Key Stake Holders:

1. Information Public Relations and Languages Department, Haryana.
2. SAMVAD Society.
3. All Haryana Government Organizations in the State including boards and corporations andUniversities etc.
4. All National level newspapers across the country and newspapers in the State includinglocal/Regional newspapers.
5. Treasuries Department, Haryana.
6. AXIS Bank (For payment gateways).

Intended benefits:

1. Significant reduction in time taken for approvals of Release Orders and Bills.
2. Payment of bills submitted by Newspapers within 28 days of submission of bills.
3. Hon'ble Chief Minister and senior officers are able to see and analyse the release orders andpayments on a comprehensive e-dashboard.

4. The Government organizations are able to submit the indents along with copies of requestletters and advertisement content online into the system.
5. Provision to send requests for Classified, Display and Tender (Indicative) advertisements.
6. The DIPR office is able to see and download all requests indents received through the system.
7. Online selection of newspapers at the time of media plan generation.
8. Role based access to various officials of the DIPRL and SAMVAD for approval of media planand bills.
9. Provision to send bills to Boards and Corporations for direct payment to Newspaper (In caseof classified Advt. of Boards and corporations)
10. Integration with treasuries through E-Billing system developed by NIC.
11. Payment gateway integration for online payment of bills to newspapers.
12. Various informative reports and formats at different stages of RO and Bill processing.
13. Option to block advertisements from any Board/Corporation in case bill pendency exceedspermitted limits.

Current Status:

The ERP system is fully functional since 15/12/2020 and is being satisfactorily used by all stakeholders. Change requests are entertained based on requests/suggestions from the DIPRL and Newspaper groups.

Hardware/Software

Hardware:

Hyper Converged Infrastructure (HCI) Based cloud setup at NIC Haryana Data Center.

VM Details: 2 VMS of 16 Core/ 32 GB RAM for Database Always On cluster2 VMs of 8 Core/ 16 GB RAM for Web Servers Cluster.

Software:

Runtime Environment	: .Net 4.5
Web Server	: IIS 10.0
Database (RDMS)	: Microsoft SQL Server 2019
Reporting Tools	: SSRS
Analytical Dashboard	: Open Source ELK Stack (Elastic Logstash Kibana)

Third Party Tools/Integrations:

- SMS Gateway : NIC SMS Gateway
- Payment Gateway : Axis Bank Payment Gateway

Certification (Certifying Agency)

The Integrated Security Management Office (ISMO) of Haryana Government, which is CERT-Inempaneled organization has done the security audit of Online Release Orders and Billing System.

Disaster Recovery and Service Continuity

Proper planning for Disaster Recovery and Business Continuity Plan (DR and BCP)

has been done by considering various types of downtime situations. Following are the details of steps undertaken to handle various kinds of situations:

1. **At Hosting Infrastructure Level:**
   a. The VMs have been created on the HCI (Hyper Converged Infrastructure) of the Data Center in FTT-1 configuration. Which means, for each VM, an exact copy of the VM is created on a different node and in case the working VM fails, the backup VM takes over the in no time.
   b. The HCI infrastructure also ensures that in case underlying physical server fails, All VMs residing on that particular server/node are automatically migrated to another node.
2. **A Data Base Level:**
   a. MS SQL Server Always -On cluster has been created using two different VMs. Under this mechanism, both VMs contain exact replica of the database which is automatically kept in sync. Both VMs can act in Active-Active and Active-Passive mode. Generally secondary VM is used for read operations and Primary VM is used for write operations.
   b. In case of failure of one VM the secondary VM takes over the whole load.
   c. Under the Always-On cluster, one cluster node is being planned at Haryana State Data Center (HSDC), which is located within same City. This arrangement will ensure BCP i.e. working of full application from HSDC in case of any major downtime at NIC Haryana Data Center.
3. **Backups and DR:**
   a. Considering the RTO and RPO for the application, Different types of SQL server Backups have been scheduled on Backup Appliance of the data center. The types of backups include (Daily Full Backup, Four Hourly Differential Backup and hourly Transaction Log Backup).
   b. Daily Full Backup is scheduled and transferred to Pune Data Centre on daily basis for DR purpose. In case of any major disaster and data loss at the data center, the backups can be retrieved from Pune which is in a different seismic zone.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Service	Brief e-Service description with benefits	**Volume (Nos) of Services year wise**		
		2020-2021 (Since 15/12/2020)	2021-2022	2022-23 (Upto date of nomination)
ERP system	Release Orders Issued and Bills processed through online system	7985	33623	13433
ERP System	Amount of bills processed and paid through online system (Amount In Rs.)	15.6 Crore	74.28 Crore	26.64 Crore

Implementation

Full intended implementation achieved as per plan. **(100%)**

Improvements / Enhancements

Indicate improvements/ enhancements specifically rolled out during the last one year:

1. Certain new reports have been added.
2. A separate payment Gateway system has been adopted for payments of boards and corporations during last one year. This was necessitated as different boards and corporations have different banks while in case of departmental advertisements the payments were to be made from the same bank.

Enhancements planned to be rolled out during next one year

At present, advertisements for print media are handled through this ERP. In the comingyear, electronic media will also be added to the ERP and Electronic media advertisements will also be covered.

ENABLER

Processes Re-engineered

1. As a major re-engineering exercise, the style of advertisements for tenders by various Government organizations was changed keeping in view that all tenders are uploaded through e-Tendering system these days.

   Earlier, each individual organization used to publish their tenders in newspapers, with one separate advertisement per tender. Using this method, the size in Sq. Cm. for each advertisement was very large and cost of such advertisements were also very high.

   As part of the re-engineering exercise, a common advertisement was created for all tender advertisements on a particular day in a tabular form. Brief details about each tender were given in separate rows of the table with a link to the tender uploaded on e-tendering website. This method drastically reduced the amount of space in the newspaper pages allocated for Government tender advertisements saved large amount of Public Money. This method was named as Indicative Advertisements.

   The ERP system automatically combines all requests for selected tender advertisements for the day and creates an indicative advertisement for the Release Order.

2. Reduction in number of levels of file movement for approval of Release Orders and approval of bills.

   A detailed exercise was carried out in studying the processes of Release order approvals and Bills approvals. Some user levels were found be redundant with almost nil value addition during the file movement. These levels were removed or merged with other user levels below the level of Director General and electronic movement of release orders and bills was made simple, fast and efficient.

3. Timelines were fixed for clearance of release orders and Bills as part of

administrative re-engineering as well as implementation through ERP:

- **Timelines for Issuance of Release Orders for all types of Advertisements:**
  - Submission of indent by client organization = T
  - Date of publishing of advertisement in newspapers = P
- **Times Lines for approval and payment of bills for classified and Indicative/ tender advertisements.**

Government Departments:

- Submission of bills to DIPR by newspapers = T
- Audit of the bills = T+1
- Approval of the DG/ACS = T +2
- Uploading of bills to E-billing software = T+3
- Forwarding to treasury for payment = T+4
- Payment of bills to newspapers by Treasury = T+5 onwards.

Boards and Corporations:

- Submission of bills to SAMVAD by newspapers = T
- Checking of Bills = T+1
- Forwarding of bills to Boards and Corporations = T +2
- Processing and payment of bills to newspapers by Boards and Corporations= T+3 onwards.

C. Times Lines for approval and payment of bills for Display Advertisements Departments:

- Submission of bills by newspapers to SAMVAD = T
- Checking of Bills by SAMVAD = T+1
- Forwarding of bills to DIPR office= T +2
- Audit of the bills = T+3
- Approval of the DG/ACS = T +4
- Uploading of bills to E-billing software = T+5
- Forwarding to treasury for payment = T+6
- Payment of bills to SAMVAD by Treasury = T+6 onwards.
- Processing and payment of bills by SAMVAD to Newspapers after receipt ofpayment from treasury = (R+2 onwards) where R is date of receipt of payment from treasury which can take between 3 to 7 days.

Boards and Corporations:

- Submission of bills by newspapers to SAMVAD = T
- Checking and initial processing of Bills by SAMVAD = T+1
- Forwarding of bills Respective organization = T +2
- Payment of bills to Newspapers by respective organization = T+2 onwards

Technologies

1. The SMS gateway integration was done using NIC SMS gateway to immediately inform the Newspapers about Release Orders issued to them. An SMS is sent assoon as an RO is uploaded for any Newspaper.
2. Similarly SMSes are sent on various events like bill submission etc.

3. As part of the ERP, a comprehensive analytical e-dashboard was developed for Honorable Chief Minister, Addl. Chief Secretary of the department and Director General IPRL to view and analyses current position of Release Orders and Payments to the newspapers. This e-Dashboard has been developed using:
    a. PHP Laravel for APIs i.e. for collecting data from backend database of the ERP.
    b. Elastic Stack (ELK) i.e. Elastic and Logstash for data collection Indexing and Kibana for creating the Dashboard.

People

Leadership Support:

The project was driven by the visionary leadership from the highest level. The Principal Secretary to the Chief Minister (PSCM) who was the Principal Secretary of the department also, took personal interest in the development and implementation of the whole system and made sure that the system is developed as per strict guidelines and timelines.

The Director General, IPRL assigned a senior HCS officer to coordinate finalization of workflow, resolve conflicts and to coordinate between all stakeholders i.e. Departmental staff, SAMVAD, Software development teams, Newspapers, Bank and Client departments. The DGIPR also took regular meetings of all stakeholders to review the progress of the system development and implementation.

Capacity Building:

Complete capacity building of the teams of Public relations department, Other Government organizations, Newspapers and SAMVAD teams was done by the teams of NICHaryana.

Capacity building and training was necessary as transition was made from completely manual system to automated system. For one month the system was run in parallel to the manual system, regular hands-on training was done during this period and any issues reported by the participating stakeholders were removed.

AXIS ban teams, provided training on handling of payment gateway based transactions and Integration of payment gateways with the ERP system.

The System was finally shifted to entirely online mode from 15/12/2020.

Change Management:

Change management is a continuing process. This is particularly true in the case of a Government process developed and maintained by the NIC teams. NIC acting as a part and parcel of the State Government has ensured continuity of the service, Making changes to the software as per requests, New Reports and addition of new features.

Two number of software developers have been hired by the DIPRL and put at the disposal of NIC for handling of software issues and development of new modules as part of the larger ERP system.

VALUE INDICATORS

Learning's for sharing

Acceptability of the change and migration from well-established manual processing of files and coming out of the comfort zone of following well set manual practices at lower level was the biggest challenge during development and implementation of the system.

Educating the staff at operational level on advantages of the computerized system along with string decisions at the higher level resulted in successful implementation of the system. After the successful implementation, all stakeholders are very well satisfied and appreciate the advantages and efficiency that has been brought into the processes. The Newspaper houses/print media are the happiest people as there is transparency in the release order issuance and the bills are paid within a months' time which could take many months earlier.

Key Learnings:

The key learnings in execution, planning, maintenance and support phases is that the system design, development and implementation has to follow the Agile methodology in Government setup. This is because of the reasons that all processes, procedures and requirements are generally not clearly told beforehand. The development teams have to keep the scope for change at every step of the development process.

Use of open source ELK stack for development of e-dashboard is a big innovative idea used in the project. The technology allows very dynamic, informative and analytical dashboardin quick time. The technology can process huge data very fast and provide instant results.

Digital Empowerment

There were no such hurdles encountered during design, development and implementationof the system. All stakeholders were taken on board and were well educated beforehand.

Green e-Governance

The project involves end to end online processes starting from the online indent submission to online billing and payments through payment gateways, it has huge savings in terms of paper work which has great impact on saving the environment.

Implementation of the ERP has also reduced the travelling between offices for collection of Release Orders, submission of Bills and collection of payments. All these services beingcontact less are environment friendly and were helpful in continuing the operationsduring the COVID-19 period.

The system is hosted at NIC Haryana cloud based data center and can be accessed through wide variety of devices which helps saving the expenditure of PCs and reduces e-Waste.

The Haryana Government follows the e E-waste (Management) Rules, 2016, for disposal of e-Waste. In addition Haryana Government has a single window service for registration of e-Waste recyclers and has also published a list of e-Waste recyclers registered in Haryana.

Dr. Amit Agrawal, IAS, *Director General, Information Public Relations and Languages Department, Govt. of Haryana, pr@hry.nic.in*

Ms. Varsha Khangwal, HCS, *Additional Director, Information Public Relations and Languages Department, Govt. of Haryana, advt.dipr@hry.gov.in*

Shri Pardeep Kumar Kaushal, *Sr. Technical Director, National Informatics Centre Haryana State Centre, p.kaushal@nic.in*

InvestPunjab Business First

Department of Industries & Commerce, Govt. of Punjab & National Informatics Centre Punjab State Centre

Dalip Kumar, Sibin C. and Navinder Kumar Sharma

PROJECT OVERVIEW

Objective of developing Business First was to bring all the stakeholder departments (involved in Business Approvals) and investors on a single platform. Business First has done that with role based Smart Dashboards. These Smart Dashboards are providing timely and accurate information to all the stakeholders who in turn reduce time in having Regulatory Clearances or Fiscal Incentives. Business First is providing following benefits to its users:

- One-Time Registration
- Dynamic - Common Application Form (D-CAF)
- One-Time Document Submission
- Online Payment Gateway
- Online paperless filing and backend processing
- Online Issuance of QR Code based verifiable approvals
- Time bound Approvals as per RTS Act
- Know Your Approvals
- Provision for Third Party Verifications
- Smart Dashboards for Decision Makers
- Tracking through Data Analytics
- Real time status/alerts through SMS & Email
- Pendency intimation to authorities on 50%, 75% and 90% ageing of the application
- Tracking of MoUs through MoU Tracker
- Business Query Handling
- Grievance Redressal Mechanism
- Intra-department communication mechanism
- Feedback Entry & Publishing Mechanism

The project is working successfully all over the state. To study successful model of InvestPunjab Business First following stateshave visited InvestPunjab Office:

- Andhra Pradesh
- Tamil Nadu
- Odisha
- Haryana
- Maharashtra
- Chandigarh
- Chhattisgarh
- Madhya Pradesh

- Rajasthan
- Bihar

NIC Punjab has helped following in replicating similar portals at their end:

- State of Haryana
- UT of Chandigarh
- UT of Daman & Diu

Business First is holding more than 8,912 projects with proposed investment of 2,74,507 Cr and employment of 9,00,210. Using Business First, member departments have processed more than 1,08,557 approvals.

Business First is beneficial for all domestic and international prospective entrepreneurs who consider Punjab as their preferred investment/business destination. Following departments are on-board

- Industries & Commerce
- Housing & Urban Development
- Local Government
- Punjab Pollution Control Board
- Punjab State Power Corporation Limited
- Power
- Labour
- Health & Family Welfare
- Fire Services
- Chief Electrical Inspectorate
- Excise
- Taxation
- Revenue
- Legal Metrology
- Forests
- Registrar Firms & Societies
- Director of Boilers Punjab
- Airport Authority of India
- National Monuments Authority
- Punjab Small Industries & Export Corporation Ltd.
- Home Affairs
- Punjab Agro Industries Corporation
- Mandi Board
- Improvement Trust
- Mining
- Tourism

Hardware/Software

Business First has got a modular design with single core and all the modules were designed around that single core independently. Each module was designed using Micro-Service Level Architecture where one backend can serve multiplefrontends like

Web App or Mobile App. The portal was developed using following open source technologies:

- Frontend: Angular with Material Design
- Backend: NodeJS with Express
- Database: PostgreSQL 14

Certification (Certifying Agency)

Yes certification from NIC Empaneled Agency i.e. AAA Technologies Limited

Disaster Recovery and Service Continuity

Business First is deployed using Tier-3 Data Centre where DR and Backup is in another country zone. The team hasscheduled Daily and incremental backup.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Service	Brief e-Service description with benefits	Volume (Nos) of Services year wise		
		2020-2021	2021-2022	2022-2023 (Upto date of nomination)
Application for Grant Final FireSafety Certificate	Clearance required from Department of Fire regarding safety of a Building from Fire (After construction completed)	14	13	10
Application for Grant ProvisionalFire Safety Certificate	Clearance required from Department of Fire regarding safety of a Building from Fire (Before construction started)	62	19	38
Boiler Installation / Erection Permissionand Registration	Clearance required from Director of Boiler regarding Boiler Installation/Erection at Factory Premises	94	87	100
Building plan Approvals (Factories)	Clearance required from Factories regarding safety of Building for establishing a Factory (Before construction)	7	2	228
Building Plan Approval - LG	Clearance required from Local Government (within MC Limits) regarding safety of Building Premises	10	9	25
Building Plan Approval – HUD	Clearance required from Housing and Urban Development (outside MC Limits) regarding safety of Building Premises	20	15	24
Certificate of Stability	Clearance required from Factories regarding stability of Building for Factory work	7	87	10
Consent To Establish	Clearance required from Punjab	109	13	347

	Pollution Control Board(PPCB) for establishing a Business Unit (Before Construction)			
Consent to Operate (CTO) - Air	Clearance required from Punjab Pollution Control Board(PPCB) before operation starts at a Business Unit (Before Commissioning)	61	12	500
Consent to Operate (CTO) - Water	Clearance required from Punjab Pollution Control Board(PPCB) before operation starts at a Business Unit (Before Commissioning)	62	12	654
Consent to Operate (CTO) - Hazardous Waste Management	Clearance required from Punjab Pollution Control Board(PPCB) before operation starts at a Business Unit (Before Commissioning)	49	2	66
Certification of Electrical Infrastructure from ElectricalInspectorate	Clearance required from Chief Electrical Inspector Punjab for safety of Electrical Equipment to be used by Business Unit	9	13	7
Forest NOC	Clearance required from Forest Department that Business Unit land not comes under Forest Land	39	52	14
Grant of Permission for Change ofLand Use (LG)	Clearance required from Local Government regarding changeof Land Use	44	23	45
HT Supply for Demand exceeding500 kVA (Regular) PCL - Requisition form	Clearance required from Punjab State Power Corporation Ltd. (PSPCL) regarding Power Supply more than 500 kVA (Regular)	17	33	17
HT Supply for Demand exceeding100 kW/kVA (Regular) AandA	Clearance required from Punjab State Power Corporation Ltd. (PSPCL) regarding Power Supply more than 100kW/kVA (Regular)	18	29	13
LT Supply for Load / Demand up-to 100 kW/kVA (Temporary)	Clearance required from Punjab State Power Corporation Ltd. (PSPCL) regarding Power Supply up-to 100kW/kVA (Temporary)	16	4	7
Boiler Erector/ Repairer-Renewal	Clearance required fromDirector Boiler regarding registration of Boiler Erector/Repairer	8	12	4
Boiler Renewal	Clearance required fromDirector Boiler regarding Renewal of Boiler use	968	1241	594

Application for Right to Business Rules Form-II (Outside Approved Industrial Park)	Clearance required from various Departments for PSIC/HUD/LG CLU, Building Plan, Trade License, Fire	20	20	23
Registration of Establishment employing Contract Labour under provision of The Contracts Labour (Regulation and Abolition) Act 1970	Clearance required from Department of Labour for employing Contract Labour	37	2	49
Grant Of License Under ContractLabour (R and A) Act-1970	Clearance required from Department of Labour for Contractor	1	95	95
Registration of Shops and Commercial Establishments Act-1958	Clearance required from Department of Labour for establishment of a Shop inPunjab	4729	4186	900
Application for Registration of Establishment Employing workersfor Building and Other Construction Work Under BOCWAct-1996	Clearance required from Department of Labour for employing Construction Worker	1	190	221
Registration of Society	Clearance required from Registrar Societies for registration of Society	14176	17110	4653
Registration of Partnership Firm	Clearance required from Registrar for registration ofFirm	3159	3443	2093
Form-CLU/EDC Application for Exemption of CLU/EDC	Fiscal Incentive Approval for exemption of CLU/EDC	32	11	0
Form-ED Application for Exemption from Electricity Duty	Fiscal Incentive Approval for exemption of Electricity Duty	155	82	0
Form-SGST Application for Investment subsidy by way of eimbursement of net SGST/VAT	Fiscal Incentive Approval for reimbursement of net SGST/VAT	70	28	0
Form-SD Application for ClaimingIncentives of Exemption / Reimbursement of Stamp Duty	Fiscal Incentive Approval for reimbursement of Stamp Duty	41	29	0

Implementation

a. Implementation Coverage achieved in comparison to the plan / target	
Application for Grant Final Fire Safety Certificate	76
Application for Grant Provisional Fire Safety Certificate	155
Manufacture Installation / Erection Permission and Registration	321
Building plan Approvals (Factories)	270
Building Plan Approval - LG	61
Building Plan Approval – HUD	78
Certificate of Stability	125
Consent To Establish	528
Consent to Operate (CTO) - Air	599
Consent to Operate (CTO) - Water	755
Consent to Operate (CTO) - Hazardous Waste Management	133
Forest NOC	150
Grant of Permission for Change of Land Use (LG)	136
HT Supply for Demand exceeding 500 kVA (Regular) PCL -Requisition form	89
HT Supply for Demand exceeding 100 kW/kVA (Regular) AandA	93
Boiler Renewal	3663
Consent to Operate (CTO) - Air	3893
Consent to Operate (CTO) - Water	3648
Consent to Operate (CTO) - Hazardous Waste Management	319
Registration of Profession Tax for Organization	5317
Registration of Profession Tax for Individual	4195
Application for Permission of installation of above ground Telegraph Infrastructure (Mobile Tower)	101
Application for Right to Business Rules Form-II (Outside Approved Industrial Park)	177
Form for Land Use Classification Certificate	111
Plot Allotment - PSIEC	136
Registration of rment employing Contract Labour under provision of The Contracts Labour (Regulation and Abolition) Act 1970	130
Grant Of License Under Contract Labour (R and A) Act-1970	238
Registration of Shops and Commercial Establishments Act-1958	10589
Application for Registration of Establishment Employing workers for Building and Other Construction Work Under BOCW Act-1996	448
License for New Dealer	90
Registration of Society	41918
Registration of Partnership Firm	12220
Registration of Brand / Label	212
Import Permit for IMFL	2965
Export Pass for IMFL	46891
Film Shooting Approval	56
Licence for Travel Agency/Ticketing Agent/IELTS/Consultancy	180
Form-CLU/EDC Application for Exemption of CLU/EDC	57
Form-ED Application for Exemption from Electricity Duty	340
Form-SGST Application for Investment subsidy by way of Reimbursement of net SGST/VAT	121
Form-SD Application for Claiming Incentives of Exemption / Reimbursement of Stamp Duty	105

ENABLER

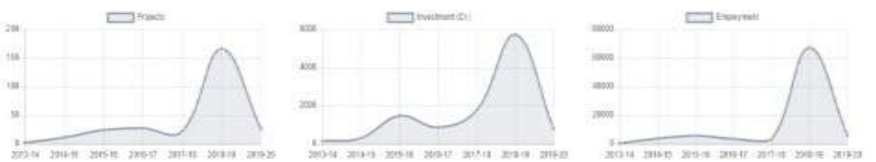
Processes Re-engineered

Process re-engineering involves following innovative ideas for Business First, Punjab.

- Dynamic - Common Application Form (D-CAF)
- Single Time Observation during processing of Application
- Using Data Analytics and dataset of past 3 years, the team has developed new Checklist BasedScrutiny Engine. This has brought standardization in scrutiny of applications all over the state.
- Business Query Handling with Regular follow ups
- Policy Feedback
- Pendency intimation to authorities on 50%, 75% and 90% ageing of the application
- Online Issuance of QR Code based verifiable approvals
- Smart Dashboards for Decision Makers
- Tracking through Data Analytics
- Real time status/alerts through SMS & Email

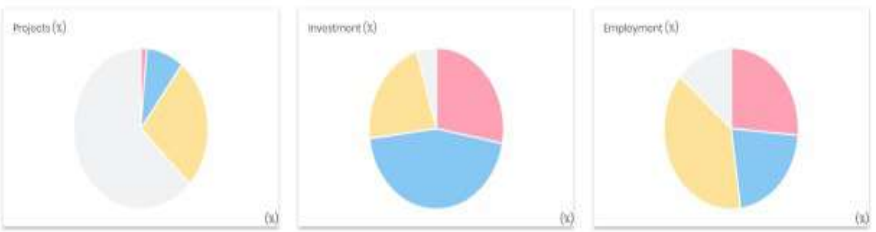
Financial Year Wise

S.No	Financial Year	Projects	Investment		Employment
			In Crores	In Billions	
1.	2013-14	2	137 Cr.	1 Bn.	337
2.	2014-15	9	328 Cr.	3 Bn.	2,693
3.	2015-16	24	1,467 Cr.	15 Bn.	5,389
4.	2016-17	27	861 Cr.	9 Bn.	3,421
5.	2017-18	32	1,767 Cr.	18 Bn.	2,932
6.	2018-19	166	5,722 Cr.	57 Bn.	67,120
7.	2019-20	35	803 Cr.	8 Bn.	5,997



Investment Size Wise

S.No	Investment Size	Projects	Investment		Employment
			In Crores	In Billions	
1.	Above Rs. 500 Cr.	4	3,092 Cr.	31 Bn.	23,416
2.	Rs. 100 - 500 Cr.	26	4,985 Cr.	50 Bn.	19,079
3.	Rs. 10 - 100 Cr.	74	2,462 Cr.	25 Bn.	34,193
4.	Upto Rs. 10 Cr.	176	523 Cr.	5 Bn.	12,269



.**Technologies**

- **Modular Design** - Business first has modular design with single core and all

the modules weredesigned around that single core. All the modules are working independently.

- **Micro-Service Level Architecture** - Each module is designed using Micro-Service Level Architecturewhere one backend can serve multiple frontends like Web App or Mobile App. Each Service has its own realm of responsibility.
- **Data Analytics** – Data Analytics has played a vital role in the evolution of Business First. After 3 yearsof implementation, the team analyzed the dataset and designed a Checklist Based Scrutiny Engine. This has provided standardization to the scrutiny of application in the state of Punjab. Smart Dashboards have provided accurate and timely information for more accurate decisions.
- **Knowledge Management** – The re-engineered processes have improved the system significantly.Each process was documented and hence provided greater clarity about what is expected.
- **Social Media** – Department of Industries & Commerce, Govt. of Punjab is very active on FaceBook(with handle https://www. facebook.com/Industries.GoP/) and Twitter (with handle https://www. twitter.com@Industries.GoP) to publish events, policies, rules and acts of the Govt. of Punjab.
- **Internet of thing (IoT)** – With the introduction of this portal all 23 stakeholder Departments operates 24 X 7 globally. This means their services can be provided anytime, anywhere giving more convenience to the stakeholders. Anyone can avail services delivered right to his/her doorstep without any physical touch.

People

After implementation of Business First Punjab, the team has conducted various Capacity Building programssuch as:

1. The Department has appointed dedicated officials i.e. Sector Officer for each Sector at State Level andBusiness Facilitator for each District at the District Level.
2. Freelancers and CAs for application filing
3. Awareness programs at District Level.
4. Trainings for all the Stakeholder Departments at State and District Level.
5. Hand holding sessions for officials at state HQ level.
6. Provisioned written and video tutorials at website for ready reference
7. VC sessions for stakeholders far from state HQ

VALUE INDICATORS

Learning's for sharing

1. Standardization to reduce system redundancies
2. Business process re-engineering is required to facilitate the targeted population.
3. Governance reform by enhancing transparency and timely approvals.
4. Seamless inter and intra communication between all stakeholders.
5. Regular follow up and targeted milestones have enhanced the efficiency.
6. Accurate and Timely information to Decision Makers leads to Accurate Decisions.

7. Selection based environment to targeted population.
8. Interactive discussions needed for a robust system

Digital Empowerment

For Digital Empowerment of investors including MSMEs, state of Punjab has done following:

1. Appointed Business Facilitators for helping investors in filing various kinds of Regulatory and Fiscal Incentive Application Forms at their Office. The investors don't need to visit remote offices like DIC or InvestPunjab for the same.
2. For Fiscal Incentives, state of Punjab has appointed Chartered Accountants (CAs) for assessment of Fixed Capital Incomes (FCI) for calculations of their Incentives.
3. InvestPunjab has appointed specialized officers for each Sector for investors help.
4. Project Implementation Unit (PIU) has organized various Awareness Programs at almost all theDistricts of Punjab for inclusion.
5. Regular workshops were conducted for investors and officials.
6. PDF & Video tutorials are available on portal for anytime reference.
7. Conducted hands on trainings and handholding sessions for officials involved in processing ofApplications.

Green e-Governance

- Business First is deployed on Cloud based hosting. Therefore we have not purchase any physicalservers.
- Application filing, processing, approval and verification. All the processes are online and paperless.
- Auto generated approvals with Digital Signature has saved lot of papers.

Shri Dalip Kumar, IAS, *Principal Secretary to Govt. of Punjab, Department of Industries & Commerce, Punjab, psic@punjab.gov.in*

Shri Sibin C, IAS, *Director, Department of Industries & Commerce, Punjab, dir.ind@punjab.gov.in*

Shri Navinder Kumar Sharma, *Scientist-C & Project Manager, National Informatics Centre Punjab State Centre, Ministry of Electronics & Information Technology, navinder.sharma@nic.in*

UPREAT Online Justice Delivery System

Uttar Pradesh RERA Appellate Tribunal & National Informatics Centre, New Delhi

Hon'ble Dr. Justice Devendra Kumar Arora, Hon'ble Kamal Kant Jain, Manoj Kumar Mishra, Manoj Tuli, Pankaj Aggarwal and Krishna Kumar Yadav

PROJECT OVERVIEW

Uttar Pradesh RERA Appellate Tribunal (UPREAT) under Real Estate (Regulation and Development) Act, 2016 on 24.01.2018 vide notification no.1501/8-3-17-65 Vividh-16 T.C. Lucknow, in compliance to The Uttar Pradesh Real Estate (Regulation and Development) Rules, 2016, having territorial jurisdiction over entire state of Uttar Pradesh with followings goals:

- Regulation and promotion of the real estate sector and to ensure sale of plot, apartment, or building, as the case maybe, or sale of real estate project in an efficient and transparent manner
- To protect the interest of consumers in the real estate sector and to establish an adjudicating mechanism for speedy dispute redressal.
- In furtherance of the aforesaid object, also to hear appeals from the decisions, directions or orders of the Real Estate Regulatory Authority and the Adjudicating officer and for matters connected therewith or incidental thereto.

The Real Estate (Regulation and Development) Act, 2016 is an Act of the Parliament of India which seeks to protect homebuyers as well as help boost investments in the real estate industry. In exercise of the powers conferred under section-84 of the Real Estate (Regulation and Development) Act, 2016, the Governor published and notified the rules, namely, The Uttar Pradesh Real Estate (Regulation and Development) Rules, 2016. The Act came into force from 1 May 2016 with following purposes:

- To establish the Real Estate Regulatory Authority for regulation and promotion of the Real Estate sector.
- To ensure transparency in projects.
- To protect the interest of consumers in the Real Estate Sector and to establish an adjudicating mechanism for speedy dispute redressal.
- To provide proper information about the Builder.
- Provide recommendations to appropriate Government on in matters relating to the development & promotion of realestate sector.

UPREAT has in exercise of the powers conferred by Sub section 2 of Section 53 of the Real Estate (Regulations and Development)Act, 2016, read with Sub-rule (3) of Rule 25 of the Uttar Pradesh Real Estate (Regulations and Development) Rules, 2016, enabling it to frame regulations of its own practice and procedure, hereby makes the rules named "UTTAR PRADESH REAL ESTATE APPELLATE TRIBUNAL REGULATIONS 2019" followed by 1st and 2nd Amendments in the regulations.

- To achieve above aforesaid goals through ICT enablement in UPREAT, NIC has been engaged for facilitating IT based effectiveand paper-less Online Tribunal System through digitalization and re-engineering of various business and functional processes to act as decision support system for empowering and enhancing judicial productivity of UPREAT

Scope of Project Work:

The National Informatics Centre is entrusted with the development and implementation of web-based tribunal system for UP REAT comprising of core modules e-Filing, Case Information System (CIS) and Document Management System (DMS) along with external/internal API integrations having followed functional and non-functional requirements:

- **Signing In**: By Organization or individual with authentication
- **Petitioning filing:** Basic details, Pet/Res/Adv details, Urgency specifications (if any), identical cases (listed/pending with UPREAT), Head-wise Document's attachment details, Court- fee calculation, details of advance fee money deposited with the bank
- **Application/Documents/Report Filing** from Respondents
- Comments (If a party files its comments on the directions of the commission)
- Comments of Individual consumer/consumer organizations
- **Rejoinder/Response**
- Petitioner Rejoinder
- Comments on Response
- **Capturing Geo-Coordinates of Pdf, Audio Video, Images:** Supporting material (upto 200 MB each file size) to the petition/complaint filed by the petitioner /respondent/complainant. An interface provided shows the actual location name using geo coordinates of images (if provided during uploading)
- **Written Submission:** By Litigant parties, affected citizens
- **Automated workflow-based** scrutiny and electronic issuance of defects.
- **Diary number Generation & Registration of case**
- **Allocation of cases** to available courts in UPREAT and Updation of case status related filed in local server and updatingthe same at website
- **Digital Communication** to litigant parties through auto generated e-mails/SMS
- **Electronic Generation & Issuance** Notices, Replies Orders /Judgements and Final Order electronic generation and issuance to stakeholders
- **Online Cause preparation** and generation and Access of Digital File of case linking it with Cause list
- **e-Hearing** in Hybrid Mode
- **Global Display Case Board**
- **Case Compliance/Office Report:** Designated Registry officials can submit their remarks in a case viewable as officereport to Hon'ble Judges during the hearing.
- Integration of Cases appeared in Cause-list (generated through CIS) with Digitized case portfolios (using DMS tool) by UPREAT users.
- Availability of case portfolio with all available functionalities of DMS tool features in court room through an interface.
- Viewing Digitized case file on HD Touch Creative Display and Case file is maintained in prescribed folders under caseportfolio.
- Personalized notes/annotation creation by Hon'ble members in non-sharable

mode using procured document writer

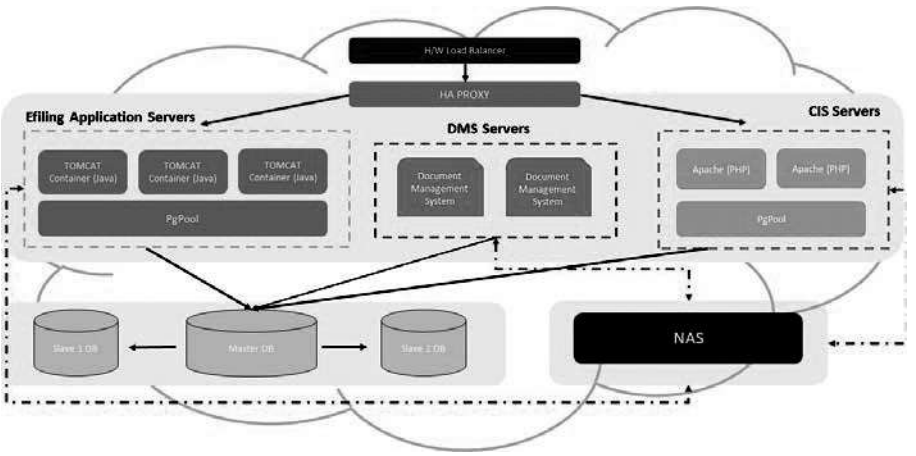
- Capturing of evidence provided by advocate during the hearing of case through interface provided.
- Reports Generation
- Summary report attached in each case file
- Fee format submitted by Legal Division to Accounts
- Status wise report of pending cases
- Detail of the petition for petitioner reference
- Fee receipt acknowledgement for petitioner
- Fee receipt acknowledgement for UPREAT Legal and Accounts Division
- Sending notices to the party/petitioner /respondent or any document through email etc.

Key Stakeholders and Intended Benefits:

Stakeholder	Intended Benefits
Uttar Pradesh Government UPREAT Online Tribunal System is a state Government mission project to enhance and support quasi-judicial addressal of builder/home buyer disputes as Appellate authority to UPRERA.	• Smart Digital ICT enabled Tribunals to bring transparency and efficiency in quasi-judicial processes • Ensuring justice to all i.e., cost effective means to approach a judicial institution for redress and relief unimpeded by any "digital divide" or other socio-economic challenges. • Sharing of information with external/internal stakeholders through API integrations in real time. • Easy dissemination of case information with transparency at ease of user • Provide more efficient G2C, G2G services • Encourage e-Governance and Green Governance through paperless tribunals. • Monitor, supervise and prevent dealing/project approval of default builder safeguarding home buyers for harmonious growth and development in real estate sector
UPREAT Chairman, Members, Registrar are overseeing the execution of the project. All officials in UPREAT, including the Chairman, judicial members, technical members, registry officials, directly use the application.	• Scrutiny: Two or more level scrutiny clearance with separate dashboard for filed appeal/IA etc. along access of relevant documents • Defects Notification: Pre-defined customizable checklist to raised defects in appeal/application form or documents. • Case Number Generation: System generated case number on two level scrutiny clearance. • Fresh Case Allocation to Bench: Allocation of fresh case to bench by Assistant Registrar. • Case Compliance/Office Report: Designated Registry officials can submit their remarks in a case viewable as office report to Hon'ble Judges during the hearing. • LR(s) Addition/Replacement: As permitted by Tribunal, LR can be added or replaced in a case and access to case and it's all documents will be auto granted /revoked in system. • Dashboard for Dias: Dynamic real time dashboard with consolidated view of the each listed case, it's stakeholder wise registered documents, previous proceedings/orders, Office Report, Notice/Summon etc available to Hon'ble Bench at one

	go during hearing • UP RERA Complaints/Project Details: UP RERA Complaint, it's notices, Interim/final orders, Promoter details (From MCA), Project details and current progress/status against which appeal filed; accessible to bench at same dashboard during hearing in real time • Online Notice and Order Generation & Delivery: Electronically generation of Notice and order for delivery to all the parties associated with the cases. • E-Causelist & online Case Proceedings • Case Status: Complete status of case along with orders accessibility through single option provided on the web portal of UPREAT
General Public Litigants, Advocates Builders Central and State Govt Agencies Litigant-Citizen Centric Application available round the clock for use from anywhere at their ease.	• Appeal u/s 44(5): Round the clock electronic filing based upon successful validation of Complaint/ Reference number from UP RERA in real time. • Online Payment: Fee and pre-Deposit under section 43 (5) by Litigants for Appeal & IA/Application • Online Defects Intimation & Removal: SMS/Email auto alerts and refiling facility to remove defects raised by two level scrutiny clearance. • Advance copy Service: Online instant service to opponent parties associated with the case through SMS/ email with security • Electronic Reply Filing: Opponent parties/LR can file reply online. • Digital Certified Copy: Provision to apply certified copy online along with fee (duly verified by Registry) and receive digital copy or hard copy. • Case Document Accessibility 24*7: All case documents accessible to registered stakeholders including legal representatives • User Dashboard: Track and view progress status of the case.

Hardware/Software



Certification (Certifying Agency)

Yes, AAA

. **Disaster Recovery and Service Continuity**

- Dedicated disaster recovery system established for this Project to handle any untoward situation with centralized cloud computing team. National Data Center at Pune is the DC site and at Delhi is DR Site under NIC MeghRaj Cloud.
- DR site is an identical setup with same strength and configuration of VMs, Containers, Dockers, NAS etc.
- Data replication has been done at two level: Meta Data/Database Level and Document Storage Level.
- The frequency of database replication is instant through Postgres whereas for document replication, Cron job implemented with fourhours latency keeping in view of minimum loss of data to user.
- Domain of UPREAT Online Tribunal System bind with two IPs (Primary DC Site, Secondary DR Site) with condition at LB to routeto secondary in case of prime site fails/non-accessible.
- NAGIOS server is also implemented to regularly monitor the performance of resources along pre-alert facilitations in case of non functioning of containers/VMs or any other issues.
- Impact assessment carried out to identify critical data and its recovery in case of security breach or natural disaster
- Penetration Security Testing by NIC Application Security Team is done at regular interval.
- Query execution time is optimized through APM.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Service	**Brief e-Service description withbenefits**	**Volume (Nos) of Services year wise (Calendar Year)**		
		2020 - 2021	**2021-2022**	**2022-23 (Upto date of nomination)**
Online Registration (Part of e-filing Module)	Role based registration with mobile and Email OTP validation and instant accesson successful authentication to access and use system.	3572	703	514
Electronic Filing (Part of e-filing Module)	This service facilitates litigants to file fresh Appeals, Applications Pleading Documents, Reply, Reports etc. from anywhere round the clock at their ease.	1851	6510	5285
Digital Payments (Part of e-filing Module)	This service allows litigants to pay applicable Court Fees (System calculated) for appeals/ applications and security deposit online through	0	45	231

	Bharatkosh Payment Gateway using Netbanking, Credit Card, Debit Card, UPI etc. and get instant receipt on successfultransaction.			
Electronic Re-Filing (Part of e-filing Module)	Provide access to online view and remove defects issued by registry of UPREAT. At ease of litigants, can re-file their corrected documents after removing defects without manual or physical registry dependencies in stipulated time.	821	596	926
UPRERA Integration (Part of e-filing Module,CIS and DMS)	Litigants can search UPRERA complaintnumber in real time and pre-fill mandatory requisite details required for filing appeal. Dynamic dashboard baseddias for judges to access original record of UPRERA directly at the time of hearing the parties.	0	592	1174
Digital Certified Copy (Part of e-filing Module)	Workflow based facilitation to request, pay requisite fee (system calculated) after requ.est approval and get certified copy of case records digital/physical as per need.	0	28	44
Case Documents Accessibility and Case Progress Tracker (Part of DMS and e-filingModule)	Authorized Case Stakeholders can access, view /download case documents like defect free documents of opposite parties, compliance reports, case orders/ judgments round the clock. Mitigated need of physical inspection in courts. Dedicated dashboard for litigants to trackcase progress throughout the case life cycle.	8016	23513	19311
Digitization of legacyrecords (Part of e-filing Module)	Service to allow registry to create meta data and upload case documents of old records based on document owner and document type in each case. Old records get readily available to litigants to direct file fresh documents/ applications to pursue cases.	1	753	0
Case Registration and Auto Allocation (Part of CIS Module)	Auto case registration and court allocation on approval from workflow-based scrutiny of e-filed appeals, applications etc. Systematic and organized mechanism for institution and registration of cases	898	4054	3301
Online Causelist generation & Publishing (Part of CIS Module)	Electronically generation of cause list of everyday hearing and auto issuance for public to access from anywhere	175	393	268
Digital Notice/ Summon Issuance (Part of CIS Module)	Electronically generation of notices to parties in a case and auto serving to parties at registered email and mobile number. Instant delivery of digital notices/summon to parties.	0	642	819

Digital Signing and issuance of order (Part of CIS Module)	Electronically generation of order by system in standard format with option digitally sign the order and auto served to parties at registered email and mobile number. Instant delivery of digital signed order to parties.	0	9185	7836
e-Hearings	Online Tribunal System helped in achieving Hybrid hearing of cases in UPREAT where litigants can appear as per their convenience before hon'ble judges along with identical digital record access at time of hearing without carrying any physical heavy records.	1265	13250	9719
Digital Communications	System generated auto alerts to each stakeholder of each case at pre-defined stages throughout the case life cycle. Real time case information dissemination along documents access to all parties in each case.	793	108983	100527

Implementation

UPREAT has achieved the following through online tribunal system provided by NIC

- A true paperless court leading to Green Governance Compliance.
- Only digital filing is accepted which has minimized the footfall in UPREAT.
- In terms of functionality, 3 documents pertaining to any party in a case can be viewed and compared in single windowduring the hearing.
- Login based personal case wise notes can maintained by Hon'ble judges to later utilized it for judgment pronouncement.
- Offline DMS facility to download complete bunch of a case record at their local system for order reserved cases.

Improvements / Enhancements

Activities Undertaken (last one year)	**Planned Activities (next oneyear)**
• Case Documents access to all Litigants of the case through DMSin UPREAT • Implemented options of Defect History, e-filing payment through • Stamps, Uploading of Additional documents, and New NoticeFormat in UPREAT	• Caveat Filing, Caveat Notice and Listing • Digital signing version 2.0 with provision to sign document using more than one DSC.
• Real time access to details and documents of the UP RERA complaint against which appeal has is being heard along with notices. Interim/final order issued by UPRERA available to the Judges of Tribunal. • Display Board provision in the Tribunal and Web portal implemented as part of ease of doing business. • Provision to write progress remarks related to the case by various registry officials (scrutiny clerk, Assistant Registrar, Registrar and Bench Secretary) used to view case progress by Hon'ble Judges of the tribunal during hearing.	• Similar Cases Identification Module ensuring up-to-date status and to eliminate change of cross orders/judgments for same cause • UPREAT case order / case status integration with UP RERA on real time

- Provision for online Legal representative substitution and addition permitted by Tribunal. Case and its relevant documents access/revocation to new/ substituted legal representative respectively on LR substitution and addition.
- Implemented filing of appeal on base of reference number in UPREAT
- Advance cause list incorporated in UPREAT for all stakeholders
- Separate supplementary causelist implemented in CIS module.
- Two step login authentications implemented in e-filing module of UPREAT
- Online acceptance of Security Deposit/Payment under 43(5) through SBI e-pay in UPREAT
- View Defects Summary functionality added in DMS module accessible by Hon'ble Judges of the tribunal during hearing
- Provision to submit compliance report from account department of UPREAT accessible by Hon'ble Judges of the tribunal during hearing
- Access and verification of system generated documents through QR Code incorporated in UPREAT
- Digital Signing of notice, orders, judgment through Digital Signature implemented in UPREAT
- Content Management System (CMS) module developed for UPREAT e-filing portal.
- New scrutiny checklist with updated remarks option implemented in UPREAT.
- Restriction imposed on petitioner in a case for filing document as respondent in the same case and vice versa.
- Local DMS download option implemented in UPREAT for accessing system offline during hearing.
- Customization (application purpose, date of filing, date and time of uploading, filer details for linked cases) in DMS view incorporated in UPREAT.
- Auto indexing/sequencing of Annexure implemented in e-filing of UPREAT
- UPREAT DMS version updated with New UI and data drill down for ease of judges/member during the hearing.
- DMS application provisioned with in-built multi window splitter (up to 3) for view documents in comparison mode.
- Write Note module (login based and case wise) incorporated for judges/member to write, view/edit and update personal case notes in UPREAT
- Provision of document Search, remarks generation and access through Case/Filing number made live in UPREAT.

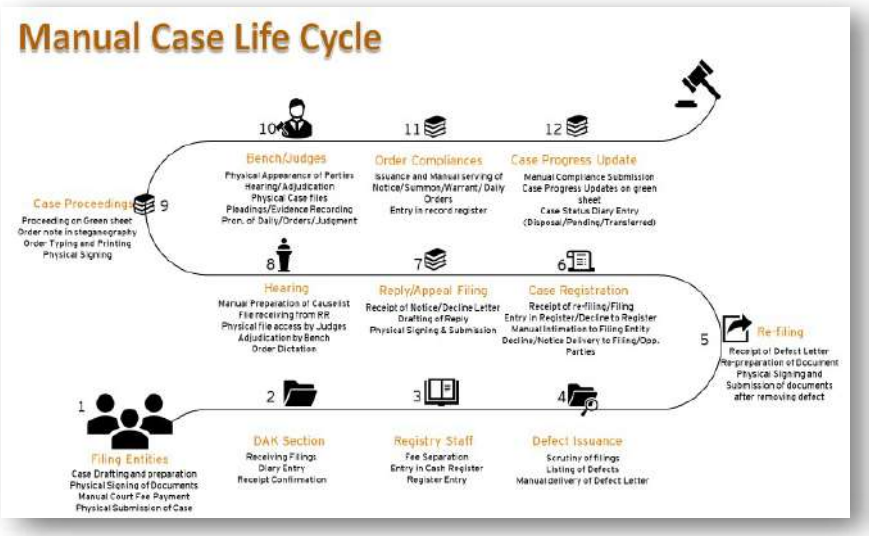
basis.

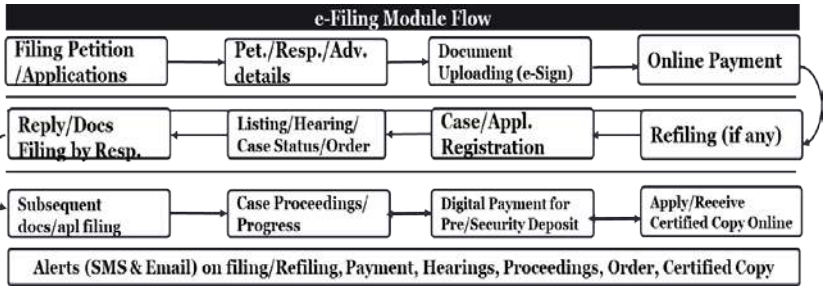
- Integration of promoter details during the hearing on the bases of CIN from MCA
- Integration with Microsoft Teams for VC link in cause list for court hearing
- Integration with UP High Court (Appellate Authority), and NCLT/NCLAT for relevant ase information/details permissible by respective uthority.
- Web based Adjournment Request in multiple cases by advocates.
- Aadhaar based e- Sign of appeal, petition, reply, rejoinder, annexure etc. by litigants at time of filing.
- Case Timeline for judges to track real movement of digital records at time of hearing.
- Predictive Analytical Dashboard for real insights to enhance judicial productivity.
- AI based chatbots for public interaction

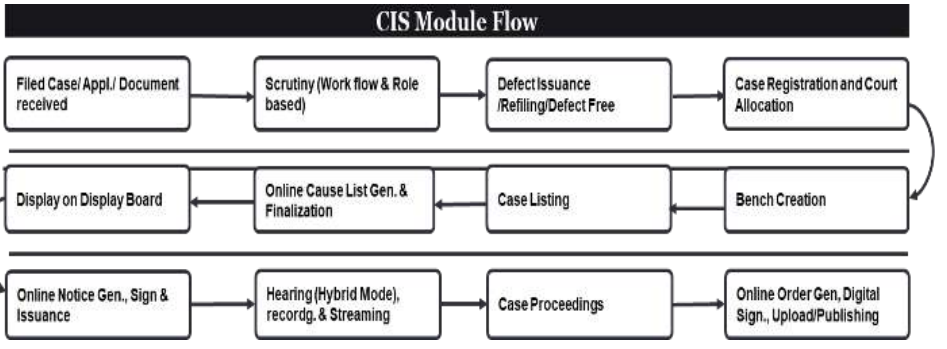
ENABLER

Processes Re-engineered

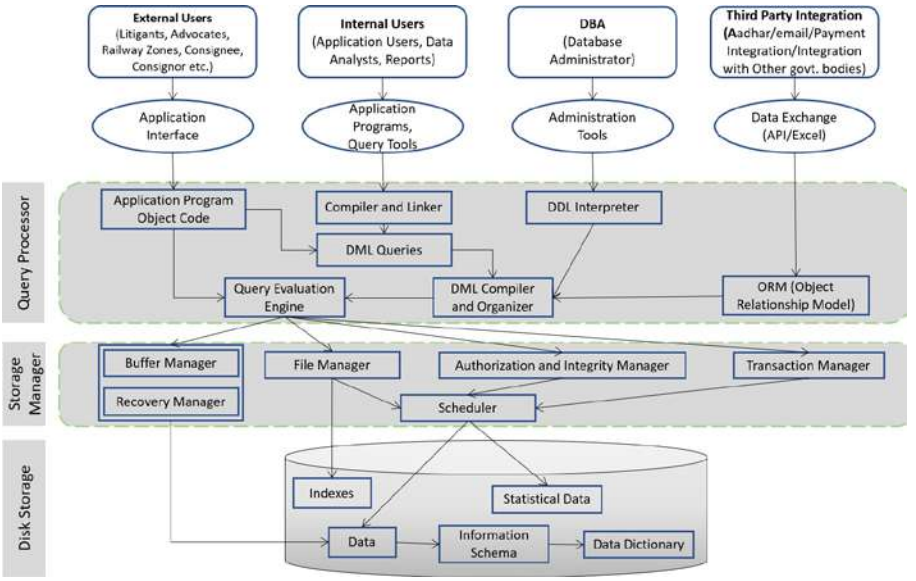
"The below case life cycle depicts what all processes, stages, stakeholders involved while filing a case before anyquasi-judicial body/Tribunal. These processes in critical in nature which require process mapping and re- engineering for speedy adjudication and addressal of cases pending since long years in seek of justice.







Technologies



People

Capacity-building is defined as the process of developing and strengthening the skills,

Trainings: On regular intervals, training sessions are imparted to the various stakeholders like litigants,advocates, UPREAT staff, officials, Judges/Members as per their need, on addition of new functionalities etc.

Open Forum/VC Discussions: One VC based session per two months conducted regularly for discussions with advocates and UPREAT Judges/staff to take feedback and address their queries/concerns.

User feedback-based improvisation: Feedback calls are scheduled on weekly/monthly basis with UPREAT chairman and judges to discussion upon areas where improvement or new initiative are required and planned accordingly form implementation.

Interactive Help Manuals: Video and Document based manuals are publicly available on how to interact with system, what are the functionalities and to create pre-awareness before the use of application.

Helpdesk Facilitation: Facilitation counter has been established at UPREAT office to help the user for all e- services related to system.

Chatbots: Solution is enabled with voice and multilingual chatbot for ease of the user to directly ask their concernand get suggestive responsive for helping them.

VALUE INDICATORS

Learning's for sharing

"The initiative of digital translation was a crucial and challenging step as it involves dealing with enormous footfall/traffic of litigants, Advocates, Professionals, Govt. Entities in filing of cases and documentations, offline payment, manual registry work, physical hearings, more manpower utilization, manual data exchange and information dissemination etc.

Being part of third pillar of democracy, it always remains crucial and critical for getting

the technology accepted and implemented across the judicial/quasi-judicial entities due to conformableness, habit and relines on old convention methods of justice.

Through Integration with Lower Court, information & documents related to appellants are being directly fetched from lower court. Also, case documents are accessible to all stakeholders throughout the case life cycle thus reducing time of serving notice and exchange of pleadings. This initiative has resulted in a truly paperless court with effective disposal of case in 60 days as prescribed in Act.

Digital Empowerment

Initiative efficiently empowered citizen and Tribunal with ease of filing, payment, case tracking, appearances, pleading submission with digital documents, digital signing, digital communications & delivery, Online defects issuance and removal, workflow based online scrutiny, document exchange b/w parties, Original records accesswith API integration with etc. saved their tangible and intangible cost involved in manual processes. Drastically reduction of the adjudication and disposal time from several hundred days to 60 days only, leading to notional saving of more than 100 core per annum.User Manuals and Help Videos were created and posted on the e-filingwebsite and available to all users. These could be used by users for self-training and could be shared with others

they would like to pass it on to.FAQs were posted on e-filing website to answer frequent and common queries.Helpdesks have been setup to assist staff and general public in adopting the e-filing system.

Green e-Governance

With electronic processing, digital mechanism and no/minimal use of paper helped in running paperless court leading to Green Governance Compliance. 12K+ digital filing has saved more than 1.5 Crore pages from printing.

Digital cloud-based system complying e-governance standards. Cloud repository for Database and Document storage scalable in nature. Standard processing for data capturing through smart and real time actions. Dashboard & MIS reporting for taking insight of the system.

Hon'ble Justice Dr. Devendra Kumar Arora, *Chairman, Uttar Pradesh RERA Appellate Tribunal, chairperson-reat.lu@up.gov.in*

Hon'ble Shri Kamal Kant Jain, *Member (Technical), Uttar Pradesh RERA Appellate Tribunal, memtech-reat.lu@up.gov.in*

Shri Manoj Kumar Mishra, Scientist-G, *Deputy Director General, National Informatics Centre, New Delhi, mk.mishra@nic.in*

Shri Manoj Tuli, *Deputy Director General, Scientist-G, National Informatics Centre, New Delhi, mtuli@nic.in*

Shri Pankaj Aggarwal, *PMU, National Informatics Centre, New Delhi, pankaj.aggrwal@nic.in*

Shri Krishna Kumar Yadav, e-court In-charge, *Uttar Pradesh RERA Appellate Tribunal, krishna21144@gmail.com*

Software for Agri Risk Unified Solution (SARUS)

Agriculture Insurance Company of India Ltd., New Delhi

Kanika Sharma Shandil, Siddesh Ramasubramania and Revanth Bezawada

PROJECT OVERVIEW

Objective:

Provide an **End-to-End Insure-Tech Solution** to farmers and related stakeholders involved in the Agri- Allied business of AIC

Scope:

- The project encompasses all aspects of Agri-Allied Insurance viz., farmer enrolment, individual loss intimation, individual loss assessment, crop health monitoring at Notified Unit and yield loss detection, claim calculation and disbursement.
- Geographically, the project covers all parts of the country where risk exists with Agri or Allied activities.

Key Stakeholders:

- Ministry of Agriculture, Government of India
- All State Governments
- IRDAI
- AIC
- NRSC
- Farmers
- Broker/intermediary Organizations
- Field Functionaries

Intended Benefits:

- Streamlined and fast-paced policy creation
- Issuing paperless e-policy document to the growers, immediately, at the time of enrolment through SMS and email
- Another step towards "Digital India" initiative at the grassroot level by digitizing the whole Agri Insurance process from farmer enrolment to premium collection and policy generation.
- Automated and Real-Time loss intimation and claim payout on breach of triggers for parametric products using weather data from IMD and other state agencies
- Periodic crop health monitoring for early detection of losses and claim settlement using Remote Sensing techniques involving Machine Learning algorithms on satellite imagery, ground truthing and weather parameters for yield-based products.
- Automated claim calculation and processing using a parameter called Crop Health Factor (a novel proxy yield conceptualized by AIC, in partnership with NRSC) for claim settlement in record time.

Hardware/Software

Client Side:

- AIC FORM Android App for Ground Truthing
- SARUS React-Native Mobile App for Enrolment, Intimation and Assessment
- GCMS Web Portal built using PHP for Geo-Spatial Analysis
- SARUS Web Portal built using Python Django Framework for Underwriting and Claims Processing
- WDMS Web Portal built using Python Flask Framework for Weather Data Monitoring

Server Side:

- AWS EC2 (Cloud Service)
- AWS S3 (Storage)
- API: Amazon API Gateway and AWS Lambda (Python) for serverless computing
- NGNIX with Apache Tomcat and Waitress as hosting servers
- Node.js
- Relational Databases (MySQL, PostgreSQL with PostGIS)
- Jenkins and AirFlow for scheduling
- ERDAS IMAGINE, ArcGIS, QGIS for Spatial Analysis (third party tools)
- PM2 tool for server-side monitoring

Certification (Certifying Agency)

- **CERT-In Compliant System** – The Indian Computer Emergency Response Team (CERT-In) serves as the nationalagency to deal with cyber security issues and issue mandates for effective IT Security practices. SARUS is compliant with regulations/recommendations issued by CERT-In (Indian Computer Emergency Response Team).
- **CVSS Certification** – SARUS went through a Vulnerability Assessment and Penetration Testing (VAPT) as per regulations of CVSS (Common Vulnerability Scoring System). The Critical, High and Medium vulnerability points identified during the VAPT have all been resolved and we are awaiting certification from the vendor.

Disaster Recovery and Service Continuity

- Server Side:
  - In line with AWS Disaster Policies, data is **stored in 3 different zones** inside Indian territory
  - During a disaster, if any of the 3 zones goes down, data can be **recovered in near-real-time basis** fromany of the other 2 zones
- Application/Development Side:
  - Periodic Data Backup at 10 minutes interval
  - Data recovery time is ca. 30 minutes in case of any failure
  - Possibility of data loss is no more than a time span of 10 minutes

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RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Service	**Brief e-Service description with benefits**	**Volume (Nos) of Services year wise**	
		2021-2022	**2022-23 (Up to date of nomination)**
e-Enrolment using SARUS Mobile App	Enrolment of farmer involving capturing required farmer details in the system and facilitating purchase of insurance.		**₹ 5.3 Cr.+** Premium collected (excl. tax) **18K+ policies** issued
	Individual Loss Intimation for farmers to notify any event of crop loss.		**2.5 Lacs+ Location-Crop** combinations notified
	Individual Loss Assessment for survey of intimations.		**100 GB+** data and documents processed

	The **digitization** of the process has resulted in faster, more streamlined and **paperless policy** generation, and claim calculation, processing and payout		
Crop Health Monitoring (Ground Truthing) using AIC FORM App	Ground Truthing activities are carried out by field functionaries using the AIC FORM App that provides in-situ data of crop, field condition and other parameters to understand the ground reality Helps in the mapping on pixel signatures with the actual crop for generation of crop layer map	**1 Lac** Ground Truthing points recorded via AIC FORM App Actively used by field functionaries across **12 states** in the country	**4 Lacs** Ground Truthing points recorded via AIC FORM App Expanded to 3 more states, making it a total of **15 states** where the App is being actively used.
Weather Data Management System (WDMS)	Extract and compile weather data from IMD and other state agencies. Single point of interface for convenient access of comprehensive weather data.		Currently, over **13 different sources** are scoured to accumulate **120+ years** of data **100 GB+** data stored
Geo-surveillance using GCMS	The portal helps to perform the QA on the Ground Truthing Data collected through AIC FORM.		QA done for 5 Lacs Ground Truthing points that were recorded via AIC FORM App
	Satellite surveillance module helps to extract and process the satellite imagery to generate parameters like NDVI, LSWI and Backscatter, automatically, on a periodic basis. These images also help to generate crop layer map using clustering machine learning algorithm.		Last 5 years pan-India satellite image processing collected from Sentinel-1 and Sentinel-2 CHF calculation for past 2 years for Bangla Sashya Bima (BSB)
	Parameters derived from the satellite imagery, in collaboration with weather data and crop layer, acts as an input to our proprietary ML algorithms to generate proxy yield called Crop Health Factor		

	(CHF). CHF can be used to identify the actual loss at the ground level and speed up the process of claim disbursement without the need of actual ground survey		
Underwriting and Claims Processing using SARUS Web	The portal facilitates the underwriting of proposals received under in-house schemes.		18K+ policies underwritten for in-house products
	Portal is also used for claim calculation at farmer level using CHF and subsequent claim disbursement.		Claims for 70 Lacs+ farmers processed for BSB scheme

Implementation

- SARUS Mobile App developed for intermediaries to assist in farmer enrolment, payment of premium and policy document generation.
- AIC FORM Mobile App developed to collect Ground Truthing data for the usage in generation of crop layer and monitoring of crop health
- WDMS Web Portal developed for daily extraction of weather data from multiple sources, storage, compilation and access through a single platform
- GCMS Web Portal developed to help perform QA on Ground Truthing data, generate crop indices, analyze satellite imagery, calculate Crop Health Factor (CHF) and visualize overall crop condition
- SARUS Web Portal developed to perform underwriting, and claims processing and disbursement

Improvements / Enhancements

Planned Improvements:

- Aadhaar integration for seamless authentication of farmer data
- Farmer login in SARUS Mobile App so that farmers can avail New Insurance, View already purchased Policy Documents and file Loss Intimation without the involvement of a broker or intermediary
- Individual Loss Assessment (ILA) functionality
- Dedicated section on Allied Insurance in SARUS Mobile App to assist farmers involved in the Allied Sector of Agriculture (livestock, fisheries, etc.)
- Automate crop layer map
- B2C Applications to be implemented in all 22 official languages of India

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ENABLER

Processes Re-engineered

- Before the **SARUS Mobile App** was developed, when physical forms were used for insurance applications, it used to take several days before farmers would receive their policy documents. With the SARUS Mobile app, **farmer**

enrolment process is much more streamlined and simplified. Data entry at multiple levels is no longer required since data is automatically captured by the system as and when an insurance policy is availed. Policy document is also generated within minutes.

- Prior to the use of **Remote Sensing** data in crop health monitoring, Crop Cutting Experience (CCE) was the most widely used methodology to determine the loss and basis of claims. In such a scenario, the District Magistrate's office would be responsible for intimating losses to the insurance companies, following which CCE would be conducted in the affected area to determine the extent of yield loss. Only after the consolidation of CCE data would claim processing begin in those cases. In this process, it took months before claims got realized into farmers' bank accounts. With **GCMS**, remote sensing data is utilized to partially replace this lengthy process involving CCE and instead use a hybrid model, complemented by available satellite imagery and analysis of indices, to determine loss ratio, thus **automating** and **simplifying** the whole claims process.
- **Automated web scrapping techniques** are used to collect weather data from 13+ sources for

  WDMS. This results in **simplification of data availability in a single platform**
- **SARUS Web Portal** provides a **simplified platform** for underwriting and **automated claim processing in a digital platform**, doing away with much more cumbersome process of using physical forms and papers as is otherwise prevalent..

Technologies

- **DevOps Model** is used in the development process. This ensures faster product delivery, greater scalability and better resource utilization
- Usage of **satellite imagery** in the field of crop insurance has immense potential in helping improve the quality of services provided to the farmers and the SARUS project is one of the leaders in the industry in that respect.
- **Analytics Dashboard** has been developed using Tableau. These play a vital role in various areas of business intelligence like market penetration, micro and macro level analysis, identification of focused areas and areas of concerns, fraud detection, improved product development, etc.
- **Serverless cloud computing architecture** is used with the help of AWS Lambda and Amazon API Gateway. This removes the overhead on server management and facilitates greater focus on development

People

In line with the **"AatmaNirbhar Bharat"** vision of the Hon'ble Prime Minister of India, AIC strives to become self-sufficient in the development and maintenance of every aspect of the SARUS app. In that respect, the organization has created a dedicated **In-House Research & Development (R&D) Department**, comprising of a Software Development Group (SDG) and a Remote Sensing and Geo-Information System (RSGIS) team. The department is responsible for the research, development and maintenance of the SARUS project with minimal involvement of third-party vendors.

VALUE INDICATORS

Learning's for sharing

- Initial systems of AIC used a Location Master to map products in different locations in the country. A major issue was that location hierarchy kept changing frequently as new villages were formed or existing ones changed names. To tackle that, we devised an innovative solution, where instead of using a separate master, the data is being derived from the list of places where a product is notified, i.e., a consolidated Notification Data provided every season by respective state governments. This ensures that even if any location name changes or new location gets added over time, no additional maintenance is required to reflect such a change. It gets reflected in the system the moment such a location gets notified in any product.
- The nature of the SARUS project is such that the server level load fluctuates a lot over the year depending on the agriculture seasons in India. The range of this fluctuation leads to a lot of effort in server management. To resolve this issue, AWS' serverless architecture (AWS Lambda, Amazon API Gateway, etc.) has been utilized to remove the overhead in managing and operating servers and runtime environments in the cloud.
- In the initial CCEs, data was frequently manipulated using external sources. To tackle this issue, a more transparent methodology has been incorporated using remote sensing technology. Unbiased,

untampered data via satellite imagery has led to improved accuracy in the whole crop insurance process.

Digital Empowerment

- We are empowering the farmers by giving them the provision to directly notify in event of crop loss using the SARUS Mobile App instead of depending on intermediaries to do so on their behalf

Policy documents are sent directly to the farmers' mobile phones via SMS. This ensures that farmers do not have to depend on postal service or other third-party couriers in their village.

Green e-Governance

Having made the whole process of insurance digital, the SARUS project is entirely paperless in nature. Be it supporting documents and form submission for enrolment, loss intimation or submission of loss assessment, physical document is neither collected nor issued.

***Ms. Kanika Sharma Shandil**, Deputy General Manager, Agriculture Insurance Company of India Ltd., New Delhi, kanikas@aicofindia.com*

***Shri Siddesh Ramasubramanian,** General Manager, Agriculture Insurance Company of India Ltd., New Delhi, ssiddesh@aicofindia.com*

***Shri Revanth Bezawada,** Deputy Manager, Agriculture Insurance Company of India Ltd., New Delhi, revanthb@aicofindia.com*

National eVidhan Application (NeVA)

Ministry of Parliamentary Affairs, Govt. of India & National Informatics Centre, New Delhi

Satya Prakash, Mukesh Kumar and Sanjeev

PROJECT OVERVIEW

Objectives: The mission of e-Vidhan or NeVA MMP is to make all the State/ UTs Legislatures paperless, streamlining all the processes for information exchange with the different State Government Departments and to publish the allowed contents on the public portal as and when it happens.It also aims at to assist the Members of the States/ UTs Legislatures to use the latest ICT tools for preparing themselves for participation in the legislative debates & law making process and empower them to handle it smartly and efficiently. It will also enable the electronic flow of information, laying of documents on the Table of the House and Electronic information exchange among all the stakeholders, thus to create less paper legislature in the country. This will also provide Data analytics, Information processing and analysis of the data of all the State Legislatures.

Scope: The e-Vidhan MMP envisages centralized architecture at the National level with common application software for each of the identified services. The application software will be hosted on the National Cloud (Meghraj). Integration across States

Legislatures would be enabled, through adherence to technical specifications and e-Governance standards. The key aspects of the project are Business Process Re-engineering (BPR) and creation of databases based on e-Governance standards for the purposes of ensuring interoperability. BPR is intended to enable process simplification and significant value addition to Members and citizens. The project will cover 28 States and 3 Union Territories with Legislative bodies. All these 31 States/ UTs are to be covered by NeVA, out of which 25 are having Unicameral Legislature and remaining 6 are Bicameral. Moreover, there are 5 States/UT Legislatures viz. Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Karnataka & Maharashtra, whose sessions are held at two different locations thereby making total of 44 locations for implementation of the project. Apart from these, the various government organizations, etc. are also to be covered under this.

Key Stakeholders: The NeVA Application has been developed to cater to various stakeholders like Members, Ministers, House Secretariat personnels, Govt. Department personnels, Citizens, media, researchers, etc.

Intended benefits:-

- NeVA has been developed to function as a member centric application, device neutral and user-friendly application to equip all the members to handle diverse House Businesselegantly by putting entire information needed by them in their hand held devices/ tablets and equip all the branches of legislatures/ department to handle it efficiently.
- NeVA-mobile app will facilitate Ministers/Members to get the entire House Business including replies to questions and papers to be laid in the House, at a specified time before the beginning of the daily proceedings.
- Inside the House, NeVA Digital House Module will support a digital e-Book format accessible through member‟s login on touch-screen device

installed at Member‟s Desks. This will enable E-voting and EAttendance along with running the House digitally.

- NeVA will provide all relevant information like Notices, Bulletins which would be issuedby legislatures from time to time for information of all members and other stakeholders.
- NeVA will also help the presiding officers in the management of the House via House Management Applications and e-Book.
- Bringing this electronic platform accounts for huge savings on papers thereby leading to reduction of carbon footprints and moving a step forward in the achievement of United Nation Development Programme's Sustainable Development Goal (SDG) -15, Life on Earth‟.

Current Status:-

At present,Tripartite MoU for implementation of NeVA has been signed with 21 Legislative Houses i.e. Punjab, Odisha , Bihar (Both Houses), Meghalaya, Mizoram, Manipur, Gujarat, Arunachal Pradesh, Nagaland, Puducherry, Tripura, Himachal Pradesh, Chhattisgarh, Tamil Nadu, Sikkim, Haryana, Uttar Pradesh (Both Houses), Jharkhand & Jammu & Kashmir. Out of which, Detail Project Report for NeVA implementation has been submitted by 18 Legislative Houses i.e. Punjab, Odisha, Bihar (Both Houses), Nagaland, Manipur, Arunachal Pradesh, Sikkim, Tamil Nadu, Meghalaya, Haryana, Tripura, Mizoram, Uttar Pradesh (both Houses), Gujarat, Jharkhand & Puducherry. The Project has been approved for 17 Legislative Houses i.e. Punjab, Odisha, Bihar (Both Houses), Nagaland, Manipur, Tamil Nadu and Sikkim, Tripura, Haryana, Meghalaya, Mizoram, Uttar Pradesh (both Houses), Gujarat, Jharkhand and Puducherry and first instalment of financial assistance for implementation of NeVA Project has also been released for them.

Recently, Bihar Council, Nagaland, Uttar Pradesh Assembly, Haryana, Mizoram and Meghalaya have become Digital Houses by successfully conducting their sessions through digital platform NeVA

Hardware/Software

The details of the software environment for the project deployed are entailed as given below:-

NeVA Public Portal and CMS Portal- It is the public portal which is available to all the users across the country to view the required information relevant to the legislative matters.

Technologies in use:

- Web Platforms: IIS 10
- Web Technologies: HTML 5, CSS 3, Java Script, Jquery, Json, Bootstrap
- Windows Platform: Windows 7 and above
- Programming Tools: C# .NET Visual Studio 2012 with Frame work 4.5
- Design Technologies: MVC 4.5, WPF, WCF, Entity Framework 6.0
- Evo Pdf (html to pdf generations)
- itext sharp (for cutting pdf and merge)
- TFS (Team Foundation Server) for common development/Version Management & auto deployment
- MS SQL 2017
- Digital House- Consists of Business Controller module, Display Module and eBook which are accessible for the different users during the House.

- Asp .Net Core 2.2(Open Source Web Framework)
- ASP .Net ¬Signal R core for Chat communication, Voting, House display.

Mobile Application: Neva iOS App

- Platform:- iOS
- Neva iOS App current Version no:- 1.0.2
- Neva iOS App current Version no in app store:- 1.3.45
- Technology used front-end:- Ionic version 1
- Technology used Back-end:- WCF, using rest API's
- Using MacBook pro:- OS version 10.15.3
- Development Tools used :- Sublime text IDE, Xcode Version 11.3.1, Visual studio code.

Mobile Application Android

- Mobile Platform: Android 4.0+
- androidx.appcompat:appcompat:1.0.0
- Platform java JDK 1.8 version
- Android studio version : 3.6.3
- Neva Android App current Version number : 1.0.4
- Neva Android App current Version on Play store :- 1.0.3
- Technology using front end : core java
- Technology using Back end :- using rest API's
- Development Tools used:- ADT

Exchanging information in secure mode with the followings using WCF technology

1. SMS Gateway Service
2. E-Mail Gateway Service

Oracle/MSSQL/otherDB: MS SQL2017 Server

Certification (Certifying Agency)

Yes, the formal Audit for the NeVA Website has already been conducted and the certification for the same has also been obtained in this regard on 22nd July, 2019 by CERT-In empanelled auditor AAA Technologies Pvt. Ltd. The Audit for the mobile application and the Digital House module has also been conducted.

Disaster Recovery and Service Continuity

In case of an eventuality/calamity, in-charge of National Data Centre will instruct the NeVA website to be restored from the Disaster Recovery site, which is located at the NIC State Centre, Hyderabad. Time required for starting of NeVA website from the remote location depends on several things; ideally the restoration will take within an hour

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RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	Brief service description with benefits	Volume (Nos) of Services year wise		
		2020-2021	2021-2022	2022-23 (Upto date of nomination)

Digital House (e-book)	A digital e-Book format is accessible through member's login on touch screen device installed at Member's Desks which will enable E-voting and E-Attendance. It will help the presiding officers in the management of the House. Also, the members can have access to all the House related documents on their e-book. Similarly, the Ministers, who have to reply to the House,can also seek supplementary replies on their e-Book.	156	627	6726
Questions &Replies/Notices	This services enables the members to submit their questions/notices through online mode for further processing in the House secretariat which makes it an easier task of dispensing the need to dispatch and circulate them to the various users. The departments can also prepare and send the replies to the Secretariat avoiding the printing tasks.	688	4878	8516
List of Business	The agenda of the day of the session can be generated and published with the availability of the relevant documents at one place and can also be provided to the Members through their portal for prior information.	258	523	1737
Papers to be laid	All the important papers to be laid can be submitted to the House Secretariat by the departments through the Departments' login and then can be attached in the LOB so created for laying on the floor of the House with no requirement of printing the same	644	4669	8269
Bulletins, synopsis, LOB, Question, News, Contacts	The Bulletins and synopsis for the session day can be accessed from the public site for the business carried out in the House.	1076	1665	2304

Bills Committee Reports, etc.				
	The entire process of passage of the Bill to becoming an Act is automated through this module. All the stakeholders involved are integrated through this module to accomplish the entire task			
	The Committee Module enables the users to process various committee reports, schedule meetings, etc. to facilitate the members of the committee. The reports can be made accessible to the members via the Committee portal.			

Implementation

The following roll out model of the project has been drawn as under:-

S. No.	Group	Name of State/UT Legislature	Target Date
1.	First Phase	5 States	2020-2021
2.	Second Phase	16 States	2021-2022
3.	Third Phase	16 States	2022-2023

Present Status of NeVA:

1. MOUs signed with 21 Houses: Punjab, Odisha, Bihar (both houses), Gujarat, Manipur, Meghalaya, Arunachal Pradesh, Sikkim, Haryana, Tamil Nadu, Himachal Pradesh, Nagaland, Tripura, Chhattisgarh, Puducherry, Mizoram, Uttar Pradesh (Both Houses), Jharkhand, Jammu & Kashmir.
2. DPRs received from 18 Houses: Punjab, Odisha, Bihar (both Houses), Nagaland, Sikkim, Tamil Nadu, Manipur, Meghalaya, Arunachal Pradesh, Haryana, Tripura, Uttar Pradesh (both houses), Mizoram, Gujarat, Puducherry & Jharkhand.
3. Project Sanctioned for 17 Houses Punjab, Bihar (both houses), Nagaland, Odisha, Manipur, Tamil Nadu, Sikkim, Meghalaya, Haryana, Tripura, Mizoram, Uttar Pradesh (both houses), Gujarat, Puducherry and Jharkhand Assemblies with release of 1st instalment to first 14 Houses from Centre's Share.
4. Houses adopted NeVA: 07 Houses Bihar Legislative Council, Uttar Pradesh Legislative Assembly and Council, Nagaland Legislative Assembly

Improvements / Enhancements

The improvements and enhancements incorporated in the NeVA Application comprises the inclusion of the features as given under:-

1) The modules like Digital Library, Bills and Committee Management system

were enhanced for better service delivery to the users/stakeholders.

2) The feature of webcast facility was made operational for all the Houses.
3) The Digital House module was enhanced with additional features to cater to the needs of the Assemblies.
4) The other existing modules like user management, question modules, LOB and other modules were also updated as per the requirements of the users.
5) The public portal was also revamped with various features to make it user – friendly with facilities to access more organized information.
6) The system has been made available in multiple languages to cater the Houses' functioning.

The new features and technologies that are proposed to be incorporated in the system are as follows:-

1) Digital archives modules is ready for roll out to all the Houses.
2) The Reporter Module has been developed as in the Testing stage.
3) The Development of Module for implementing Government Assurances is also underway.
4) To make the system AI enabled, efforts are being done towards introduction of the speech-to-text translation mechanisms, speech-to-speech translation, etc.
5) The Constituency Management Module is being developed for roll out in the next phase.

ENABLER

Processes Re-engineered

The processes that have been digitalised through the application are as follows:-

- Master data entry- The Admin and SuperAdmin portal which helps in managing the public site are being used by the Legislatures to update their public portals for information dissemination.
- Question Processing flow - In this module, the submission of the questions by the members has been digitalised without the need to dispatch it through offline mode and all the necessary intimation in that respect may be communicated to the member through the online mode. Moreover, it has been re-designed as a role based process which caters to various stakeholders through the same application. The status of the question process can be tracked through the system at every stage with integrated search facilities.
- Department Module – The Department Module helps in preparation of the replies, draft bills and forward other papers laid by the different Govt. departments to the House Secretariat for Laying on the floor of the House.
- Bills Management - Government Departments- Facilitation of uploading of Bills to be introduced, uploading all other subsequent versions of the Bills until Assented, scrutiny & suggestions and modification in Bill. Legislative Branch: Maintenance of Bills database, updation of various Dates as the Bill progresses, sending the Bill for Assent to the Governor, sending the Bill to the Centre, in case Parliament Nod is required, Sending the Bill to various Committees as desired by the House. Committee
- Branch: Seeking public opinion/suggestions on the bills, Scrutiny of public

opinion/suggestions, placing public opinion/suggestions in the form of Summary for deliberation of the Committee, to finalize the Report on Bill as finalized by the Chairman of the Committee. Citizens: Online submission of opinion/suggestions on bills. Members of State Legislatures: Scrutiny and suggesting amendments in bill document.

- LOB Creation- The application facilitates the preparation of the agenda of the session day in digital mode for the information of all the users.
- Digital House- The Digital House Module is to make our legislature digital (paperless).

NeVA Digital House" is a Application suite, having following major modules:

- NeVA e-Book
- Digital Display of House LOB
- E-Voting
- E-Attendance
- House Productivity Report
- Talk Time Management
- Speaker PAD
- Minister PAD

- Committee Module- Constitution of Committees; Constitution of Sub Committees;Creation of e-files; Meeting schedule; Tour/Visit itinerary; Maintenance of Membership of Committees; Preparation of Committee Reports; Correspondence with concerned Government Departments; Scrutiny of replies by the Departments; SMS/e-mail integration; Laying of Reports on the Table of the House; Facilitating Action Taken Reports; Maintaining verbatim reports of various meetings; Uploading all the related information/data on the public portal.
- Members of Committee: To view meeting Notices, Tour itinerary online; Online receipt of study material sent by Committee Secretariat; Online scrutiny of replies submitted by Government Departments.
- Reporter Module-Facility to view List of Business, Questions and their answers, all other papers laid on the Table of the House including Bills; Facility to view Session videos; Facility to listen Session Digital Audio Files; Facility to enter verbatim text based on the time slots allotted to each Reporter; Facility of merging of verbatim text of different languages among the Reporters; Facility to transfer verbatim report to the Chief Reporter; Facility to view verbatim records of any other sittings; Consolidate and prepare the final version of the Day's proceedings; Publishing of Days proceedings on the public portal in Word/PDF format; Sending of verbatim records to the respective Members in electronic form for making any correction. Sending the final verbatim file to the synopsis and editorial branch.
- Mobile Application- Application developed in both the platforms Android/ioS for access of relevant information/data to the Members, officials and the citizens. The various House documents like LOB, Questions and Replies, Notices, Bulletins, synopsis, etc. can be accessed through the app in respective regional languages.
- Provision of the webcast facility to all the legislatures citizens to view the live proceedings of the House on the respective portals.
- Provision of Unicode compliant tools to facilitate data creation in multiple Indian languages.

Technologies

The Software has been developed in an integrated manner with the adoption of the Agile development model. The Application is integrated with the social media platform like Fcebook, Twitter, etc. Also the, incorporation of the speech-to-speech and speech-to-text translation mechanisms based on Natural Language Processing are being worked upon which will be incorporated in near future.

Moreover, the Public portal is provisioned with the charts and graphs as a part of data analytics. More advanced and state-of-art tools are being considered for incorporating the latest data analytics technology for better user experience.

Knowledge management tools offering a variety of functionalities to better manage the data repository are search tools, keying in of data through the secure content-management systems with the restricted access.

People

The Central Project Monitoring Unit (CPMU) set up in the Parliament House Annexe in 2018, is responsible for the overall monitoring of the project and ensuring its smoother progress. CPMU is responsible for providing all the assistance to the state SPMUs, etc. It has been established to look after the capacity building programmes and trainings of the variors Legislatures, officials across the country with the project.

To strengthen the project, two day training workshops have been conducted at various state assemblies to train and familiarise the officials of their secretariats, NIC as well as the Nodal officers of various departments with this application in continuation with the conduction of the 3 day Phase - II extensive training workshops at CPMU NeVA, Annexe Delhi. Various VCs have been conducted for the training of various stakeholders comprising Nodal officers of State/UT Assemblies, NIC officials as well as the concerned officers of various departments of State Govt. The CPMU team also arranged various programmes through the webinars to all the legislatures' participants in an open virtual learning mode during the COVID-19 pandemic.

Besides this, some of the states have also undergone Members trainings at their Assemblies to facilitate the running of their sessions digitally. The statistics for the trainings provided through different modes are as follows:-

- Phase 1 workshops in States - 24
- Phase 2 in Delhi - 14
- Phase 3 Member’s Training - 6
- Video Conferencing/Online Mode - 34.
- Besides this, the leadership support from the presiding officesr in the Houses and the top management officials in the various organisations has played a crucial role in the successful Implementation of the project.

VALUE INDICATORS

Learning’s for sharing

The various key learnings in the form of challenges and opportunities that were faced during the conceptualization and execution of the project are as follows:-

1) Utilisation of the existing functional automation assets like hardware/ software with the current e-Vidhan project.
2) Non requirement of the separate data centres in each state which would otherwise add on to the maintenance cost and the manpower cost.

3) Provisioning of the highly reliable connectivity infrastructure to the states for all time access of application.
4) Consideration of the sizes of the touch-screens, hardware to be installed for the different Houses as per the space available.
5) Non requirement of the unnecessary hardware like Servers, DBMS suites, language fonts, etc. being the responsibility of the Central Govt.
6) Making provisions of Hardware procurement by states as per their requirement through the suitable vendors.
7) Re-analysis of the cost of the project for hardware and other necessary items for each state Legislature based on the Gap Analysis, study,etc.
8) Change of the rules, regulations in the working of the House to suit the requirements of the software applications.
9) Requirement of the top management in the organisations to lead the implementation of the project and to ensure periodic review of its status along with the formulation of the better execution plans.
10) To engage all the stakeholders from Members, Ministers, Department officials, etc. towards the adoption of the application who may be reluctant to use the it in the initial level.
11) Capacity Building and regular training of the House Secretariat Staff, officers, department officials and other users towards the adoption of NeVA. To build the digital know how of the users by making them aware of the benefits.
12) Provision of the sufficient funds to the states so as to encourage them to successfully implement the project.
13) Facilitating the states with the constant technical and administrative support for mitigating the impacts due to hindrances.

Digital Empowerment

The steps taken to address various indicators in implementation of the project are as follows:-

1) Simple easy to use application- The application has been developed keeping in view the simplicity and far-reaching effects in the usage of application. The software is developed in a user-friendly way without making it difficult for the users towards understanding.
2) Availability in multiple language - The software is a Unicode complaint and has been developed to support multiple languages (regional languages) to ease the working of the users of the different legislatures.
3) Basic processes- The applications incorporates the use of the basic processes to make it easy for all types of users to understand it easily. It does not require a user to have prior knowledge of some technology, etc. for the use of the application.
4) Touch based access to e-book for easy understanding- The members in the House are provisioned with the touch based devices enabling them to have touch based access to the ebook and the other data.

   The e-book has also been designed in a very simple manner without any complicity of the functioning.
5) User-friendly interface of both web and mobile application- Both the web

application and th emobile application interfaces have been developed in a vaery user-friendly manner with all the data being made available on a single page.

6) Easy to understand language- usage of simple language in all the portals

7) Provision of customisable settings for users for ease in performing various tasks

Green e-Governance

The NeVA initiative is in line with the "Go Green" initiative and "Swachh Bharat Mission" of the Government of India. This will have long term impact on the environment as several thousands of tons of papers will be saved, thus saving of lakhs of trees annually and by making the working of Legislatures paperless, it will bring necessary transparency and cleanliness in Government Departments and Assembly Secretariats. An amount of Rs.340 Crore approximately, against the project cost would be saved annually due to implementation of NeVA leading to a step forward in the achievement of United Nation Development Programme's Sustainable Development Goal (SDG) -15 "Life on Earth". Therefore, the project would pay itself with in a short period of even less than two years, which makes the project economically viable and environment friendly.

Dr. Satya Prakash, *Additional Secretary, Ministry of Parliamentary Affairs, asmpa@gov.in*

Shri Mukesh Kumar, *Under Secretary, Ministry of Parliamentary Affairs, mukesh.kumar.mopa@nic.in*

Shri Sanjeev, *Senior Technical Director & Hod, Parliamentary Affairs Informatics Division, National Informatics Centre, New Delhi, sanjeev.irr@nic.in*

Sampada

Revenue Department, Collectorate Hardoi, Uttar Pradesh & National Informatics Centre, Hardoi, Uttar Pradesh

Avinash Kumar and Amit Mishra

PROJECT OVERVIEW

Checking and countering encroachment on government land is a major task of revenue department. However due to non-availability of any database of any sort of "Actual status" of such land, the encroachments get mostly unchecked. Even if any encroachments are reported, the field inspection reports do not usually convey the actual reality and hence a systematic approach for solving this problem was felt. Towards achieving this goal of checking the Bhu-mafia and encroachment problem "Sampada" – a google map based geofencing application was built completely in house with the help of NIC Hardoi. Launched as a pilot in 2021, we have now created a database of nearly 5000 land parcels belonging to the state. The land parcels were surveyed, photographically recorded and geo-mapped to create satellite images – using technology as basic as ordinary smartphones and a process that involved nothing more than walking across the boundary of the plot. By leveraging already existing land record information available in the Bhulekh portal of the Uttar Pradesh Government through an Application Programming Interface (API) with another API leveraging Google Maps, we created a platform to serve as a dynamic repository of Government Land records. Survey of government land can now be completed in a fraction of the time previously, which can significantly reduce the workload of the currently overburdened revenue administration, enabling the district officials to go beyond a fire-fighting approach towards a holistic land administration system. Salient Features: 1. Leveraging Existing Datasource: Land record data is drawn through an API from the state land record portal, Bhulekh. The revenue official can identify the land record to be surveyed from here. 2. GPS Technology through Google Maps API: The revenue official creates the boundary mapping and satellite image by tracing the boundary of the land with his phone in hand. No heavy equipment like chains is needed, and accuracy is higher. The map is available digitally, unlike paper maps, and cannot be manipulated. 3. Photograph Repository: Photographs of the existing state of land are taken from four corners mapped in the boundary. 4. Data Collection: State of land (encroached / not encroached), name of encroacher and eligibility for patta (land allocation), date of survey are recorded. 5. Institutional Knowledge through Data Repository: A history of each land record is developed to create institutional knowledge. Details of encroachers and details of individuals eligible for patta are stored to take necessary action.

Hardware/Software

This application is developed in Android Platform, Google Map API is used for location services, PHP and MySQL are used as backend server and database

Certification (Certifying Agency) No

Disaster Recovery and Service Continuity

Data is stored at cloud and daily automatic backup of data is taken and stored at different location.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Service	Brief e-Service description with benefits	Volume (Nos) of Services year wise		
		2020-2021	2021-2022	2022-23 (Upto date of nomination)
Landless families allocated land	Economically weaker Families who do not have land are identified and provided land on patta	4	7	53
Encroachments detected on government lands	Government land that are encroached is identified	12	14	96
Government lands freed from encroachment	Encroached land is freed and marked as encroachment free	13	11	42
Government lands mapped and surveyed	Geofencing of land is done	0	0	5100

Implementation

Test case - Sampada application was tested by a group of 10 Lekhpals and Revenue Inspectors in Sadar Tehsil of Hardoi. Based on feedback, changes were incorporated in the application. This group served as master trainers. First Stage: Sampada application was deployed in a single sub-division and over 300 plots were mapped and surveyed by Lekhpals. Randomized plots were checked by Revenue Inspectors. SDM and Tahsildar also carried out random inspection to verify data integrity. Second Stage: The application was extended to all subdivisions in the district. Nearly 2,500 plots of land have been surveyed under Sampada. Randomized inspection by Revenue Inspectors as well as higher authorities including SDM are done to ensure accurate reporting of data. Impact: Land allocation has been completed for over 50 families. Nearly 100 cases of encroachment were detected and eviction proceedings have been undertaken to safeguard the land. Sampada draws on data of land records in the record of rights publicly available from Bhulekh Portal of UP Government using an API. Data is created in Sampada when the user begins the survey process of a plot of land. Satellite image of the land and the mapping of the boundary is generated on the Google Maps API of Sampada application after the user traces the boundary of the plot. Photographs of the land are recorded along with the filled-up details of the encroachment, if any – the status of the land, the name of the encroacher, the time period of encroachment. This data is stored in the application database. The data corresponding to all the plots that have been surveyed on Sampada can be accessed and analyzed. A web-based dashboard simultaneously presents the statistics of the lands surveyed – the number of surveys completed, the number of encroachments detected, the number of encroachments removed – this is used in monitoring.

Improvements / Enhancements

Social Impact: Identification of landless poor encroaching on government land and regularization or allocation of patta – over 50 landless families identified and regularized. Nearly 100 cases of encroachment detected on government lands and

eviction action undertaken to free the lands. Governance Impact: Digital database of on-ground status of government lands developed – over 2,500 government lands mapped and recorded under Sampada. Data reflects reality - Satellite images of lands show on-ground status of the land. Overcoming vested interests – Randomized inspection of surveyed lands by higher authorities including Revenue Inspector, Tahsildar and SDM to ensure integrity of data and prevent collusion. Immutable Records – Digital database of encroachment status and mapping to prevent manipulation of data by colluding officials to favour vested interests. Data-Driven Action – Single database of land status makes it possible to derive actionable insights. In villages with highest encroachment, revenue officials including SDM, and police have been alerted. A list of encroaching individuals, a list of beneficiaries eligible for patta have been identified. Institutional Knowledge – Past encroachment history land is available to assist in decision making. Responsive Administration – The administration is able to act on encroachment cases much more rapidly. Technology Impact: Fast survey procedure has reduced time in measurement of government lands and decreased burden on staff. Highly scalable application – can be easily extended to cover more districts. Zero cost solution – No equipment except for an already existing phone is needed. Simple process – Lands can be easily surveyed without any technical skills. Even elderly and less technologically savvy staff can be trained within a few minutes to use the application.

ENABLER

Processes Re-engineered

Social Impact: Identification of landless poor encroaching on government land and regularization or allocation of patta – over 50 landless families identified and regularized. Nearly 100 cases of encroachment detected on government lands and eviction action undertaken to free the lands. Governance Impact: Digital database of on-ground status of government lands developed – over 2,500 government lands mapped and recorded under Sampada. Data reflects reality - Satellite images of lands show on-ground status of the land. Overcoming vested interests – Randomized inspection of surveyed lands by higher authorities including Revenue Inspector, Tahsildar and SDM to ensure integrity of data and prevent collusion. Immutable Records – Digital database of encroachment status and mapping to prevent manipulation of data by colluding officials to favour vested interests. Data-Driven Action – Single database of land status makes it possible to derive actionable insights. In villages with highest encroachment, revenue officials including SDM, and police have been alerted. A list of encroaching individuals, a list of beneficiaries eligible for patta have been identified. Institutional Knowledge – Past encroachment history land is available to assist in decision making. Responsive Administration – The administration can act on encroachment cases much more rapidly. Technology Impact: Fast survey procedure has reduced time in measurement of government lands and decreased burden on staff. Highly scalable application – can be easily extended to cover more districts. Zero cost solution – No equipment except for an already existing phone is needed. Simple process – Lands can be easily surveyed without any technical skills. Even elderly and less technologically savvy staff can be trained within a few minutes to use the application.

Technologies

The entire application has been developed by NIC Hardoi using Android,C# (C-Sharp) programming language on the .NET framework of Microsoft. Open-source technology

of Google Maps has also been leveraged for the surveying and satellite imaging feature of the application. Application Programming Interfaces have been used to integrate Google Maps with the surveying feature of Sampada. Boundary mapping and satellite imaging are done through this API. GPS technology in-built in the phone is used for location detection needed in the survey. An Application Programming Interface has also been used to draw the publicly available data of land records from Bhulekh Portal of UP Government. The in-built camera of the phone is used for taking photographs of the plot of land. These features have been integrated in one place in the Sampada platform in the survey procedure of land plots. The technology involved is not extraordinarily sophisticated – nearly every smartphone today comes with GPS and camera, and Google Maps is a cross-platform service available on Android and iOS – thus Sampada is interoperable on all devices.

People

The key step in translating the vision behind Sampada into a reality was training the revenue field staff, who would be the users of the system. Before training could commence, a need was felt to explain to the staff the reason for introducing a new application to obtain their buy in. There was a discussion on the shortcomings of the current approach, which were evident to the staff. It was explained how Sampada attempted to resolve these issues and the thought behind each feature of Sampada was discussed at length. The staff were expressly assured that the digital system was not being introduced to replace them. On the contrary, it would significantly reduce their physical burden by shortening and simplifying the survey process. Five early users, who had taken part in field trials, shared their experience of the application and the benefits they felt. They served as the first master trainers to train the remaining users – because the application process was so simple, there was little difficulty in explaining how to use Sampada.

VALUE INDICATORS

Learning's for sharing

ocial Problems: Powerful individuals are able to capture government land whereas eviction is mainly carried out against poor and vulnerable encroachers who need regularization of plots. Governance Problems: Lack of knowledge of ground reality, as what is reported is often different from reality. Thus, encroachments often remain undetected for years, and are hard to remove. Vested Interests and collusion of government officials with Bhu-Mafia (land-encroachers), and manipulation of paper-based records. No institutional knowledge on encroachments in the absence of any existing database. This results in an ad-hoc approach to tackling encroachment. Technology Problems: Slow, cumbersome survey procedure with heavy chains. Expensive new technologies such as Differential GPS (DGPS) will take significant time to roll out.

Digital Empowerment

The key step in translating the vision behind Sampada into a reality was training the revenue field staff, who would be the users of the system. Before training could commence, a need was felt to explain to the staff the reason for introducing a new application to obtain their buy in. There was a discussion on the shortcomings of the current approach, which were evident to the staff. It was explained how Sampada attempted to resolve these issues and the thought behind each feature of Sampada was discussed at length. The staff were expressly assured that the digital system was not

being introduced to replace them. On the contrary, it would significantly reduce their physical burden by shortening and simplifying the survey process. Five early users, who had taken part in field trials, shared their experience of the application and the benefits they felt. They served as the first master trainers to train the remaining users– because the application process was so simple, there was little difficulty in explaining how to use Sampada.

Green e-Governance

To maintain the list of Government land in the tehsil, manual register is maintained which wastes lot of paper but after the launch of the Sampada app all data is maintained digitally by the tehsil which saves paper and time of the tehsil staff.

Shri Avinash Kumar, *District Magistrate Hardoi, Revenue Department, Collectorate Hardoi, Uttar Pradesh,, dmhar@nic.in*

Shri Amit Mishra, *DIO NIC, National Informatics Centre, Hardoi, Uttar Pradesh, uphar@nic.in*

SPARK (Service and Payroll Administrative Repository for Kerala)

Department of Finance, Govt. of Kerala & National Informatics Centre Kerala State Centre

Mohammed Y. Safirulla K., Girish Parakkat and Jayakumar G.

PROJECT OVERVIEW

The system has been developed with a view to cater to the Administration, Payroll and Accounts matters of all Government establishments. A centralized integrated computerized personnel and payroll information system will help the departments to get details of any employee immediately, achieve highest level of transparency in dealing with the employees and can have more consistent application of rules etc. The major features are given below.

- A G2E web based Personnel Administration and accounts software for Government of Kerala covering 5.25 lakhs employees.
- Permanent Employee Number for all employees.
- Digital Signature enabled login.
- Addresses all requirements in Service, salary, Income Tax and Accounts matters.
- Centralized database helps in quick decision making and applying rules and regulations uniformly for all employees.
- Activity driven procedure linked data capture.
- All reports in PDF format.
- Provision to send alert messages to employees, when payments are credited.
- Provision to generate Identity Cards.
- On-line filing of Property returns for Government and AIS staffs with the option of filing digitally using Digital Signature Certificate.
- Changes made in one module will be reflected in all related areas of activity.
- On the payroll side, accurate and automatic payroll processing is facilitated.
- Rules and regulations are uniformly applied to all employees.
- Avoids complaints.
- Achieves better employee relations.

Integration Of Various Stakeholder-:

Integration with Accountant General office:

- Online Application for GPF Through Accountant General
- Gazetted Employees Management System (GEMS)

Integration With Kerala State Insurance Department through Viswas portal: State Life Insurance (SLI) and Group Insurance Scheme (GIS) details all state government employees are managed through Viswas Portal.

Integration of Govt and Aided educational Institutions: Sampoorna is a school management system project implemented by the Education Department of Government of Kerala. SPARK have being working with Sampoorna. for processing pay and allowance of teachers in these School.

Integration with Government Aided Institutions' PF System (GAINPF): The PF accounts of employees working under Aided institutions are managed by **Government Aided Institutions' PF System (GAINPF).** The system takes care of the entire life-cycle of PF management such as PF subscription, monthly entry, advance & withdrawal, refund, interest calculation, issuance of credit cards, annual statements etc.. through integration of GAIN PF with SPARK the system shares data with SPARK for processing the PF related claims of employees in aided institutions.

Infrastructural support from KSITM(Kerala State IT Mission): Infrastructural supports for smooth running of SPARK are provided by KSITM.

- State Date Centre: Hosting of Servers and Near DR site.
- Kerala State Wide Area Network(KSWAN): Network Support.

Mandatory DSC from KELTRON(Kerala State Electronic Development Corporation): For Security of bills submitted online all DDOs are requested to take Digital signature certificates (DSC) from KELTRON.

Integration With UIDAI for Aadhar Seeding: All Regular Employee can Verify and update Name as in Aadhaar and Number in SPARK. All temporary employee Register in SPARK with Aadhaar.

Hardware/Software

System Infrastructure:

- Co-located servers at State Data Centre having Load balanced multiple Application servers and Dedicated Replicated DB servers with SAN incorporation.

Platform/Technology used:

- Database: PostgreSQL 9.6
- Web Application: ASP .NET 10.0
- Operating system: Microsoft Windows Server

Servers in Use:

- Database servers : 2 (Master slave replication configured)
  - Server 1: For OLTP and processing
  - Server 2: Reporting and E-submission

Operating system: Microsoft Windows Server 2008 R2 Enterprise 64 Edition

- Application servers : 5 - VMs
  - Four servers to public
  - One for Spark PMU Help desk
  - Operating system: Microsoft Windows Server 2016 Standard

Infrastructural supports are provided by:

- State Date Centre : Hosting of Servers and Near DR site
- Kerala State Wide Area Network(KSWAN): Network Support
- National Informatics Centre(NIC) : Development and Technical Support
- Aadhar Seeding for Temporary Employees
- KELTRON : Hardware Support and Training

(Certifying Agency)

Formal Security audit certification have been obtained with respect to cyber security from CERT-K

Disaster Recovery and Service Continuity

The backup, disaster back up policy and mechanisms in place are:

- Replicated Data base

- Daily full backup
- Daily backup copy at different locations
- Tape drive backup copy

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes.

Name of e-Service	**Brief service description with benefits**	**Volume (Nos) of Services year wise**		
		2020-21	**2021-22**	**2022-23 (Up to date of nomination)**
Allotted Permanent Employee Numbers (PEN)	Total number of regular employee having PEN 378947	90671	169847	209100
Bills of salary and Claims Processed	•Salary bill •DA/Salary Bill •Pay revision arrear bill 2019 •All Claim bill	6068886 10082128 483647 524341	6052922 2854577 6620579 571825	3509431 265315 363419 435585
	•GPF Admission Application •GPF Temporary Advance Application •GPF Closure Application •GPF NRA Withdrawal Application	25673 102612 14065 71001	23165 120748 22999 92282	12473 84232 17391 69607
Temporary employee registration		24683	37921	73125
Pay and allowance temporary employee bill		149822	131360	131276
Increment		407940	439262	297803
Transfer		59651	90178	68421
Promotion		72258	85226	56500
Leave application		42791	83096	94258

Implementation

While implementing this project, the management team, formulates its organization strategy by implementing the technologies available at that time and ventures the project based on the circumstances of that time. Data is soul to an e-governance system. Inputting initial data into the system, verify it, and lock the data from further manual editing etc are vital basic steps to build and nourish that soul. Data comes to SPARK through three sources. In the first place, it is through bulk data entry by the departments when they become part of SPARK. Second major source is the data being generated by SPARK when the users run processes available in the system. Third is manual updating of data by authorized users in areas where automated processes are

yet to come. Since payroll activities were commissioned first in SPARK, with speedy implementation in mind, user departments verified the data that are vital for payroll processing and started to use SPARK. It will make HR procedures more effective, efficient and transparent. But now a lot of human resource management related modules have been added to SPARK and the system is taking the shape of a comprehensive and single Employee Management Information System for the state government as envisaged originally. Hon'ble Governor's speech, Budget, White paper, Bulletins, List of Business, Papers laid, Demands for Grants, News, Notice for 6th and 7th Session of 16th Assembly have been made available in NeVA website and mobile app.

The SPARK Data integration with other e-governance project bridges the gaps between government and its stakeholders and also helps to strengthen Government to Citizen (G2C), Government to Employees (G2E), Government to Government (G2G) and Government to Business (G2B) transactions. Implementing this Data Integration with Other e-Governance project was a crucial step. As SPARK being the single and comprehensive employee management information system for the state government with the HR and pay roll details of all the government employees, it also acts as the mainstay of state financial disbursement system. At the time of joining in service, the employee details get registered in SPARK database. Subsequently entire data in respect of service and salary related matters of the employee are captured in the system. As a result, HR and pay roll related information of any employee can be retrieved from the system in no time. SPARK shares HR related data with other ICT systems like VISWAS, AMS- Attendance Management System, e-office, GPF system etc. In addition to that, the SPARK software is integrated with treasury and Accountant General Office General Office to facilitate financial transactions through SPARK. This Interoperability of the systems will help to standardize the data and will ensure better performance results. Recently attendance punching data integration has been carried out in SPARK for Secretariat employees. Moreover the digitization of employee data in SPARK enables the decision makers in formulating various policies relating to human resource management in government Sector. The prime example of utilizing SPARK data for decision making was seen during finalization and approval of 2014 Pay Revision Order. The financial implication of PR 2014 was calculated based on the SPARK data.

SPARK Data integration with other e governance projects has done in such a manner that specific data from SPARK in approved format flow into the connected application through secured web services and in return processed and authenticated data from each connected e-governance project, that are relevant to SPARK, are fed back automatically in SPARK system. As data checking being done at each level the data stored and updated in SPARK and connected systems will be highly accurate.

Improvements / Enhancements

SPARK PMU is continuously updating the system, based on new Govt policies and also by considering the needs of employees, as they are the main stake holders of the system. The below mentioned changes have been made in SPARK during the period 2020- 2022.

Online Leave Management Module: SPARK has enabled leave management module for managing the leave details of state government employees enrolled in SPARK system. Any employee who has been enrolled in SPARK system (having PEN) can apply leave online through the Leave management module proffered at the SPARK login page.

- Online leave management system

- Attendance management system
- Online outstation duty intimation
- Leave account processing and cancellation module

e-Service Book: In order to ensure the accuracy & precision of service records, Government have given approval in principle for launching e-Service Book for Gazetted and Non Gazetted Employees of State Government instead of Physical Service Book. Thereby SPARK PMU was entrusted with the development of module for the e-Service Book.

Objectives:

- Aimed at paperless governance and effective human resource management.
- Service records which were earlier documented in paper files will now be available online.
- For employees and heads of departments, the service book is a crucial document. All data associated with the service of government staff is recorded in the service book. Right from the date of joining of an employee to promotions, increment, transfers, departmental action, pay scale, leave and other service matters are included in the service book.
- In the event of shifting of an employee from one department to another, the service book would be sent online to the new office.

Online Application for GPf Modules:

The SPARK PMU has updated a new module for General Provident fund for submitting online application to Accountant General. GPF Admission /Non Refundable Advance and Conversion application by individual employee with the proper recommendation and sanction from the Department officers concerned and this is to be pushed as online to AG‘s system.

For each and every online application there is a status retained in the individual users or DDO level to know the progress of application. Corresponding sanction order details will be available in the DDO users and can be forwarded to AG for processing. Once the application processed or sanctioned from AG subsequent intimation will be available in the DDO interface. As per **the G.O(P) No 37/2019/Fin, dated 30/03/2019** Government has revised the existing Upper Monetary Limit to various categories of Sanctioning Authorities for sanctioning NRA/Conversion of Temporary Advance to NRA subject to a maximum of 75% of the eligible balance at credit of the subscriber, as booked by the Accountant General. All NRA/Conversion of Temporary Advance to NRA will take in effect only after getting online authorization of the Principal Accountant General in SPARK and all the bills of the GPF NRA will be generated and encashed by the DDO's through SPARK only based on this online authorization issued by the Principal Accountant General.

- Facilities in ONLINE APPLICATION FOR GPF MODULES
- GPF New Admission
- GPF Temporary Advance Application
- GPF NRA/Withdrawal Application
- GPF Closure Application

Certificate of Transfer of Charge on Leave (CTC): A new module has been enabled in SPARK for online leave management system and for Generation of Charge Transfer certificate (CTC) of Gazetted government employees. DDO will sanction the leave application submitted by individual employee and same will be forwarded online to AG‘s system. Once the Leave is approved or sanctioned from AG, necessary leave salary slip will also be issued by AG and same will be available in in DDO interface. Pay slip will also be available to Employees and DDOs through KSEMP portal of AG.

Income Tax Module: A new module for processing income tax (for individual processing) has been enabled in the SPARK
Features:

- The tax calculation is based on Section 115BAC
- option for comparing and opting the apt tax regime
- option for tax comparison
- option for Download IT Report
- Process income tax through both individual access and DDO access

Annual Property Returns Filing Module: The annual property returns filing module in SPARK is complete and is used by many departments. From, the next year onwards, employees of all departments have to be brought under the system.
Online Pran Generation Module (OPGM): PRAN(Permanent Retirement Account Number) is issued by NSDL (National Securities Depository Limited) for which employee need to fill the NPS application form and submit it to respective District Treasury officer. After verification, the District treasury officer will forward the verified applications to NSDL for providing PRAN to the concern employee. The whole procedure was done manually which is considered lengthy and tedious. In order to fasten the procedure an online PRAN generation module was introduced.
DDO need to forward an online application for the employee to concern District Treasury Officer. Before applying DDO should ensure that all the employee details are correctly entered in spark. The employee details are needed to be filled Four options are needed to be filled by the DDO,

- Employee details
- Nominee details
- Bank account for PRAN
- Validate & Forward to DTO

ENABLER

Processes Re-engineered

As part of process reengineering, SPARK PMU enforced some major changes in the system and also issued many Government orders for ensuring the sustainability of the system. Some of the major process reengineering strategies implemented by SPARK PMU are as follows:
Online Leave Management Module: Earlier the leave management of government employee was complicated. The employee had to submit all leave application manually to their reporting officer. For Approval, application had to be forwarded to higher authority. After approval the leave details had to be updated manually in service book otherwise salary of employees will get affected. Through this online work flow Employees can apply any type of leave and can management the leave anywhere by DDO. Options for accessing leave management module is facilitated to users based on the SPARK user privileges assigned to them. The Reporting officer/Approving authority can be verify the application and approve it through their login in SPARK.
Online Application For GPF Modules: Applications for GPF Admission. Temporary Advance, Non Refundable Advance, Closure were forwarded manually to Account general office by Employee after proper recommendation from DDO. These applications were forwarded manually to treasury from AG after approval. GPF transactions were made through treasury to concerned employee. Verification and Approval procedural for these GPF events was time consuming and the employees had to deal with various procedural delays from AG office from approval. But the SPARK PMU has updated a new module for General Provident fund for submitting online

application to Accountant General. GPF Admission /Non Refundable Advance and Conversion application by individual employee with the proper recommendation and sanction from the Department officers concerned and this is to be pushed as online to AG‘s system.

Processing Module (Salary/ Arrear/Leave surrender/Other allowance): Before SPARK implementation, salary/arrear processing of government employees was done manually by each employee. In that case the employees had to deal with various procedural delays and complications. Most of the employees may be unaware about new increment, arrears, allowances etc. This may end up with erroneous salary processing.

Now Monthly salary/arrear processing can be done through SPARK. When DDO process a salary/arrear, the process will go in a job queue. The processing time and processing status will be displayed on the screen. Salary/ processing option is enabled for Gazetted, non-Gazetted and Temporary employees. As part of process reengineering, SPARK PMU enforced some major changes in the Salary/arrear process module during the period 2020-2022:

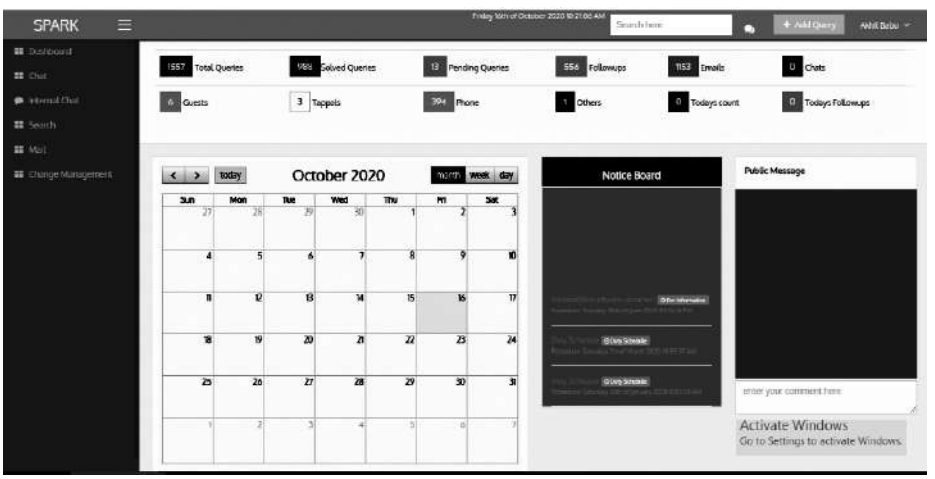
DSC Mandatory for e -submission: SPARK has facilitated the e-submission of Salary Bills and claim bills with Digital signature by the DDO /The head of the institution concerned. E-submission of Salary bills with DSC facility was already there for Finance Department and Treasury Department now this facility has been extended to all the DSC implemented departments and in addition to the salary bills, now claim bills can also be e-submitted with DSC.

Paperless E-submission of salary Bills through SPARK: The major process reengineering strategies implemented by SPARK PMU is Paperless E-submission of salary Bills through SPARK. The monthly salary Bills and other claim which was processed and generated through SPARK were submitted physically to treasury with the hardcopy of bills after approval from the higher authorities. For automating this procedure of bill submission to treasuries, SPARK PMU has enabled paperless e-submission of salary bill module in SPARK. This made the whole process simplify and disbursing of salary to employee this not affect this present situation.

Technologies

QUEST; an in-house helpdesk software:

An in-house software 'QUEST' has been developed by SPARK PMU to monitor the number of emails, guests, phone calls, chats, Tapals and the type of queries received



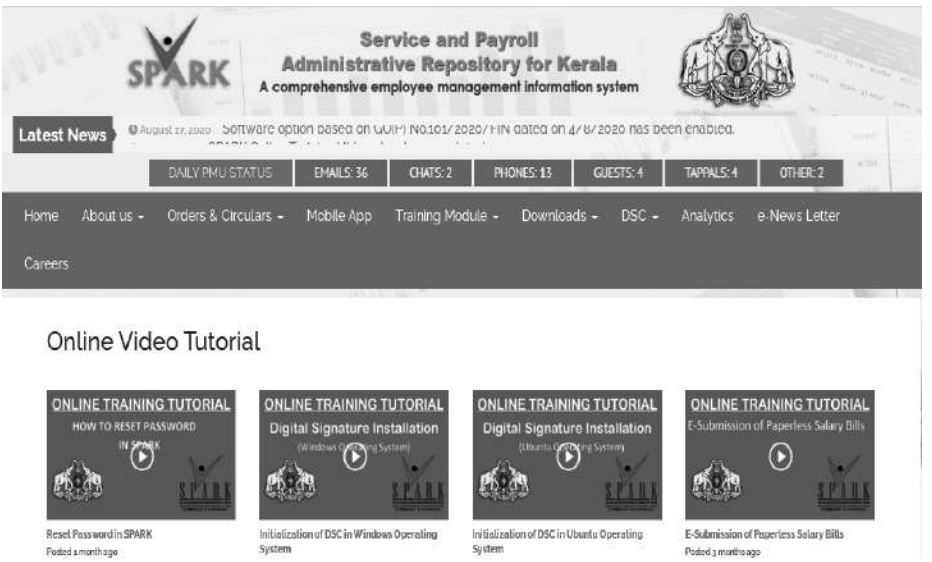
at SPARK Helpdesk. With the help of 'Quest' software, SPARK PMU can identify the frequent queries from the stakeholders and it helps in locating the SPARK modules which need modification. On examining the frequent queries, necessary changes or additions can be made in those modules to make it more users friendly.

Online Learning environment in SPARK:

SPARK is the Employee Management Information System of Kerala Government for managing its human resource. Lifelong learning happens when formal and informal, traditional and online leaning methods are blended systematically into a single learning life-cycle.In the formal side SPARK PMU arranges formal training programmes on demand from field departments. SPARK PMU has also created a dynamic learning environment through Department Master Trainers. Department Master Trainers are, in fact, training volunteers who have substantial experience in using SPARK and got further intensive training. In a lifelong learning environment, presence of an online learning platform to bridge the time gap between different formal training batches is quite essential. With this objective in mind we have designed a new info website for SPARK and that will be launched soon. The new info site will have a very easily usable and regularly updated online manual and FAQ.

Online video tutorial:

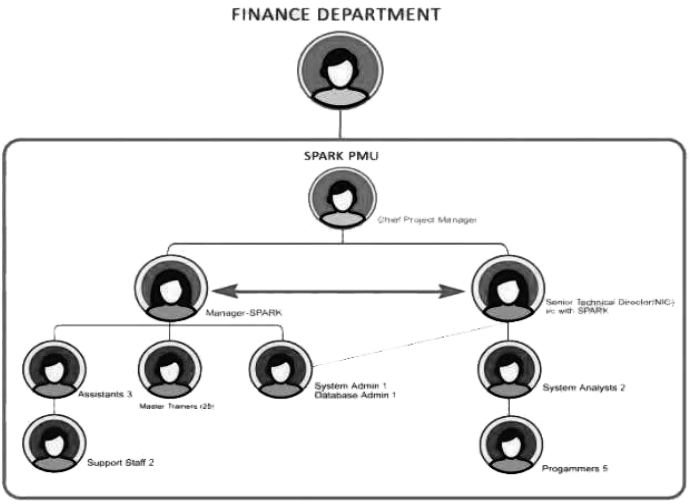
SPARK PMU is continuously updating the system, based on new Govt policies and also by considering the needs of employees. Tutorial video of new and latest update / module will be upload in website www.info.spark.gov.in.



People

SPARK maintains a sedulous and responsive helpdesk system, which is destined to resolve the queries related to service and payroll activities through SPARK. As part of confining all service and payroll activities through one point and to automate the government procedures, all state government employees' service and salary related procedures are now being processed through SPARK During the project implementation period, SPARK PMU has developed a customized helpdesk management software, 'Quest' to manage the helpdesk procedures, and now as part of process reengineering, SPARK PMU redesigned Quest software to make this meet all

the necessities of an help desk unit. Well organized systems are in place for facilitating SPARK implementation, providing runtime support, obtaining user feedbacks, develop and update the software. Finance Department implements SPARK through the SPARK Project Management Unit (PMU) functioning under it.



Organisation Structure of SPARK PMU:

We have a dedicated team of experienced 41 Master Trainers stationed at SPARK Project Management Unit. Out of it 35 Master Trainers are stationed in SPARK PMU, Thiruvananthapuram, 3 Master Trainers in SPARK, with district level regional help desks across the state.

SPARK PMU has two frontend help desks system functioning at Thiruvananthapuram and Kannur districts, to deliver support services to its stake holders. SPARK helpdesk unit working under SPARK PMU unit Thiruvananthapuram and its regional unit at Kannur offer services through emails, chats, phone calls, tapal and assist officials who approach PMU as guests. SPARK PMU redesigned the 'Quest' to equip the software manage all helpdesk procedures effectively and promptly. Quest enables the SPARK authorities to monitor the calls and the type of queries received at the Help Desk. With the help of 'Quest', SPARK PMU can identify from which module the most number of queries are asked and the changes to be made in the module. It also helps to record and quantify the number of queries answered by mail, chat and phone at the Help Desk by each person.

VALUE INDICATORS

Learning's for sharing

As part of confining all service and payroll activities through one point and to automate the government procedures, all state government employees' service and salary related procedures are now being processed through SPARK. With respect to payroll and other benefits, an average of 21,06,213 bills are processed yearly through the SPARK system. Data to be handled is also very huge as system has to manage the data of 5,42,220 regular and 1,60,279 temporary employees from 33199 offices under 119

departments, so obviously, the queries approaching SPARK helpdesk unit would also be very huge. During the project implementation period, SPARK PMU has developed a customized helpdesk management software, 'Quest' to manage the helpdesk procedures, and now as part of process reengineering, SPARK PMU redesigned Quest software to make this meet all the necessities of an help desk unit.

Help desk functions operating through 'Quest'

- Email handling
- Duty Assigning
- Tracking the query status
- Forwarding the complaints to software section and communicating with software section-Chat activities
- Sending SMS to employees

Email Handling: SPARK PMU has been receiving more than 600 emails each day. Forwarding these emails to helpdesk personals, who have been assigned email duty is done through this 'Quest' software. Also the SPARK administer can know the number of emails pending with each helpdesk personnel's and status of the email query sent by to SPARK's email id, using this application.

Duty Assigning: SPARK authorities can assign duties to help desk personals using this helpdesk software. Also this 'Quest' software is helpful in identifying the areas of expertise of each helpdesk personals and assign duties based on their expertise, which is helpful in handling the queries approaching SPARK PMU very efficaciously. This application is worthwhile in managing the helpdesk duties and also expedient to utilize the human resource at SPARK helpdesk.

Tracking the query status: This facility is very useful in tracking the status of a query once attended by the SPARK helpdesk unit. The helpdesk personals has to log into the 'Query' system using their individual User id and password and on attending each issue the helpdesk person enters the details of attended issue into 'Quest' query details page. The details to be updated in the 'Quest' query page is PEN of the employee who is having this issue, user code (DDO's PEN), Email, Contact number, Query type (Salary, promotion, DA arrear, Salary arrear, transfer, part salary….), Communication type, this option is to mark the query is discussed through email, phone, chat, tapal, or as discussed in person when guest visited SPARK PMU).

Forwarding the complaints to software section and communicating with software section: This facility included in the 'Query' system to report the issues which need software assistance to software section. Software section has also given separate login and provided user id and password to log in to the 'Quest' system for viewing the forwarded query details from SPARK help desk, also the software section can communicate with SPARK helpdesk using this option.

Chat activities: SPARK PMU will soon enable the option for incorporating Chat facility to the 'Quest' system. This will be useful for managing the chat activities and also to record the chat details and solutions discussed through the chat session. New chat module of the 'Quest' will be having default messages saved as canned messages for common queries, so that the chat operators can select such messages from the canned message list and can reply the queries through chat conversation. These canned messages save the typing time and thereby enabling the chat operators to answer more queries coming to their chat box.

Sending SMS to employees: Helpdesk persons update the query details into 'Quest' software after attending the query and the 'Quest system generates the 'Query ID' for

the updated query. The 'Quest' system will be soon modified in such a way that the Query ID generated on query updation will be sent to the concerned employees/user's contact number updated through Quest, so that they can approach SPARK PMU with this Query ID for knowing the status of the issue in detail, also if their issue forwarded to software section, the solution will be sent as sms through the proposed sms sending option.

Digital Empowerment

As part of e-governance move in the state, all the major projects of the state have been brought under digitalized work flow. Sharing of these digitalized data to other projects, which need this information for their processing procedures will help those projects to save lot of time, effort and manpower. A centralized integrated computerized personnel and payroll information system will help the government to get details of any employee immediately, achieve highest level of transparency in dealing with the employees, more consistent application of rules etc. On the payroll side, accurate and automatic payroll processing is facilitated. It also ensures that the rules and regulations are uniformly applied to all employees thereby avoiding complaints and thereby achieving better employee relations. Integration with treasury is a part of Integrated Financial management System (IFMS) implementation. Before Treasury integration, salary bills, processed through SPARK need to be re-entered manually in Treasury offices for encashment. Manual re-entering of data in salary bills may end up with data redundancy and affect the integrity of data. But, after Treasury integration, the data processed in SPARK system automatically gets updated in Treasury offices, so manual re entering of data is not required in Treasury Offices. This reduces the time and efforts of financial transactions.

As a part of digital empowerment The SPARK system has provision to generate all the reports in PDF format. SPARK provides interface for individual employees to view their salary, loan, leave, GPF, accounts and personnel details, Provision for filing Annual Property Returns for Government Employees and All India Service officers. Benefits of the system includes easy and speedy pay bill preparation, automatic generation of Employee Identity card, automatic alerts and notifications when payments are credited and ensures transparency and smart administration.

Green e-Governance

Going paperless have a huge impact on the environment through reducing paper consumption, by turning paper documents into electronic ones. A tree can only produce, on average, 17 reams of paper, and takes about 100 years to grow. By reducing paper usage, companies can have a direct impact on reducing their carbon footprint. After all, more than 50% of paper comes from virgin forests. Going paperless helps to reduce C02 (carbon dioxide) emissions. Turning a single tree into 17 reams of paper results in around 110 lbs of C02 being released into the atmosphere. Additionally, trees are also 'carbon sinks' and every tree that is not cut down for paper usage is able to absorb C02 gasses. The average tree can absorb around a ton- 2,000 lbs- of C02 in its lifetime.Considering thisscenario the idea of paperless salary bill submission was introduced, Government have examined the matter in detail and are pleased to accord permission to the DDOs of all Government Departments, including Aided institutions, only to e-submit the digitally signed SPARK bills for the salary claim from 3/2020 alone, without submission of any signed hard copy of the outer/inner/schedules of the same to treasuries.

While for 15 departments it was a successful experience, Government now extended the paperless bil1 system for monthly salary bill s of 8/2020 onwards for the 57

department. The Implementation of paperless salary bill submission was successfully accomplished with all the necessary amendments were made and implemented within the given time period. Now we are planning to implement paperless salary bill submission in all departments (115) in next year. By going paperless we can not only save the environment but it also saves companies a lot of money. By automating all E-governance project processes and transitioning to more eco-friendly workflow solutions, each project can saves tens, hundreds, and millions of dollars this year, and every year.

Mr. Mohammed Y Safirulla K, IAS, *Officer on special Duty–Finance Resources, Department of Finance, Govt. of Kerala, secyresourses@gmail.com*

Shri Girish Parakkat, *Joint Secretary to Govt., Department of Finance, Govt. of Kerala girishp@kerala.gov.in*

Shri Jayakumar G, *Senior Technical Officer, National Informatics Centre Kerala State Centre, jayakumar.g@nic.in*

Telangana State Child Protection & Welfare Portal (TSCPW)

Women Development & Child Welfare Department, Govt. of Telangana & Centre for Good Governance, Telangana

D. Divya, D. Rathnakumar and Rajendra Nimje

PROJECT OVERVIEW

The Telangana State Child Protection & Welfare Portal (TSCPW) supports the government in end-to-end tracking of children who are rescued in Operation Smile, Operation Muskaan or any child who are recognized as need of care and protection. The portal provides standardization of information about rescue, rehabilitation and repatriation of the rescued children. It provides vital data analytics to understand the hotspots, vulnerabilities and gaps in the whole process to ensure child wellbeing.

Objective:

- Telangana State Child Protection & Welfare Portal enables the officers of WDCW Department to effectively monitor the whereabouts, conditions and progress of the rescued children across the state.
- TSCPW portal facilitates to register children who need care & protection or conflict with law.
- It facilitates Institutional/Non-Institutional placement of child and enables Review of the Placement regularly and transfer children within state or out of state. It enables to give orders, do social investigation and develop individual care plans for each child. Child profile walks through complete details and processes undergone including police and judiciary proceedings and labour compensations.
- It reduces the drudgery kind of work involved in processing as system generates required templates automatically. With minimum customization, the processing staff can generate complete document. TSCPW empowers and helps the officers to perform daily tasks in an easier and better way. At the same time all level officers have dashboard & reports for monitoring & Control. It ensures transparency & enables real time data monitoring.
- This application makes it easier to donate funds to improve the lives of institutionalized children and ensures transparency and accountability in maintaining the information of the children funds. Additionally, it makes it easier for State and district inspection authorities to inspect childcare facilities and provide feedback, which helps higher officers to decide whether to continue or shut them down. It automatically generates department orders using pre-defined templates and provides the option to sign and upload them. To track employees' performance, senior officials have access to dashboards and reports.
- The salient features of the application include- Anywhere access, Mobile Compatibility, Master data Management, Role based Access and Administration, MIS Reports and Dashboards, Dynamic Child profile. Each user has a unique pre-configured Login ID, using which he/she can access the numerous services at their disposal.

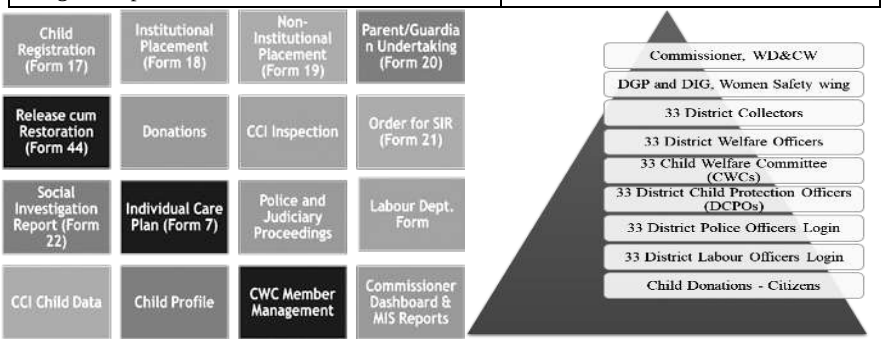
Scope- functional and geographical:

- Each application user interface is meticulously designed such that it provides alerts and prompts to the user in the form of pop-ups and SMS to everyone involved at every stage, so that the users are always aware and informed of the actions performed in the application. Since the application is mobile compatible, it can be accessed through mobile browsers.
- Understanding the ease of eGovernance, Women development and Child Welfare department of Telangana has proposed TSCPW to overcome the difficulties faced to track the children rescued and their rehabilitation facilities.
- TSCPW developed by Centre for Good Governance has created better platform and facilitated employees to apply for online services. Introducing this system did not only avoid errata, but also improved transparency and maintenance of consistent data.
- TSCPW application Dashboard and reports reduced the cumbersome and time-consuming manual communication of the officials with 300+ Child CIs to know the basic details like strength and tracking a child after a period. Child profile covers all the details of the children which includes complete track of the processes undergone in chronological order, Police and Judiciary proceedings, Compensations acquired, social investigation report, Progress report etc.
- The initial discussions were held with the Commissioner, Women Development & Child Welfare Department, Telangana and also a detailed requirements studies and series of interactions & Meetings conducted for understanding the processes.
- TSCPW has integrated Payment Gateway for Donations. People from all over the world can donate to a reliable source.
- Modern technology has been a forefront priority for TSCPW and innovative approaches like Mobile compatibility, SMS alerts, alert notifications for pendency & Reengineering of various processes by involving stakeholders.
- Prior to initiation of TSCPW, there was no MIS, due to which it was difficult to monitor the strength of children rescued in different districts in each operation across the Telangana state. Without MIS it was very difficult to know the strength at various childcare institutes and the conditions of the infrastructure of the same. It was difficult for the higher officials and HODs to know status basic details like children strength at each CCI, placements, child welfare committees operations and inspection reports of state and district inspection committees etc.
- TSCPW has filled in many gaps in terms of technological and administrative challenges across the entire eco-system which makes it a one-of-a-kind invention.

TSCPW Software has the following modules-

Child Registration	Pre-release report service
Placement of the child	Post-release report service
Review Recurring of Placement	CCI Inspection module
Transfer of the child	CCI Child Data
Parent Undertaking	View CCI Child

Release cum Restoration	Police and Judiciary Proceedings
Child form upload	Labour Form
Order for Social investigation	Dynamic Child Profile
Social Investigation	CWC Member Management Service
Individual care Plan	Dashboard and MIS Reports
Progress report of the child	



Hardware/Software

- Java 1.8
- Spring boot 2.x
- Database: postgresql 12
- Gitlab
- Virtualized Environment-VMware

(Certifying Agency)

Yes, Deccan Infotech private limited.

Disaster Recovery and Service Continuity

- CGG, as the technology partner, has its own datacentre and uses information technology to process information quickly and effectively. CGG processes information and stores large amounts of data in its state-of-the-art datacentre at its premises.
- An information technology disaster recovery plan is being implemented by CGG in conjunction with the business continuity plan. Priorities and recovery time objectives for information technology are developed during the business impact analysis. Technology recovery strategies are developed to restore hardware, applications, and data in time to meet the needs of CGG business recovery.
- CGG uses the following technologies for Disaster Recovery and Business Continuity:
    - DC-DR replication between and within the same datacentre at the storage level with latest technologies such as "Synchronous Mirror Business Continuity" for high-availability of services to the citizens.
    - Data Centre-Disaster Recovery (DC-DR) replication between datacentre is within 20 km radius using OEM proprietary technologies with VMWare for high-availability of services to the citizens. The Disaster Recovery Centre for CGG's datacentre,

equipped with state-of-the-art Hardware, Software and Control Infrastructure to achieve optimum operational performance, safety and security is located within its premises (STPI, Jubilee Hills).

- CGG Business continuity is achieved by VDI (Virtual Desktop Infrastructure).
- CGG has its own infrastructure of power source like multiple 500 KVA, 250 KVA generators in place and GRID POWER (300 KVA) for its datacentre along with a renewable energy source through Solar Carport Plant (289.75 KWp) to reduce Carbon Intensity is in place.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes.

Name of e-Service	Brief e-Service description with benefits	Volume (Nos) of Services year wise	
		2021-2022	2022-23 (Upto date of nomination)
Child Registrations	Registration form captures basic information about the rescued child and rescue operation team. It also captures circumstances, health conditions, Parent/ Guardian details etc. Based on the circumstances, record moves to necessary logins.	17,469	5,767
Placement of the child	It facilitates to select the process of institutional placement, non-institution placement or transfer of children based on child welfare committee decision	Institutional Placement: 8,781 Non-institution placements: 4,264	Institutional Placement: 1,360 Non-institution placements: 2,033
Parent Undertaking	It facilitates to hand over the child to parent based on child welfare committee decision with supervision.	2,994	1,795
Release cum Restoration	It facilitates to hand over the child permanently to parent based on child welfare committee decision with 6 months supervision.	734	237
Police and Judiciary Proceedings	Based on the circumstances in which child was found, the record moves to concerned police station. All the police and judiciary proceedings captures in the system and reflected in reports, dashboard and child profile.	264	0
CCI child data	Existing children details i.e., children who are already in CCIs before TSCPW are captured and incorporated in the process.	8,751	NA
CCI Inspection module	Childcare institutes should be inspected by State inspection committee and district inspection committee quarterly. The detailed information is captured and based on these,	NA	79

	higher officials can take decision to continue or close down the particular CCIs.		
Social Investigation Report	Detailed investigation for information regarding personal, family, relations, habits, , present living conditions, education detail, friends and neighbours, behavioral details, Physical and mental condition, health details etc. are captured and pdf is generated for sign and upload.	NA	296
Individual Care Plan	Complete child information, Areas of concern and proposed interventions are captured, and progress report is generated fortnightly by making necessary changes if needed, which should be followed to make the condition of the child better.	NA	833

Implementation

An innovation in the form of TSCPW was conceived and nurtured by the Government of Telangana to create a breakthrough reform in services provided especially in pandemic time, which increased the children in need of care and protection. The major stakeholders of the Project are employees of WD & CW Dept. and Centre for Good Governance (CGG), who have undertaken the massive exercise to consolidate accurate Data and devise a method for onboarding the existing children into TSCPW along with incorporating all the JJ Forms. The process addresses goals and objectives as follows:

- Easy access for online services.
- Transparency in Child data and funds.
- Availability of required documents in online.
- Dynamic Updation of respective child profiles.
- Accurate Data of children and CCIs.
- MIS Reports & Dashboards for higher officers.

TSCPW has simplified the conventional Government process to just a few user-friendly processes. Drawings of early-stage implementation did not only emphasize the magnitude of strategic requirement for deployment of application by integrating other departments. But also, the necessity to conform the modifications in the system. Workflow of the system is developed strategically by separating the Stakeholder at every module as an entity. Seamless integration of activities of diverse entities into a single system.

- Modules and process flow
- Monitor, review and evaluation

Modules & Process flow:

Developed software is conformed and confined to specific roles and services as shown below.

Child Registration: Child registration can be done by district child protection officer or child welfare committee member in their respective logins. After registration the data moves to child welfare committee login for placement. And also based on circumstance selection, the record may be moved to police and labour logins. Child strength in each phase reports are available in online including transfers

Placement of the child: Options are available for Institutional placement, non-

Institutional placement or transfer to other CWC according to the decision made by child welfare committee. Facilitated to conduct regular reviews based on the selection of review date in previous placement. Placement of the child can be changed according to the needs.

Social Investigation Report: Order for Social Investigation Report given by child welfare committee member. As per the order, the data moves and available in district child welfare unit login. Detailed investigation is done and information regarding personal, family, relations, habits, history of involvement of family members in offence, present living conditions, education detail, friends and neighbours, behavioural details, Physical and mental condition, health details, Training & employment, various observations are captured.

Individual Care plan (ICP): Apart from child complete information, Areas of concern and proposed interventions are captured which should be followed to make the condition of the child better. Every fortnight, ICP need to be reviewed and progress report is being generated. Accordingly necessary changes are made for the child's improvement. If the child is restored with parent permanently, Pre-release report is generated before restoration. After restoration also, post release reports are generated by capturing all the details of the child after restoration iteratively to know how the child coping up.

Parent Undertaking: After placing the child in non-Institutional placement, if CWC decides to hand over the child to parent then system generates parent undertaking form.

Release cum restoration: After placing the child in Institutional placement, if CWC decides to hand over the child to parent then system generates parent Release cum restoration after Pre-release report.

Inspection Module: Child Care Institutions (CCI) are inspected by State/District Inspection committee quarterly. All their observations and recommendations are captured in detail w.r.t. status of children, infrastructure, facilities, children committees, record maintenance, staff details etc. Final recommendations whether the CCI is satisfactory or may be continued with conditions or to close it down are provided by the committee.

Police and Judiciary Proceedings: All the records with specific circumstances i.e., Homeless, Street children, Runaway, Missing, Begging Child Labour, Bonded Labour, Child Abuse/Exploitation, Child Trafficking, Child Marriage Victim need to select police station. Those records reflects in selected police station login. All the police and judiciary proceeding can be captured i.e., Complaint Filing Details, Police Station Details, General Diary details, FIR Details, Accused Details, Statement U/s 161/164 CrPC, Darpan/ Trackchild Portal details, Charge Sheet details, hearings and Final Judgement details and the detailed role-based reports for higher officers.

Labour Form: Data with specific circumstances i.e., Child Labour, Bonded Labour displays to Labour logins of that specific district. Customized forms for Child, bonded and adolescent labour. All the Labour proceeding captures data like i.e., Inspection Report Details, Bank Account details, Release Certificate details, immediate assistance (corpus fund) Details, Compensation awarded, Back wages recovery details etc. Detailed role-based reports for higher officers.

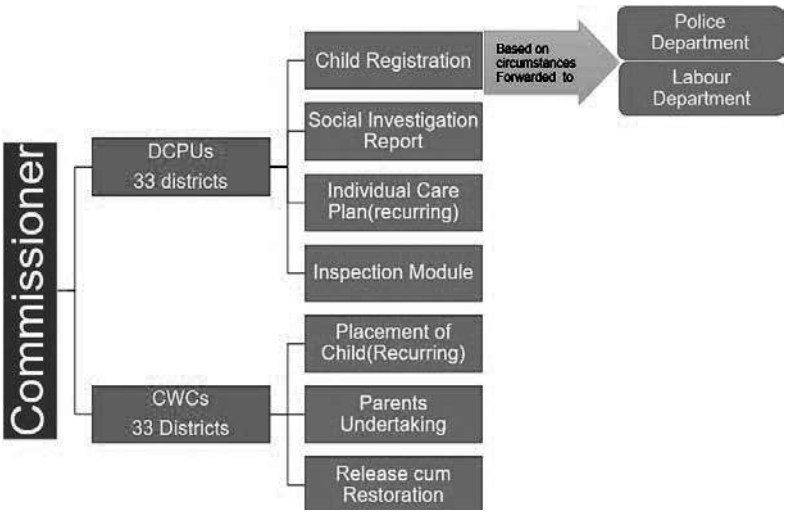
Child Profile: Child profile walks through the above modules in chronological order.

CWC Member Management: All the districts child welfare committee member records

are maintained. Details like Name, Designation, Date of joining, Mobile number, email id etc. Reports are provided to know each members work status.

Payment Gateway: Donations can be done from all over the world. This provides a hassle free and reliable source for philanthropists and secure certificate of Appreciation. Children in need of care and protection are benefited by this.

TSCPW-Role Based Modules



Monitor, Review and Evaluation:

- Progress Reviews conducted with CGG team and WD&CW Department. Adherence to processes, by facilitating regular internal and external audits of all process followed in project delivery.
- To extend the technical and implementation support, dedicated support team was set up with a team of professionals consisting of Senior Project manager, Project Leaders, Team Leader, Senior Software Developer, Software Developer, Project Associate etc. In addition, a help desk, to resolve through designated e-mail (helpdesk.tscpw@cgg.gov.in) is established to address the queries. The help desk is manned by a team, well versed with the envisaged functioning of the portal which works from Monday through Saturday, excluding public Holidays during the business hours i.e., 10.30 a.m. to 5.00 p.m.

Status Reporting

- In addition to all formally scheduled meetings, informal meetings and Interactions occur throughout the entire project on an as-needed basis; CGG and WD&CW Department discusses and schedule such meetings. The Senior Project Manager updates the status report on a monthly basis to update the CGG and WD&CW Department about recent completions, accomplishments, and efforts expended.
- Each Stage concludes with a formal checkpoint called Stage exit. When a stage has been successfully “exited", this indicates that all the deliverables due to date have been completed and all outstanding issues have been addressed. However, if there are any unresolved issues that does not hinder the present stage or the commencement of next stage, the project may be proceed with the consent of both parties mutually agreeing to resolve the issue within a stipulated time frame.

- Strong leadership with a long-term vision motivated the teams to achieve the project goals.

Improvements / Enhancements

Complete Project is rolled out during the last year.

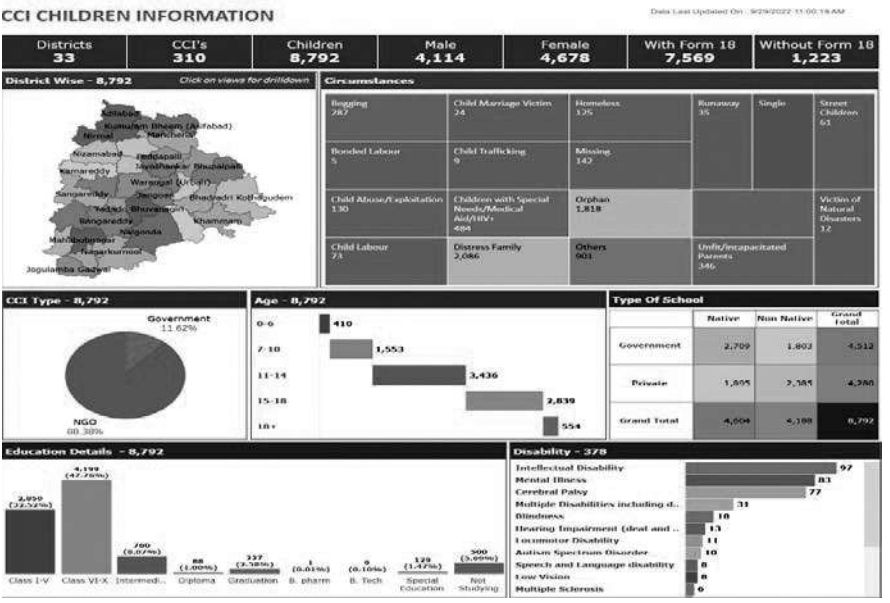
Roadmap for next one year:

- Adoption Module: Facilitate CWC Members to review and declaration of legally free for adoption and generate medical investigation report & police reports and also to add legally free for adoption children to Caring portal and get the final adoption status.
- Sponsorship module:
  - Registration for sponsorship.
  - Verification of the details.
  - Approval from DWOs/Collectors.
  - Monthly disbursement and review of the same.
- Issues and feedback Module: It facilitates officers to raise technical issues they are facing and provide the status of their technical issues. Additionally, it helps to track the technical issues with the help of the reports.
- CCI Licensing Module: This Module is proposed to bring accountability in Child Care Institutions. It facilitates Licensing and Renewal of CCIs.

ENABLER

Processes Re-engineered.

Re-engineering process involves source code translation, reverse engineering, program structure improvement, program modularisation and data re-engineering. Re-engineering involves adding effort to make them easier to maintain and reorganise data structures. TSCPW has been implemented for monitoring the real time data for ensuring transparency in whereabouts and well-being of children.



The implementation of this system provides the following benefits:

- Digital repository of the various kind of Documents
- Efficient tracking of Placement and progress reports of children
- Dynamic Updation of child Profile
- Reduction of Cycle time and better coordination for sending and receiving Documents through system
- Dashboard and reports for efficient monitoring and quick decision making

Technologies

- Tableau: dashboards and child profile are developed for data analytics.
- Integrations: Police, Judiciary and labour department's proceedings are incorporated with Child Welfare Department.

People

The user interfaces of the application are made very simple and self-explanatory. User instructions manuals are also provided in the application itself for reference. Also, online support is being provided by CGG team and the users from all the districts across the state approach the team on email and get the issues (if any) rectified. Grievance Software is under development to capture the effort of Helpdesk and to take proactive decisions.

The project Rollout was initiated across the state of Telangana in the month of July 2021. A detailed requirement study was made for all processes through meetings with end users. Automation requirements were identified. Implementation discussions conducted on fortnight basis in detail. Improvement requirements were identified.

Developed application as per the workflow indicated by the department. A test application is hosted for taking user acceptance for prototype and application. Regular discussions, Video Conferences, Short meetings and trainings are incorporated in software development process. Complete implementation support being extended to all the Districts/Other departments. Software development life cycle as mentioned below is followed for deployment and implementation of the project.

Proposal / Contract	Competent Authority	•High level Features list from Department •Proposal Review	Approved Technical and Commercial Proposal
Project Initiation & Kickoff	Proposal/contract signed by Client •Draft Plan	•Plan review •Meeting with TSCPW Head Office Committees and Nodal Officers	•Project initiation and Kickoff meeting conducted •Project dependencies agreed upon •Meeting minutes circulated
Requirement Analysis	•Technical proposal-Features list •Initiation Meeting minutes	•Understand current business processes and systems •Identify additional processes and systems that could come in scope •Review of Software Requirements Study (SRS)	•Approved SRS •Project Plan
Design Prototype	•SRS	•Review of Design	Approved Design Prototype

Implemetation	Approved Tested & Audited Module	•User Acceptance Test •Address issues that arise during implementation w.r.t to the validations or minor modifications required •User training and collecting feedback	•Approved module with the modifications carried out

VALUE INDICATORS

Learning's for sharing

- Commitment from Top Management – Commissioner, WDCW driving the enhancement and Improvements of Portal since inception
- Helpdesk Facility - All mail issues related to new features and issues are addressed on the same day.
- Conducting Trainings & Workshops on new features on regular basis.
- Systematic SMS Alerts – Notifications and alerts for actions and pending activities.
- Customized templates: PDFs i.e., orders are generated with minimal Data entry effort by using auto-populated information and pre-defined templates.

Lessons learnt in the process

- Capturing of all users mobile Numbers are crucial to follow the workflow online.
- Revamping, Re-engineering made the system for smooth maintenance.
- Adopting new and latest technologies recommended by Govt. guidelines protects the system from becoming obsolete.
- Enable cost savings wherever possible assures continual use of the software. All updates to the software also follow the guiding principle of reducing costs without compromising on compliance to regulatory frameworks.

Digital Empowerment

- Payment gateway integration for receiving donations.
- Repository is available in digital format.

Green e-Governance

- Reduces Paper Usage as there is no need to maintain Children files.
- As per IT Policy, Data is being maintained on tapes.
- Used minimum required IT Infrastructure.

Smt. D. Divya, IAS, *Special Secretary to Government & Commissioner, Women Development & Child Welfare Department, Govt. of Telangana, jyothi.v@cgg.gov.in*

Shri. D. Rathnakumar, *Project Manager, Centre for Good Governance, Telangana, rathnakumar.d@cgg.gov.in*

Shri. Rajendra Nimje, Ex-IAS, *Director General, Centre for Good Governance, Telangana, jyothi.v@cgg.gov.in*

Himachal Pradesh Real Estate Regulatory Authority – MIS

Himachal Pradesh Real Estate Regulatory Authority & National Informatics Centre Himachal Pradesh State Centre

Shrikant Baldi and Ajay Singh Chahal

PROJECT OVERVIEW

Prior to RERA act, 2016, Department of Town & Country Planning, H.P. under Apartment Act. registered the Real Estate Projects and Agents through offline mode by receiving hard copies of documents. In the absence of computerization, it was very cumbersome for a prospective promoter to Apply and Register for a project as well as Agents and filing the complaints by home buyers against promoters.

Objectives and Scope:

The objective is to protect the interests of prospective home buyers by providing an integrated software solution for the HP Real Estate Regulatory Authority which would have linkages between the Authority, Promoters, Agents and home buyers. The major functional areas of HP Real Estate Regulatory Authority, which have been covered in this application are-

- Registration of Real Estate Projects
- Extension of Real Estate Project registration
- Registration of Real Estate Agents including pre-registration facilitation to Promoters
    - Renewal of Agent Registration.
    - Filing complaints.
    - Uploading of all judgements passed by HP RERA, Adjudicating Officer and HPRERA Tribunal.
    - Online filing QPRs/APR by the promoters.
    - Project Pre facilitation for transparent and faster approval process with line department and their monitoring.

Key Stakeholders of the Software:

Stakeholders for the web application solution can be broadly classified into following categories:

- RERA Authority,
- Promoter
- Agent
- Allottee
- General Public

Promoters

- Pre-registration of Real Estate Project: It provides project facilitation during the project registration process like taking NOCs/Sanctions/Permission from various departments/corporation. From this module utility promoters during the registration process of his/her project, if faces any inconvenience/delay in the concerned departments/boards for getting timely approvals to launch the project, can file his grievance online with RERA H.P. The H.P. RERA after receiving and sending the same grievance to the concerned departments will get resolved all the issues pertaining the approvals/ NOCs with in specific

timeline.

- Web portal offers facility to Promoter to file an on-line application for registration of his/her Real Estate Projects, on line tracking of same, calculation of fees on line and making payment on line through E-Payment Gateway and also getting sanction of his/her project on line.
- All the promoters are on bulk e mailing/SMS system. This helps the authority to disseminate important instructions from time to time.
- 24x7 accessibility for uploading the case is available. A dash board has been made available to the promoters which provides as digital store for their on-line work.
- Filing of Quarterly /Annual Progress reports on line: QPRs /APRs are the report to be filed by promoters furnishing the details of the progress in the Real Estate Projects. Web Portal offers on-line submission of QPRS /APRS and also send alerts to the promoters for finally submission of QPRs/APRs. QPRS can be filed on line User manual guide and SOP are available on Web Portal to help the agents to fill the QPRs.
- Complaints against the project can be filed on line.The objective of the project is to provide a standard platform to students of weaker section of society with a facility to seamlessly apply for grant of Scholarship for pursuing Higher Education. The emphasis is on providing the scholarship grant in a time bound banner to serve the very purpose of receiving scholarship and bring a qualitative change in scholarship disbursement process.

Real Estate Agents:

- Web portal provides facility to the Real Estate Agent to file an application on line for registering him/her as Real Estate Agent.
- On line tracking of his/her application for registration as Real Estate Agent and also Real Estate Project through application status application.
- QPRS can be filed on line User manual guide and SOP are available on Web Portal to help the agents to fill the QPRs.
- There is a provision in Web Portal to upload the decisions of Authority, all relevant documents and Performa as per the provisions of Real Estate Regulation and Development Act,2016 and Rules, 2017 thereof to facilitate general public and all the stakeholders i.e. promoters, buyers and Real Estate Agent. The user's manual and SOP are available on Web Portal to help the General Public promoters and the decisions of Real Estate Appellate Tribunal can also be seen on this website. Further the contact numbers of all officers/officials have also been incorporated in this website for getting any clarification/guidance/information with reference to their project, Real Estate Regulation and Development Act,2016 and Rules, 2017 there under.

General Public:

- General public can access the real time information regarding availability of plots, apartments and commercial units etc. easily through this website www.hprera.nic.in so that they can conveniently purchase the property from registered promoters. It provides total inventory of any Real Estate Project including project type, carpet area wise, plot area wise etc.
- Each Project can be located on google map by adding coordinates.

- Complaints against the project can be filed on line by General Public/ any aggrieved person. The complainant can track his complaint to know the actual status of his complaint time to time.
- There is a facility to file online execution petition with RERA to get timely relief. An appeal against the order of the Authority/Adjudicating Officer can be filed online through this Web Portal with Haryana Real Estate Appellant Tribunal.

The main features/functions of this software application are:

- Online Registration of Real Estate Promoters/Projects
- Online Registration of Real Estate Agents
- Online Filing of Complaints
- Online Filing of Execution Petitions
- Project Facilitation (Online Registration of Grievances)
- Online Filing of Annual Progress Repots
- Online Filing of Quarterly Progress Reports
- Pin Point Location of Real Estate projects on Google Maps
- Apply for the Certified copy of Judgments/Orders Online
- Apply for the Renewal of Agents
- Apply for the extension of Projects
- Revoke Agent and Project Registration
- Role based separate dashboards for users
- Graphical analysis for decision support purposes
- Analytical reports for decision making
- Dissemination of status information through SMS/Email
- Real-time updation of the contents on the portal
- Employee and Users Management
- Roles assignment
- Content Management with dynamic feature for dashboard management and internal approval processes

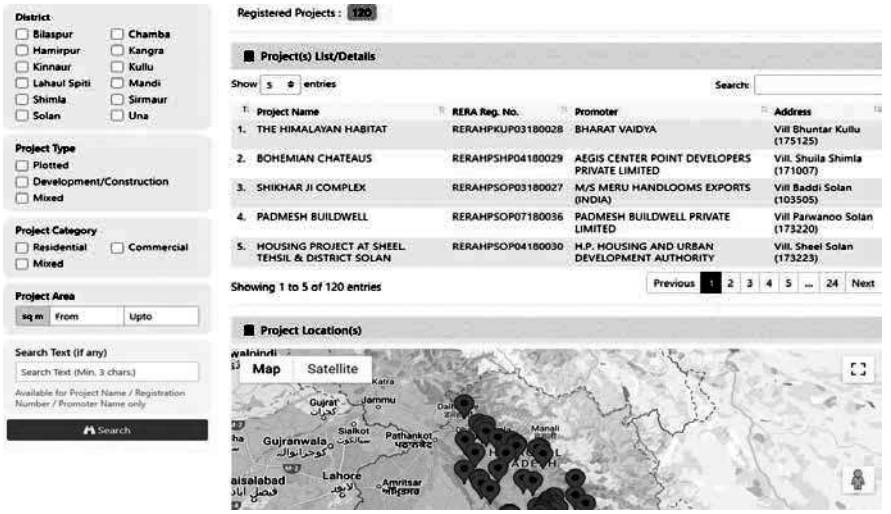
Key Stakeholders of the Software: Stakeholders for the web application solution can be broadly classified into following categories:

- Application Administrator: To configure the parameters of the software for the other stakeholders.
- HPRERA Authorities/Employees: The employees of the HPRERA.
- Developers/Builders: Developers are specialized in building certain types of property, such as houses, shops or offices.
- Promoters: They are entrusted with the task of promoting the project, which was developed or constructed by the developer.
- Agents: They provide a wide range of property services to clients.
- State Govt. /Local Authorities: They decide the planning applications for the redevelopment, considering the views of the many stakeholders, like local residents or environmental groups, and evaluate the proposals against local and national planning policies.
- Landowners:

- Architects/ Engineers: Architects and related professionals hired by developers to design the buildings and spaces they wish to create. Engineer provides expert advice on different aspects of the development process.

Current Implementation Status

- **120** Projects, **93** Agents have been registered in the State.
- **78** Complains registered out of which 44 have been disposed.



Hardware/Software

- Framework: MS .NET 4.7.2
- Development Tool: MS Visual Studio 2019
- Software Architectural Pattern: MVC 5
- Programming/Scripting Language: C#, HTML, XHTML, JavaScript
- Database: MS SQL server 2016
- MIS Reports: Html, Rotativa

Certification (Certifying Agency)

YES

Certifying Agency: AAA Technologies Limited, CERT-In Empaneled Agency

Certificate Issue Date: 14th October, 2021

Disaster Recovery and Service Continuity

- DR site as per NIC cloud policy. Presently, the database server with disk backup scheduled at Primary. Additional VM for the purpose of configuring High Availability for database and configure mirroring on this database VM in Primary.
- That in the event of any failure, there would be no data loss as transaction log backup has been configured in the disk.
- Backup Policy in place with the transaction log backup every 30 minutes, differential backup once a day and full back up weekly once on the disk in Primary.

Database Replication

- The data storage capacity at cloud platform is around 50 TB.

- Since SQL server 2016 R2 Enterprise edition is being used, Always On has been configured. At DR location. Log Shipping is also configured.

RESULTS INDICATOR

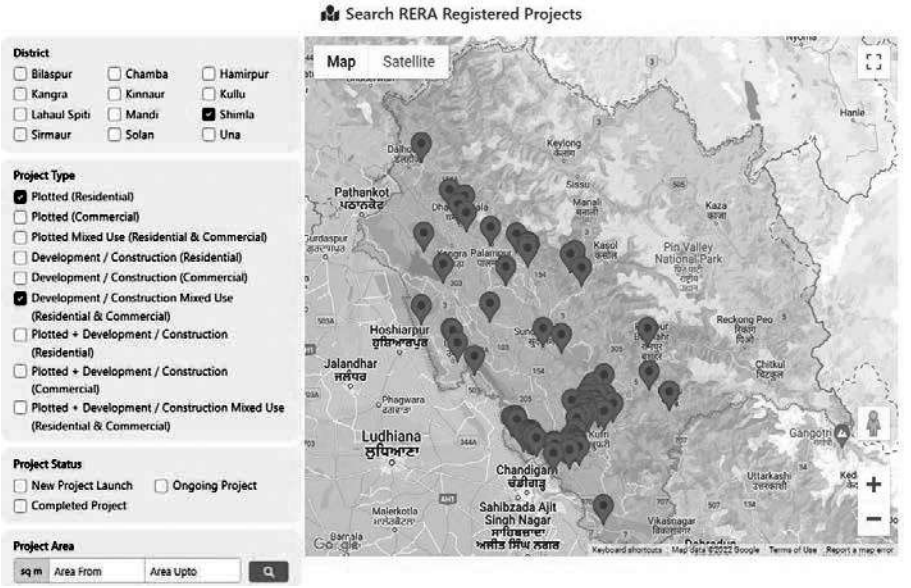
Description of various e-Services, benefits and their Volumes

Name of e - Service	Brief service description with benefits	Volume (Nos) of Services year wise		
		2020-21* (backlog entry)	2021-22	2022-23
Online Registration of Projects and Promoters	Promoters can conveniently apply online through web portal for the registration of Projects(s) and can monitor the status of their Application online in real time. The Registration authorities also have access to the portal to deal with applications online with a minimal or no requirement of paperwork. System generated certificates will be issued online/through email upon final approval.	23 Projects Registered	25 Projects Registered	38 Projects Registered
Online Registration of Agents	Agents can conveniently apply online through web portal for their registration and can monitor the status of their Application online in real time. The Registration authorities also have access to the portal to deal with applications online with a minimal or no requirement of paperwork. System generated certificates will be issued online/through email upon final.	35 Agents Registered	35 Agents Registered	12 Agents Registered
Complaint Filing	Agents/Promoters/Allott ees and other stake holders can file their complaint online through web portal. Orders/ Judgments/ Reply/ Notice/ Rejoinders etc. will be uploaded online.		25 Complaints Received	21 Complaints Received
Project Facilitation/Gri	Project Facilitation helps and facilitate real estate promoters for expediting various approval from		5	6

e vance Management	different departments of Govt. of Himachal Pradesh.			
QPR and APR	Online submission of Quarterly and Annual Progress Report by the Project Owner with their inventory and progress details.		15	34

Implementation

The Application covers the whole State of Himachal Pradesh. This includes all the Districts and Tehsils throughout the State. The application also covers Promotes and Agents that are registered outside the state who wish to establish their business in Himachal Pradesh. As it is web-enabled application, the reach over Internet to citizens is provided all over the globe.



Improvements / Enhancements

- The Reporting and Monitoring structure can be further enhanced and extended to provide a detailed and concise data, covering all the major aspects of all the activities performed through the web portal.
- A real time dashboard based on the inventories updated by the promoter quarterly, helping out active buyers to search relevant flat/cottage/villa/house etc. and reach the corresponding builder/promoter without any hassle.
- Backlog data updation of all projects and agents for online monitoring and reporting.
- Exception reports based on the data/inventories added by the promoter for the monitoring at the Head Office Level.
- The application provides users with an interface to send their information in English and Hindi. It helps in effective planning at Government level by providing information on real time basis which can assist in overcoming any

unexpected loopholes in the system.

- The user authentication is based on Email ID and registered mobile number which provides a role based application flow with system generated and issuance of online certificate of registration.

ENABLER

Processes Re-engineered

- Standardization of Business process for online registration of Promoters/Projects, Agents, Complaints and Grievances.
- Role based access to department user at each level with individual Dashboards.
- Pre-registration facilitation provides a single window interaction platform for the promotors to link pending approvals at the level of Line Departments including Revenue, Urban Development, Municipal Corporation and Forest. The current status can be monitored at all levels and necessary direction can be issued to concern departments to expedite the process. Each action is also visible to the promotors and can clear the any objection in time.
- SMS based dissemination of information to users with online acknowledgement.
- Growing demand for a Standard ICT Solution to manage the data of on-going Housing/Plotted/Commercial Projects, Promoters and Agents. The State Governments faces resource and financial crunch. Limited financial resources of the State demands proper finance and personnel management for planning purposes. Data management has become a major component in managing State resources for Real Estate Projects/Promoters and Agents.
- Availability of all Real Estate Projects/Promoters and Agents related data at a central portal: The State Government knows exactly the Numbers of Promoters and Agents, Registered Projects (Housing/Plotted/Commercial), Complaints, Grievances, business detail, employment detail etc on a single click.
- Lower cost of maintenance with robust, cloud hosted, security audit and DR facility, being made available without additional cost to the States.
- Applicants can conveniently apply online through web portal for the registration of Projects, Agents, Complaints and Grievances and can monitor the status of their Application online in real time. The Registration authorities also have access to the portal to deal with applications online with a minimal or no requirement of paperwork and can issue/upload system generated certificates online.
- Integrated role based Dashboards to monitor activities, inventories, compliances, grievances etc. of Promoters and Agents and any complaints filed against them.

Technologies

GIGW Guidelines compliant based on shared and reusable architectures, i.e applications; systems and infrastructure are characterized as service oriented, component-based and reusable.

The solution provides multi-tiered architectures (at least 3-tiered with clear separation between the presentation logic, business logic, and data access logic). The Solution

architecture is highly granular and loosely coupled.

- The solution is interoperable in nature and design and development is based on Service Oriented Architecture (SOA)
- The solution is ensure data safety and integrity in the event of communication channels operation failures
- Domain specific categorization for Enterprise Architecture

Data Quality as per e-Gov Metadata standards

- Naming Conventions
- Data Type and Length
- Data Logs (Creation / Updation)
- Table Indexes and references
- Aliases & Default values

Security: OWASP security guidelines

- Single Factor Authentication (Password Based)
- Two Factor Authentication (Password + OTP Based)
- Captcha on Public forms
- Encryption and decryption of parameter.
- Role Based Work Flow in Application
- Forget Password, Password Expiration Policy

User Friendly Form

- Customized errors
- Customized system alert
- Client & Server Validation
- Required Field Validator
- Form Look and feel
- Restriction on file upload

Accessibility

- Web Based Solution – http and https
- 24x7 availability
- Hosted on NIC Cloud
- Separate Report Server

People

Accolades from State Level Officers	
Dr. Shrikant Baldi, IAS Chairperson, HPRERA	The Real Estate Regulatory Authority of Himachal Pradesh is about to complete second year since it's functioning from January 1, 2020. I extend my heartiest congratulations and greetings to the Real Estate developers, agents and home buyers at this juncture. We have put our sincere efforts to develop a regulatory system which ensures accountability, protects buyer's interest and also promotes transparency in the Real Estate Sector. H.P. RERA has since its beginning taken earnest steps for proper implementation of Real Estate (Regulation and Development) Act, 2016 and Himachal Pradesh Real Estate (Regulation and Development) Rules, 2017. In such a short period the real estate promoters and other stakeholders have been sensitized, facilitated and encouraged through web meetings for online registration of real estate projects & agents, and filing of quarterly progress

	reports/ annual progress reports. The H.P.RERA has decided numbers of cases of the complaints, in the favour of allottees by ordering refund of their money by the promoters along with interest and penalties under the Act ibid. I wish to place on record my sincere appreciation of the outstanding contribution of all the officials of H.P. RERA for amicable settlement of disputes and timely execution of its orders being second amongst all the RERA's of the country. We are taking many innovative steps like a module of pre-registration facilitation in our newly developed consumer centric web portal to help and facilitate real estate promoters for expediting various approvals from different departments of Govt. of Himachal Pradesh. I wish to acknowledge the motivation and guidance given by all other RERA chairpersons and members in the meetings of AIFORERA. I also acknowledge the exceptional efforts put in by both the members as well as other professionals in making H.P. RERA a vibrant team. In coming years, we shall strive towards building a conducive and transparent ecosystem for the Real Estate promotion in H.P. I am very grateful to the Govt. of Himachal Pradesh for providing grant in aid and making all possible help in the smooth functioning of H.P. RERA. I look forward to your kind suggestions for further improvement in the working of HP, RERA. The HPRERA Management Information System is citizen CENTRIC user-friendly web portal, standardized, and transparent and consumer centric Web Portal to help all stakeholders i.e. General Public (prospective home buyers/ allottees) Promoters and Agents.

VALUE INDICATORS

Learning's for sharing

Main learning is that businesses and citizens are eager to adopt ICT quicker if they develop confidence in the Government software solutions and timely action being taken through the software.

The eGovernance Project/MIS for development of a standard and generalized solution for the Real Estate Regulatory Authority, HP was conceptualized in March, 2020 during a discussion with the NIC HP Team and Officials of HPRERA. It was proposed to digitalize the records of already registered projects/promoters, agents and complaints registered with HPRERA along with development of updated forms for the fresh online registrations of Projects, Agents and Complaints. HPRERA also wished to include a GIS based system to give real time location of their projects to be displayed in the public domain of their portal. The NIC Team then took the responsibility develop a solution to manage all their data and make it eligible enough for the back logging in the database.

Multiple Training programs were organized at the HPRERA Office (Shimla); in person and through the video conference for the end users which included RERA Authority as well as the Registered Promoters and Agents to make them fully familiarized with the Application flow, their Roles and the importance of a web based MIS.

Supporting Documents: SRS, User Manuals and FAQ have been distributed and also made available online on the web- portal.

Application IT enabler: The stakeholders are expected to have the following general characteristics while using the application:

- Basic IT awareness and willingness to work in an automated environment
- Familiarity with the operation of basic Graphical User Interface (GUI) components of Operating
- System and Web browser
- Familiarity with the functions/acts/rules of Real Estate.
- Ease in scanning and uploading documents to the web application

Innovation & Integration: The application is also integrated with Google Maps API, allowing people/buyers to quickly find the related housing projects developed/under-development. It also helps promoter/builder/developer increase customer credibility and enhances marketing strategy. It provides single sign-on with role based application access at each level. The Registration modules are integrated with SBI Web Payment Gateway (Online payment gateway for seamless integration and data consolidation at department level).

In-Built Business Rule: The application is also designed to enforce scheme wise business rules and data validation at form level for first level data verification at entry/user level.

Digital Empowerment

The main objective of this Project is to make the State and all the Stakeholders digitally empowered in technology. It is ensured that government services are accessible by the citizens electronically by simplifying the application/user interfaces. Moreover, the Application has been made mobile friendly whereby a person/citizen/applicant/employee/promoter/agent doesn't necessarily need a computer or a laptop ever time, but a Smartphone and internet connection.

Online Payments

SMS/Email alerts

Cloud First: A web solution hosted on NIC cloud has 24*7 accessibility.

Digital Data Bank: A data bank is created with complete automated process and is available for a robust decision making.

Transparent System: Online processes and its Reporting on public Portal make the system more transparent to the end user.

Language Barrier: The application provides Bi-lingual form label with option for submitting form data in English and Hindi.

Financial Inclusion: It helps in promoting the projects already developed or under development in the state, giving real time information and location of the project which helps buyer/property seeker search for relevant house/plot/shop/office etc.

Green e-Governance

Earlier, Most of the operations of the HPRERA were manual and maintained on the handwritten registers and printed forms. The Complex and bulky forms need more user time for filling-up at field offices, sending through post, data consolidation, digitization, missing productive and predictive analysis, validation, correction and report generation. There were no proper database-oriented applications for future references and processing, it was very difficult to have yearly data analytics and comparative statements which are being maintained manually or in excel formats.

Following key areas are addressed in web solution to make system "A Green e-Governance Tool":

- Online Application for Registration of Projects, Agents and Complaints.

- Online issuance of Registration Certificate.
- Statutory Compliances of Project and Agent in the form of QPRs and APRs.
- Online submission of Grievance.
- Public portal for the citizens to search project inventory, amenities, timeline, ogress, authorization and online grievance.

This has resulted in following benefits towards green governance.

Paperless Operations: The application captures all department operations through online data entry forms available for both department officials and citizens. The QPR/APR are also submitted in online mode only. The paperless operations help in eliminating the need to collect, process and store records on paper. Moreover, the indexing and searching becomes efficient and easy. It has also increased the carbon credit rating of the State.

Paper/Postal Cost Saving per year:

Total Papers user per year (based on approximation) = 1,20,000

Number of Poplar Trees saved per month (1 tree makes 8,333.3 sheets) = 14 trees Cost of toner/paper A4 size saved (@ Rs 1.6/sheet) = ₹ 1,92,000

Authority and User Dashboard: Provides real time monitoring of the data and at-a-glance views of key performance indicators which assist in effective and quick decision making.

MIS Reports: MIS reports are generated by the systems to help RERA in evaluating their daily activities, online grievance filing, their resolution, monitoring and tracking progress.

Email & SMS based alerts: SMS and Email based alerts on transactions related to project/agent and complaint registration, project compliances, grievance management etc. where the users (Promoters, Agents, Complainants and RERA Authorities) get transaction alerts on their mobile number/email help them get immediate information.

Online Feedback System: Helps to identify the problems and assist in the enhancement of the existing system and processes through suggestions/comments received from the User.

Reports in Digital Format: All Reports are available in digital formats (xlsx, pdf) with download and search options. Text based smart search for all archived and new judgments and orders.

Dr. Shrikant Baldi, IAS, *Chairperson, Real Estate Regulatory Authority Himachal Pradesh, Himachal Pradesh, hp.rera2020@gmail.com*

Ajay Singh Chahal, *Deputy Director General & State Informatics Officer, National Informatics Centre, Himachal Pradesh State Centre, sio-hp@nic.in*

One Map GIS Portal Series for Greater Noida

Greater Noida Industrial Development Authority (GNIDA) &National Informatics Centre, New Delhi

Surendra Singh, Amandeep Duli and Amit Bhargav

PROJECT OVERVIEW

The portal has the long-term goals of better city governance, transparency and effective warehouse of having all data at one place. The development authority departments works in silos. The application integrates data of departments for effective decision making of authority executive, public and investors. The authorities are always short of staff and need technology innovations and solutions for effective governance. This enables quick decisions as the ground reality is before the administrator. Web services from various databases of the Authority enable real time solutions for all departments.

Scope - functional and geographical:

OneMap provides major support in governance by embedding GIS in all aspects of decision making in the GNIDA, bringing transparency and geo-spatial information support in decision-making, enable a sound process of monitoring development and identifying "gaps in development, planning, management and decision making". Make GIS data available at all levels –that helps bringing accountability and responsibility in governance.OneMap series for Greater Noida attempts to create a highly accurate and detailed map portal using drone based technology.

The core objectives are:

- Integration with MIS to bring all assets in one platform.
- Integration with individual departments real time work flows
- Development of dash boards and mobile application for better visualisation

The significant GIS layers on the portal are:

- Master Plan
- Sector Plans / Layout Plans
- Points of Interest
- Khasra Plans
- Topographic map layers
  - o Builtup
  - o Water Bodies
  - o Transportation
  - o Flora
- Utility Maps
  - o Water Supply
  - o Electric
  - o Gas
  - o OFC lines
  - o Sewer Network
  - o Drainage Network
- Bulk Waste management

- Project O & M
  - o Road patch work
  - o Road resurfacing
  - o Sweeper Attendance Information
  - o Vehicle movements of
    - Manual Sweeping
    - Mechanical Sweeping
    - Remedial Measures
    - Construction and Demolition waste vehicles

The Salient features of the portal useful for G2G, G2B & G2C are:

- Plot Reports depicting
- Ownership & other records
- Vacant plots
  - Non-Allotted and Vacant
  - Allotted but vacant after 5 years of lease deed
- Khasra Editing and status reports
- Daily/ Monthly Generation of Project O & M reports which are linked with the billing:
- Health Departments vehicle tracking services obtained from vendors of
  - Mechanical Sweeping
  - Manual Sweeping
  - Remediation Measures
  - Construction and Demolition Waste
- GIS based Attendance monitoring system for Sweepers
- Engineering Project Road Resurfacing and Patch work reports
  - Planning Reports for nearby and proximity of all features
  - Dash Boards for a synoptic view of details of authority
  - Feedback mechanism for the citizens
  - Bulk waste management reports
  - Change Detection
- Vacant to Built up
- Built up to vacant

The portal has resulted in huge saving for the authority in finding vacant industrial plots worth about 400 crores for the authority. Apart from that the O&M reports have resulted in efficient mechanism for work quality and billing. Khasra reports have provided the Authority with real time status of their land and directions for interventions.

The portal has also enhanced the ease of doing business for the investors who can at a click of a button can select their desired plot. Real time plot information is available to the investors to take their decisions. The portal answers the questions like where is the plot, what is nearby, what are the directions and what are the utility (Roads, electricity, sewage, drains) information near it. The portal provides real-time map services to national portals like Gati Shakti and Nivesh Mitra..

Hardware/Software

The application was prepared on ESRI technologies using ARCGIS API for Java

Script.

The application uses latest GIS technologies for its creation. The basemap was prepared using Drone Survey. CORS and rovers were used for establishment of control network. All the assets and POI were captured in the CORS reference using Rovers.

(Certifying Agency)

Yes.

Details of the certifying Agency-

Name- AAA Technologies Limited

CIN- U72100MH2000PLC128949

Address- 278-280, F-wing. Solaris-1, Saki Vihar Road, Opp. L&T Gate no. 6, Powai, Andheri (E), Mumbai- 400072, India

Phone- +91-22-285738115/16

Email- info@aaatechnologies.co.in

Disaster Recovery and Service Continuity

Since the database is in the cloud server, all data is in the intangible format. The server is regularly backed-up. Hence, the loss of data is almost negligible.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes.

Name of e- Service	**Brief service description with benefits**	**Volume (Nos) of Services year wise**		
		2020-21	**2021-22**	**2022-23 (Up to date of nomination)**
Plot Reports	Ownership & other recordsVacant plots	Functional since October 2019	Functional since October 2019	Functional since October 2019
Utility Maps	Water Supply Electric Gas OFC lines Sewer Network Drainage Network	Functional since October 2019	Functional since October 2019	Functional since October 2019
Project O & M	Road patch work Road resurfacing Sweeper Attendance Information Vehicle movements of Manual Sweeping Mechanical Sweeping Remedial Measures Construction and Demolition waste vehicles.	Functional since October 2019	Functional since October 2019	Functional since October 2019
BWG waste	BWG waste management is done by the application.	Functional since	Functional since	Functional

Management	Engineering O&M is also being captured using mobile applications. The administration has linked its BWG and O&M billing with the portal.	October 2019	October 2019	since October 2019

Implementation

The portal has resulted in huge saving for the authority. 138 Vacant and non-allotted industrial plots have been identified by drone and were auctioned for about 400 crores.

The GIS portal is a boon for the decision makers of the authority who have access to all information at one place. This leads to better, faster decision making and transparency. All the information collected in One Map is available to public.

Improvements/ enhancements specifically rolled out during the last one year-

- Introduction of 'Manual sweeping' to the portal- live movement, scheduled path and reports can be viewed in real-time.
- Introduction of 'Remediation Centre' to the portal- Live CCTV footage of the remediation site, live movement, scheduled path and reports can be viewed in real-time.
- Introduction of 'Construction and demolition waste collection and disposal' to the portal- Live CCTV footage of the remediation site, live movement, scheduled path and reports can be viewed in real-time.

Improvements/ enhancements which are planned to be rolled out during next one year-

- Location Coordinates for future projects will be integrated- to search any location/ plot/ road etc.
- Details of vacant plots to be integrated.
- Utility services – labor identification, tracking, attendance, path identification
- Door to door vehicle tracking system, path identification, scheduling etc.
- Live status of any upcoming/ ongoing projects will be integrated.
- Superimposition of Master Plan-2041 over the geo-referenced map, to update the existing utilities and proposed utilities.

ENABLER

Processes Re-engineered

- The entire vehicles of GNIDA deployed in Mechanical, Manual, Remedial Measures and Construction and Demolition waste are monitored on the portal.
- All vehicles are fitted with GPS and real time monitoring is done. The vehicles have to move daily in their desired geo fenced areas.
- Any violations for speeding or non-adhering to the desired geo fence corridors are not billed. Daily & monthly reports are generated.
- CCTV footage of the remediation vehicles are also streamed live on the portal. Integration with the weigh bridge for remediation has also been carried out. This prevents leakages from the system.
- Sweeper attendance system has also been integrated in the portal. Daily locations of sweepers are visible on the portal. Daily reports form the basis for billing.

- Road patch repair and resurfacing module in the portal has resulted in eradication of duplicate work. Each patch work is geotagged, marked on the portal and given a unique number. This patch has to be maintained by the agency for one year. If the patch is repaired within this period the billing may be stopped. Similarly road resurfacing module has been prepared and deployed on the portal.
- Module for Monitoring of Bulk Waste Generators is also present on the portal. Bulk waste sites are identified by inspectors using mobile application and validation is done on the portal. Subsequent work flow enables RWA and pickup persons to geotag their daily activity. Penalties are imposed for non compliance. Engineering O&M is also being captured using mobile applications.

Technologies

The application was prepared on ESRI technologies using ARCGIS API for Java Script.

People

Created a citizen centric Application-

- Faceless Interactions by the Citizens, by accessing the website or the Mobile App, in terms of the following-
- Plot Information like plot no, allotment ID, plot size, plot location, allotment date, lease date acne be also accessed without visiting the Authority.
- Exact location and coordinates of the plot can be easily viewed.
- Details of vacant plots can be accessed through the plot report section on the website or the App.
- Nearby facilities to the plot, like hospitals, schools, major highways, major landmarks, can also be viewed.
- Major utilities lying around/ on the plot like sewer lines, drainage, water supply line, electrical poles, etc. can be viewed.

Capacity Building and empowering the GNIDA Employees

Departmental maintenance work flows of Health, Land and Engineering are also integrated in the One Map GIS portal. They have also resulted huge saving by reduction in O&M billing, finding vacant properties, change detection and better service delivery. The portal across devices helps the authority to plan better and optimize its resources.

VALUE INDICATORS

Learning's for sharing

The solution provides all geo spatial information of the ground, authority and line agencies at one place. Real time MIS information of the authority is also integrated with GIS. Departmental maintenance work flows of Health, Land and Engineering are also integrated in the One Map GIS portal. They have also resulted huge saving by reduction in O&M billing, finding vacant properties, change detection and better service delivery. The portal across devices helps the authority to plan better and optimize its resources. In house capacities for usage of the portal and data have built over period.

Digital Empowerment

The One-Map system includes the ability for the citizens/ users to confidently participate in the digital world, and reach the desired goals by voluntarily, proactively, and creatively, using the existing knowledge of database.

Faceless Interactions by the Citizens, by accessing the website or the Mobile App, in terms of the following-

- Plot Information like plot no, allotment ID, plot size, plot location, allotment date, lease date acne be also accessed without visiting the Authority.
- Exact location and coordinates of the plot can be easily viewed
- Details of vacant plots can be accessed through the plot report section on the website or the App.
- Nearby facilities to the plot, like hospitals, schools, major highways, major landmarks, can also be viewed.
- Major utilities lying around/ on the plot like sewer lines, drainage, water supply line, electrical poles, etc. can be viewed.
- Movement of the Waste Management vehicles can be viewed.

Green e-Governance

Since the entire data and interface is on the website and mobile App, and the data stored is on the cloud server, there is no e-waste generation in any of the processes involved.

Shri Surendra Singh, *Chief Executive Officer, Greater Noida Industrial Development Authority (GNIDA), Greater Noida, ceo@gnida.in*

Shri Amandeep Duli, *Additional Chief Executive Officer, Officer, Greater Noida Industrial Development Authority (GNIDA), Greater Noida, aceoad@gnida.in*

Shri Amit Bhargav, *Scientist-F, National Informatics Centre, New Delhi, bhargawa@nic.in*

Award of Recognition

GST Prime (NIC GST Analytical System)

Commercial Taxes Department, Govt. of Karnataka & National Informatics Centre Karnatka State Centre

C. Shikha, B. V. Murali Krishna and Suresh C. Meti

PROJECT OVERVIEW

GST Prime, though initially developed for Commercial Taxes Department, Karnataka, its success and usefulness has attracted interest from other state GST departments and same has been deployed in 20 other states, implementation is in progress in 5 more states and is extended to Bengaluru Zone of CBIC officers also, on request.

It is an Analytical tool for the GST officers to monitor the tax compliance, to identify and initiate appropriate actions against the non-filers of returns, identify and highlight the possible fraudulent activities carried out by tax payers in order to evade taxes, identify and reverse ineligible Input Tax Credit claims. The application is based on the data synced from external systems like GSTN System and E Way Bill System on daily basis, processes the data to provide the intelligent information to the officers at fingertips. Pre-processing of the data and persisting the same makes the application highly responsive even with large amount of data.

The application has various reports to provide above critical information to the tax officers, at all levels, for their day-to-day discharge of duties w.r.t. to tax collections. On login, officers are presented with the critical information an officers would like to see more often such as tax payer base, collections, return filing status, sector wise performance, top defaulters and top filers for their office jurisdiction. There are useful insights derived for the higher officers helping them to take critical decisions on how and where to put efforts to collect more taxes with minimal efforts, what could be the effect of certain policy changes etc.All the related data from various returns filed by the tax payers and other activities such as E Way Bills are taken together to bring forth the list of non-filers as well as those likely to be following illegal practices to evade taxes. Thus, the insights are supported by relevant supporting information for the tax officers to tackle the case, moreover, the data is synced with external systems, systematically and frequently hence the officers are equipped witnear real time data. A feature called Tax Payer Profile provides the complete 360o view of a tax payer. This helps the tax officer to completely understand the tax payer at one place for various activities like inspections, audit, dealing with non-compliances etc.

The application provides role based access to the officers so that only the required data is visible to the officer based on the login. In the absence of such a system, it would have been herculean task to identify the big defaulters and big tax evasions. To simplify the identification of fit cases to be taken up, the popular ABC analysis is followed. Tax payers are grouped in to 3 categories based on the tax payed by them in previous financial year and defaulters or tax evaders in the respective groups could be easily taken up for further actions by the officer.

Hardware/Software

Software:

- Database Server: RadHat Linux

PostgreSQL RDBMS

- Application Server: Microsoft Windows Server

  - Microsoft .NET web application (C#)
  - Microsoft .NET console application (C#)
- Others
  - Responsive (using Bootstrap and JQuery)
  - Charts and Graphs s

Hardware:

- Physical Servers
  - Database Server: CPU- 24 Cores; RAM- 256GB; Storage- 4TB;
  - Application Server: CPU- 16 Cores; RAM- 128GB; Storage- 6TB

(Certifying Agency)

Yes, Application is audited for security by M/s SecureEyes Techno Services Pvt. Ltd., Bengaluru.

Disaster Recovery and Service Continuity

- Near DR for DB is in place
- DR setup at other location is in progress
- Regular data backups are taken at the Data Centre

Implementation

- It is an online, browser based application.
- The application is used by all the officers of the department who are looking after the tax collection, vigilance and intelligence activities, across the state.
- Used by management to take informed decision to increase tax compliance
- Analytics for detecting the tax defaulters.
- Analytics on the filings to detect tax evasion / suppressions.

Analytics to detect fraudulent activities like illegitimate input tax credit claims, bill trading, circular trading etc.

Improvements / Enhancements

The application has been improved continuously in terms of new analytics, user experience, security etc.

Following are some of the new features:

- fraud detection through matching data from various statements,
- invoice verification against the ITC claims,
- detection of circular trading,
- supply chain,
- analysis of top tax payers of the jurisdiction of the officer,
- much improved tax payer profile with in-depth analysis on tax payer,
- details and returns filed by tax payers of other states,
- improved user experience,
- prediction of tax collection using AI,
- improved tax payer search

Future plan is to enhance fraud detection and improve upon future predictions on tax collection.

ENABLER

Processes Re-engineered

- Since inception, GST system is an online system. But the online activities such as registration, filing of returns, payments etc. take place at the GST Common Portal. The data is made available to the respective states either through GST online portal, SFTP dump or API. SFTP dump is made available once in a month, consolidated for the state. Then someone has to segregate the data office wise and distribute further. By the time data reaches the concerned officer, it would have lost its importance.
- GST Prime pulls the data through API in near real time (at the most a delay of a day), processes the data and makes it available online to all officers in the form of useful analytics.
- Data synchronization from GST Common Portal and E Way Bill system is automated through scheduled console application. The issues while pulling the data are systematically logged and the same are visible to the concerned in-charge through reports.
- The format and nature of data received from GST Common Portal and E Way Bill System is standard across the states and hence same applications could be easily replicated.
- Multiple related data is available at one place for the officers to avoid manual compilation of data to draw inferences.
- Simple user interface is in focus so that the officers can start using the application without much need of a formal training.
- Reports can be exported to Excel format and further processed, if required.

Technologies

- GST Prime is a browser based online application. It is responsive and hence can be used on mobile devices.
- The console applications can be scheduled to run on specific time and hence data synchronization activity is automated.
- Scripts written using Selenium are run daily to check the data consistency across the application, monitor the data synchronization activity, usage of the application by the officers etc.
- Data analytics is based on the database queries. AI is used for prediction of tax collection.
- JavaScript based Charts and graphs provide appealing and meaningful outcomes.
- Tabular data can be searched, sorted, exported as per requirement.

People

The application is in use by tax officers of all levels right from the Commissioner of Commercial Taxes to tax inspector in 20 states. In Karnataka, where is it is deployed first, as per the requirement and guidance, is extended to CBIC Bangalore Zone where officers at all levels from Principal Chief Commissioner to tax inspector use the system. Put together, more than 6500 accounts have been created and on an average 1200 users login in to the system daily in Karnataka. The Commissioner, Commercial Taxes reviews the activities of the offices and officers regularly using the GST Prime

application itself and no other statistics in any form are being used / referred.

States where implemented:

Karnataka, Assam, Bihar, Chandigarh, Chhattisgarh, Goa, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Puducherry, Tripura, Uttarakhand, West Bengal, & Bengaluru Zone of Central GST, Dehradoon Commissionerate.

Few other states are in different stages of implementation like Punjab, Uttar Pradesh, Tamil Nadu, Andra Pradesh, Delhi, etc.

The interested states are first given demo of the live application so that they can take a decision on adapting the application. After implementation, detailed training is imparted to the master trainers including the senior officials. Master trainers in-turn train the other officials. Additional training sessions conducted by technical team as and when required. The resources who are in-charge of data synchronization and application management are given in-depth training on those activities and enabled for local troubleshooting and error reporting etc.

VALUE INDICATORS

Learning's for sharing

- ABC Analysis: Grouping of the tax payers in to 'Top', 'Middle' and 'Other' category based on the tax paid by them in last financial year helps the officers to identify and concentrate on big defaulters and can focus the efforts very effectively.
- Sectoral Analysis: Identifying the sectors in which the tax payers have been carrying out business based on the previous year filings helps in sector wise analysis. This in turn helps in making informed policy decision
- Fraud Detection: Comparison of taxes paid, turn over etc. across the return periods and comparison of the data from different statements and E Way Bill activities helps in checking the consistency of the business and detecting any abnormalities such as tax evasion, suppression, illegitimate ITC claims, bill trading etc.
- Taxpayer Profile: Taxpayer profile that gives complete in-depth details of a tax payer helps the officers in clearly understanding a tax payer and helps in inspection, audit etc. Certain details of the tax payers of other states can also be provided on demand.
- Circular Trading: Some tax payers tend to show business in a closed group resulting in circular pattern to claim false input tax credits. Identification of such patterns will help the officers in further investigation to detect the frauds in illegitimate input tax credit claims.
- Supply Chain: Supply chain helps the officers to identify the suppliers and recipients for different number of levels of transactions. If one fraudster is identified, the feature helps in identifying the suppliers and recipients of that tax payer and check authenticity of their business records. This will help in finding all the tax payers involved in the fraud.
- Prediction: Artificial Intelligence based prediction of future tax collections helps the management plan the activities based on the outcome. The past data and the seasonal variations etc. are considered while predicting the collections.

- Risk Based Analysis: Various Key Risk Indicators (KRI) are identified for the filers and non-filers of the returns. Based on these KRIs, the tax payers list is shown to the officers with the details of the risks involved. This will help the officer to investigate further.

Digital Empowerment

The application is for internal use by the GST officers. The application focusses on simple navigation, better user experience and easy to understand terminologies are used. Hence there is not much need for training without which most of the officers can start using the application. Help for all the reports are available online using which the officers can get more clarity on the outcomes.

Green e-Governance

- GST System as such an ICT driven system.
- GST Prime is an online analytical system where all the analytics can be viewed online in the required format without any need for taking any prints etc.
- All the related data is presented in same place and hence no need for further manual compilation. The required information is visible quickly. Hence less time spent on the system.
- The application is responsive and hence can be accessed from smaller devices.
- Help is provided along with the reports itself and hence there is no need for printing a separate help / user manual.

Mrs. C. Shikha, IAS, *Commissioner, Commercial Taxes Department, Govt. of Karnataka, shikha.c@ka.gov.in*

***Dr. B. V. Murali Krishna**, Additional Commissioner, Commercial Taxes Department, Govt. of Karnataka, addlcom.gst@ka.gov.in*

***Mr. Suresh C. Meti**, Technical Director, National Informatics Centre, Ministry of Electronics & Information Technology, Karnataka State Centre, suresh.meti@nic.in*

Integrated Covid Management System (ICMS)

Department of Personnel and Administrative Reforms and E-Governance, Govt. of West Bengal

B. P. Gopalika and Abhishek Roy

PROJECT OVERVIEW

Integrated Covid Management System – Mobile APP – WhatsApp Bot & Portal :- The portal enables a citizen to search for covid bed availability in both government and private hospital of their selected area. Request for bed in Government hospital for covid positive patient. Search and request for oxygen availability, ambulance availability, hearse van , crematorium related information etc.

Hardware/Software

- Technology Used: WhatsApp BOT.
- Implementation Agency: State e-Governance Mission Team West Bengal.
- Service Delivery Channel(s): Mobile app Android and iOS.
- Target Audience and Outreach: Entire population of West Bengal**.**

(Certifying Agency)

Application is hosted in SDC which has all necessary certification and has been security audited.

https://www.facebook.com/OfficialDigitalIndia/videos/597986444974390

WhatsApp number :7596056446

https://twitter.com/_DigitalIndia/status/1394679428374962179

Disaster Recovery and Service Continuity

Periodic backup policies and DR policy in accordance to SDC guidelines are in place.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes.

Name of e Service	Brief service description with benefits	Volume (Nos) of Services year wise		
		2020-21	2021-22	2022-23 (Up to date of nomination)
ICMS	Integrated covid management app, portal and Wa Bot	NA	1 CR	1.2 CR

Implementation

- Completely implemented.

ENABLER

Processes Re-engineered

- BOOKING OF HOSPITAL BEDS
- UPLOAD OF COVID REPORT
- REAL TIME UPDATION OF BED AVAILABILITY, OXYGEN AVAILABILITY AND AMBULANCE BOOKING

Technologies

- AI CHATBOT BASED ON WHATSAPP AND PORTAL

People

- Project was designed and implemented by State Egovernance Mission team headed by Dr Abhishek Roy.

VALUE INDICATORS

Learning's for sharing

- Implementation across the state of West Bengal. Huge transaction load.
- Regular updates of the SAFE HOUSE, HOSPITAL, OXYGEN ETC INFORMATION.
- Real time updates of HOSPITAL BED AVAILABILITY.

Digital Empowerment

https://www.facebook.com/OfficialDigitalIndia/videos/597986444974390

WhatsApp number :7596056446

https://twitter.com/_DigitalIndia/status/1394679428374962179

Green e-Governance

- Solution is completely online and paperless.

Shri B. P. Gopalika, IAS, *Additional Chief Secretary, Department of Personnel and Administrative Reforms and E-Governance, Govt. of West Bengal*
Shri Abhishek Roy, *Head* SEMT, *Department of Personnel and Administrative Reforms and E-Governance, Govt. of West Bengal, abhishek.roy@semt.gov.in*

eOffice Manipur

Department of Information Technology, Govt. of Manipur & National Informatics Centre Manipur State Centre

Gurumayum Robert Sharma, Herojit Sanjenbam and N. Binod Singh

PROJECT OVERVIEW

eOffice Manipur is one of the key IT projects of Department of IT, Government of Manipur, aimed at improving internal efficiencies in an organization through electronic administration leading to informed and quicker decision making, which in turn results in better public service delivery. eOffice Manipur is a complete digital work place solution for Manipur Government offices and is based on Central Secretariat Manual of eOffice| Procedure (CSMeOP), formulated by Department of Administrative Reforms and Public Grievances (DAR&PG), It provides a convenient way for officials to access information related to every aspect of their working and knowledge sharing by presenting a single gateway to information and services. The speed and efficiency off eOffice Manipur not only assists departments in informed and quicker decision but also makes them go paperless. The eOffice system has the potential to bring internal operational effectiveness in the working off Departments. eOffice Manipur is a product suite possess of applications for transforming day to day official work of an organization. The components are as follows:

- File Management System (eFile): automates the processing of files and receipts.
- Knowledge Management System (KMS): acts as a centralized repository of various documents such as acts, policies and guidelines.
- Management Information System (MIS) : retrieval of various forms of reports of eFile used in the Departments/Sections.
- Personnel Information Management System (PIMS): onboarding of eOffice users and details.

Scope:

- eOffice Manipur has been implemented in all the Government Departments including District Administration| and also extended to all the Directorates, Agencies/PSU, Societies, Undertaking of the Government of Manipur.
- eOffice Manipur aims to expand to all Colleges, School, and Universities.

Key Stake holders:

Key Stake holders of the project are:

- Department of Information and Technology (DIT), Government of Manipur.
- NIC Manipur State Centre support technical activities with the administrative support from Due to this cohesive and mutual understanding of the Departments the project got success what we see today.

Intended Benefits:

Easy Data Retrieval: With all the data related to an organization available at a single place; it becomes easy for users to retrieve data/records as per their requirement.

Efficiency: As Files/Records are transferred or exchanged between users on few clicks, thus leading to effortless and seamless movement of Files/Records which in turn results in increase in efficiency.

Access & Authorization: Ensures role-based access/permissions to each eOffice user as per the work allocation and the hierarchy of the organization.

Assured Data Security and Integrity: Implementing robust audit trails, role-based access and digital signing assures security and integrity of Files/APARs.
Reduces usage of paper: With Files/Circulars/Leaves nd Tours approvals available online, the usage of paper reduces significantly.
Access from anywhere and anytime: eOffice being a Web Based application makes it accessible anytime and anywhere (subject to organizational restrictions/policies) n secured environment.
Easy monitoring via MIS Reports: eOffice provides variety of reports depending on the requirements of the implementing organizations which helps in accessing and monitoring the working in an organization.
Transparency and Accountability: The users working in eOffice are accountable for any action taken in the system which helps in making the system transparent and accountable.
Transform the government work culture and ethics: Promote innovation by releasing staff energy and time from unproductive procedures.
Current Status: Till date there are more than 155 Directorates, Agencies/PSU, Societies, Undertaking have been on-boarded and 2975 users have been enrolled in eOffice Manipur.

Hardware/Software

The Open Architecture on which eOffice Manipur is a web-based and cloud enabled product that brings together the independent functions and systems under a single framework. The aspects of extensibility, scalability, security, interoperability and open standards were also taken into consideration while defining the overall architecture.

- Web Server: Apache HTTPD
- Application Server: Apache Tomcat
- Application Development Software: PHP & Java
- Database: PostgreSQL
- Operating System: RHEL or CentOS
- Virtualization Software: VMware

Certification (Certifying Agency)

Yes, eOffice Manipur instance took the replica certificate being audited through M/s SecurEyes Techno Services Pvt. Ltd. (httos://secureyes.net/about.aspx).

Disaster Recovery and Service Continuity

For keeping eOffice Manipur instance data safe, following are in place.

- Cloud and Virtualization enabled environment.
- Near data copy of documents.
- Streaming Replication of databases.
- Storage based replication of entire eOffice data (documents and databases) at identified DR site.
- Offline tape backups as weekly full and daily incremental by DC at NDC Bhubaneshwar.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	Brief service description with benefits	Volume (Nos) of Services year wise		
		2020-21	2021-22	2022-23 (Up to date of nomination)

eOffice Manipur	eFile Create	188777	19251	12942
	eReceipt Created	71400	91355	87465
	No. of Users Created	988	1072	915
	No. of Department Created	62	72	21

Implementation

- eOffice Manipur expanded up to 16 Districts till the SDO and BDO offices.
- 16 District till the SDO and BDOs offices.
- Police and Forest (till district) onboarded.
- 2975 users have been enrolled on e-Office.
- 67 Departments & 88 Directorates/Societies/Agencies re now onboarded on the e-office platform and by end of 2022, it is envisaged to be 100% implemented.
- eOffice is accessible in the SWAN network, the most widely available network under Government of Manipur.

Improvements / Enhancements

- Only State in North-East with State-wide roll out .

ENABLER

Processes Re-engineered

The eOffice system comprises of different sub modules that are inter-linked to manage the official work flow of the entire life cycle of a Document/DAK from the moment it is received by the organization till the time it is disposed of with the proper set of actions. It involves the following broad processes and details of Process Re-engineering involved in each process.

- Digitization of inward DAK: In physical environment, the inward DAK is moved physically, resulting in loosing of information by person handling the DAKs, slow movement of DAKs, registration/diarization f DAK at multiple points, etc. In electronic environment, the DAK is scanned and diarized at Central Registry Unit and moved electronically, resulting in faster movement, no need of diarization at multiple points. Email diarization feature is also inbuilt in the system.
- Acknowledging the Unique Receipt No. to sender: In physical environment, sending of acknowledgement to sender is a cumbersome task. In electronic environment, an in-built system is in place through which acknowledgements can be send to senders on click of a mouse button, thereby facilitating the participation of the sender in government business by tracking whereabouts of real-time status of their application/DAK.
- Electronic Files creation: In electronic environment, user has been provided with an option to create electronic files.
- Electronic File/Receipt Movement: Movement of file/receipt in electronic environment leads to elimination of corruption, venal practices & red tapism, as personal priorities/ discretions have been eliminated because of transparency and accountability. Deleting/ replacing the notings or tearing of files etc. cannot be even thought of. Minimized delays, as users working in eOffice are accountable for any action taken in the system which helps in

making the system transparent and accountable. Faster movement of files in real time irrespective of geographical locations.

- Digitization: eOffice emerges as a Digital Record Keeping platform, as Files/Receipts are digitized and physical files/receipts are weeded out, resulting in saving of Infrastructure (Cupboard, etc.), Real Estate (Office Space is released) and Physical Security (Custodian).
- Government wide information exchange facility: Government could visualize a digital platform facilitating a unique way of exchanging information with other departments for consultation, approval, information, etc., resulting in ease in doing business at Government level.
- MIS Reports: An effective Management Information System (MIS) having the statistical productivity, monitoring, and information/reports, helps in managing the productivity at individual/ section/ department level.
- Interface/Portal for Public: Facilitates dissemination of information meant for public like Office Orders, Notices, etc., thereby building confidence among the citizens towards Government machinery.
- Access Anywhere Anytime: It creates an environment where employee can work from anywhere anytime.
- Assured Data Security and Integrity: Implementing robust audit trails, role-based access and digital signing assures security and integrity of files.
- SMS & Email Services: For sending acknowledgement, dispatching of approved letter (DFA) outside organization, file/receipt movement from one user to another.

Technologies

- Common data sets and standards.
- Parichay (Single Sign-On based) two factor authentication.
- Role based authorization.
- Enterprise-wide central repository for an easy way to locate circulars, office orders, annual reports, etc.
- Digital Signature Certificate (DSC) and eSign enabled.
- WebVPN enabled for accessing eOffice from anywhere.

People

- A systematic Capacity Building Exercise becomes an important activity for successful and sustained implementation of eOffice Manipur. The Capacity Building Programmes on eOffice for various categories (Users, Master Trainers, EMD in Managers and Product Administrators) are regularly conducted.
- Virtual and hands on training of all the Government office.
- E-office cell set up for any technical support by call or Remote desktop.
- The Master Trainers identified by users of the department. Master Trainers are also responsible for imparting training on new releases / features, as and when released.

VALUE INDICATORS

Learning's for sharing

- Implementing eOffice Manipur in a manner that seamlessly transitions from physical files to electronic files requires utmost care and best practices have to be followed. Through each organization has its own way of working but the following best practices have proved to be a key factor in road to successful and sustainable eOffice implementation.

- Commitment from Top - eOffice should be mandated by Department. Regular review by project steering committee for project deliverables & enforcement is required for smooth implementation.
- Change Management- Moral boosting of employee with appreciation for good performance, guiding their official work and increase in their productivity & efficiency, given them a feeling of direct/indirect contribution of growth and environment.
- Capacity Building of users on regular basis.
- Owning the project and data management by departmental identified users as Nodel Officer and Local Admin.
- Establishment of in-house support and capacity building team.
- Government process Re-engineering and preparation of SOP for dealing with different cases like storage of physical paper/DAK after digitization, digitization of legacy files/receipts, weeding out of files/receipts, etc.
- Closing of files, as & when action on file is completed and Archival of files, as per the guidelines prescribed n Record Retention Schedule by DAR&PG.
- Adequate Infrastructure at client side must be in place before going live by distributing Laptop to leach officers starting from level of Deputy Secretary and above.
- Department to use standardized functional heads while file opening for better categorization and quick retrieval.
- Digital Signing in noting and DFA should be made mandatory as a policy before going live, to ensure| authenticity, integrity, and non-repudiation of electronic information.
- Emphasize on the concept of "Minimum Government - Maximum Governance'.

Digital Empowerment

- eOffice Manipur is based on Central Secretariat Manual of eOffice Procedures (CSMeOP), standard guideline laid down by Government of India (GOI) to work on core business function; of an organization.
- Facilitates the user to work anywhere anytime on any device any platform either using Web VPN or NICNET.

Green e-Governance

eOffice Manipur has contributed to 100% Environment Friendly & Go Green initiative in following ways:

- Due to the 100% paperless features tonnes of papers are saved which in turn saves trees.
- Infrastructure like Printers, Cartridges, Cupboards, and Office Spaces are also saved.
- Saving on Account of travel for transporting of files from one location to other.

Shri Gurumayum Robert Sharma, *Joint Director, Department of Information Technology, Government of Manipur, Robert.sharma@gov.in*

Shri Herojit Sanjenbam, *Information Officer, Department of Information Technology, Government of Manipur, herojit.s@nic.in*

Shri N. Binod Singh, Scientist-F, *National Informatics Centre Manipur State Centre, Ministry of Electronics and Information Technology (MeitY), binod@nic.in*

LouchaPathap – Online Land Record Information System of Manipur

Department of Revenue, Govt. of Manipur & National Informatics Centre Manipur State Centre

Namoijam Kheda Varta Singh, Chandam Bobo Singh and Haobam Jiten Singh

PROJECT OVERVIEW

The main objective of the project is digitization of Land Record and dissemination of information through web and mobile App. Earlier the system was implemented in house in a client server environment. Now after launching this online service on Aug 2018, the service is made available to the general public 24x7 throughout the year. Other objectives include the following:

- Providing easy, anywhere and anytime access to Government Services (both Information & Transactional).
- Enabling conclusive land titling on implementation of hard binding integration model which enables Automatic mutation on registration.
- Providing land tax pendency information.
- A deterrent strategy to fraud and malpractice of data by introducing the following features:
    - Role base user access control and workflow.
    - Maintenance of user log for audit and authenticity.
    - Saving and accessing of the case body securely and transparently.
- Integration of cadastral map with RoR of LouchaPathap.

Scope – functional and geographical:

- Defined role based multiuser workflow (Mandol, Zilladar, SDC, SDO, System Admin) in Mutation, Partition, Correction and Re-construction of land record.
- Outreaching online RoR information to public from anywhere by 24x7.
- Outreaching online Tax pendency information to public from anywhere by 24x7.
- Mobile App for online RoR information.
- Online land tax payment integration (e-Grass).
- Automatic online land ownership mutation on land registration.
- Integration with Cadastral Map.
- The project is implemented in 6 revenue districts of Manipur namely – Imphal West, Imphal East, Thoubal, Bishnupur, Kakching, Jiribam. If other regions or districts have provision to hold or construct revenue records, the project implementation can be extended as well.

Key stake holder – intended benefits:

- Administration
- Easy and transparent governance
- Building confidence from public

- Government:
- Protects government land
- Citizen friendly
- Less litigation
- No fraud and Less corruption
- Citizen:
- Quick, Lesser Time Consuming
- Tamper Proof Records
- Easy Access
- Others stakeholder:
- Bank – Facilitates on Mortgage/Objection

Current status:

- Out of 603 revenue villages 498 villages have been commissioned.
- 498/603 villages ROR are made available through the public cloud url https://louchapathap.nic.in.
- Tax pendency status are also made available under PattaDown Link in the url https://louchapathap.nic.in.
- A cumulative transaction of more than 690920 has been recorded till date.
- A Cadastral mapping test of 7 villages of Bishnupur circle has been done successfully with the help of BhuNaksha team New Delhi. A staging server at State Data Centre, New Secretariat Imphal has been configured with the url http://10.178.0.7/bhunaksha.

Hardware/Software

LouchaPathap was incepted in the year 2002 and was implemented the client server application of VB 6, MSSQL 2000 with paired balancing GIST 2.0 SDK in the year 2004. GIST SDK 2.0 of CDAC India was used for rendering regional Manipuri Bengali text.

- Present Application is Unicode compliant and is hosted on NIC NDC cloud at the url
- https://LouchaPathap.nic.in since 16-Nov-2018.
- Windows 2012 Data Centre Edition is the Operating system.
- Developed in ASP.net language in free license Visual Studio Community Edition 2017 development studio.
- MS Framework 4.5
- Back end DB is MSSQL Server 2012 R2 express edition.
- MS Framework 4.5 and MSSQL server 2012 express edition are free resources.
- The application is Rich responsive and Unicode compliant.
- LGD code is dove tailed in each referential entity of back end DB.

(Certifying Agency)

YES. Web application security audit of LouchaPathap is made cleared from AKS Information Service Private Limited Noida New Delhi on 04-Oct-2018 and hosted on cloud on 16-Nov-2018. Another round of software security audit is in progress with Centre of Excellence for Application Security (CoE-AppSec), Guwahati.

Disaster Recovery and Service Continuity

SymmetricDS is under deployment. It is an open source database replication software that focuses on features and cross platform compatibility.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes.

Name of e-Service	**Brief service description with benefits**	**Volume (Nos) of Services year wise**		
		2020-21	**2021-22**	**2022-23 (Up to date of nomination)**
Lochapathap Online RoR information	Online RoR information are available on public page of Louhapathap. Citizen can view plot and ownership details as fast as internet is available from anywhere 24x7. The Jamabandi format can be printed for urgent uses.	108651	378938	507152
Lochapathap Online Land tax information	Online Land tax pendency information are available on public page of Louhapathap. Tax computation is accurate as per the State Government Tax slab order details. Stops corruption and paying of extra tax amount.	108651	378938	507152
Lochapathap DASH BOARD	Dash Board shows number of computerized villages District-wise. Benefits decision makers for further roll out and plans.			
	Dash Board of LouchaPathap displays number of current transactions and cumulative transactions. Benefits for MIS report preparation at National and State level both.			

Implementation

With the implementation of this project, several milestones have been achieved in different phases. The following functionalities of this project have been implemented successfully till date.

- Hon'ble Governor's speech, Budget, White paper, Bulletins, List of Business, Papers laid, Demands for Grants, News, Notice for 6th and 7th Session of 16th Assembly have been made available in NeVA website and mobile app.
- Questions and Replies for 7th Session of 16th Assembly were processed digitally in NeVA work flow framework and made available in NeVA website and mobile app.

- Questions of all sessions of 14th, 15th and present, i.e., 16th Assembly are processed digitally in Question Information System and are made available in Odisha Assembly website.
- The Digital Audio Recording System is live during the session and maintains all the recordings during the session which are used by respective officials for preparing the House Proceedings.
- Accounts Automation System for Hon'ble Speaker, Hon'ble Deputy Speaker, Hon'ble Members have been successfully implemented. All bills from the month of May, 2021 upto the current month have been processed and generated. The bills include: Pay bill, FAT bill, Water bill, Telephone bill, Motor Vehicle advance, Professional Tax, and HRA.
- The Press Clipping Information System has been developed and deployed successfully.
- The House sessions during the Covid-19 period were conducted successfully through Video Conference (VC) virtually connecting the Hon'ble Members from remote district/regional head offices/centers. The no. of questions asked in year 2020 was less because of the discontinuity of House Sessions during Covid-19 pandemic.

However, this is not a full stop to the digitization movement. This evolutionary project is a continuous and un-ending march aiming towards transforming the Legislation into a digital system entirely through potential future enhancements.

Implementation

- Data validation and freezing for continual online transaction has been achieved on 5 revenue districts out of 6 revenue districts.
- Out of 603 revenue villages 498 villages have been commissioned.
- 498/603 villages ROR are made available through the public cloud url https://louchapathap.nic.in.
- Tax pendency status are also made available under PattaDown Link in the url https://louchapathap.nic.in.
- A cumulative transaction of more than 690920 has been recorded till date.
- A Cadastral mapping test of 7 villages of Bishnupur circle has been done successfully with the help of BhuNaksha team New Delhi. A staging server at State Data Centre, New Secretariat Imphal has been configured with the url http://10.178.0.7/bhunaksha.

Improvements / Enhancements

- Implemented Cloud LouchaPathap to 21 villages of Jiribam district.
- Implemented Cloud LouchaPathap to Konthoujam, Hiyangthang, Mayang Imphal, Lilong Chasing, Sekmai, Lamphel Central, Patsoi, Sekmai and Wangoi under Imphal West.
- Online Transaction of Land record data under survey/re-survey at Director settlement is ensured during the next one year.

ENABLER

Processes Re-engineered

- Can access and verify information from anywhere using Internet.
- Role base access for higher level security.
- Maintenance of user log for audit and authenticity.
- System is hosted on cloud so is accessible from anywhere anytime.
- After the data are hosted on a secure central repository, there is no more fear psychosis of losing data and records due to disaster and nature calamity.

- Secure hosting of the application through SSL.
- After the implementation of this online system, number of revenue related court litigations considerably reduced.
- After successful implementation of such system, mindset and adaptation of the officials and staffs in using ICT is improved considerably.
- Adequate training and capacity development for the CSC for such new initiatives by the government greatly improve the prospect and service delivery at CSCs.
- Implementation of such transparent and efficient system helps in building confidence of the general public towards the Government and District administration.
- Mobile App for RoR and REST API are also deployed within the url https://louchapathap.nic.in
- API for integration of cadastral map and LouchaPathap RoR is developed and tested using Bhunaksha software of NIC HQ. Delhi.
- Two types of Integration model of LRS and NGDRS i.e., (i) using API (ii) Hard binding at database levels, are under development for a conclusive land titling system in the state.

Technologies

- System is hosted on cloud so is accessible from anywhere anytime.
- Mobile App for RoR and REST API are also deployed within the url https://louchapathap.nic.in.
- Can access and verify information from anywhere using Internet.
- Role base access for higher level security.
- Maintenance of user log for audit and authenticity.
- Assisted Transliteration module for Local script to roman English.
- API for integration of cadastral map and LouchaPathap RoR is developed and tested using Bhunaksha software of NIC HQ. Delhi.
- Two types of Integration model of LRS and NGDRS i.e., (i) using API (ii) Hard binding at database levels, are under development for a conclusive land titling system in the state.
- The new online system is Unicode compliant and hosted on Cloud Servers at NDC SP New Delhi.
- A fair and transparent system enforced within the online system.

People

- Imparted one-day hands-on Training of Cloud LouchaPathap to revenue staffs of Imphal West District at LRC unit Imphal west on 04-Jan-2020.
- Imparted one-day hands-on Training of Cloud LouchaPathap to revenue staffs of Kakching District through VC starting on 26-Aug-2020.
- Imparted three-day hands-on Training of Cloud LouchaPathap to revenue staffs of Jiribam District through VC starting from 27-Oct-2020.
- Imparted three-day hands-on Training of Cloud LouchaPathap to master trainee of Imphal West District at the office of the NIC Imphal West in June 2019.

VALUE INDICATORS

Learning's for sharing

Projects throw up challenges and opportunities for the teams involved in conceptualizing, planning and executing / maintaining / supporting the projects. Briefly cover key learnings, best practices, from these aspects including any innovative / disruptive technologies, process changes that have been used.

Two types of Integration model of LRS and NGDRS are studied.

Model-I:

It integrates land record and registration through API from both ends. Final decision to proceed the registration using the Land record web service is decided by the concern SRO on seeing the information return by the land record API/web-service to his systems.

After completion of the registration process, registered detail information including the location of the area, plot number, khatta number, land class, area, the new owners/claimant/registrants etc. are pushed to land record database by secure connections. Decision to proceed the mutation process is decided by the concern SDC (Patwari) on seeing the list of information pushed by the concern Sub Registrar. Patwari clicks on a particular row of pending records of mutation. It sends the information to the concern Mandol for initiation of Mutation process by online.

Model – II: (Hard binding integration - Automatic mutation on registration):

In this model of integration of Land record and Registration, there is secure connections with defined user roles under 2 (two) Factor Authentication to access/fetch the land record database from the concern Sub Registrar Office (SRO) in respect of the details submitted by the registrants for registration. The system automatically checks the record mapping/correctness in between the current existing information in both Database of Registration and land records. Automatic mutation on registration is enabled by this Model.

Developed and implemented a transliteration module for converting legacy Manipuri Bengali script to Roman English script using Unicode code point computational mapping for the source and target scripts. The algorithm is supplemented by a local script application context dictionary. A cascade benefit after the dual script adoption is in integrating Land Record Information System in Local Script with Property Registration in Roman English.

Digital Empowerment

Financial Inclusion, Language, demographic and cultural differences may result in certain types of stakeholders not getting fully benefitted from e-Governance initiatives. Please describe the specific steps taken to address these indicators.

Being a Unicode compliant Cloud based LouchaPathap System, the system fully benefits all the stakeholders in terms of Language and Demographic differences by:

- Adopting dual script (both Bengali and English) into the system.
- Accessing the system using Internet from anywhere.

Green e-Governance

Green e-Governance is about application of Green computing practices to the domain of e-Governance. It involves adoption of environmentally friendly practices with respect to creation, use, and disposal of ICT gadgets / infrastructure. There are several dimensions to green e-Governance and prominent among these relate to disposal of e-Waste. Describe the specific steps taken and other Green Governance initiatives.

Shri Namoijam Kheda Varta Singh, *Secretary, Department of Revenue, Government of Manipur*

Shri Chandam Bobo Singh, *Deputy Secretary, Department of Revenue, Government of Manipur, chandom.bobo@manipur.gov.in*

Shri Haobam Jiten Singh, Scientist-D, *DEITY, National Informatics Centre, Manipur State Centre, MEITY, sjiten.sh@nic.in*

Post Matric Scholarship Portal

Education Department, Govt. of Bihar & Digital Government Research Centre, National Informatics Centre Bihar State Centre

Manoj Kumar, Niraj Kumar Tiwary and Shailesh Kumar Shrivastava

PROJECT OVERVIEW

Post Matric Scholarship is a centrally sponsored scheme to financially support the students from weaker section of society to help pursue their education after matriculation. The scheme is specifically focused at increasing the gross enrolment ratio of weaker section students in higher education. The scholarships are available for studies in India only and are awarded by the State Government/Union Territory Administration to which the student actually belongs i.e. where permanently settled. The scholarship is paid to the students studying in recognized institutions and pursuing a specific of equivalent course.

The students are paid non-refundable compulsory fee and maintenance fee based on the course they are pursuing. There is a list of post-matric, graduate and post-graduate courses defined by the State government which are covered under this scheme and student pursuing those listed or equivalent courses are paid in this scheme.

There are certain eligibility criteria like nationality, ceiling of age, net family income, caste and domicile, which needs to be verified before the grant of scholarship. Apart from that, it has been mandated by the Central and State government to pay the scholarship in DBT mode which necessitates the capture and verification of Bank Account Number of student. To avoid duplicity there is need to capture and verify the Aadhaar Number of the students from UIDAI. After verifying all these requirements 40% of the share of scholarship is paid by State Government and 60% is paid by Central Government. There are some cases where 100% of scholarship amount is paid by State Government. These are the cases where the state government has extended the family income limit more than specified by the Central Government.

Most of the students of Bihar migrate outside to pursue their education, the verification of such students, courses and colleges is another challenging task because a team needs to physically visit the college for verification. Considering, the students of Bihar are spread almost in all the states on India, the verification task needs to be carried out very diligently so that un-recognized colleges and courses can be weeded out.

The National Scholarship Portal (NSP 2.0) was being used earlier for collection of applications for payment of scholarship. The data collected on NSP was being shared with respective states for verification. The verification of the data provided by NSP was proved to be a tedious job as everything needed to be done manually and also there was many discrepancies found with data. This has resulted in inordinate delay in payment of scholarship for session 2019-20, 2020-21 and 2021-22. Therefore, it was decided by the Education Department to develop a dedicated solution specifically for Bihar to collect application for scholarship, verify the collected data, pay state's share of scholarship and then share the data with NSP so that central share of scholarship can be paid.

The Application "Post Matric Scholarship Portal" has been developed to address the issues mentioned above with technical consultation of National Informatics Centre

(NIC), Bihar with active support of three department Education, SC & ST Welfare and BC & EBC Welfare of Govt of Bihar. Presently above 11.87 lakhs students have been benefited with portal and an amount of Rs. 480 Crore has been paid.

Objective:

The objective of the project is to provide a standard platform to students of weaker section of society with a facility to seamlessly apply for grant of Scholarship for pursuing Higher Education. The emphasis is on providing the scholarship grant in a time bound banner to serve the very purpose of receiving scholarship and bring a qualitative change in scholarship disbursement process.

Stakeholders:

- Education Department, GoB
- SC & ST Wefare Department, GoB
- BC & EBC Welfare Department, GoB
- Minority Welfare Department, GoB
- National Scholarship Portal
- NIC, Bihar
- Students of Bihar pursuing higher education across India
- Recognized colleges offering various courses

Scope of the Project:

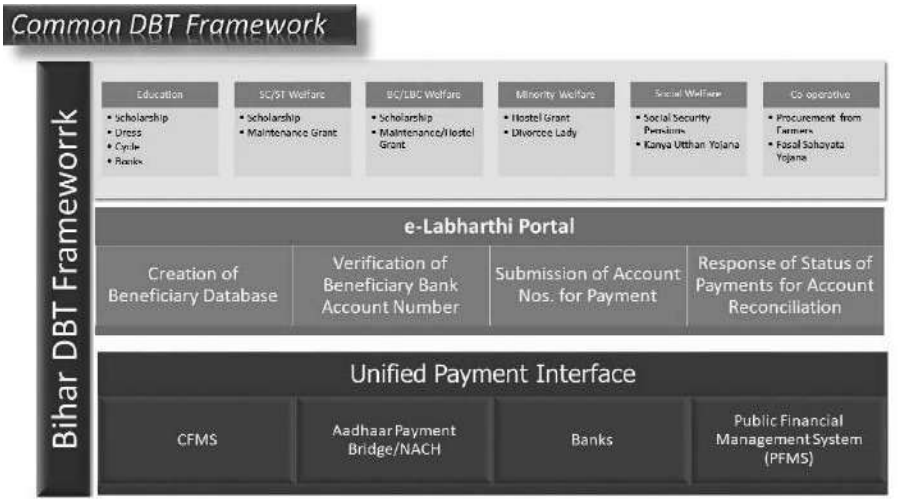
- Registration and Verification of Colleges for laid down academic standard
- Verification of Courses according to guidelines of Government
- To bring the Post Matric Scholarship scheme on Common DBT Framework
- Registration and Verification of Students
    - Verification of Documents and Fee Receipt Submitted
    - Bank Account Verification using PFMS.
    - Automated Caste, Income and Domicile Certificate Verification from RTPS application.
    - Demographic Aadhaar Authentication, Mobile and e-Mail Authentication.
- Transfer of State Share directly to the Student's Bank Account
- Sharing of Data with NSP for payment of Central Share of Scholarship
- De-duplication with existing databases such as Aadhaar etc.
- Process Reengineering of schemes for simpler flow of information and funds.
- Greater Accountability of concerned authorities.
- Elimination of redundant processes in fund transfers and fast processing of applications.

Geographical Scope:

- Students and Colleges across India

Common DBT Framework:

The mandate of Finance Department, Govt of Bihar is to bring all the welfare schemes to a common platform established by NIC, Bihar. Therefore, this scheme has also been on-boarded on Common DBT Framework.



Intended Benefits:

- Efficient Scholarship Processing and Transfer to the Accounts of Students.
- Transparency in the entire process.
- De-duplication and identification of ineligible beneficiaries.
- Standard Operating Procedure defining end-to-end activities.
- Increase student enrolment ratio from weaker section of society.
- Automation in verification processes.

Current Status:

- The Post Matric Scholarship Portal has been Developed and hosted at https://pmsonline.bih.nic.in/
- The Mobile Application "Post Matric Scholarship App" has published on Google Playstore on link https://play.google.com/store/apps/details?id=bih.in.postmetric
- About 17.5 Lakhs students have registered on the portal out of which about 3.5 lakh students were found ineligible and 11.86 lakhs student are paid scholarship. Rest of applications are under process.
- Various capacity building programme have been conducted at District Level in order to make field functionaries conversant with the portal and mobile app.
- Rs.480 crore has been distributed as scholarship for the session 2019-20, 2020-21 and 2021-22.
- Preparations are underway to open the portal for accepting the application for the year 2022-23.

Hardware/Software

S.no	H/W and Software Specification	Name of H/W and S/W
1.	Servers & Desktop	High End Blade Servers, Local servers, Desktops Hosted at NIC Mini Cloud Patna
2.	OS	Windows Server 2012
3.	DBMS	SQL Server 2008, SQL-Lite
4.	Web Server	IIS 7.0 and more

5.	Framework	.Net framework 4.5, Java
6.	IDE Software	Visual Studio 2019, Android Studio
7.	Reports	HTML 5 based reporting
8.	SMS	Mobile Seva of DEITY and NIC SMS Gateway
9.	Mobile App	Android based Java Application
10.	Unicode Support	Indic IME
11.	Video Player	HTML 5

Certification (Certifying Agency)

The application has been audited by CERT-IN empaneled vendor Codec Networks Pvt. Ltd.

Disaster Recovery and Service Continuity

To keep the data and application safe and ensure service continuity the applications are hosted in State Data Centre Bihar. The SDC provide cloud environment on virtual servers. Streaming replication of database has been setup which also acts a resource for reporting database. The daily incremental backup is scheduled and full back up of database is being taken every fortnight. The Bihar SDC is a STQC certified datacenter and continuous security and performance audit of Data Centre is being carried out as per standard operating procedure. The Bihar SDC has created DR with Microsoft Azure Cloud. The websites along with required software are made available in DR site so that in case of failure of DC the DR site can automatically be made active. The management of DR Site is done by a group of specialist technical officers of IT Department, Govt. of Bihar.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Service	**Brief e-Service description with benefits**	**Volume (Nos) of Services year wise**			
		2019-2020	**2020-2021**	**2021-2022**	**2022-23 (Upto date of nomination)**
College Registration	Online Registration by College on the PMS Portal	11148	11148	11148	Process is about to Start.
College Verification	Provisional Verification	9770	9770	9770	
College Verification	Final Verification	7400	7400	7400	
Student Registration	Aadhaar, Identity and Bank Account Verification of Student	299296	530469	895542	
Physical Committee Verification	Applications and Courses of Students	260505	462958	772428	

Institute District Committee Verification	Overall verification of application submitted by student including Caste, Income and Domicile.	224323	392519	651396	
Student Home District Committee	Overall re-verification of application submitted by student and approve the release of payment	213137	375037	628576	
No. of Student paid	Scholarship paid to Students using Common DBT Portal	206075	364772	615439	

Implementation

The Coverage of implementation has been across India. The table below shows the registration of colleges and student across India.Stake Holders:

States	Verified Colleges	Verified Students	Verified Applications
Andhra Pradesh	23	335	451
Arunachal Pradesh	5	66	113
Assam	7	145	264
Bihar	5509	1495276	1671910
Chandigarh	4	55	97
Chhattisgarh	52	477	706
Delhi	43	343	446
Goa		10	19
Gujarat	15	97	163
Haryana	265	3522	4966
Himachal Pradesh	17	174	293
Jammu And Kashmir	4	93	178
Jharkhand	159	2583	3936
Karnataka	48	192	279
Kerala	8	58	124
Madhya Pradesh	310	6726	11165
Maharashtra	32	434	669
Manipur	2	44	92
Meghalaya	4	92	100
Mizoram	2	32	72
Nagaland		35	68
Odisha	37	1018	1446

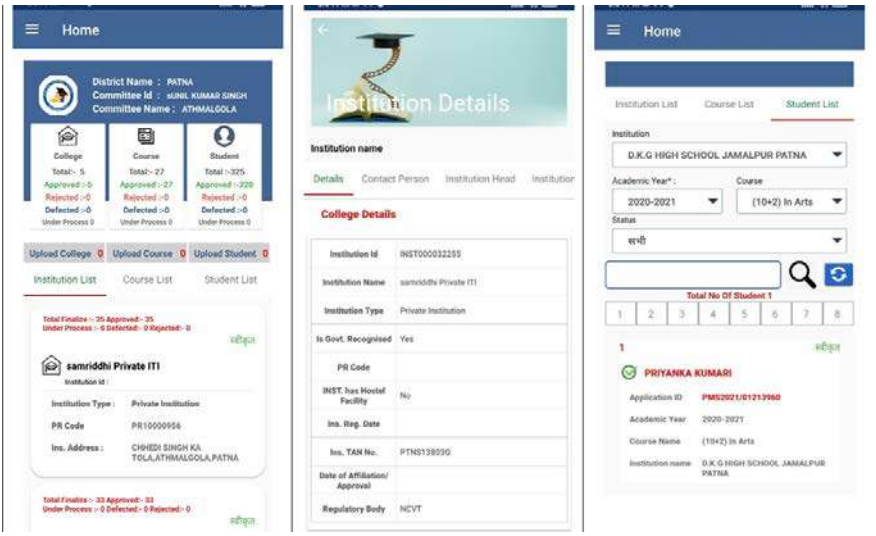
Puducherry	3	24	46
Punjab	206	6053	10917
Rajasthan	55	1041	1902
Sikkim	3	64	130
Tamil Nadu	34	713	946
Telangana	15	79	104
Tripura	2	109	257
Uttar Pradesh	393	6369	9241
Uttarakhand	65	869	1416
West Bengal	78	1592	2791
Total	**7400**	**1528720**	**1725307**

Delivery channels:

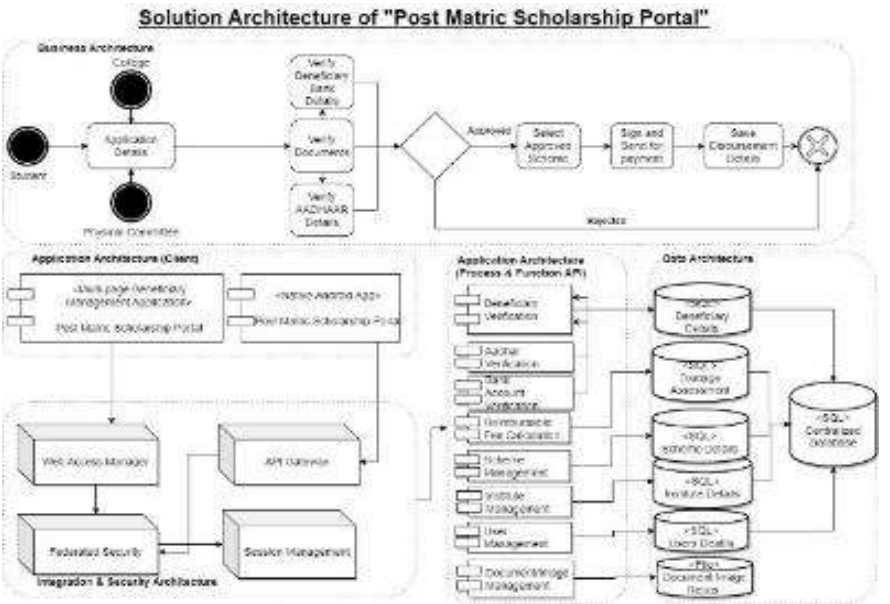
- SMS Alert
- Online Enquiry
- Mobile App
- Helpdesk and Kiosk
- Call Centre Support

Category of stakeholders:

- State Administration
- District Administration
- Education Department, SC & ST Welfare Department, BC & EBC Welfare Department.
- Students of Bihar



Solution Architecture



Improvements / Enhancements

Improvements/ enhancements specifically rolled out during the last one year:

- Mobile Application used for Physical Verification of colleges. Onsite geo-tagging of colleges with photograph.
- Used RTPS web-service to automate the validation of Caste, Income and Domicile Certificate.
- De-duplication of student records using Aadhaar
- SMS alters at every stage of application processing.
- Accurate targeting of Beneficiaries.
- Elimination of redundant process in fund transfer

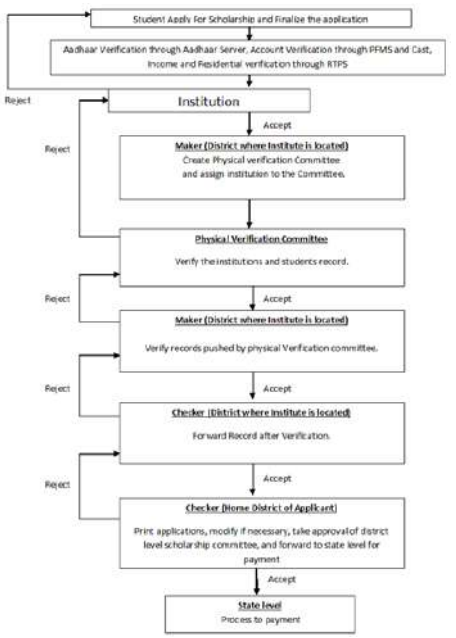
- Generation of Utilization CertificatesImprovements/ enhancements planned to be rolled out during the next one year:
- Provision to verify the eligibility criteria of applicant prior to the submission of the actual application for grant of scholarship.
- Changes in Mobile App based Application access features.
- Unified list of courses across all the colleges..

ENABLER

Processes Re-engineered

- Automated the process of Income, Caste and Domicile verification by consuming web-services provided by RTPS.
- Aadhaar, e-mail and mobile verification of the Students at the stage of Registration.
- Mobile App for verification of Colleges and geo-tagged photograph during verification.
- De-duplication of records using Aadhaar
- Formation of Physical Verification Committee at student's Home District for actual verification.
- Grievance/Suggestions from Students through e-mail and phone.
- Integration with PFMS for automated Payment and Beneficiary Validation.

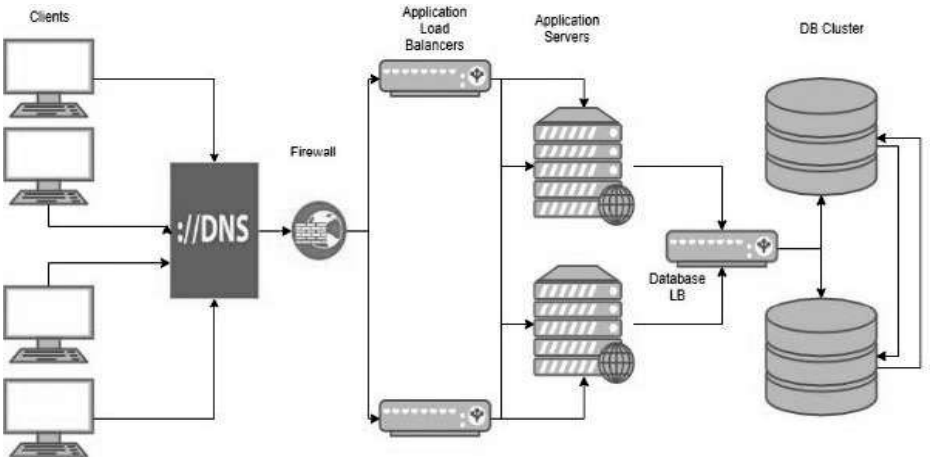
The chain of approvals has been more transparent:



Technologies

- Work flow Management System with separate roles defined for each stakeholder.
- Three tier architecture for data, application and middleware management.
- Web and Mobile based integration framework.
- Mobile based application for online reporting and access of status
- SMS Integration for alerts.

- API integration for mobile applications.
- Mobile Application Development for Hybrid Platforms.



People

State Apex Committee: This is headed by Chief Secretary with Principal Secretary, Finance, Social Welfare, SC & ST Welfare, Minority Welfare, BC & EBC Welfare, Project Director, BEPC, Director Primary Education, Director, Secondary Education, Director Higher Education, Director Mid-day meal, State Informatics Officer as Members. This is apex body for taking policy decision for DBT related activities and student services.

State Project Core Team: Principal Secretary, Education Department, Government of Bihar and NIC, Bihar has notified officers as Project Members of project team. This also have members from administrative officers etc. who advices and assist during project implementation. This team is supported by a team of hired programmers well versed in adopting online web applications, mobile applications and provides technology implementation of the Project. This team work under overall supervision of Principal Secretary, Education Department, GOB and State Informatics Officer, Bihar.

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Project Steering Committee: In order to support project, it is necessary to create and train a group of resource persons who can work at State HQ level and oversee progress

of project and ensure smooth operations at field level. A DBT related ICT cell has been created with hired manpower and domain experts at department level. These people have been trained on using application by Central Core Bihar team. These people not only co-ordinate with field formations scuh as schools, blocks and districts but also interact with field formation for collecting data. In addition, the ICT cell motivate decision makers to use ICT in decision making process and create ICT enabled environment for planning and monitoring. Regular meetings are being conducted to ensure smooth functioning of ICT initiative.

District/Block Level and School Level Support: In order to support project at District and Block level large chunk of data has to be uploaded regular basis various kinds of resource persons have been hired or recruited. Project is being executed with both officers and resource persons of BEPC work together to achieve the objective of the project. Kind of Parameters required at decision making is being identified by the field formations but it is being aligned with organization objective at HQ level. Data Assistants/Field officials dealing with data entry, verification operations have been trained and equipped both for uploading data, data standardization and also they can use ICT as a tool for decision making. Proper h/w and software infrastructure has been created at field formations for updating data. District Informatics Officer/IT Manager/BEP Data Officers has been trained to use the application and provide technical support to the Project. Training has been conducted for all offices including School Principals, Block Resource Centers and District Planning Officers staff.

Workshops with Stakeholders adoption of latest technologies for Service Delivery: Workshops have been conducted for various stakeholders of the project to make them understand about available technologies and best practices in order to support project at division/district large chunk of data has to be verified/uploaded on Servers at regular basis. Numerous training programmes has been conducted by Master trainers. Currently there is emphasis is on using Mobile technology to deliver services and gather data from field formations. In addition, regular training has been conducted through video conferencing using NIC as well as SWAN.

VALUE INDICATORS

Learning's for sharing

The application has been an enabler for the students belonging to the weaker section of society. The seamless procedures of the application have helped many students to timely receive their scholarship which proved to a great assistance for the students continuing their higher education. PMS portal establishes a transparent procedure for quality service delivery to the students. The project can be implemented across country as same kind of workflow based systems are necessary for all the states.

Key Learnings:

- The automation and data sharing with the help of web-services helps to streamline the procedure in a great manner.
- The available digital infrastructures such as Identity Infrastructure in form of Aadhaar, Electronic Banking infrastructure in form PFMS should be utilized in the e-governance project is make it seamless.
- Mobile App based interfaces should be prioritized as it gives ease of use and people with less IT awareness can use it.

- The Mobile Apps should always be designed in such a way that deferred updates of captured data can be done. It helps the application function in internet shadow zones.
- Following standard operating procedures and a team with clarity of action goes a long way in project implementations.

Digital Empowerment

- Mobile/Web based multi-channel service delivery.
- Bilingual (Hindi and English) and Unicode supported user interface.
- Conversion of manual into electronic processes.
- Collection of data at source using mobile devices.
- User-friendly and transparent process for stakeholders.

Green e-Governance

- The end-to-end activity related to the project is being handled in electronic mode. All the stages right from the College Registration to Students Payments are being covered using Mobile and Web Application.
- The approval process is also done in online mode through the web-portal and no paper is being generated.
- The entire reporting system is online and role based reporting mechanism has been created.
- Most of the communications are being done through e-Mail and SMS.
- The capacity building exercises are being done in online mode.
- All orders, circulars and notification related to the Post Matric Scholarship are being published on the portal itself.
- All the training materials, guidelines and user materials are available on the portal in electronic form.

Shri Manoj Kumar, IAS, *Director, Secondary Education, Education Department, Govt. of Bihar, directorse.edu@gmail.com*

Shri Niraj Kumar Tiwary, *Scientist-E, Digital Government Research Centre, National Informatics Centre Bihar State Centre, nk.tiwary@nic.in*

Dr. Shailesh Kumar Shrivastava, *Scientist-F, Head, DGRC, Digital Government Research Centre, National Informatics Centre Bihar State Centre, sk.shrivastava@nic.in*

Water Tanker Pass Issuance and Monitoring System with Mobile App

Thiruvananthapuram Municipal Corporation, Kerala

Binu Francis

PROJECT OVERVIEW

Thiruvananthapuram Corporation, one of the largest corporation in Kerala having 214 Kilo Meter Square area and 9.68 lakhs population (2011 census), being the capital city of Kerala, a dynamic and vibrant city, have more business activities than any other cities in Kerala.

Water supply is one of the mandate of the urban local body, enshrined in the constitution, powers and responsibilities are vested to the local body by the state enactments. But in Kerala, Kerala Water Authority is the Government agency to provide drinking water to the public. There are 2,91,528 water connections in the city Corporation. That is around 30% population is not covered with the water authority's water supply system. Further there are 35,000 traders and more than 2000 government as well as other institutions. The water supply in Thiruvananthapuramcity is sourced from Aruvikkara dam having a capacity of 386.65 MLD and per day consumption is 355.65 MLD as per the data available with the Kerala Water Authority. There are certain locations, where water supply network of water authority is not available and there are break down or bursting of water supply line frequently in many areas, which disrupts supply of water on a regular basis. Further many large institutions are arranged water through private water tankers.

There are more than 100 water tankers in the city and they are sourced water from different source, including authorised vending point of Kerala Water Authority, ponds, lakes and such other water bodies. There are so many complaints regarding sourcing of water from unauthorised points which are heavily polluted, which will adversely affect the health of the general public. There is no system in the city to control the same, even if there is a direction to the private water tankers to source water from the official vending point of the Kerala Water Authority; they are not ready to collect the same from the vending points since sourcing water from the ponds and such other water body is very cheaper and very near to the selling point. In order to control or to regulate this unauthorised sourcing of water and to control the mafia working in this area corporation mooted a new system with the support of the e-platform.

Objective of the project

- To ensure that safe drinking water is available for public.
- To regulate the pricing structure of water tanker service and prevent exploitation of the general public by operators.
- To ensure proper availability of drinking water during droughts and critical events which cause water shortage.
- Prevent use of drinking water for other purposes like construction, gardening, agriculture etc.
- To prevent a public health crisis caused by consumption of polluted water and there be make Thiruvananthapuram disease free city.

- To replace the manual system with a digital platform making it easier for the general public to use and to ensure that service delivery is done on time with proper quality.
- To make the entire operations fully transparent and implement necessary monitoring mechanisms to supervise the operation of the system.

Hardware/Software

The system is developed using fully open source technologies. The backend system and APIs are developed in PHP and Zend Framework. The system uses PostgreSQL RDBMS as the database backend. It is running in a Linux based cloud server utilizing apache as the server software. The mobile components are developed using Ionic framework which is a hybrid framework based on Angular JS.

Certification (Certifying Agency)

The system has been Security Audited & Assessed as per CERT-IN Guideline & OWASP Standard. The Site & Application was found fit and safe for hosting under continuous monitoring and observation by Authorized Authorities. The Application/Site is fulfilled the criteria as per CERT-IN Security norms. The penetration test was conducted by Mirox Cyber Security's certified security engineers.

MIROX CYBER SECURITY & TECHNOLOGY PVT LTD, 4th floor, Nila, Technopark Thiruvananthapuram Kerala- India

Disaster Recovery and Service Continuity

The disaster recovery strategy planned for the system involves a two pronged approach involving technology and another involving the stakeholders. While every possible precautions are taken to prevent downtime or failure of the central system, regular automated backup services are utilized for getting the data backup to be stored safely. In case of a total system failure, this backup service can bring up the system online in a new server within two to three hours.

The stakeholders have been trained to switch to manual operation to handle emergency cases which may come up during such downtime. The call center will act as the binding force in such situations and a command and coordination cell will be opened in the call center to coordinate the activities. Necessary directions will be given to the operators and public as needed to prevent chaotic service delivery and requests. Streamlining of operations will be done by the cell until the system is operational.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	Brief service description with benefits	**Volume (Nos) of Services year wise**		
		2020-2021	**2021**	**2022-23 (Upto date of nomination)**
ater Tanker Booking Service	I: Finance • Total Amount Collected: 17.33 Cr • Kerala Water Authority Payment : 5.11 Cr	24225 Trips	38510 Trips	33677 Trips

	• Income received by Corporation • 91 Lakhs(0 income to the corporation before its implementation) • Total Trips Completed till Aug 2022 : 96412 trips • No of Drinking water trucks Registered: **87 Trucks** • No of Non Drinking water trucks Registered: **20 Trucks** II: Other Benefits • No Monopoly / Mafia • There is a regulator • Reasonable /Fixed Charge • Realtime service/ Delivery • Water Source from authorised vending points which ensure quality of water			

Implementation

- The implementation aimed at bringing all water tanker operators in the Thiruvananthapuram Municipal Corporation area under a single umbrella and to regulate the water collection from treated and chlorinated water only at water authority vending points . The targeted goal has been achieved 100% and all water tanker movement in the city is now being done via the system only.
- Any illegal activity will be identified and the vehicle detained by the health squad of the Corporation. There is no reported complaint from the public regarding the illegal water transport since 24 months from the implementation of the system.

Improvements / Enhancements

- Registered almost all water tanker vehicles operating in the city limits amounting to approx. 107 vehicles. Inspections were carried out on all vehicles to ensure that all bylaw conditions were adhered and licence was issued. Annual licence renewal procedure was implemented to re-evaluate vehicles every year.
- A by law detailing the operating principles and rules governing the system was passed by corporation and approved by Govt of Kerala and published in the gazette.
- System helped to provide 24 * 7 water tanker service to the citizens.
- AIS 140 GPS devices were fitted in the vehicles to provide real time location data.
- Regular water sample collection and testing facility was implemented for ensuring quality of water. The test data is published in the web portal for social auditing purposes.
- Public water tanker booking facility was provided through multiple booking channels.
- Call Center operation was provided 24*7 to ensure proper grievance redressal of customers on time.
- Driver mobile app was provided to issue digital passes which can be verified

by Kerala Water Authority officials from the vending point.

- Strict separation of vehicles transporting drinking and non-drinking water was implemented with color coding for easy identification. (Blue for drinking and Brown for non-drinking).
- Level playing field was brought about in the industry whereby even small players could earn a livelihood without falling prey to the competitive pricing models implemented by large players.
- Since all water is being collected from Kerala Water Authority vending points , it provided additional revenue to Kerala Water Authority and prompt payment was ensured on a weekly basis.
- As no payment credit was involved in the entire system, the operators who had problems in collecting payment from customers on time earlier, were hugely benefited. The corporation ensured that the payments reached them on time.
- The cost of service was regulated thereby preventing exploitation of customers by the operators during periods of high water scarcity.
- The district administration, Kerala Water Authority, Corporation and related departments had to do additional planning and implementation of water tanker based delivery to consumers when major events like pipe burst or drought happened. Now this system takes care of the additional load which comes up during such periods.

ENABLER

Processes Re-engineered

Booking: The booking was done manually and details were kept on registers earlier. The system offered multiple ways to bring booking via online modes and the data was stored digitally. Booking could be done by the public via app or website. The officers could receive booking at their respective offices and also booking could be done via call center or Akshya Centers.

Payment of service charge: Earlier the payment of service charge was done in cash after service delivery. The tanker drivers collected the money at the customer location which led to increased friction between the customers and drivers regarding the rates. This process was modified and the rates were published beforehand and the end users could make the payment online only. No cash transactions are involved which made the system fully accounted for.

Release of payment to operators: Earlier, the Thiruvananthapuram Corporation could release a payment only by using a manual file movement process which caused much delay in processing any payment. But in this system, the detailed calculations on how much money is due to each vehicle trip is done by the system and is reported to the implementing officer. The officer verifies the data and instructions are given to the bank to transfer the money directly based on this report. Since there is only minimal involvement of the officer, the processing of payment is very fast and the process was set up to release the payment once a week regularly.

Technologies

Technology Used: The system is developed using fully open source technologies. The backend system and APIs are developed in an advanced open source MVC framework based in PHP. The system uses PostgreSQL RDBMS as the database backend. It is

running in a Linux based cloud server utilising apache as the server software. The mobile components are developed using the Ionic framework which is a hybrid framework based on AngularJS. The Zoho analytics is used to generate detailed and intelligent reporting.Drill down facility and dat exporting facility available in the framework.

Web Portal for Public: A web portal was developed and deployed as part of the project which interfaced with the general public. They were able to create accounts and book for water tanker service via this portal. The history and details of active bookings were available to them in real time via this portal. The central system could communicate with the end users via this system. The portal can be found in the address https://smarttvm.tmc.lsgkerala.gov.in.

Public mobile app for end users: To increase ease of service delivery, the project integrated a booking and tracking module to the corporation's Smart Trivandrum mobile app. The fact that most of the city residents had already installed the app (Above 50 K Downloads) and is relying on it for obtaining relevant information and notices from the Corporation made it a suitable candidate for adding the service instead of deploying a new mobile app exclusively for this project. All facilities which are available in the web portal were also provided in the mobile app too.

Software for centralised coordination: The key component of the architecture of the system was the central software which acted as the command and coordination centre connecting all the stakeholders to a single point. This acted as the brain of the system and allowed data transfer between various other connected systems.

Mobile app for drivers: The truck drivers were given an android mobile application which they can install in their own phone. The communication between the central system and drivers happens via this app. The details of the customers booking including quantity of water, location, contact number etc was communicated to the drivers via this mobile app. The digital pass issued by the corporation which can be used to collect water from Kerala Water Authority vending points was also delivered to the driver via this app.

Call Centre Software: The call centre was equipped with hardware and software for high call volumes. It could receive concurrent calls from multiple lines via a software component which was further integrated with the central system. Thus the call centre executive could see the relevant information related to the caller like current and past booking orders,complaint tickets etc on the screen when a call came in. Mobile number 9496434488 & lan number 0471 2377701 are attached to this call centre.

AIS140 GPS/ IRNSS: The trucks were fitted with AIS 140 GPS devices which were directly integrated to the central system via HTTP protocol. The device fed the data in predefined format which allowed the system to determine the rea-ltime location of the truck.

Geofencing of vending points: The vending points were geotagged and the GIS information was fed to the central system. Based on this data and the data from the GPS device fitted in the truck the system could monitor and identify when a truck arrives at a vending point station.

Geomap based vehicle monitoring: The system was integrated with a geo map based vehicle monitoring module which allowed real-time monitoring of the vehicles. The GPS devices fitted in the vehicles provided a continuous location data feed directly to the corporations servers. This data was compiled and analysed by the system in real-time. The information about the status and location of the vehicles which operated in

the city was then plotted on to a geomap interface. The users could visually see the vehicles in the map and determine where they are and what their status is. Map was colour coded to differentiate vehicles which are supplying water and those which are running empty. The system also allowed users to check the movement of a vehicle during a certain historical time period. This helped in maintaining control over the vehicle movements and to prevent unauthorized operations of any sort.

People

Elected Representatives: The leadership and initiative from the elected representatives, council and the Mayor of Thiruvananthapuram corporation was a major component in the success of the system. From passing the bylaw to involvement in areas where public support is needed, they did a great job in both understanding the importance of the system and in communicating it to the public. The stringent stands taken by the council in dealing with the illegal operators who polluted the water bodies is commendable.

Officials: The movement of the operating mechanism of water tanker management from a file based manual system to a digital system was very well accepted by the officials involved. The capacity building training conducted for the officials in this respect was a huge success and many significant suggestions and improvements were brought forward by them to fine tune the system. Once they understood the effectiveness and the speed at which actions could be taken, the officials were keen to bring in more protocols under the system. During the initial stages, the health officials strongly patrolled the city to detect and detain any illegal operators which ran parallel to the system.

Vending Point Operators: The vending point operators who acted blindly before the system came in were very keen to be part of the system. They learned to use the mobile app to scan the QR code and to get the information on the booking water quantity and booking customer information.

Truck Operators: The truck operators are the class of stakeholders who were changed by the system the most. From illegally operating at day and night fearing the police and official machinery, they were empowered to work professionally in day and night time. They were trained to work using proper gear and uniforms and to use the mobile app to access necessary information.

Call center executives: The improvement which came about to the call center executives in the last two year is immense. The training given to them has allowed them to work as a team and has brought a few to the forefront as team leaders. They are now capable of handling any situations which arise in the system using the experience they gained over the time.

Thiruvananthapuram Municipal Corporation	• Hon Mayor • Secretary • Health Officer • Health Supervisor-Project implementing Officer • Health Inspector • Jr Health Inspector • Call Centre Staffs
Technical Advice & Monitoring: Kerala IT Mission, SeMT	Sabarish K (Head, E Governance at Kerala State Informa Technology Mission) Nishanth S R(SEMT)

VALUE INDICATORS

Learning's for sharing

- A proper by-law was not available so as to bring the entire digital system under a legal framework.

  The corporation council passed a detailed by law for the operation of the system. All the activities related to water collection, transportation and service delivery are detailed in the by law. The by law was formulated after multiple rounds of detailed discussions with various stakeholders including the Kerala Water Authority team, technical staff of Kerala Water Authority water treatment plant, corporation staff and officers, private truck operators, residents associations and public representatives, various elected representatives and technical staff of SeMT and IT mission officers.
- A digital platform was necessary to run the system but there were no comparable systems as far as we could look for. There was no proper working model in the country in a similar social and cultural environment for reference.
- A similar model was not available in Kerala Water Authority whereby use of digital pass was done at vending points. Manual paper based pass was used at all locations.
- Many big players already had a business framework to profitable operate in the city and such players were not willing to be part of the system owing to concerns regarding profitability and increased operating cost.
- The truck drivers were not willing to collect water from Kerala Water Authority vending points which were located at a large distance from their parking locations. They had local wells or other sources which they could access easily without travelling much.
- Operators who serviced both drinking and non-drinking water in the same truck were not ready to be part of the system as they could transport only drinking or non-drinking in the same vehicle once registered.
- The vehicles had to be modified in many respects including addition of GPS devices, change of colour and labels, change of sintex tank to tanker, addition of epoxy coating etc for enrollment in the system. Although there were Govt notifications regarding all these parameters, earlier these operators did not follow it properly. This caused some resistance in certain operators in joining the system.
- The business ran on a credit based system where regular customers got up to 30 days credit from the operators. When an advance payment mechanism was implemented via this project, such customers raised some concerns and wanted to go outside the system.
- Bulk booking facility was provided to the customers using which they can book for a large quantity of water in a single booking and get the water delivered at different dates as per their requirement. The call center coordinated with the customer to understand the daily requirement and delivered the water on time.
- The public also had concerns in providing payment prior to completion of service delivery. This was mainly regarding possible delay refund in case

service is not given. Various IEC activities were arranged during the implementation during the initial stage to increase public awareness about the system. Training programmes were arranged for councillors and corporation staff on various aspects of the system. FM and radio advertisements, social media campaigns, newspaper articles and regular newspaper advertisements through major Malayalam newspapers were utilised to publicise the advantages and operating mechanism.

- Grievance redressal was also a challenge as the new system was non-familiar to both the general public and truck operators.

  A call centre was set up at the corporation office and recruited staff was trained for the operation of the help desk.The booking related doubts, customer feedback, other customer queries , doubts of vehicle operators all are cleared with the help of this help desk. Any possible delay in service is duly informed to the customer and corrective actions will be taken to ensure service delivery. Also email, mobile app push alerts and SMS messages are sent at regular intervals to keep the customer aware of the progress of the service.
- The Kerala Water Authority vending points were operating only during office hours. This caused problems in providing water to customers who booked during night time. The corporation had meetings at different levels with Kerala Water Authority and provided additional staff at vending points to make it operational 24*7.
- Most of the truck operators were not familiar with mobile apps and other technology gadgets.
- Extensive training programmes and awareness messages through whatsapp groups were provided to empower them.
- The behaviour of the truck operators to the public was very rough and lots of complaints regarding overspeed and rash driving came up in the initial stages. Overspeeding issue was blocked by fitting the trucks with speed governors and also they are tracked using GPS speed reports taken at regular intervals. If the speed is above the prescribed speed the vehicle will be disabled and further digital passes will not be issued to it.
- They were not ready to run under an organised system as the fee charged by them was very high compared to the corporation fee. Also, they had no guarantee that they would get their payment from the corporation on time.

  System was set up to provide payments to operators weekly without delay. This increased the confidence of the truck operators. All the payments are directly paid to the truck operator's bank account on a weekly basis (every Wednesday). The operators are not required to come to the corporation office and all the tracking data are available via their account in the online system. Document submission facility is also available in the account.
- The GPS device and other vehicle documents were not properly maintained by the truck operators.

GPS device connectivity and other document validity are checked automatically through the system and the pass is issued only when all the documents are valid.

- Even after launching the system in full swing, parallel illegal service

operated. Special monitoring squad was formed in the corporation and additional patrols were implemented in the city. If a vehicle was caught, huge fine is imposed to vehicle owner and other legal remedies will also be taken as applicable.

- Legal challenges: Some of the big players in the industry filed a complaint to the Govt of Kerala and further filed a case in Hon'ble High Court for stopping the system implementation. The argument they raised was that the corporations activities through this system was affecting their livelihood and disrupting their business operations. They complained that such involvement of a local body in an individual's business was illegal. The Hobl High Court directed the Govt of Kerala to look into the concerns and to make a decision on the matter. The Govt of Kerala convened a hearing to provide a platform for the compaintnats and corporations to raise their arguments. Finally the Govt of Kerala dismissed their complaint and approved the by laws which was then published in Kerala Gazette.Aggrieved by the action of the government, the parties has again approached the Hon High Court and it is pending before the Hon High Court .

On the basis of the complaint mentioned above, the Committee on Petitions of legislative assembly, Govt of Kerala conducted a review of the system. The Hon Mayor and Secretary of Thiruvananthaputam Municipal corporation , Secretary - LSGD , Secretary - Water Resources, Kerala Water Authority MD and supporting staff attended the review. The Committee directed the Govt to approve the by law immediately.

Even after the Govt of Kerala approved the by law, the complainants filed a review petition at Hobl Supreme Court of India challenging the High Court decision. This case was later withdrawn by the complainant.

Digital Empowerment

Financial Inclusion, Language, demographic and cultural differences may result in certain types of stakeholders not getting fully benefited from e-Governance initiatives.

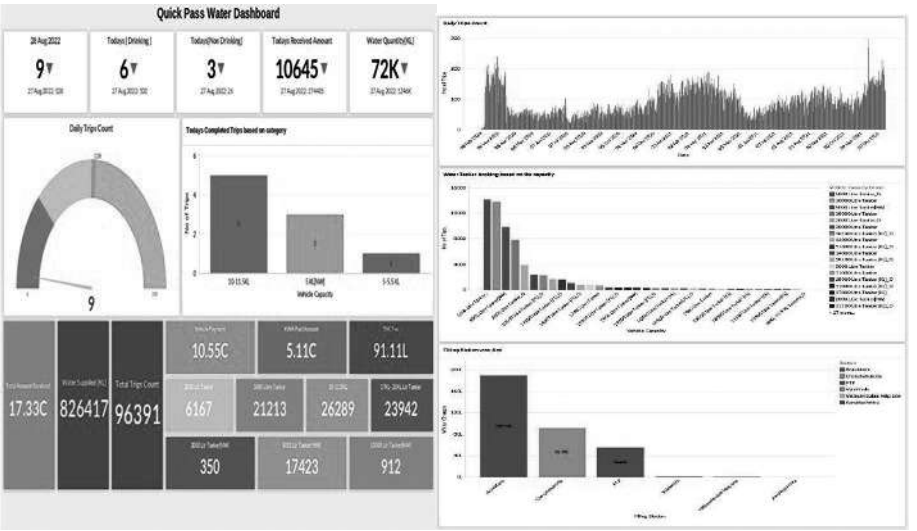
The system houses various mechanism to ensure inclusion of all classes of citizens as follows:

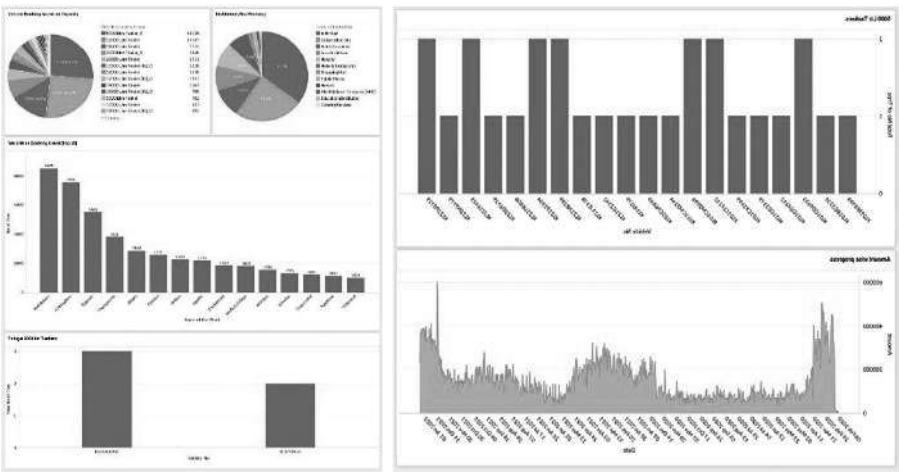
- Online booking and digital payment for anyone who has access to Internet and online banking.
- Akshaya center based booking for anyone who do not have internet access but has online banking.
- Direct Office booking for any one who do not have internet access and online banking facility.

Green e-Governance

Green e-Governance is about application of Green computing practices to the domain of e-Governance. It involves adoption of environmentally friendly practices with respect to creation, use, and disposal of ICT gadgets / infrastructure. There are several dimensions to green e-Governance and prominent among these relate to disposal of e-Waste. Describe the specific steps taken and other Green Governance initiatives.

Supporting documents, software, statistics, reports and experience of users Dashboard of the system.





Mr. Binu Francis, *Secretary, Thiruvananthapuram Municipal Corporation, Kerala, tvpmcorpn@gmail.com*

e-WBMDTCL: Minor Mineral Supply Chain Management System

Industry, Commerce & Enterprise Department, Govt. of West Bengal & National Informatics Centre West Bengal State Centre

Vandana Yadav, Raju Mishra and Mainak Mukhopdhyay

PROJECT OVERVIEW

According to section 3(e) of the Mines and Minerals Development and Regulation Act,

1957 "Minor Minerals" means building stones, gravel, ordinary clay, ordinary sand other than sand used for prescribed purposes, and any other mineral which the Central Government may, by notification in the Official Gazette, declare to be a minor mineral.

The term ordinary sand used in clause (e) of Section-3 of the MMDR Act, 1957 has been further clarified in rule 70 of the MCR, 1960 as sand shall not be treated as minor mineral when used for any of the following purposes namely; (i) purpose of refractory and manufacturer of ceramic, (ii) metallurgical purposes, (iii)optical purposes, (iv) purposes of stowing in coal mines, (v) for manufacture of silvicrete cement, (vi) manufacture of sodium silicate and (vii) manufacture of pottery and glass.

Additionally, the Central Government has declared the following minerals as minor minerals: (i) boulder, (ii) shingle, (iii) chalcedony pebbles used for ball mill purposes only, (iv) lime shell, kankar and limestone used in kilns for manufacture of lime used as building material, (v) murrum, (vi)brick-earth, (vii) fuller's earth, (viii) bentonite, (ix) road metal, (x) reh-matti, (xi) slate and shale when used for building material, (xii) marble, (xiii)stone used for making household utensils, (xiv) quartzite and sandstone when used for purposes of building or for making road metal and household utensils, (xv) saltpeter and (xvi) ordinary earth (used or filling or leveling purposes in construction or embankments, roads, railways, building).

The Mines and mineral (development and regulation) act 1957 provides for development and regulation of mines and minerals under the control of union. This act enacted by parliament in 8th year of republic of India. Section 23c of this act provide immense power in hands of state government to make rules for preventing illegal mining, transportation and storage of minor minerals.

Minor Minerals are the gift of nature, which needs to be exploited scientifically through sustainable mining, without incurring damage to environment. Since mineral reserves is under the administrative control of the State Government, it is the primary responsibility of the Government to ensure scientific mining and to maintain continuous supply of minor minerals to all development projects including infrastructure and welfare scheme projects like NH, SH and Housing projects and to private projects in a transparent manner in the supply chain from the source to the end users.

But it is often reported that due to unscientific mining and illegal lifting of minor minerals by unscrupulous mineral mafias, huge amount of revenue loss has been caused to the State Exchequer. Illegal lifting and theft of minor minerals has been a continuous

The Consequences of illegal mining are:-

Deepening of river bed:- Sand is an economic resource and source of silica which is used for optical glasses. Besides this sand constitutes important biotic. component in aquatic ecosystem like river. Therefore excess removal of sand (illegal lifting) which is an important minor mineral leads to deepening of river bed. Illegal sand mining in areas of Small River and limited river bed resource leads to serious issue like in Kerala. Even excess removal of sand leads to modification of ground water due to formation of depressions and change in pathway of river.

Environmental degradation:- Illegal mining leads to irreparable harm on ecology and environment due to use of environmentally unfriendly refining methods and materials.

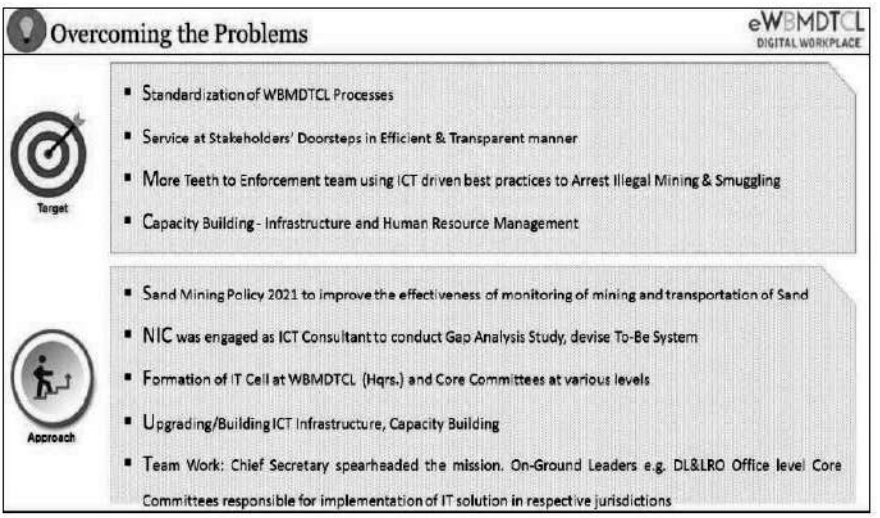
Biodiversity loss:- Huge biodiversity loss happens due to habitat destruction during illegal mining. Heavy sand mining leads to change in course of river in consequence of which many aquatic animals lose their habitats.

Huge Revenue loss to state exchequer:- Illegal mining leads to loss of income of legal miner as illegal miner in Effect competes with legal mining operations. There is Huge theft of machineries, explosives and minor minerals leading to a great revenue loss to state exchequer.

Spread of mafiaism:- Huge illegal mining activity has led to spread of mafiaism to combat this revenue officers along with police personnel conducts enforcement activities to control illegal lifting by mafias.

Other consequences like noise pollution, health risks to the nearby people residing , exhaustion of resources very soon , deforestation done before mining activity leads to huge forest loss etc.

In order to address the issues, West Bengal Industries, Commerce & Enterprise Department embarked on a major ICT enabled System : e-WBMDTCL



The broad objectives of the aforesaid e-WBMDTCL are as follows:-

a). To ensure adequate and uninterrupted supply of minor minerals for all infrastructure and other development projects.

b). To ensure uninterrupted supply of minor minerals to all rural housing and other welfare scheme projects.

c). To prevent illegal lifting/theft of minor minerals from unscrupulous mineral mafias.

d). To put in place robust monitoring mechanism to prevent illegal lifting of minor minerals.

e). To ensure optimal mobilization of revenue so that mineral revenue inflow is maintained to the State exchequer.

f). To induct technological intervention is every stage of process chain.

g). To ensure sustainable mining without compromising with environment, without damage to roads, river embankments etc.

West Bengal state government believes that ICT should be used for benefiting millions and that it is a tool for development and not an end in itself. So, gaps seen in execution of WBMDTCL in previously occurred were sought to be removed through the e-WBMDTCL through the optimal use of IT.

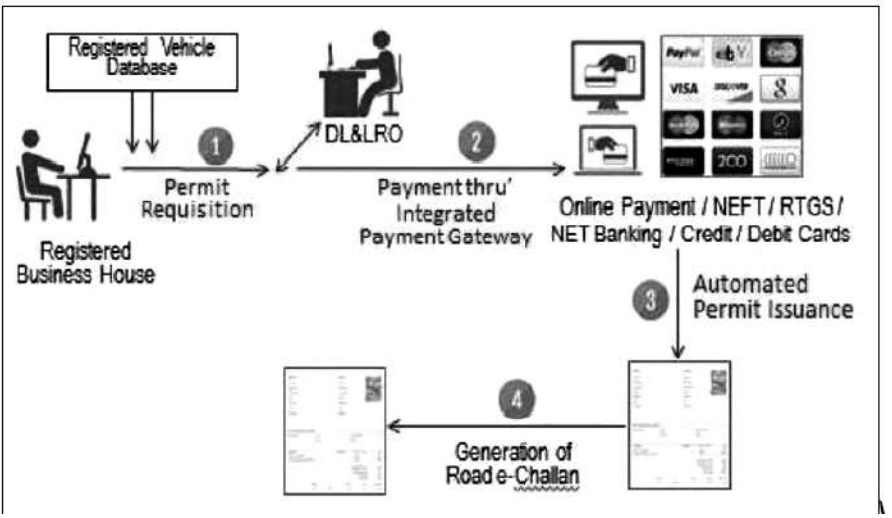
Minor Mineral Supply Chain Management System, developed by NIC, is ICT driven process reengineering initiative leveraging state-of-the-art modern technology for end to end tracking of Minor Mineral Mining & its Intra- & Inter-State Movement through a robust mechanism for Digitization of Sand Mining Blocks, Lessee and Vehicle Registration, e-Collection of Royalty & Fees, e-Issuance of Excavation Permits & Road-challans etc.

The online solution focuses on: -

- Process Standardisation & Technology Enabled Innovative Approaches, (Ii) Collection of Information on Criminal & Breach Cases for Better Enforcement (Iii) Service at Stakeholder's Doorsteps
- Vehicle Registration System: Online registration system designed to capture all details of individual/company held commercial vehicles interested to participate in Minor Mineral transportation is launched.
- MINOR MINERAL EXCAVATION PERMIT SYSTEM: Lessee from their respective office/site could now apply and obtain excavation permission from the concerned District Land Reforms Officer (DLLRO).
- ROAD e-CHALLAN SYSTEM: QR Coded e-challan – containing Origin & Destination, Minor MIneral Block and Lessee details, Validity period - is being generated and facility to check its authenticity
- DMM SYSTEM FOR EXPORT: Online Supply chain of Minor Mineral to nearby states resulting in new avenue of Revenue generation.
- ENFORCEMENT MANAGEMENT SYSTEM: Enforcement wing spread across revenue, transport and land department are embedded with Mobile App for ease in execution of enforcement activities.

Though the project is primarily targeted at businesses engaged in mining, distribution and trade in Minor Minerals, the benefits accrue to the entire population of the State (~9.12 crores as per Census 2011). Besides, the DMM e-Service for Export of Minor Minerals in nearby States has increased the coverage.

Vehicle Registration Module to capture all details of individual/company held commercial vehicles interested to participate in sand transportation: Vehicle owners are mandated to update fitness certificate, pollution certificate and IT/GST details.



Master Sand Block Module: This thus enabled a bird eyes view to the state level officials of the entire operations ongoing in sand and potential sites for future operations through amalgamation and planning as per latest statutory norms.

Excavation Permit Module: The lessee from their respective office/site could now apply and obtain excavation permission from the concerned District Land Reforms Officer (DLLRO). DLLRO after verification of the Environment Clearance Limit for the sand lease grants approval for the excavation permit. The system auto calculates the royalty, cess, DMF, IT and other statutory payments and provides a one stop payment solution to the lessee. This reduces the compliance burden on the legal miners and obviates the need of multiple visit to various offices, establishments.

Road E- Challan Module: Standard QR code-based e-challan format is adopted across state. All relevant details including origin address and destination details, sand mining lease and lessee details, time of generation of E-challan and validity period are captured

on road challan. Its uniformity and ease of generation by lessee enabled in facilitating EoDB for both lessee as well as enforcement officials.

Permission Holder/Stock Module: In this module the system auto calculated royalty rates and other statutory payments but allowed the DLLRO to modify the rates as per the approved rates by competent authority. Thus, Eastern Coal Fields Limited (stowing sand), Irrigation & waterways Department (dredging of Mundeshwari River), Ganga Sagar Mela greatly benefitted from this system.

DMM Module: This opened up new avenues of sale for the legal miners thus filling market vacuum left after stringent enforcement and curtailing illegal mining in the nearby states. The compliance burden for lessee and hassle to travel to Kolkata was eliminated completely and for first-time revenue was generated from DMM office seamlessly.

Enforcement Module: Enforcement wing spread across revenue, transport and land department are given access to the entire sand management portal. One Mobile App is also provided for ease in execution of enforcement activities. They have the option of verifying any e-Challan using QR code, entering unique ID or just the vehicle number. In fact, they need not stop the vehicle and just by punching the vehicle number

determine the legality of sand being transported.

Consumer module: To facilitate consumers to verify authenticity of sale of sand, verify your E-challan module is developed and anyone can punch in code or QR scan code the E-challan to determine authenticity of e-challan from online official portal of WBMDTCL.

The Web-enabled mechanism of e-WBMDTCL has following features:-

- Configurable, Customizable using front end interface paving easy on-boarding of new minor mineral
- Based on Responsive Design using CSS3 & HTML5 for optimized Look & Feel of the portal as per device environment & screen size
- Solution also constitutes of Java Script, CSS, Open source reporting library iTextSharp, XML and Service Oriented Architecture (SOA)
- BI for generation of intelligent MIS
- AI driven trend and future prediction & prescription for better management of citizen que in Camps
- Mobile Apps to facilitate (a) Field-level Inspections, (b) Real-time Status Reports (c) Geo-Tagging of Minor Mineral Blocks
- Integration with Bank Payment Gateways / Treasury Portals through Web API
- Online dynamic dashboard, Pendency Checker at all hierarchical levels
- Auto SMS notifications to Lessees, Dealing Officials
- Auto SMS/Email alerts / notifications to appropriate authorities for needful updates

User friendly design, adequate testing to ensure flawless smooth execution of portal and thereby building higher degree of confidence of its users at all hierarchical levels. Seamlessly integrating a wide array of modern ICT technologies - the Web, SMS Gateway for Auto Notifications, Mobile App, Data Analytics & AI driven trend, Chatbot - this e-Gov initiative has significantly reduced service-delivery times in Minor Mineral Business and has greatly enhanced the government's regulatory capabilities.

Hardware/Software

e-WBMDTCL is hosted at West Bengal State Data Centre (WB-SDC). The project is based on inter-operable, browser based application. The application complies with Interoperability Framework for e-Governance in India (IFEG). The technological aspect datasheet of e-WBMDTCL is as follows:-

- Hosting environment at WB-SDC equipped with Hardware Firewalls and other network equipment, security patches are updated regularly
- Followings are the deployed to implement Duare Tran project:-
    - Microsoft : Visual Studio 2015, SQL Server 2014, Windows Server 2012 R2, Web Server: IIS 7.0
    - HP DL 560 Gen8 Servers (2 x 2 App Server and DB Server)
    - Dlink Datacenter FCoE Switches (Rijie RG S6220-48XS4QXS) - 2 numbers
    - EMC VNX8000 Storage
    - Checkpoint CPAP-SG12400-NGFW Firewall - 2 numbers
- Browser based Application. Accessibility, Platform & Browser Independent.

Security Standard followed: OWASP

- Open Source Reporting Tool ITextSharp is used for generation of reports for viewing online.
- Robust backup & disaster recovery mechanism with DR at National Data Centre, New Delhi.
- Load-Balancing &Always On methodologies are implemented for the Application and DB Servers (2 + 2) at WB-SDC to ensure uninterrupted access of e-WBMDTCL
- Configurable, Customizable using front end interface paving easy on-boarding of new schemes/benefits
- Based on Responsive Design using CSS3 & HTML5 for optimized Look & Feel of DS portal as per device environment & screen size
- Solution also constitutes of Java Script, CSS, Open source reporting library iTextSharp, XML and Service Oriented Architecture (SOA)

AI driven trend and future prediction & prescription for better management of eServices.

- Mobile Apps
- Integration with Bank Payment Gateways / Treasury Portal through Web API
- Online dynamic dashboard
- Hourly auto SMS alerts / notifications to appropriate authorities for needful updates
- Cost-effective solution: Re-use of available ICT Infrastructure and systems
- Ensuring multiple channels of communication including Online, Push SMS, Email, Mobile Apps and Helpdesk
- User friendly design, adequate testing to ensure flawless smooth execution of portal and thereby building higher degree of confidence of its users at all hierarchical levels
- Application S/w developed as per OWASP guidelines; uses standard Web technologies and techniques such as HTTP redirects, cookies, JavaScript and strong symmetric key encryption (MD5 Hashing) both in code level & database level, role-based access to deliver the service, encoded HTML and URL outputs

Security aspects of e-WBMDTCL Portal:-

- VAPT Test of Servers prior to deployment
- Implemented over HTTPS using SHA-256 with RSA Encryption TLS 1.2 SSL
- OTP/CAPTCHA based 2 Step Authentication to prevent DOS/robot
- Application S/w developed as per OWASP guidelines; uses standard Web technologies and techniques such as HTTP redirects, cookies, JavaScript and strong symmetric key encryption (MD5 Hashing) both in code level & database level, role-based access to deliver the service, encoded HTML and URL outputs

Certification (Certifying Agency)

Cyber Security Certificates received from CERT-In empanelled agency declaring the project free from Cyber Security Vulnerabilities e.g. Cross Site Scripting (XSS), Injection Flaws, Malicious File Execution, Insecure Direct Object Reference, Cross

Site Request Forgery, Information Leakage and Improper Error Handling, Broken Authentication and Session Management, Insecure Cryptographic Storage, Insecure Communications, Failure to Restrict URL Access, Buffer Overflows and Denial of Service.

Disaster Recovery and Service Continuity

WB-SDC, Kolkata where e-WBMDTCL Portal is hosted, has Disaster Recovery facility with DR site located in IDC, Shastri Park, New Delhi. Asynchronous replication over WAN using FC-IP protocol and seamless connectivity with DR site over 34 Mbps leased line minimizes any negative impacts to e-WBMDTCL operations. In a nutshell, following strategies are in place: -

- Co-located System in State Data Centre
- 2 App & DB Server with SAN Storage
- Load Balancing (Array Load Balancer) through 2 App Server following Least Connection Algorithm
- SQL Server Always on Failover Clustering between 2 DB Servers. If one of the servers, or nodes, fails, another node in the cluster can take over its workload without any downtime
- SQL Server Transparent Data Encryption
- DR at Shastri Park, New Delhi

RESULTS INDICATOR

In pre-deployment era, WBMDTCL had been operating on legacy manual-based systems, using antiquated procedure that had not been changed for decades. It displayed typical hallmarks of an inefficient, over-bureaucratic organisation. Processes involved in handling service requests were cumbersome and time consuming. Multi-level movement of physical applications plagued with red-tapism leading to time & cost overrun.

SERVICE DELIVERY: Service delivery to lessees was obtained in their physical presence before onset of online system of issuance of e-challans. Access to lessees by lessee log in has great impact in EoDB on part of lessees and now they hardly need trip to DLLRO offices. There were time constraints on part of lessees for submission of application, requisition and payment of taxes / duties either at district office or at banks as there was no 24*7 service time window. Current system has made easier to lessees to apply, submit, make payments anywhere, anytime.

ENFORCEMENT - CHALLAN VERIFICATION SIMPLIFIED: Manual Challans were not time-stamped, QR coded and not with unique ID number, vehicle number with loading capacity etc. and thus it cannot be ascertained easily that the challans are genuine or not. Even, Police had to approach before the challan issuing authority for verification. Inter district verification was a Herculean Task.

Current online system of e-challan issuance has all details mentioned for easy verification and tracking. This was very really helpful while conducting raids by police, land, motor vehicle departments as they can check and re-verify all the details from challans like - vehicle number with loading capacity, challan details with time validity, details of lessees, etc.

MONITORING, COMPLAINT REDRESSAL & LONG-TERM RECORD MAINTENANCE: In pre-online system, records were kept in form of hard copy in files or registers. The Paper Files had chances of misplacement / deliberate destruction

of documents during transit. For districts, there was no such mechanism from where data can be analyzed as easily as available in online. One has to manually check files, registers and other documents and analyze data which was time consuming and resulting in delay in decision making.

Currently, the portal helps to track all details of lessee, minor mineral blocks, permits and challans in a single and digital profile with real time supervision and monitoring. The real time complete data is available for District wise, Sub-Division wise, River Name wise in portal which becomes time effective for preparation of report returns and data analysis and review policy or decision. The district office has become trouble free to maintain records of permits and challan manually.

REVENUE GENERATION: Current system is capable of auto-verification of permitsand auto-calculation of statutory payments and thus has better impact to combat duty evasion. Intelligent data analysis is possible and thus is effective to curb illegal mining activities. This has reduced cost of recovery and become less error prone. The one stop payment solution has allowed lessee to pay anytime around the clock thus facilitating their business.

Implementation

The Challenges faced while implementing e-WBMDTCL are:-

- Bringing in a paradigm shift in providing services to its stakeholders in line of Ease-of-doing-Business from prevailing Manual System to Online Portal
- Attitudinal change, Technological skill enhancement, Adaptability to respond to stakeholder requirements in ever demanding scenario and commitment to provide superlative services.
- Processes were not streamlined – different supply chain processes, different format of e-Challans in different districts across the State.
- For Government Officials: Poor IT awareness, Risk of IT system replacing manpower, Fear of using system and working on system, Risk of information loss.
- Challenge in imparting training and capacity building: Staffs of Lease Holders were used to the manual way of working. Skill sets required to handle IT systems were limited.
- Ensuring robust ICT infrastructure not only in DL&LRO (Excavation Permit Issuing Authority) offices across State, but also in Lease Holder Office Premises in River Bedside.
- Built on “Reduced discretion - Electronic workflow - Electronic service delivery” implemented at https://mdtcl.wb.gov.in to ensure delivery of services in a timely, transparent, more accessible manner
- Seamless online communication among all government officials across state, all lessees, administrative departments & other stakeholders through work flow-based systems built with emerging technologies
- Multiple channels of communication with several closer access points for faceless services including Online services, Pull/Push SMS, Email, Mobile Apps, E-tutorials & User Manuals and dedicated Helpdesk
- Mobile App aided Enforcement management by officials spread across Revenue, Transport, Police and Land departments for ease in execution against illegal mining / illegal transportation of sand
- Mobile Apps to facilitate Geo-Tagging of Sand Blocks, Enforcement, Real-

time Status Reports. Online Collection of Royalties & Fees

Improvements / Enhancements

Year	Total Transaction Amount	Total Challan Generated	Total Quantity (CFT)
2021	493,934,604	512871	132135607.4
2022	3,326,104,991	464554	121624710.2

e-WBMDTCL: KPIs as on 29/09/2022 10:00 PM

Sl. No.	**Description**	**Count**
1	Total e-Challan Generated Today	5,930
2	Total e-Challan Generated till Date	45,41,958
3	Total Revenue Collected Today (RS.)	51,06,379.00
4	Total Revenue Collected till Date (Rs.)	388,09,22,630.00

From October 2022, it has been planned to implement RAYATI e-Service. In the state of west Bengal there are multiple mining lessess across various minor mineral blocks like sand, stone , granite etc . A land details verification module has been developed so that willing landowners can submit their land details to the govt for carrying out mining activities on heir land. Any person/company can register on the portal in order to submit the details.

Besides, the Empanelment module is being launched for engaging the contractors/agency/traders being engaged by the government to carry out various mining activities after participating in government tenders.

ENABLER

Processes Re-engineered

Built on “Reduced discretion - Electronic workflow - Electronic service delivery” implemented at https://mdtcl.wb.gov.in to ensure delivery of services in a timely, transparent, more accessible manner

Seamless online communication among all government officials across state, all lessees, administrative departments & other stakeholders through work flow-based systems built with emerging technologies

Multiple channels of communication with several closer access points for faceless services including Online services, Pull/Push SMS, Email, Mobile Apps, E-tutorials & User Manuals and dedicated Helpdesk Mobile App aided Enforcement management by officials spread across Revenue, Transport, Police and Land departments for ease in execution against illegal mining / illegal transportation of sand Mobile Apps to facilitate Geo-Tagging of Sand Blocks, Enforcement, Real-time Status Reports. Online Collection of Royalties & Fees Prior to the Mobile App & Online hybrid model-based Enforcement Management System, the WBMDTCL had been operating on legacy manual-based systems, using antiquated procedure that had not been changed for decades. The corporation displayed the typical hallmarks of an inefficient organisation.

Manual Challans were not time-stamped, and not with unique ID number, vehicle number with loading capacity etc. and thus it cannot be ascertained easily that the challans are genuine or not. Even, Police had to approach before the challan issuing authority for verification. Inter district verification was a Herculean Task. Records were kept in the form of hard copy in files or registers. The Paper Files have chances

of misplacement / deliberate destruction of documents during transit. For the entire district there was no such mechanism from where the data can be analyzed as easily as available in online. One has to manually check the files, registers and other documents and analyze the data which was time consuming and resulting in delay in decision making.

From manual system where, one has to read one or more voluminous files to collect information about a single sand block/ lessee and having chances of error in case of missing of documents. The details were not in a compiled manner which can be accessed by a click as in online system which leads to cumbersome record retrieval & compilation processes and so time consuming & error-prone.

In Current online system of e-challan issuance has all details mentioned for easy verification and tracking. This was very really helpful while conducting raids by police, land, motor vehicle departments as they can check and reverify all the details from challans like - vehicle number with loading capacity, challan details with time validity, details of lessees, etc.

Online system can help us track all the details of lessee, the sand blocks, the permits and the challans in a single and digital profile with real time supervision and monitoring. The real time complete data is available for the District wise, Sub-Division wise, River Name wise in portal which becomes time effective for preparation of report returns and data analysis and review policy or decision. The district office has become trouble free to maintain records of permits and challan manually.

Dedicated cell of WBMDTCL is available for quick redressal of queries / problems / requests, application tracking system available for online requests – reduces phone calls / visits required to DL&LRO offices. The online sand mining complaints has been treated as urgent and disposed of. This has brought about unification in all the enforcement wings with a sense of purpose to curb the illegal mining in the State.

Besides, better Enforcement against Illegal Minor Mineral Mining has resulted resulting in arresting Revenue Leakages and Enhancement in Revenue Collection significantly.

The robust Mobile App based mechanism introduced by the West Bengal Mineral Development and Trading Corporation (WBMDTCL) for Enforcement Management & Monitoring of Minor Mineral Mining has contributed in arresting the illegal mining significantly and thereby doubling the revenue through royalty and cess collected for transportation of the building material. The state has earned a revenue of over Rs 388 crore which is around 150 percent increase in terms of 2010-11 fiscal.

Earlier the entire process of enforcement and monitoring of the transportation of the building material used to be done manually and there was ample scope of pilferage. However, with the introduction of Mobile App based Enforcement Management & Monitoring system, the e-WBMDTCL has empowered the WBMDTCL as the monitoring authority, to curb pilferage to a reasonable extent. Most importantly, this is helping common people to get minor minerals at the right price.

The enforcement mechanism has been strengthened with officers of any enforcement agency getting access to the permit details just by scanning the QR code on the road challan which controls the illegal sale of sand. With the use of Mobile App, officers of enforcement authorities can get the transport permit status just by keying in the registration number of the truck carrying sand. It has curbed the movement of vehicles evading royalty and check overloading,

The following are the key achievements: -

- Reduction in compliance burden and business cost for the legal sand miners in the state and near elimination of illegal sand miners as they have been shut out of the Ecosystem and no longer have recourse to manual processes duplication.
- Increased revenue for the state Centralized database enabling data analysis for field level verification to promote legal mining, strategizing enforcement measures, planning future sand mining auctions, providing trends and insights for future policy framing and decisions. One key insight is the requirement of stockyards near the major urban agglomeration of Kolkata-New Town Area.
- Integration of enforcement wings and availability of data for Income Tax and GST Departments to undertake legal action in case of any violation. This has also incentized all miners to come under the aegis of law and undertake scientific, legal and environment friendly mining

As detailed in previous sections, all the services are now being rendered online through e-WBMDTCL minimizing the human interventions, collections of royalties/fees are now only through digital ways and the requests for permits/challans are processed & issued using online system.

Technologies

e-WBMDTCL is developed as web enabled application and hosted in the West Bengal State Data Centre (WB-SDC). The stakeholders access it through web browser (client application).

The project is developed with ASP.NET 4.5 as Frontend and MS SQL Server 2014 as Backend Database. Database is mounted on Windows Server 2012.

The related ICT solution also constitutes of Java Script, CSS, Open source reporting library iTextSharp, NIC SMS gateway, Android based Java Application, Adobe Flash Player, IIS Web Server 7.0, XML and Service Oriented Architecture (SOA).

Because of its Responsive design, e-WBMDTCL is accessible through web browsers from PCs, Smart Phones, Tablets etc. The entire solution is hosted in a state of art Data Center with a robust infrastructure. As the developed system is a web based one, deployed at a central location, it is easily accessible by all the stakeholders, anytime and anywhere.

e-WBMDTCL is designed in such way so as to allow flexibility to scale up horizontally or vertically based on future needs and requirements of stakeholders.

AI driven trend and future prediction for better management of Excavation of Minor Minerals have been implemented.

In the e-WBMDTCL portal, we have used machine learning, an application of Artificial Intelligence (AI) that enables the Portal to learn and advance, based on initial excavation data without being specifically programmed. Machine Programme Predictive Algorithms using open source R language is incorporated in e-WBMDTCL Portal to predict future demand of minor minerals in the market.

- Browser based Application. Accessibility, Platform & Browser Independent. Security Standard followed: OWASP
- Open Source Reporting Tool ITextSharp is used for generation of reports for viewing online.
- Robust backup & disaster recovery mechanism with DR at National Data Centre, New Delhi.
- Load-Balancing &Always On methodologies are implemented for the Application and DB Servers (2 + 2) at WB-SDC to ensure uninterrupted access

of e-WBMDTCL

- Configurable, Customizable using front end interface paving easy on-boarding of new schemes/benefits
- Based on Responsive Design using CSS3 & HTML5 for optimized Look & Feel of DS portal as per device environment & screen size
- Solution also constitutes of Java Script, CSS, Open source reporting library iTextSharp, XML and Service Oriented Architecture (SOA)
- AI driven trend and future prediction & prescription for better management of e-Services.
- Mobile Apps
- Integration with Bank Payment Gateways / Treasury Portal through Web API
- Online dynamic dashboard
- Hourly auto SMS alerts / notifications to appropriate authorities for needful updates
- Cost-effective solution: Re-use of available ICT Infrastructure and systems
- Ensuring multiple channels of communication including Online, Push SMS, Email, Mobile Apps and Helpdesk

People

The success of e-WBMDTCL is triggered by the transformative Leadership exhibiting the realities of purposeful, progressive and visionary governance is a critical driver to implement changes. Chief Secretary, Secretary of the Department steer-headed this initiative from the beginning.

Leadership was critical to enhance motivation, morale and performance of reluctant stakeholders and induce them to accept the changes. It was ensured that leadership exhibited purposeful, progressive and visionary governance and moved on to become a critical driver for implementing changes. Without such extensive active support from the leadership, it would have been impossible to make eWBMDTCL a success.

Extensive stakeholder consultation has been integral to the project, not only at the design and conceptualization stage, but on an ongoing visit. Feedback generated through regular meetings, on-site surveys, and institutionalized as well as informal channels, are used to assess the requirements of both the external stakeholders (viz. the citizens and businesses the department serves) and the internal stakeholders (viz. department officials) as well as their level of preparedness to implement components of the project, and project modules are tailored accordingly.

A comprehensive capacity-building exercise, designed to train departmental personnel and the lessees of WBMDTCL to use the new system, preceded the implementation of the project. The related approach also focused on attitudinal change, technological skills enhancement, adaptability to respond to stakeholder's requirements and commitment to provide superlative services. The exercise is now an ongoing process, and is integral to the success and sustainability of the department's e-Governance initiatives.

The department started with creation of teams for successful implementation of e-WBMDTCL, preparation of detailed project reports for each of the activities like software development, data digitization, site preparation, process reengineering, capacity building, change management etc., creation of ICT infrastructure, training to departmental manpower resources & stakeholders.

The measures adopted by the department towards this end, include the following:

Prior to the launch of the project, departmental personnel across the entire organizational hierarchy, were imparted basic computing skills through a series of training sessions conducted with the assistance of NIC Over 90% of the departmental officers were trained under the initiative.

For a majority of those trained, these sessions were their first direct exposure to the use of modern ICT tools. Master trainers were identified across the state.

The exercise was instrumental is raising computer awareness among the departmental staff, and was critical to creating the knowledge-foundation for the implementation and sustainability of the project.

Besides, motivational programs for all levels of state excise were also conducted.

A team of 6 software developers and software support personnel are contractually engaged to develop, test and implement the software-component of the project, under the supervision of NIC These personnel were also tasked to train the department's officers and licensees to use the software.

Prior to the launch of any new software module, the IT Cell of the WBMDTCL, in conjunction with the Training wing of the department, holds multiple workshops to train the department's officers and on the use of the software module.

A specially-selected team of officers have been trained on Training-of-Trainers basis to provide hand-holding support to the external stakeholders.

A dedicated team of departmental officers and Software Support Personnel has been put in place to provide telephone- and email-based support, as well as on-site support to the stakeholders

User Manuals for the software modules are available for download on the departmental website.

From organizational sustainability standpoint, the department has taken necessary measures to ensure the following: -

- Officials earmarked as e-WBMDTCL Project champion are not transferred during the entire project period.
- Creation of IT cells with suitable technical manpower in central location to provide service to all sites on call basis.
- Necessary budgetary provisions towards recurring costs of all types like maintenance, consumables etc. are made by the excise department.
- Advance and timely action are being taken to renew/revise service contracts wherever applicable so that there is no dislocation in service.

Besides, special attention was given by the department to incorporate following features in e-WBMDTCL to ensure sustainability of this project: -

- Demand-driven IT system which increases the degree of adoption by various stakeholders
- Development of the system in modular fashion
- Designed in such way so as to allow flexibility to scale up horizontally or vertically based on future needs and requirements of stakeholders
- Successful implementation of Stock Inventory Management System on the principles of 'Stock Point' and 'Stock In' & 'Stock Out'

VALUE INDICATORS

Learning's for sharing

The Lessons learnt from the process re-engineering exercise in e-WBMDTCL: -

- Changing user mind-sets is a necessary pre-condition before embarking on ICT based process re-engineering.
- Stakeholder consultation during the stages of development and design are essential for easy post-deployment acceptability.
- Effecting change has to be an exercise started from higher up in administration and then down the hierarchical set up.
- Appraising the stakeholders and convincing them of the benefits is more important than just enforcing ICT re-engineering.
- Accessibility, time and locational independence to users is important.
- Taking along users not comfortable with technology by arranging suitable training is essential for universal dissemination.
- Network and Connectivity are crucial and deploying fall back mechanisms as a measure of redundancy is important.
- Piloting and making necessary course corrections from feedback and user experience before final deployment is essential.
- Robust Helpdesk support and round the clock troubleshooting should be put in place.
- Training and capacity building should be a continuous exercise.

As per best practices to cope with transaction volume growth, necessary measures are taken in e-WBMDTC (Scalability & DB level Always On).

Besides, necessary measures are taken at application software code level (e.g. efficient indexing & tuning of database, view based access in database level, session management, rendering services through web services etc.) to cope with concurrent service delivery requests within minimum response time.

The e-WBMDTCL project, while greatly reducing service delivery times for the West Bengal Industries, Commerce & Enterprise Department, has also been successful in inculcating a strong sense of accountability amongst the dealing officials.

With status tracking and pendency checker at all levels of the hierarchical set up, accountability is ensured. Validations have also been built into the system whereby officers have to process the service requests pending with them within a specified time limit, failing which the request is automatically reverted back to the controlling officer with an SMS alert. This mechanism has ensured transparency and enhanced administrative efficiency.

Digital Empowerment

- Business centric E-governance under the aegis of the legal system has been the primordial achievement of this project. From the very outset, a strategic approach was taken of disassociation and integration. By disassociation it was ensured that each of the modules and their flow process id kept in a manner to cut through all possible red tapes and disassociate and discourage any possibility of manual intervention/subvention.
- All e-Services are integrated in a way to speak to each other. Thus, vehicle data while generating E-challan was fetched from the vehicle module, and

the person in turn having access to the E-challan module to generate such E-challan was drawn from Master Sand Block data module. These nitty gritty to the finest of details is superbly designed and implemented by the WBMDTCL IT Cell Software Development Team under the technical supervision of NIC.

- What makes the project unique is the vast field experiences and catering to each and every requirement of the lessee and district administration while ensuring absolute transparency, efficiency and strict adherence to legal norms in the process.
- Administrative processes have been standardized and scope for discretion minimised.
- Holistic and integrated governance model.
- Transparent and accountable administration.
- Minimal human intervention and reduced chances of error.
- No burden of physical document management.
- Digital archiving of documents / information and easy data retrieval process.
- Intelligent M.I.S data available for effective administrative intervention and policy formulation.
- Ease of transaction by Lessees with the Government leading to enhanced business and augmentation of State revenue.
- Effective enforcement activities on account of enhanced monitoring and reduced risk to environment and also address effectively the issue of revenue leakages.

Green e-Governance

ICT facilities created under the e-WBMDTCL project have taken care of Green e-Governance to the extent possible: -

- Obviated the need for taking print outs by ensuring easy retrieval of data at any time through electronic information management system.
- e-Services under this project maximize transportation efficiencies, reducing carbon admission, since Lessees can avail various services from their own home/offices. In general, online services use around 30% less energy than manual services.
- The e-WBMDTCL project of the Department has resulted in saving around 18 Crores papers of stationery till now from the launch of the project.
- The project has tried to popularize its motto of “THINK BEFORE PRINT – save trees” among stake holders and citizen.
- Special care has been taken to reduce number of statutory documents which can be printed.
- Special training sessions are conducted for participants on Green ICT and its impact.
- Adjust settings of IT systems to save power when not in use for short periods.
- Schedule tasks that need computer processing to be done in a block of time
- For printers that have duplex capability, set their default settings to duplex and grey scale to reduce the amount of electricity, paper, ink and toner used.
- Avoid printing files if reading the same on the monitor will suffice.
- Operate computers, printers and other IT equipment with proper ventilation.

- Use virtualization on servers, when available, to allow multiple operating systems to run on each machine.
- Use e-mail when possible rather than fax to save on paper and energy used.
- To save towards resources and power, the existing ICT facilities like West Bengal State Data Centre and the existing PCs/Laptops already available through departmental budgetary provisions have been repurposed.

In a nutshell, e-WBMDTCL has been designed for achieving paper-less office. Electronic Information Management System has ensured easy retrievability of data at any time and hence obviated the need for taking print outs. The Electronic Inventory Management at business premises has reduced the need for physical visits to such premises by officers which in turn has reduced fuel consumptions and vehicle use for such exercises. Information sharing and communication amongst offices at all levels using BI tools built into the project has reduced the need for manual delivery of information which in turn as further rationalized vehicle use and reduced carbon footprint.

Ms. Vandana Yadav, IAS, *Secretary to the Government of West Bengal, Industry, Commerce & Enterprise Department, Government of West Bengal, vandanayadavias@gmail.com*

Shri Raju Mishra, *Joint Secretary to the Government of West Bengal and State Nodal Officer, e-WBMDTCL, Industry, Commerce & Enterprise Department, Government of West Bengal, osdwbmdtcl@gmail.com*

Shri Mainak Mukhopadhyay, *Scientist-F & o/c, NIC State Secretariat, West Bengal, National Informatics Centre West Bengal State Centre, mainak@nic.in*

e-GRAS Manipur (Government Receipt Accounting System)

Govt. of Manipur & National Informatics Centre Manipur State Centre

Neilenthang Telien, Oinam Tombi Singh and L Premchandra Sharma

PROJECT OVERVIEW

- Government Receipt Accounting System (eGRAS) is a web-based application that facilitates electronic transactions for online payment of Tax and Non-Tax Revenue across Manipur. The main objective of e-GRAS is to facilitate taxpayer/remitter convenience in many ways, including anywhere-anytime payment, extended time, and a choice of banks.
- eGRAS allows payment of Tax / fees of Taxpayers/remitters through the eGRAS portal or through the departmental portal which have integrated with the eGRAS.
- Taxpayers/remitters can make transactions (i.e. deposit/payment) online and the collection of Government receipts is done through a pooling account that is established with the participating banks to which the receipts are credited. The banks upload daily scrolls, which are checked and processed by the Cyber Treasury Officer. The CTO tallies the gross monthly e-receipts of the amount shown in the date-wise Monthly Statement of e-receipts sent by the banks and the Reserve Bank of India.

Hardware/Software

- PHP Version 7.4
- Apache 2.4.46(Unix)
- Red Hat Enterprise Linux
- PostgreSQL 12.4

Certification (Certifying Agency)

Yes, a formal certification has been obtained from AKS Information Technology Services Private Ltd. Govt. of India, CERT-In empaneled Company on 28th January 2021.

Certificate No: AKSIT/2020-21/Cert./179

Disaster Recovery and Service Continuity

Main site at National Data Center at Bhubaneswar

DR site at NIC Manipur Data Centre.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	Brief service description with benefits	Volume (Nos) of Services year wise		
		2020-21	2021-22	2022-23 (Up to date of nomination
Government e-receipt	No of Challans generated from eGRAS	12	814	1243
	Total receipt collected from eGRAS (in Rs)	25,002	30,332,802	57,69,53,710

Portal to Portal integration	Integration of departmental portal with eGRAS for payment of Challans	-	-	4

Implementation

The facility of receipt payment for 49 schemes belonging to 19 departments has been included in e-GRAS so far. In addition, e-GRAS is also integrated with several department portals including Suvidha (Election Commission of India), Profession Tax (Department of Taxes, Government of Manipur), eCourts, and Manipur Inner Line Permit (ILP) System for efficient collection of government receipts.

Improvements / Enhancements

Improvements/ enhancements during the last one year

- Integrated with Treasury NET for providing real-time reports of government receipts.
- Integration of e-GRAS with department portals ECI Suvidha, Profession Tax, e Courts and Manipur ILP has been implemented.
- On-boarding of Bank of Baroda

Planned to be rolled out during next one year

The e-GRAS system is being integrated with RBI e-Kuber e-Receipt enabling taxpayers to remit to the Government from any bank without having restrictions for transacting only through agency bank, faster mode of payment, and immediate remittance to RBI.

ENABLER

Processes Re-engineered

- The earlier system of government receipts involved receipt of challan and approval from Treasury/Sub-Treasury and finally payments through the manually filled challans at banks. Finally, the challans are submitted to concerned treasuries. The system had shortcomings and delays.
- The State Government has rolled out the e-GRAS system and has allowed payment anytime, anywhere. This has provided a quick and simple method of payment to the public. Tax payer no longer need to visit the Treasury/Sub-Treasury and Bank.

Technologies

- Integration with SBIepay and other banks
- Web service for providing a report of real-time government receipts
- Integration with RBI eReceipts (in process)

People

The commitment of the Finance Department, Government of Manipur, and the dedicated technical support from NIC Manipur for the implementation of the e-GRAS application could make the system come into a reality.

VALUE INDICATORS

Learning's for sharing

eGRAS Manipur is working on bringing on board other banks for allowing greater participation from nationalized banks. The recent site to site integration of Inner Line

Permit portal with eGRAS is also one of the goals/objectives met in bringing an easier, convenient and faster way of accessing permits to the applicants, and in the process ensuring that government receipts are realized.

Digital Empowerment

eGRAS Manipur is an online web application. There is no language, demographic and cultural difference and it can be used by any tax payer.

Green e-Governance

e-GRAS is purely a web-based software solution. The system does not generate e-waste. The application is being hosted in a cloud data centre.

Shri Neilenthang Telien, IAS, *Additional Secretary (Finance), Government of Manipur, neilenthang.t@ias.nic.in*

Shri Oinam Tombi Singh, Scientist-*D, National Informatics Centre Manipur State Centre, Ministry of Electronics and Information Technology (MeitY), tombi@nic.in*

Shri L premchandra Sharma, Scientist-F, *National Informatics Centre Manipur State Centre, Ministry of Electronics and Information Technology (MeitY), premchand@nic.in*

Jharkhand electronic- Government Receipt Accounting System

(Je GRAS)

Finance Department, Govt. of Jharkhand & National Informatics Center Jharkhand State Centre

Ajoy Kumar Singh, Sumit Kumar Srivastava and Yashwant Kumar

PROJECT OVERVIEW

Objectives:

- Real time realisation of receipts for Government of Jharkhand from multiple intermediaries.
- Single point of online payment service portal for Citizens and Business.
- Hassle free receipt account generation from a single portal.
- Instant updation of all over the counter (OTC) receipts of e-Challan through API by receiving
- Bank.
- Any Department/Treasury/DDO Office can log on to the portal for viewing the daily receipts.
- Partial or full Challan defacement.
- Payment Status Query API.
- Graphical Dashboard.

Scope-functional and geographical:

JeGRAS allows a wide array of payments options paid to the state government by citizens, business organizations and departments. Multiple Payment options (Debit card/ Credit Card/ Net banking/UPI/Over the counter) ensure robust and easy payments. These payments include Revenue collection (tax/ non-tax), deposits, VAT, Excise, Royalty, Stamps & Registration Fees, Vehicle Tax, Road Tax, Vehicle registration, Pollution certificate, Character certificates, Death/Birth Certificates and more. These facilities can be accessed online by the service provider departments and making online payment through JeGRAS. The payee instantly gets the required certificate/documents online through department's portal. The JeGRAS portal can be accessed globally using active Internet connection. Payment can be made from anywhere even from remote village locations using PCs, Laptops or Smartphones. Stakeholders: Government of Jharkhand, Bank, RBI and AG Office Jharkhand.

Hardware/Software

- Front End: Asp.Net, Vb.Net, CSS, JQuery, JavaScript, Ajax.
- Middleware: Internet Information Services (IIS), Restful APIs, SOAP Services, XML, JSON.
- Database: Oracle EXADATA 12C.
- Another Server: SFTP Server, WinSCP API

Certification (Certifying Agency)

YES (Final Stage of Re-Audit)

MAVERICK QUALITY ADVISORY SERVICES PRIVATE LIMITED (MQAS)

Cert-IN Empanelled

Recovery and Service Continuity

- Multiple Payment options (Debit card/ Credit Card/ Net banking/UPI/Over the counter) ensures that if either of the facility is not working then other option is available to continue the Challan generation process.
- Two different Payment gateways (SBIePAY& PNB) are available so that either of one is always functional.
- The Jegras Application hosted in State Data Centre Jharkhand. Under business continuity plan a near line Data Centre is proposed to be hosted in NIC (procurement is under process).

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	Brief service description with benefits	Volume (Nos) of Services year wise					
		2020-21		2021-22		2022-23 (Till August)	
		Total Count	Total Amount	Total Count	Total Amount	Total Count	Total Amount
Taxes	Land Revenue	755344	8712768677	795793	16179314172	600348	6061034330
	Other Taxes and Duties on Commodities and Services	88	889184.52	109	31045269	33	1777422.34
	Other Taxes on income and Expenditure	32285	420663186.2	34272	126497855.5	7139	37174726.5
	Stamps and Registration Fees	1236077	7076130296	2026255	9864484177	928931	4629100011
	State Excise	9354	18202916866	8774	18046513755	2330	6490500309
	State Goods and Services Tax (SGST) (1)	584191	48651968784	620073	63276629255	287584	30777129802
	Taxes and Duties on Electricity	9734	1952602481	8880	7917184187	4638	4271702808
	Taxes on Agricultural income	6	11018.6	8	11800	0	0
	Taxes on Sales, Trade etc.	16370	43007932626	24735	52131263206	9076	26795644996
	Taxes on Vehicles	903968	9137977629	1042385	11907823271	478074	5720998397
Non Taxes	Animal Husbandry	1380	39516234.07	1575	31489812.5	899	11323075
	Civil Aviation	1	986594	0	0	2	1446198
	Civil Supplies	9033	1370017644	2489	1317583270	669	31414027
	Co-Operation	1279	19393320.25	1029	9621118	223	34913592
	Crop Husbandry	5884	5251160192	6623	53374324.79	3180	63596806.99
	Dairy Development	236	4413295	370	4446308	71	7571363
	Dividends and Profits	2	150003200	9	24050	1	10
	Education, Sports, Art and Culture	1485	312277013.2	1362	1263033984	568	127478375.8
	Family Welfare	3	4439	1	5000	1	10000

	Fisheries	527	63309812	511	61035019	160	19288281.5
	Forestry and Wild Life	424	3159475328	510	6431086837	201	2551008199
	Housing	505	66614856.52	376	2903819.1	140	1521893
	Industries	111	276378678.8	119	96745511.17	38	2537828
	Information and Publicity	8	56583	4	163949	8	205152
	Interest Receipts	79	201692432.9	102	556148011	60	1446379542
	Jails	775	38723621	749	42097496	409	41545264
	Labour and Employment	684	14433066.3	2047	33862404	521	11670525.5
	Major Irrigation	5	64078	3	450018932	0	0
	Medical and Public Health	8278	138692140.1	7863	87791903.91	3572	812299612.2
	Medium Irrigation	6	12996	63	43519598	22	20158864
	Minor Irrigation	4	38198.7	1	452088	3	99217.05
	Miscellaneous General Services	8019	191740032.2	461	3200224211	90	728640497.4
	Non-Ferrous Mining and Metallurgical industries	59002	47350542816	65716	73053207063	28049	34688081709
	Other Administrative Services	10378	718209603.2	14221	71646137.01	5075	25348223.55
	Other Agricultural Programmes	7	6267396	5	1598726	0	0
	Other General Economic Services	2150	104440609.5	2540	135907284	1001	55383812
	Other industries	12774	222584131.4	14879	133404223.1	6715	40365653.04
	Other Rural Development Programmes	101	61736305	175	151791086.3	101	28437766.64
	Other Social Services	91	206193129.4	20	9935964.2	17	3885760
	Other Special Areas Programmes	11	26265	3	3511		
	Other Transport Services	12	5494	41	45900	16	24100
	Plantations	1	32157	1	20	1	20
	Police	91957	666053263.4	58412	750453864	53990	187261492.5
	Power	13	1603751570	32	479091804	13	2072000
	Public Service Commission	17	27789309.48	7	36195574	6	60
	Public Works	473	17327446	2190	124151890	555	27258450
	Road Transport	7	47060	2	20	8	5614
	Roads and Bridges	22	74894374	492	861582678	49	49769582
	Social Security and Welfare	6073	180638648.9	466	32078613.69	264	3465721.5

	Stationery and Printing	297	6203	312	31317	45	18891
	Supplies and Disposals	98	803721	1	10	2	2710
	tourism	4	2170470.54	6	67500	1	2500
	Urban Development	10	758197461	9	787529582.4	6	506993862
	Village and Small industries	92	209516728.3	149	302663667	22	6085099
	Water Supply and Sanitation	120	6560429	91	6376001	30	132997
	Total	3769855	200680659094.48	4747321	27010415702 9.67	2424957	126322767148. 51

Implementation

- Three Parties/Source Reconciliation system is implemented before finalization of account:
  - JeGRAS Portal
  - Bank e-Scroll
  - RBI CN (RBI Credit Notification)
- Timely Submission Account to the AG Office.
- Manifold increase in Revenue collection
- The application is audited and running on Secured Socket Layer (SSL)
- Facilitates Online payment through Net Banking, Approval has been accorded for Payment through Credit Card and Debit Card, Over the Counter (OTC) payment at Treasury Linked SBI and any Branch of State Bank of India through GBSS within state of Jharkhand.
- All over the counter (OTC) receipts of e-Challan generated from e-GRAS portal are instantly updated in Treasury database by receiving Bank.
- Any Department/Treasury/Office can log on to the portal for viewing the daily receipts (successful/failed transaction) through MIS
- After providing the services by a particular Office, the e-Challan can partially or fully be defaced.
- The portal also maintains the Transaction history of payee GRN wise.
- In case of non-receipt of Status of Transaction and post debit of payee's account, provision has been made in the portal for verifying the status by payee himself using the Double Verification API provided by SBIePAY.
- In case the Payee's accounts get debited with failed status and the payee does not uses the verification channel, the Gateway uses the PUSH API for updating the transaction status in eGRAS portal. This way payee can obtain the actual status of his/her transaction.
- In case the payee's account has been debited and even after using the verification by Payee himself using the double verification API, the status remains failed, the amount so debited gets credited back to Payee's account within 24 to 72 hours.
- Dashboard for viewing the instant receipts.
- Manual Challans have been done away with and replaced by e-Challans.
- Hassle free receipt account generation from a single portal.

Improvements / Enhancements

Point of Sale (POS) with on Android Device implementation and IPG integration with

BOB (PayUMoney) gateway under process: This integration will enable users to make payments for JeGRAS by using POS machines thereby enabling the users a faster and hassle-free payment option on the go. BOB (PayUMoney) gateway integration will add a new Payment gateway along with the existing SBIePAY and PNB payment gateways. Adding a new Payment gateway will enable the users with more robust and dynamic payment options. Availability of multiple gateways will ensure more bank and continuity of JeGRAS payments even if one of the Gateways fails to function temporarily.

ENABLER

Processes Re-engineered

S. No	Initial Issues	Process Re-engineered
1	Entire Challan deposit process was manual which included manual filling of Challan, getting it signed by concerned treasury, depositing in bank and then finally updation in Govt. account. This process took 10-15 days which resulted in Delay in fund realisation for Government of Jharkhand for multiple intermediaries	The portal is integrated with a Payment Gateways and e-KUBER of RBI for online collection of receipts and reconciliation. Online payment through Net Banking, Approval has been accorded for Payment through Credit Card and Debit Card, Over the Counter (OTC) payment at Treasury Linked SBI and any Branch of State Bank of India through GBSS within state of Jharkhand. All over the counter (OTC) receipts and Online payments of e-Challan generated from JeGRAS portal are instantly updated in Treasury database by receiving Bank.
2	Each Department has to enter into agreements with Banks and keep different bank accounts for online payment integrations – Delay in Reconciliation and Monthly Accounting.	Hassle free receipt account generation from a single portal.
3	No single point of online service portal for Citizens	Portal can be accessed globally. Single point of online payment service portal for Citizens and Business.
4	Multiple dashboards for Multiple Departments – Reconciliation problems for all stakeholders	Any Department/Treasury/Office can log on to the portal for viewing the daily receipts (successful/failed transaction) through MIS
5	No integration between Treasury and Department portals for two way account reconciliation	Integration between Treasury and Department portals for two way account reconciliation between JeGRAS and Department Portal
6	Every possibility exists that Bank has not submitted correct number and amount of successful transactions	There is no such chance as before finalization of monthly accounts system itself checks the e-scroll from banks and RBI.
7	If the payment failed or in case of service not received no refund	• In case the payee's account has been debited and even after using the

	mechanism.	verification by Payee himself using the double verification API, the status remains failed, the amount so debited gets credited back to Payee's account within 24 to 72 hours. • Also if the service has not been received after a certain period of time by the payee then refund request can be made to the concerned department.
8	No deface mechanism.	After providing the services by a particular Office, the e-Challan can partially or fully be defaced.

Technologies

Enterprise Architecture:

- Service Oriented architecture (SOA)
- Soap based, Restful API architecture
- Private and public key use for digital signature
- Server side signing
- Data Exchange : XML and JSON
- Payment gateway Integration
- Encrypt And Hashing Technique Algorithm: SHA256 ,AES,RSA
- Transport Layer Security (TLS) :TLS 1.2

Data Analytics and Knowledge Management:

- Web : Chart-Js use in
- Mobile : Chart flutter

Social Media:

- Usage of Face book to get feedback from citizens.

People

The implementation of JeGRAS has not only revolutionized the revenue/tax collection system of the state of Jharkhand but also the management system of Government offices in terms of technical skill enhancement, faster citizen services, minimal corruption occurrences and healthy office culture. Now the DDO offices are technically enhanced with respect to processing of e-Challans and collection of various revenues (tax/non-tax). Je-GRAS allows the departments to integrate seamlessly with itself as state's common payment platform to collect & record the major sources of tax revenue receipts which include VAT, Stamps & Registration Fees, Vehicle Tax, Excise, Royalty and others. The portal is integrated with a Payment Gateways and e-KUBER of RBI for online collection of receipts and reconciliation. Enhanced training sessions have been conducted throughout the state for the Government employees who are and will be using JeGRAS so as to ensure hassle free operation of the e-Challan system.

VALUE INDICATORS

Learning's for sharing

Before JeGRAS implementation the existing system of revenue collection consisted of multiple and separate payment gateways for individual departments portals that resulted in Multiple MoUs with Department and Banks, reconciliation issues and late

settlement issues with the Govt. of Jharkhand. To overcome these problems the Technical and Administrative team of Jharkhand Government visited various states such as Maharashtra, Rajasthan and Chandigarh etc. to study the best practices and conceptualize the innovative 'single payment portal system' for Tax and Non-Tax revenue collection in state of Jharkhand. This portal can now provide online API based interface to all departments of Jharkhand for their online collection just like any payment gateways of Banks.

After implementation of JeGRAS all the manual Challans collected from vendors were stopped by executive order of Finance department, Government of Jharkhand. Only Online Challans or e-Challans is prevailing now. Now Government is able to get the revenue in real time. Reconciliation issues have been almost nullified. Penalty calculation of late settlement has become easier because of which government can impose and collect the penalty for late settlement from the participating agency banks. This brings transparency in the system for depositors, Government, RBI, Agency Banks and Account General Office.

Digital Empowerment

Most of the revenue/receipt/tax services are integrated with JEGRAS to facilitate all the departments were using different modes of transactions for collection of revenues. This resulted in accounting issues due to lack of common accounting database. But, now through integration of service of Government Department they have better preview of receipt status. Also, with one common payment service i.e. JeGRAS consolidated accounting of entire departments of Jharkhand is possible with lesser or no chances of errors. Reconciliation, accounting, revenue collection is faster and convenient through one common JeGRAS portal. All the departments can login into JeGRAS portal with their credentials and do the reconciliation and accounting of revenue collections accessing the data from one common database. Fingertip services to the citizen/stakeholders. Initially before JeGRAS integration.

Green e-Governance

Green governance is, indeed, a daunting proposition. It entails serious reconsideration of some of the most basic premises of our economic, political, and legal orders, and our cultural orders as well. It requires that we enlarge our understanding of 'value' in economic thought to account for nature and social well-being; that we expand our sense of human rights and how they can serve strategic as well as moral purposes. JeGRAS is an initiative in the direction of Green e-Governance by Government of Jharkhand. With the introduction of e-Challans the Revenue (Tax/Non-Tax) collection is now practically paperless. Payments can be made to the State government online through Net Banking, Credit Card, Debit Card or UPI and the soft copy of the receipt is available to the user in the form of PDF after successful transaction. This eradicates the use of paper completely thereby taking a step towards saving the environment, making it greener.

Shri Ajoy Kumar Singh, *Principal Secretary, Finance Department Government of Jharkhand, sec.fin.jhar@nic.in*

Shri Sumit Kumar Srivastava, *Section Officer, Finance Department, Jharkhand, sumit.srivastava@jharkhandmail.gov.in*

Shri Yashwant Kumar, *Senior System Analyst, National Informatics Centre Jharkhand State Centre, yashwant.k@nic.in*

Education Portal for Govt. Schools and Office Automation

School Education Department, Govt. of Uttarakhand & National Informatics Centre Uttarakhand State Centre

Bandana Garbyal, Mukesh Bahuguna, Sanjay Gupta and Pushpanjali

PROJECT OVERVIEW

Geographical spread of Uttarakhand is marked by plains and hills in the south and tough mountainous terrain in the north which controls the demographic pattern. Implementation of the state run education system face challenges born out of complications. To enhance the effectiveness of the education system in vogue, it was conceived by the state Govt. to develop a web based portal which can be used as an integrated platform for the students, teachers, administration and decision makers of school education. With this background a portal named "School Education Portal Uttarakhand" was designed & developed by NIC Uttarakhand and implemented by the school education department Uttarakhand in Jan 2016.The portal is a huge repository of 70000 teachers/employees profile and 22000 Government schools with "sugam" and "durgam" categorization. It is having various online modules related to school education department Uttarakhand and SCERT Uttarakhand. After sustenance and acceptance of school education portal at the grassroots level and portal conceptualize and developed for the board of secondary education Uttarakhand.

Objective-The project was aimed and completed following multitude of systems as written below:

Ist phase:

- Human Resource Management System: To have an online system with complete digitized service profile of teachers and employees.
- School Management System: To capture details of schools like demographic details, infrastructure details, student enrolment, sanction post and unit categorization (X or Y) on the basis of eleven norms and their sub-norms parameters etc.
- Teachers Transfer Module: Transfer system is based on the quality points calculated for the teachers. Quality points are calculated on the basis of certain parameters i.e. teacher's tenures in X(Sugam) and Y(Durgam) type of schools, last three years' attendance records of employees and exam result performance in employee's subject in last three years etc.
- School Inspection module: This module is for creating and managing the inspection team, inspection schedules, reports etc. for the inspection of schools for improving the quality of education in the State.
- Student enrollment module: This module captures school and class wise student personal details. The enrolment of students for Uttarakhand School Education Board is also done using this module. The student's promotion to next class after completion of academic session is also done by respective schools.
- Other Major modules:
  - Work-flow based system for application and processing of teacher's service extension.
  - Collection and processing of school related data to give star rating to the schools.
  - Generation of QR Code enabled teachers and employee's identity card.

  - As per requirements of District Education Department Almora, a module is developed and incorporated in the portal though which alumni of any of the Government school in the district can donate funds to his/her school for infrastructure development of the school.
  - Module for sharing of best practices by teachers in the field of ICT.
  - Module for e-learning during Covid 19 pandemic lockdown
  - Android based mobile app for teachers and student attendance
  - GIS interface for school's location with categorization
  - Uttarakhand board result publication
- Major enhancement in office automation during and after year 2020:
  - Online system for receipt of application and processing of applications for recruitment of guest teachers for Rajiv Gandhi Navoday Vidyalaya Uttarkashi, Uttarakhand
  - Analytical dashboard for Uttarakhand board results
  - One of the mandatory requirements of getting CBSE affiliation to 200 Atal schools was existence of school website. In view of this, a new module was designed and developed as part of existing School Education Portal of Uttarakhand, and is successfully implemented in Uttarakhand. The module has facilities through which all schools can update the contents about their school, using their own user credentials.
  - Role based and workflow based an online module for ACR submission and assessments of government teachers have been implemented.

Scope:

- The broad scope of the project was to induce ICT work culture in Department of School Education Uttarakhand. With this objective, the first step of the project was to create directory of schools and repository of school teachers and employees service profile data. This formed the basis for building various future modules in the portal. The department's prime objective of having a web portal was to bring transparency in teacher's annual transfer process. Once this was implemented, subsequent modules were added to the portal for the benefits of teachers, students and administrators. Future scope of the project can be summarized as
- Inclusion of Artificial Intelligence and Machine Learning modules based on SCERT online module data for monthly test.
- Developments of Online leave management system.
- Online school management
- Other requirements by school education department Key stakeholders:
- School education department Uttarakhand
- SCERT Uttarakhand
- Board of secondary education Uttarakhand
- Teachers of Uttarakhand Government schools
- Students of Uttarakhand Government schools

Intended benefits:

With the implementation of School Education portal, department is able to implement any activity for monitoring of schools, student results analysis, transparency in annual transfer of teachers, teacher's recruitment process, analysis of teacher's vacancy in schools, assess student's learning outcomes etc. Other main benefits of the project are:

- A powerful tool in the hand of stakeholders for continual improvement of the school education system in public domain.
- Availability of all information related to school system at one point viz details of students, subject-wise teachers, amenities available in the school etc.
- The generation of teacher's gradation list after incorporating an individual teacher's quality points is electronically generated using this system. The gradation list helps in assessing the vacancies for compulsory transfer of teachers.

Hardware/Software

The project is developed mainly in Open-source technologies. Software and hardware used are as below

- SW – Linux/Tomcat7.0/Java
- Database – PostGreSQL
- HW- Two Virtual Servers in state data centreUttarakhand
- SSL configured.

Certification (Certifying Agency)

Yes, Portal have been security audited regularly by CERT-IN empaneled vendors whenever new module is added to the portal. Following agencies were involved in certification:

- XIARCH SOLUTIONS PRIVATE LIMITED- 24-Feb-2022
- XIARCH SOLUTIONS PRIVATE LIMITED- 3-Feb-2020
- AKS Information Technology Services Private Ltd.- 19-Mar-2018
- Torrid Networks Pvt. Ltd- 23-May-2017

Disaster Recovery and Service Continuity

As the application and databases, both are deployed on virtual servers in state data center Uttarakhand, database and application backup plan is followed as per data center policy. However, critical applications such as dissemination of board results, online registration of applications etc are hosted at National Data Center to ensure service continuity.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	Brief service description with benefits	Volume (Nos) of Services year wise		
		2020-21	2021-22	2022-23 (Up to date of nomination
e-ServiceBook	Captures all the service book details of employees and teachers including employees' profilephoto. All the entries of service book vizPersonal details, posting details, spouse details, details of training attended, leave details etc. are covered under this	66085	+5159=71244	+3918=75162

	system. Employee's profiles are created and updated by the respective controlling units.			
e-Inspection	This module is for creating and managing the inspection team, inspection schedules, reports etc. for the inspection of schools for improving the quality of education in the State.	5072	5098	3537
e-StudentProfile	Student profile including aadhar number(encrypted) is captured by this system as per class-wise enrolment by head of school.	7000	386392	188426
Online application for Guest Teacher Recruitment	Online registration,receiving of application and merit generation for Rajiv Gandhi Navoday School Uttarkashi	-	150 (Started)	-
Online ACR submission	Role based and workflow based an online module for ACR submission and assessments of government teachers have been implemented.	-	27962	-
Students monthly assessment	Online module for monthly assessment of student competency and learning outcome	22	239348	474223
Teacher's service extension	Role based online module for application of service extension by teachers of Uttarakhand.	236	212	253
Employees document verification	Verified academic documents of teachers uploaded on portal through the role based workflow based module.	-	14622	1000 (in process)

Implementation

- The system covers all primary, secondary and senior secondary schools run by Uttarakhand Government as well as Government aided and unaided schools across all the 13 districts and 95 blocks in the State.
- It covers all offices of school education Uttarakhand,SCERTUttarakhand offices including DIETS and Board of secondary education Uttarakhand. As whole, the project coverage is enumerated as below
  - Primary Schools :12866
  - Junior Schools: 3921
  - High Schools: 991

- Inter colleges: 1251
- Institutes :34
- Offices: 1392

- Geographically large part of Uttarakhand is covered by tough mountainous terrain, classified "Durgam" areas others as Sugam areas. The project covers all the units spread in Durgam as well as Sugam areas.
- All 272 controlling (administrative) units, 70,000 teachers including employees, 22000 schools and more than 10 lakh students across the state are covered as on date.
- Module for monthly assessment of students for assessment of student competency and class wise subject wise learning outcome has been implemented for school wise data entry in the first phase.
- All the functionalities of "School Education Portal" and "Board of Secondary Schools Portal" cover all the geographical areas of the state, however, some of the specific modules are initiated by specific districts as pilot projects.

Improvements / Enhancements

- As per eligibility for CBSE affiliation for Atal Schools, an integrated website of approximately 200 Atal schools across the state based on content management have been developed and implemented for content updation by the unit login on education portal.
- For the compliance of order from Hon'ble High court Nainital, Uttarakhand, department of School Education Uttarakhand has given requirements for development of module on school education portal for a work flow and role based application for uploading details of teachers academic /training and other service related certificates after verification from the concern institutes/Universities.The module developed and implemented across the state.
- Online submission and assessment of ACR for government school teachers have been developed and implemented this year successfully.
- The module DAKSH for monthly assessment of students is being developed for student wise assessment and will be implemented in next phase.
- Online receiving of application for request of teachers posting in DIETS is proposed to be developed.

ENABLER

Processes Re-engineered

- Government Process re-engineering- Teachers Transfer Process

Pre-Computerization:

- A large no. of manual requests was submitted by teachers for seeking transfer from remote locations to the location of their preference
- No repository of transfer requests.
- The availability of school wise vacancy of teachers was not transparent to different stakeholders.

Post-Computerization:

- Online generation of gradation list of teachers on the basis of quality points. The quality points are calculated on the basis of concerned subject

performance, attendance and their posting in type of school (Sugam or Durgam).

- The eligible teachers are allowed to submit their choice of posting.
- The status of submitted application is accessible to the individual applicant for transfer.
- Online submission of related documents in case of transfer is sought on the basis of medical ground by a teacher.
- Workflow designed and finalized in coordination with the department after undergoing an iterative process, assigned the roles and responsibilities, consolidated the workflow, and implemented it.

- Government Process re-engineering- e-Inspection module
  - Online monthly scheduling of inspection team
  - Online submission of visit report in prescribed format
  - Auto grading calculated as per the percentage set criteria of achievements
  - System reconstitutes the inspection team on a periodical basis and hence provides Govt. a tool for fair
  - & efficient governance
  - More than 1000 inspections submitted monthly through the system. Online inspection report includes school infrastructure condition, construction and re-construction building or physical status, student and teacher attendance and student performance in school.
  - Regular generation and publication of inspection reports through this automated system has come up as an efficient tool for improving awareness and sense of accountability.
  - d.The system has led smooth monitoring, decision making andmade it easy to identify the areas for improvement through online submission of school inspection report by the respective controlling unit.
  - As the system generates a grading based inspection report which highlights the areas of improvement and escalates to the respective sections, it creates an alert for all the concerned departments
- Government Process re-engineering- e-Service Book :

Captures all the service book details of employees and teachers including employees picture.Details like Personal details, posting details, spouse details, details of training attended, leave details etc. are covered under this system. The employee's profiles are created and updated by the respective controlling units. As on date approximately 70,000 profiles have been created.

- Teacher's quality of teaching can be assessed. The Quality points are calculated based on teacher's attendance in school, his/her student's result etc.
- It is a cumbersome process to acquire individual's data with accuracy and carry out the assessment of each employee. After implementation of the system across the state, the data pertaining to quality assessment has been done for all 70000 teachers, and an exhaustive database is generated using this portal. This system offers a platform to maintain and upgrade this database regularly which is being used by the state Govt. for the efficient assessment of quality of education being imparted by the teachers. It equips Govt. with an efficient tool to monitor quality of education.

- To assess training requirement of teachers.
- The e-service book captures all the trainings done by employees hence skill mapping of all 70000 employees in the state has been carried out. Using this information the department is in the process of identify teachers who have not attained any formal degree like B.Ed, D.L.Ed. related to teaching.
- Mapping of subject wise teacher's availability in all the 22000 government schools across the state is carried out.
- The system captures the subject wise class wise and RTE based sanction posts and hence enables government to assess vacancies which are going to arise due to superannuation of teachers and provides a tool for recruitment planning.
- Teachers are able to view their service record online without any administrative hassle.
- Teachers can download self-Identity card with QR-code data.
- Through this portal all the teachers and employees (70,000) are provided with individual login credentials to enter into the system for above activities.

Technologies

- NIC SMS service has been integrated in most of the modules of the system and used for sending confirmation SMS after verified registration of the candidates, form submission after payment, forgot password and bulk messages etc.
- GIS interface for school location with categorization of SUGAM and DURGAM helps in decision making support system for the department.
- Android app for Geo-tag based location capture of group photographs of teachershelps in tracking daily real time attendance of teachers. Implemented in Udhamsingh Nagar district of Uttarakhand.
- Online module developed for upload of self-prepared contents or videos by teachers for e-learning from home during Covid 19 Pandemic may also use as knowledge management system for department of school education Uttarakhand.
- School education portal have a facebook page and feedback page where employees, teachers and users can give their suggestion and interact with each other.

All administrative units are having whatsapp group to interact and update each other

People

Capacity Building

- Approximately 500 Government schools of Uttarakhand are identified as smart schools where complete package of ICT infrastructure are made available including VSAT systems and connected to each other. Widely used for virtual trainings and meetings by the ministers, administration, teachers etc atup to the school level during Covid 19 pandemic.
- Regular training programs and workshops for teachers and employees are conducted on new modules of the Portal.
- The department officials are now able to work on this web portal after providing basic operational training on computers and internet.
- Every teacher and controlling units are having their login based access to the portal
- for related activities. Now teachers are able to self-prepare their learning contents, videos and uploading on the portal for the student's benefit.

Change management

- Creation of MIS cell at Directorate level enabling a single point of contact for large no. of stakeholders to address their grievances related to employee, school and student's data.
- Allotment of unique employee Id and generation of Identity card with bar-code for teachers.
- Use of ICT in schools
- Accessibility of e-Service book for teachers and officers.

Implementation

Time to time GOs and office orders released at directorate and secretary level to adopt the new system at all the grassroots levels

VALUE INDICATORS

Learning's for sharing

- Digitization of large no. of teacher's profile and their verification has been a very challenging task. For this, strict time lines were defined by top management to finish the digitization work within stipulated time period.
- There should be a central team at State level to drive and monitor the progress of any computerization project.
- ICT infrastructure for hosting the web portal was a big issue initially while conceptualize. Virtual Servers on MEGHRAJ cloud of GOI were allocated for this. The application now migrated to state data Centre Uttarakhand.
- In order to keep data up-to-date due to posting/transfer of teachers etc, the transfer orders and relieving/joining orders should be generated through online portal using a workflow based system.
- Availability of continuous internet connectivity are still a big challenge in the remotest areas, thus timely submission of applications and fees by the candidates become difficult.

The training of teachers conducted by SCERT, DIET etc can also be integrated with the portal for real time update of teacher's data.

Digital Empowerment

- Use of more and more virtual meetings and trainings through the smart school's project in the state. b) Accessibility of online system at remotest of the location.
- Sharing of best practices and uploading of class wise subject wise e contents by teachers thereby benefitting the students
- All Atal Schools is having their content management based website generated through the education portal where each school can update their content through unit login.

  Availability of Uttarakhand board Student results through online system

Green e-Governance

- Implementation of online system for receiving of 1.5 lakhs applications for UTET exam 2019 and Guest teacher recruitment minimizes expenditure of paper/stationary at great extent.
- Virtual meetings and trainings used up to the village level schools through the ICT setup of Uttarakhand smart schools.

- Limited use of paper: The e-services reduce the use of paper. All the Go's and office orders are generated and uploaded on the portal which can be viewed and stored electronically.
- Limited use of gadgets. Cloud based hosting of Portal.
- Online receiving of feedback about portal from teachers and officials.
- The maintenance of hardware systems is in place for enhanced efficiency of hardware and therefore minimize generation of e-Waste.
- Awareness programs to create environment friendly and Green e-Governance.

Restrict transportation/ travelling as all information is readily available and accessible through portal. Also physical movements of candidates automatically restricted due to the implementation of online system for receiving of applications

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***Mrs. Bandana Garbval**, Director, Directorate of Elementary Education, Uttarakhand School Education Uttarakhand, ua.elementary@yahoo.in*

***Shri Mukesh Bahuguna**, Senior Administrative Officer, School Education Department Uttarakhand, ua.education@yahoo.in*

***Shri Sanjay Gupta**, Senior Technical Director, National Informatics Centre Uttarakhand State Centre, sanjaygupta@nic.in*

***Mrs. Pushpanjali**, Senior Systems Analyst, National Informatics Centre Uttarakhand State Centre, p.anjali@nic.in*

Rajasthan Agriculture Statistics "RaJAS"

Directorate of Economics and Statistics, Govt. of Rajasthan & National Informatics Centre Rajasthan State Centre

Om Prakash Bairwa, Ram Niwas and Amit Agarwal

PROJECT OVERVIEW

There are many types of agriculture data collected for different purposes from various locations. Earlier data collected at district offices were send to Directorate at Jaipur by post or excel file for the compilation and statistics generation which took lot of time in data transmission and compilation thus statistics generation could not be done timely which delays in analysis and generation of publications. 'Late data means no data', delay in data sending to various agencies means there is of no use of the data.

Rajasthan Agriculture Statistics (RajAS) Portal is an integrated system to capture details of the various agriculture related data online from the District/Tehsil offices. The system allows the department to keep an eye on agriculture productions and yields in the state. It is used to generate various analytical and statistical data in the state. The system captures the data from Districts/Tehsil in a time bound manner. Once the data is captured, it has been made available to various sections for analyzing and generation of statistics. The portal serve as a useful tool for creation of district level statistical information and also to generate state level statistics and various major analytical reports timely, which may be useful for the state and central government and various agencies. The system provides role base logins to the users and serve as a single sign on on all type of agriculture statistics.

Key Module of the projects are:

- Timely Reporting Scheme (TRS) – 20% villages in every Agriculture Seasons (Rabi / Karif / Zaid Rabi)
- Jinswar – Every Agriculture Season (Rabi/Kharif/Ziad Rabi)
- Rainfall – Daily basis
- Farm Harvest Prices – Kharif and Rabi Seasons
- Agriculture Wages – Monthly
- Improvement of Crop Statistics (ICS) – Kharif and Rabi Seasons
- Financial MIS – Monthly
- Publications – Agriculture Statistics Publications
- Bulletins – Agriculture Statistics Bulletins

Key Stakeholders

- Directorate of Economics and Ststistics, Rajasthan: Overall Monitoring of the agriculture statistics in the state. Workout the five year frames for TRS. Keep an eye on the information in the state. Also responsible for analysis of the data and report the data at state and central government. Software Design, Development and maintenance of the project.
- District Statistics Offices data collection and entry on the portal, Monitoring of agriculture statistics in
- Land Records Sections: Data Collection (Rainfall, Jisnwar) and entry on the portal. Generates various Statistical reports.
- Patwari: Survey and Collection of various village level data like TRS, Jinswar, Agriculture wages, Farm harvest price etc

Key features of the projects

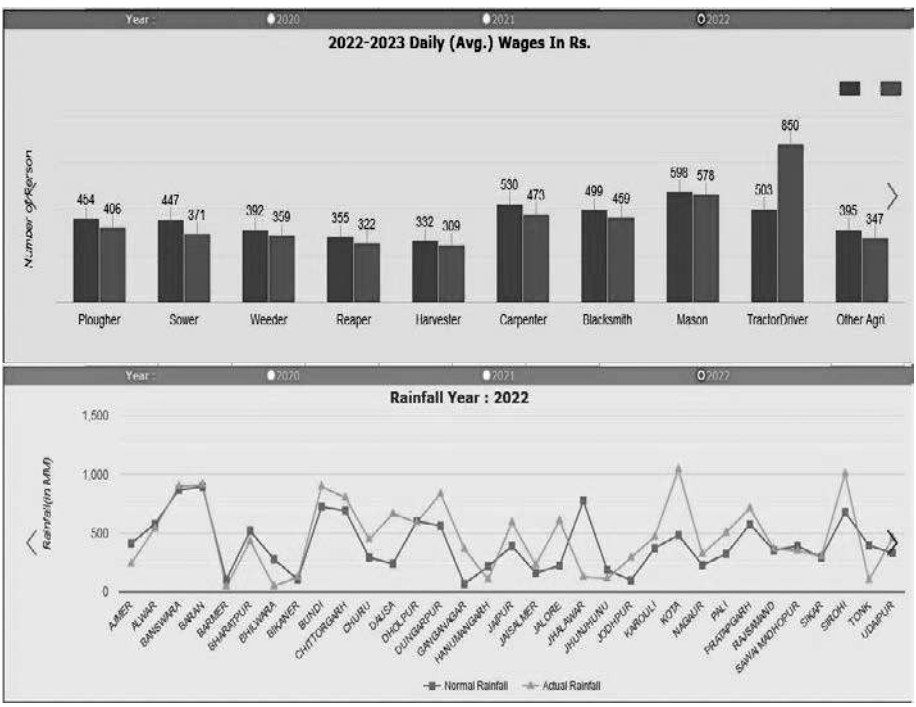
- Uniform process of various Agriculture data collection across the state.
- Role based Single Sign on.
- Availability of various MIS reports at District & State level.
- Circulation of Instructions, Notifications etc. to Districts / Citizens.
- Generation of various Publications and Bulletin and releasing for citizens
- Modular Implementation (Agile) Approach

Key benefits of the projects

- Transparency in data Collection.
- All information to citizens about the Agriculture Statistics, Publications etc. at single place.
- Timely generation and releases of the statistical data.
- Economic Solution - In-House Development

Current Status

- Data capturing only through portal.
- Automatic generation for TRS framework, TRS estimation, rainfall statistics and analytical reports.
- TRS Estimates are being send to Agriculture Department, GoR.
- TRS Estimates and advance estimates, Agriculture & Rural Wages are being send to Ministry of Agriculture, GoI.
- Jinswar module developed and under implementation in Districts.
- Improvement of crop Statistics (ICS) are being send to NSO (National Statistical Office, Faridabad) GoI.



Hardware/Software

Application is developed using ASP.Net 4.8, C# and Microsoft SQL Server 2012 technology with three tire architecture using responsive framework.

Application is hosted at State Data Centre, Rajasthan using rack servers. It is working on SSL.

Application/Web Server - 4 Proc 8 Cores Server with 512 GB RAM, OS-Windows 2016 Server (IIS-10)

Data Base Server - 4 Proc 8 Cores Server with 256 GB RAM, OS-Windows 2012 Server & MS SQL Server – 2012

Certification (Certifying Agency)

Cyber Security Division, NIC, New Delhi in January 2021

Disaster Recovery and Service Continuity

- Provision of full database backup and transactional backup on SAN (Storage area network) is scheduled.
- Development and Support team also take regular backup on local staging Server of the database. Updated (latest) Application code is also available on the staging server.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	Brief service description with benefits	Volume (Nos) of Services year wise		
		2020-21	2021-22	2022-23 (Up to date of nomination
Timely Reporting Scheme (TRS)	Captures agriculture season wise crop estimate data of selected villages. Generation of estimates in time bound manner.	111363	138674	562
Rainfall	Captures daily rainfall data from tehsils/districts. Generates Average rainfall and raindays.	37878	42413	30051
Farm Harvest Prices	Captures prices of a commodity at which the commodity is sold by the producer. Generates total and average prices	944	1262	796
Agriculture Wages	Captures data of wages given for the selected villages. Generate wages of skilled and field labours.	10585	11246	2410
Improvement of Crop Statistics (ICS)	Captures Crop improvements data on three specified formats (1.0,1.1,2.0). Generate timely report for NSO, GoI.	2128	1827	NA

Implementation

Portal was started with the coverage of PAN Rajasthan and made mandatory for all District and Tehsils to enter data on portal and no other means for sending data is

acceptable. Legacy data available with the department has also been migrated to the portal in phased manner.

Extensive training has been provided to all Districts officials for using the portal and correct data entry in their district. Dedicated support team have been identified so that any query may be answered quickly. Regular District wise training and monitoring through Video Conferencing done.

Presently agriculture data are being captured on the portal from all Districts and Tehsils of the state.

Improvements / Enhancements

Improvement/enhancements in last one Year-

- Software for Financial Management Information System has been developed and implemented.
- New citizen centric home page developed showing trends/graphs in the state.
- Mobile App for Citizens and field offices.
- Legacy agriculture data for rainfall, wages, TRS has been migrated.

Major requirement envisaged (for coming year) are as under-

- Generate Khasra Girdawari from the Jinswar Data with the Land Records integration for owner details.
- GIS Mapping of all Data Collection location of the state.
- Mobile app for the collection of data from Districts/Tehsils.
- Addition of new Role for Block offices to be developed to deepen the reach of the portal.
- Portal is demanded by many state. Productisation of RajAS portal to be done so that it may be implemented in other state also.

ENABLER

Processes Re-engineered

Before the RajAS portal, no such data for agriculture statistics exist in the government. Major innovations were adopted as part of process reengineering in module designing in following entities:

- Citizens
  - Online tends.
  - Mobile App for various agriculture statistics.
  - Various agriculture publications, Bulletins online.
- District Offices
  - Real time monitoring of Agriculture Statistics in District.
  - Easy Data compilation.
  - No need to send any report to Directorate office.
- Directorate of Economics and Statistics
  - Real time monitoring of Agriculture Statistics in State.
  - Various types of monitoring reports.
  - No need to collect and compile data and report for sending to GoI.

Technologies

The role based Web-Application uses responsive design, enabling it to be easily

accessible through PC/Laptop/ /Tablet/Mobile devices. Mobile App for Android users available.

Dashboard for State and District to quickly monitor the progress and pendency.

Video Conferencing has been used for the training and monitoring purpose. Field officers were also get updated through social media like WhatsApp groups.

People

Extensive capacity building programme has been conducted for all District officials to monitor and data entry for their district. Support system has been identified with a dedicated support team so that any query may be answered quickly. Regular District wise training and monitoring through Video Conferencing done.

As Portal is mobile/tablet friendly, they access the portal, wherever available as per their suitability

VALUE INDICATORS

Learning's for sharing

- Change Mindset: The toughest challenge faced was to change the mindset of district officials who are reluctant to adopt new system which enables directorate to monitor and generate statistical data on real time.
- The process re-engineering was big challenge due to existing manual and outdated process of registration.
- E-readiness of various stakeholders.
- Development of system within limited resources available with the department.
- Modular approach to development, frequent module launches.
- Daily meetings and interactions to ensure smooth progress.
- Feedback from stakeholders used to make the service more effective and user friendly.

Digital Empowerment

RajAS portal is an integrated web based system in which all the agriculture related data are entered from various entities. As Rajasthan is a backward state and major region belongs to rural, the portal is designed in a way that users does not face any problem. Data in Hindi is acceptable. Helpful hints are provided at every stages of application form.

Green e-Governance

Publications, Orders, Circulars and notifications are distributed through the portal which were earlier circulated on hard copies.

No need to send any paper reports to any authorities. All concerned authorities have been provided login to see their reports.

Dr. Om Prakash Bairwa, Director and joint *Secretary, Economics & Statistics Department, Directorate of Economics and Statistics, Rajasthan, dir.des@rajasthan.gov.in*

Shri Ram Niwas, *Deputy Director (Agriculture), Directorate of Economics and Statistics, Rajasthan, ddagr.des@rajasthan.gov.in*

Shri Amit Agrawal, *Senior Technical Director & Scientist-F, National Informatics Centre Rajasthan State Centre, amit.agarwal@nic.in*

Khadya Sathi-Online

Department of Food & Supplies, Govt. of West Bengal

Parwez Ahmad Siddiqui and Anurag Srivastava

PROJECT OVERVIEW

Khadya Sathi Online:

'Khadya Sathi-Online' is an in-house project, conceptualized to convert all the manual processes to online digital processes towards building an integrated and interactive ecosystem. All the physical activities under the Public Distribution System (PDS), paddy procurement, supply chain management and billing are aimed to be replicated in the online ecosystem but with best possible Business Process Reforms. Several Modules and Sub-modules have been developed to provide end to end solution with validations and controls through integration.

Centralised Digital Ration Card database has been created & all applications and their processing and approvals are online through a Web-portal, WhatsApp chatbot & Android App. E-Ration Card (e-RC) has been introduced and beneficiary could lift ration from any shop across the state through biometric authentication immediately on approval of their application. Every foodgrain delivery transaction is authenticated and beneficiaries are intimated printed paper slip and SMS to their registered mobiles. Online supply chain management module removed delays and monthly quota is now delivered to citizens in one go without requiring them to visit again and again. More than 1 crores applications for different services covering about more than 3 crores individuals have been disposed through Khadyasathi-Online.

Khadya Sathi Scheme was conceptualized with the following objectives:

a. Providing G2C Services:

- Universal Accessibility: A multi-gateway facility for the beneficiary to access the services - Web Portal, Mobile Application, Chatbot, over-the-counter formsturned online by officials immediately after receipt in physical format
- Anytime, anywhere: The services accessible 24x7 from anywhere over web for application and status check
- Electronic document: Replacement of the paper ration card with e-ration card so that beneficiary does not have to carry the physical ration card for availing benefits
- Consumer Rights: To ensure actual beneficiary is getting the entitled foodgrains through proper authentication.
- Portability: to allow Beneficiary to lift ration from any FPS across the State / Country as per their choice
- Improving transparency: Information to be shared proactively with all details in public domain so that social audit is possible.
- Awareness : beneficiaries are intimated through SMS to their registered mobile regarding status of their applications, transaction or entitlement & rights
- Information on the fingertip: YouTube videos, Chatbot, social media creatives on Twitter and Facedbook, materials displayed at FPS, toll free Help Desk. Push / pull SMSes are fired to inform entitlements, give receipts, etc.

b. Providing G2B Services:

In the public distribution system, the business entities and stakeholders are:

- The Fair Price Shop (FPS) Dealers,
- Distributors or wholesalers,
- Rice Mill owners and
- Flour / Atta Mill owners.

The main objectives are:

- To make the dynamic & real time details of the PDS beneficiaries available at the FPS and farmers at the point of transactions (paddy purchase centers) during the transactions.
- To make the FPS (Ration Shops) IT-enabled with internet, e-POS machine, finger print scanner, etc. so that all the transaction can be done authenticated online.
- To remove the manual record and account keeping system and need to make manual entries in physical register / account books.
- All types of applications related to licences or empanelment and renewal can be done online and without visiting the office or physical touch points.
- All type of the bills to be submitted and processed online thus removing physical touch points.
- Payments against claims are done online directly to the bank accounts through multiple payment gateways integrated with the portals.
- Online advance allocation of food grains and commodities and capturing the distribution and closing balance so that adequate quantity of food grains is available to cater the beneficiaries and accounting is done online.

c. Providing G2G Services:

- To make the services related with Khadya Sathi Scheme and Paddy Procurement more efficient, transparent and improve service delivery quality, time and experience for the citizen, external and internal stakeholders.
- To maintain a dynamic, clean and useful database of all beneficiaries and stakeholders
- To regularly update and clean ration card database through data analytics to share data with any other Departments and Govt. entities through API.
- To make the system accessible to officials any time anywhere so that work can be disposed from home or other locations in times like Covid or movement depending upon the situation.
- To reduce physical paper-work, record keeping and difficulties in retrieving
- To provide easy and convenient tools to supervising officials for better, efficient and targeted monitoring through dynamic MIS Reports and Dashboards and provide guidance and support or policy and corrections
- SOPs and Guidelines to keep them acquainted with activities of the Department
- Efficient management of human resources available

Hardware/Software

- Laguage : .net framework
- Database : Microsoft SQL Server
- Mobile Application : Android

Certification (Certifying Agency)

All the applications of Food & Supplies Department are required to be security audited including Vulnerability Assessment (VA) and Penetration Testing (PT) by statutory bodies like Standardization Testing and Quality Certification (STQC) Directorate (Govt of India) and other agencies entrusted by the Government from time to time. The safe to host certificate from these agencies is mandatory before hosting any application at the State Data Centre.

Disaster Recovery and Service Continuity

Food & Supplies Department uses a distributed, multi-layered database architecture fully hosted at State Data Centre. The core databases are hosted in physical database servers secured through firewalls and have real-time replication and failover systems. Whereas venture specific databases are hosted in State Data Centre Clouds which are replicated by the data centers internal data preservation plan. All database servers are also included in frequent database back up policies which is maintained and monitored diligently by the Data Centre Team and also the Departmental

Nodal Officers.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Service	Brief e-Service description with benefits	Volume (Nos.) of Services year wise		
		2020-2021	2021-2022	2022-23 (Upto date of nomination)
Application submitted in The online portal	This service is to apply for new ration card or for deleting ration card for changing information of the beneficiaries. Benefits : Application can be submitted from anywhere, anytime. Tracking of application status is possible.Disposing of the application has been faster.	9 lakhs	86 lakhs	78 lakhs
Aadhaar Seeding	Linking Aadhaar number with ration card after eKYC or after demographic authentication.	60 lakhs	3.8 Crores	1.7 Crores
Online Aadhaar authenticated transaction	Delivering food grains after bio metric Aadhaar Authentication	-	94%	98.5%
Farmer registration and paddy procurement	How many farmer have been registered and amount of paddy Procured	17 lakhs	21 lakhs	28 lakhs
Grievance registered	How many grievances has been registered. This indicate people are getting avenues to register their grievances.	12,434	17,614	9,108
Portability	Lifting of food grains form any FPS across	0	3,124	77,684

	the India for NFSA beneficiary and from any FPS of West Bengal for RKSY beneficiary Benefits: Very much helpful for migrant worker, create competition among FPS owner to pull beneficiary with better service delivery			
WhatsApp chatbot	It is used to deliver information regarding the PDS and to check the status of application and ration card. Benefits : information on the finger tip	0	8,48,754	17,00,149
SMS	SMS regarding status of the application, card status, entitlements of a family, ebill after food grains lifting etc.	0	4 Crores	20 Crores
Social Media Posts	YouTube Videos, Twitter and Facebook Post for increasing the awareness and digital literacy	0	216	257
E Bill Submitted	Online Bill submitted by FPS owners, Distributor, Rice Millers, Flour Millers , Societies, SHG	0	2,26,489	2,26,489
Mobile Application Downloaded	Khadya Sathi Amar Ration Application for easy access to the Services	0	33,236	83,460

Implementation

a. Implementation Coverage achieved in comparison to the plan / target

SI No.	Target	Achievement
1	Universal Accessibility to the citizen	This target has been achieved 100 %
2	Sustainable Development Goals of zero hunger	Target has been achieved 100 %
3	100 % Online Paddy Procurement	Target have been achieved 100 %
4	Providing access to the entitled food grains not only from home FPS but from anywhere.	After implementation of portability of ration card this target has been also achieved. More than 22.2 lakhs Portable transactions in last 3 months that's helping the migrants workers.
5	Providing Food Grains at door step of the beneficiary through Aadhaar authenticated transaction.	After the implementation of the Duare Ration and making it complete online this target has been achieved.
6	Linking ration card beneficiary with Aadhaar number	More than 7.93 Crore beneficiaries' Aadhaar have been captured that is near about 90%. Now if we exclude below 5 years beneficiary (as they are not required mandatorily to have aadhar) then this percentage will be higher.
7	To make sure that the	Last month more than 98.5% transaction was done

	intended beneficiary is receiving his/her entitled food grains.	through Aadhaar verification and 100% transactions were done online.
8	Easy access to lodge the Grievance	Grievance Application and Monitoring System has been developed so than with increased awareness citizen can reach to the Government with their issues easily. Last year with around 17,000 registered grievances, which used to be in hundred annually before, we may rest assure that we are in the correct path.
9	Giving Ration Card and Food Grains with 48 hours to the genuine beneficiary	After the introduction of e-Ration Card online dynamic allocation this target has been also achieved.
10	Reducing the application disposal time	Before average time for application disposal was around 40-45 days now this disposal time is around 15-20 days.
11	Reduction of the grievance redressal time	Before there was no provision to check and to monitor the grievances lodged at sub office. Now all the lodged grievances can be monitored and the average time for grievance redress is less than 10 days.
12	Submission of the online Bills	Now all the bills are submitted online and no manual bill is permitted.

Improvements / Enhancements

Roll out of Modules, Sub- Modules and Functionalities done in last one year :

- Duare Ration : It was decided that beneficiary will get their ration at there door step. FPS owner will get extra commission for doing such transaction. This whole pconcept has been implemented with the GPS tagged transaction.
- Portability of the Ration card : This has been done so that beneficiary can lift his/her food grains any ration shops of India (for NFSA beneficiary) and form any Ration Shop of West Bengal (for RKSY beneficiary)
- E-billing : So that there is no need of calculating submitting manual bill by FPS owners, distributors, rice miller, flour miller, societies, SHGs . Bill gets generated from the online distribution data and the same can be submitted online.
- Online Inspection Module : Scheduling and submission of the inspection can be done online.
- OTP based Aadhaar seeding through Portal : For giving the beneficiary more option OTP based Aadhaar authentication process has been developed and deployed on web portals.
- Introduction of Common Application Form so that beneficiary does not confuse with existence of different application forms for different reasons.
- Integration with Digilocker : beneficiary store their ration card at digilocker.
- Integration with Birth & Death Portal:
- GPS based tracking of Transactions under Duare Ration Scheme
- Online scheduling by farmers to sell their paddy

Roll out plan for next one year :

- Online quality control monitoring module : Sample collection data will be sent to the quality control laboratory without reveling the origin of the sample and the return report will be sent to all the stake holder. Through this the testing of food grains like fortified atta/rice/wheat etc will be faster and easier. This will help to keep the surveillance process more effective the ensure the quality of food grains in the PDS system.
- Use of Artificial Intelligence and Machine Learning to eliminate duplicates from the Ration Card database, Application for Ration Cards, Registration of Farmers.
- Mobile Application Development is going on which will be used for doing transaction in addition of the ePOS device.
- Introduction of automated Weighing scale integrated with ePOS machines
- Introduction of Retina Scanner in addition to fingerprint reader.

ENABLER

Processes Re-engineered

- Introduction of e-ration card has made it possible to give ration card within 24 hours to the new beneficiary and providing food grains within another 48 hours.
- A 'Centralized Processing Center' (CPC) has been established at head quarter to dispose of the application centrally not requiring physical presence of the applicants.
- The extra time available to staff at the HQ is utilised in disposing these applications.
- This has enabled the field staff / offices to dispose their duty such field inquiry of the applications, inspection of FPS and Distributors.
- Introduction of Common Application Form and CPC have made it possible to dispose a whopping 37 lakhs applications annually with average disposal time of 20 days without any extra staff being engaged.
- Internet enabled and e-POS device and scanner linked FPSs are able to do more than
- 98% Aadhaar authenticated transaction. Giving nomination facility to the infirm and differently abled beneficiaries has also contributed sizably to this.
- Registering more than 28 Lakhs famers and procuring more than 53 Lakh MT paddy annually have been possible with the help of automation and process simplification and with the help of online scheduling process ensuring genuine purchase from the genuine farmers eliminating middlemen.
- Introduction of WhatsApp chatbot has reduced the inflow of calls at helpdesk for information. Introduction of Helpdesk, WhatsApp chatbot, YouTube Videos, presence on Twitter and Facebook, well-structured FAQ at Portal and Android App and SMS service have reduced the visitor at office for information and for registering the grievances.
- Online Billing facility has made the claim disbursement process to stakeholders simple and impersonal.
- Online FPS inspection module has led to de-criminalisation of petty irregularities which are disposed of with remedial instruction. Opportunity of

submission to the Dealer at every relevant step augment natural justice and helps in reduction of unnecessary court cases.

- Online WQSC has ensured the Rice Stock receipt, quality monitoring and online billing without the Rice millers required to visit offices.

Technologies

Considering the number of beneficiary (about 9 crores), active users (about 23 thousands), monthly transactions (2.13 crores) and dynamicity of the functionalities concept of Enterprise Architecture has been kept in mind. Database gets updated through real time hits as well as through schedulers. API are used extensively for data sharing. Test environment is used to develop and testing purpose and after extensive testing the production version of the functionalities, sub-module or Modules gets deployed.

Data analytics is used for removing the duplicate ration cards, Application processing. It is also used to create different MIS reports. Data Analysis of the Portability transactions are helping to understand the periodic movement of the migrant workers and to make sure that food grains are available at the migrated place. It has been also beneficial to find out the work load of the office and to allocate and reallocate of the man power accordingly. Data analytics also helps to find out the block / sub-division wise famer registration and to find out the hotspots of paddy procurement zones.

GPS enabled transaction gives us the real location of the transactions made under Duare

Ration Scheme and it helps us during the processing and approval of billing by the Ration Dealers as the commission for the transaction under 'Duare Ration' is much higher that the normal transaction happening at FPS.

Social Media such as YouTube, Facebook and Twitter is extensively used to dissiminate knowledge and information regarding the PDS among the common citizen and the beneficiaries and in their capacity building. This has been a major driving platform for the digital literacy and success of the Khadyasathi Online initiative.

People

- A dedicated IT& Reforms Cell has been set up to propose, evaluate and prescribe FRS / SRS and development of the modules, sub-modules and functionalities
- National Informatics Centre (NIC) assists in System Architecture Design and Software Development for Khadyasathi Online.
- All the information related with development of the modules, sub-modules and functionalities are periodically disseminated to the field officials in the form of training by the officers of the Cell so that they are up to date on all the modules.
- Training to the officials and Dealers, Distributors, Rice and Flour Millers
- Weekly Video Conferences are undertaken so that the officials of the field offices are in loop of what is happening in the development portion of the module and so that advice, suggestions and practical realities are taken into consideration. Here even Data Entry Operator level employees are welcome to give feedback.
- Overall, Khadya Sathi Online has reformed the way over 4000 employees of this
- Department work.

- Over 20,000 FPS Dealers and their associates / helpers are handling ePOS and stakeholder management module. When we keep in count other stakeholders and their employees, the number of people the project incorporates stands well over 30,000.
- More transparency and accountability as monitoring is more focussed and deviations & poor performers are identified easily
- The whole system is more user-friendly to the people and stakeholders and offers them multiple options to access / avail the services as per theor choice, ability and convenience

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VALUE INDICATORS

Learning's for sharing

- Use of ICT is a must in large projects:

  Due to the sheer volume of stakeholders, delivering efficient work without ICT was impossible. Public Service delivery in such cases can be made efficient only by bringing in systematic and procedural reforms and restructuring of delegation of powers of scrutiny and approval leveraging technology.

- Empowering people reduces work load:

  Initially all the application used to get entered and submitted by the office though physical applications received. Yearly entering more than 24 lakhs of applications in the online system used to processing and delay the service delivery. More over during data entry many types of mistakes used to happen. Now when online services have been opened to the citizen they are submitting their own applications and they are doing it with proper care. This is creating very few erroneous applications leading to faster service delivery.

- Digital literacy of the stakeholders is must:

  The end users of the online services are the FPS dealer, Rice Millers, Distributors and flour Milelrs. They were not willing to move on the online platform discarding age old pen and paper system. This delayed the effectiveness implementation of the online supply chain management. After several rounds of hand hold training and familiarisation, successful implementation was possible.

- Cleansing of data is required:

  Khadya Sathi Online Project deal with nearly 9 crores active beneficiaries. Though provision of card surrender due to death or other reason was their but soon it was found that duplicates records are coming in the system for several reasons. So the beneficiary database has gone through the several data cleansing process many of which are automated.

- Common Application Form :

  Initially there were 10 forms to do different works related to ration card like Form-3,Form-4, Form-5 , Form-6, Form-7……..etc. This use to confuse people and they were not sure which for can be used for getting which service. Realising this a Common Application Form has been introduced so that general public can get all the services using one application form.

- Use of GPS for real-time transaction location :

  As Duare Ration transactions have higher commission than the normal

transactions so FPS owner were misusing this provision to get the higher commission. Then GPS location capturing during transaction has been enabled which has stopped this unscrupulous practice.

- Sharing information amongst departments is mutually helpful:

  By sharing information / database among the departments helps in resolution of many perennial issues and further betterment of the data. Auto deactivation of the Ration Card of a dead beneficiary without waiting for the family to apply separately for deletion / surrender of the Ration Card through the Birth and Death Registration Portal of the Family Welfare and Health Department is such an example.

  Sharing of Khadyasathi database with Swasthyasathi scheme, portal of scholarship of BCW and Tribal Department is also an excellent example.

- Importance of Pilot launches:

  In some cases the module was deployed in the production without a pilot run. This created multiple issues so it is very important that every module should go through a pilot run though limited users.

- Elimination of physical processes to avoid back slippage:

  There is an inertia of any process which are in operation for a long time. All the stake holders get habituated with it. This inertia creates back slippage. To avoid this physical system has be discontinued after a certain period of time.

Digital Empowerment

For providing universal access multimode gateways such as web portal, downloadable free android App from google play store, free chatbot service have been deployed.

Manual submission of application over office counter is also allowed where Data Entry Operators enter the physical application in web modules. Integration has been done with more than 3,560 Bangla Sahayata Kendra for easy and free access to the services for the common people.

All services including WhatsApp Chatbot are also available in Bengali language in addition to English.

Aadhaar seeding can be done multiple ways like from FPS, from Inspector office of Food and Supplies Department, From BSK and through online portal.

Grievances can be lodged through 12*7 toll free Helpdesk number or submitting it online by the end user.

To bring the awareness SMS service has been deployed through which beneficiaries are informed regarding their application status, card status, their family entitlement, after ifting food grains the e-bill with quantity and price.

More than 15 + YouTube videos, numerous Facebook and twitter posts, FAQ on Web-portal and android App, etc have been used to bring awareness and to bring digital literacy among the general public. FAQ and information have been created in multiple languages so that it will be easy to comprehend in their vernacular language.

As an example please find below the Information provided on e-ration card :

Green e-Governance

1. E-Ration Card has led to reduction in printing of physical ration cards, physical farmers registration certificate, physical application, inspection reports, bills and annexures thus reducing carbon footprint.
2. Online application for Ration Card and Farmers Registration Certificate

related services makes it easier to submit soft copy of documents along with application form, wherever required

3. There is no need of registers, stock books anymore in more than 550 offices, 570 distributor and 20,000 + FPS shops.
4. As all the reports, bills, etc are available anytime and any number of time so there is no need to take print out and store them for future use.
5. All the billing and accounting is done online.
6. Movement of vehicles and manpower has reduced to a great extent.

Shri Parwez Ahmad Siddiqui, IAS, *The Secretary to the Government of West Bengal, Department of Food & Supplies, Govt. of West Bengal, foodsecretarywb@gmail.com*

Shri Anurag Srivastava, IAS, *Sr. Special Secretary to the Government of West Bengal, Department of Food & Supplies, Govt. of West Bengal, anurag.ias07@gmail.com*

TejasVI Analytical Dashboard Platform

National Informatics Centre, New Delhi

Manie Khaneja

PROJECT OVERVIEW

The government's shift towards digitalization through initiatives like 'Digital India' has resulted in a drastic increase in the data. A powerful analytics tool is required to analyses the collective data that enables Governments with a better strategy, data-driven decision making to predict trends of needs and measure program success.

Tejas VI is an easy, powerful and affordable analytics visualization tool. It is a complete data preparation and analytics platform with the power to integrate all data types. This tool is completely developed in-house using open source technologies and bringing together the best features comparable to market-leading BI tools.

Tejas provides State-of-the-art and powerful data analysis for officials to design analytical reports and turns data into accurate analysis and smart visualizations. The tool would be primarily used by Government Departments at various levels in the center and state. Only basic knowledge of data analysis and reporting is expected from the Government Employees and they are not expected to be very familiar with data visualization and business intelligence tools as the user interface is simple, easy to use and self-explanatory.

Tejas can be connected virtually to any data source, blend and prepare that data in a drag-and-drop environment and create clean datasets for further exploration and analysis. It can build scalable workflows, automate processes, share reports, improve efficiency, and make an impact, without any coding. Departments can expose their data through a web-based API or can directly upload Flat Files in the tool. Tejas would be provided on the Software as a Service (SaaS) model to various Government Departments, thus there would be no need to purchase and host any other BI tool.

Tejas empowers discussions on displayed information through comments, allows officials to download visuals and data with associated notes, enables sharing of visuals over NIC mail, GIMS and other social media and empowers Analysis by creating personalized views for different officials with minimum repetition of effort. It enables officials to understand the quality of the data being captured, the top performers on a key performance indicator (KPI), create scorecards to track performance on a group of related KPIs, the root causes driving the value of a KPI, segments that need the most attention for improvement and look at the data in different methods, such as by time series, relative ranks, parts of a whole, etc.

Hardware/Software

- Frontend Framework: Angular 10
- Service APIs developed using: Java 11, spring boot 2, Python 3
- Databases used: Postgres-12, MongoDB
- Caching implemented using Hazelcast 4
- Data processing using: Spark 3
- Deployed on NIC cloud using Docker and Kubernetes

Certification (Certifying Agency)

- AAA Technologies P. Ltd
- (An ISO 9001:2008 & ISO 27001:2005 Certified Company)
- 278-280, F Wing, Solaris-1,

- Saki Vihar Road, Opp. L&T Gate No. 6,
- Powai, Andheri East,
- Mumbai 400 072, INDIA

Disaster Recovery and Service Continuity

The project is deployed on NIC cloud services, thereby enabling the same Disaster Recovery and service continuity Strategies as the NIC cloud services. NIC cloud has data centers at multiple locations across India.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Service	Brief e-Service description with benefits	Volume (Nos) of Services year wise		
		2020-2021	2021-2022	2022-23 (Upto date of nomination)
eGramSwaraj Analytical dashboard	eGramSwaraj Analytical dashboards for Planning, Accounting and Mission Antoyadaya	N/A	03	04
DigiPay dashboard	DigiPay ashboard	N/A	01	01
JJM dashboard	JJM dashboard	N/A	01	01
GPDP Dashboard	GPDP Dashboard	N/A	01	01
NIC Punjab State	NIC Punjab State	N/A	01	01
NIC Maharashtra State	NIC Maharashtra State	N/A	01	01
NIC Himachal Pradesh State	NIC Himachal Pradesh State	N/A	01	01
Haryana State	Haryana State	N/A	01	01
NCRB (National Crime Records Bureau)	NCRB (National Crime Records Bureau)	N/A	NA	01
CGG (Centre for Good Governance)	CGG (Centre for Good Governance)	N/A	NA	01
Allahabad High Court	Allahabad High Court	N/A	01	01
NIC Health department	NIC Health department	N/A	01	01
MoMA (Ministry of Minority Affairs)	MoMA (Ministry of Minority Affairs)	N/A	01	01
MoPR (Ministry of Panchayati Raj)	MoPR (Ministry of Panchayati Raj)	N/A	01	01
Census dept dashboard	Census dept dashboard	N/A	NA	01
NIC eOffice Dashboard	NIC eOffice Dashboard	N/A	01	01
Service plus Dashboard	Service plus Dashboard	N/A	01	01
Civil Aviation dashboard	Civil Aviation dashboard	N/A	NA	01
TNSC Dashboard Tamil Nadu State NIC	TNSC Dashboard Tamil Nadu State NIC	N/A	NA	01

NHRC Dashboard National Human Rights Commission Dashboard	NHRC Dashboard National Human Rights Commission Dashboard	N/A	NA	01
DSU,DPIIT Department for Promotion of Industry and Internal Trade	DSU, DPIIT Department for Promotion of Industry and Internal Trade	N/A	NA	01
MCD Department	MCD Department	N/A	NA	01
NIC Delhi State	NIC Delhi State	N/A	01	01
Panchayat Awards Dashboard – E-Panchayat Division	Panchayat Awards Dashboard – E-Panchayat Division	N/A	NA	01

Implementation

a. Implementation Coverage achieved in comparison to the plan / target We have provided the service free of cost to multiple State and Central Government Departments. We also closely work with them in enhancing the requirements which would make a great impact.

Improvements / Enhancements

b. Indicate improvements/ enhancements specifically rolled out during the last one year and those which are planned to be rolled out during next one year. In addition to performance and security enhancements at various levels, the following new features were rolled out during the last year:-

- The data preparation module has been enhanced by providing API connections in addition to existing files and database connections.
- Data Quality report has also been provided for deeper insight into user's data with much ease.
- Addition of scheduled connection mode for all source types.
- Multiple new visuals (more than 30 visuals) have been added as well as existing visuals have been provided with more customizable properties.
- Integration with Bharat Maps for the development of visuals suitable for geographical data.
- Enhancements in security configurations.
- Users can Design/Explore/View dashboards consisting of data for which he/she is authorized by the admin thereby enabling data security/privacy.

Following enhancements are planned to be rolled out during the next year:-

- The data preparation module shall be further enhanced with more data transformation options within the application.
- Advanced analytics features including time-series analysis, forecasting, etc.
- Further improvements in performance and security

ENABLER

Processes Re-engineered

Project deployment was automated using Docker and Kubernetes. This also enabled the handling of the sudden surge in user requests utilizing the auto-scaling and load

balancing features.

Technologies

Dashboard (Visualization of Datasets) is a major requirement in the present era of Data driven / Data centric Governance in India. Tejas will act as a game changer in the way dashboards are created. As a No Code Platform, with minimal effort Government departments will be able to present / analyse their datasets which can help in monitoring, KPI follow ups, policy change and strategic decision making in real time.

We have used these open source technologies:

- Hazel cast (Hazelcast IMDG is an open source in-memory data grid based on Java)
- Apache Spark (Apache Spark is an open-source unified analytics engine for large-scale data processing) to achieve and enhance our data analytics requirement.
- Angular web framework and spring boot Java based framework for making Microservice based platform.

As a part of capacity building of users we have a Knowledge Base or Online Help Docs section on our webpage which covers every feature of the tool. The section has both documents and video tutorials. We also have a separate email channel for user doubts and feedback.

We have in-house Sandes application for messaging and commenting system

People

Demonstrations and training are provided for basic and advanced usage of the Tejas VI tool. For user onboarding we have a team of consultants that can guide the admin/top level users who can further lead and transfer the knowledge to his/her team. We also notify our users for features and performance upgrades regularly through weekly/monthly emails. Users can also contact our team for any requirements/ clarifications by various means.

VALUE INDICATORS

Learning's for sharing

- We have integrated with various GIS services such as BharatMaps and Google Maps within our portal that would help the users to dive deep still Gram Panchayat level and even to track Key Performance Indicators up to particular geocoded location (Latitude / Longitude).
- We have benchmarked ourselves with global leading visualization tools.
- We have also integrated Google analytics to check and analyze the trends and patterns of user usage types.

Digital Empowerment

- Tejas is a simple to use data analytics and visualization platform having an intuitive GUI which is consistent throughout.
- Even for advanced use cases the user interface has been designed to be user friendly to be understandable by any user in spite of language, demographic and cultural differences.
- Custom, interactive dashboards can be designed and viewed by any officer from a grass root level.
- Government offices. That would enable e governance and help in moving

towards the path/dream of digital India.

Green e-Governance

- We support Green computing practices.
- Through TejasVI the Admin type user can create as many sub-accounts pertaining to following criteria along with restricted access.
- Analyst (Complete access to projects whose privileges are given, access to create new datasets, link data source, create visuals, dashboard pages and make changes to live dashboard within the privilege provided)
- Explorer (Complete access of visuals and pages of projects whose privileges are given to him and can create new dashboards based on existing datasets).
- Viewer (Access to view and download dashboards).

In fact, this product has huge potential in reducing the paper usage of data and reports in the last mile of Government offices and even analyzing can be done on computer and easily sharing of dashboards with team members and used for taking data driven decision making and implementing better strategy in government programs by analyzing the trends and patterns in the data.

Shri Manie Khaneja, *Deputy Director General (Scientist-G), National Informatics Centre, New Delhi, Misnistry of Electronics and Information Technology, manie@nic.in*

Satyapikaanan - Face Verification System

National Informatics Centre, New Delhi

Sharmistha Dasgupta and Anil Choubey

PROJECT OVERVIEW

Objective

- To provide state of the art Face-Analytics services - detection, verification, anti-spoofing, quality assessment to various applications in different relevant domains.
- To Promote AI led governance.
- To develop a suitable model of Face Detection as well as Face Recognition.
- To design suitable APIs to provide Face Detection, Recognition and other related services. To design various AI enabled artifacts like Gesture Recognition, Anti-spoofing, Mask Detection etc and deploy them in e-Governance application through service mode.
- To identify suitable use-cases to solve various problems using Face Recognition and other related services.
- To design, develop and deploy various AI enabled solutions based on Face Recognition to solve different e-Governance problems.

Stakeholders:

1. CBSE, National Testing Agency, Result Division – Candidate's Registration System (CARES)
2. Sarathi Parivahan - RTO
3. Meghalaya Pensioner's life certificate
4. FRBAS-MeitY: It is a generic solution for capturing contactless attendance of employees of an Organisation.
5. FRBAS-PBSSD: Trainees and Trainers Attendance System under Utkarsh Bangla programme of Govt of West Bengal

Benefits and Current status:

Introduction of Cloud based AI Satyapikaanan service brough automation and efficiency in workflow.

Hardware/Software

HW:

Nvidia T4 Server: AI accelerator GPU server

Virtual Machine: Ubuntu 500GB/16GB

SW:

NAPIX (National API exchange)

Python web frameworks

Deep learning frameworks- Pytorch, tensorflow etc.

Analytics library

Nvidia Triton Server

Postgres DB

Uvicorn web server

Nginx

Android

Certification (Certifying Agency)

NIC Security Audit (Website Audit (Ref ID: NIC/CSD/IA/16804))

Certifying agency: National Informatics Centre (NIC)

Disaster Recovery and Service Continuity

Multi-region deployment.

Multi Node setup at NIC Delhi & West Bengal datacenter with service delivery via Kubernetes technology.

Micro-service Architecture

Services are independently manageable services. It can enable more and more services as the need arises. It minimizes the impact on existing service

Containerized Environments

Each service is run in isolated environment in replicas so that no other service is affected due to disruption in one service/replica

Scaling Up and Down.

Using container orchestration tools, service is automatically scaled up and down on demand

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RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	Brief service description with benefits	Volume (Nos) of Services year wise		
		2020-2021	2021-2022	2022-2023 (Upto date of nomination)
NTA's Candidate registration system	Automatic face quality assessment is plugged in	NIL	NIL	14123918
SARATHI's Online learners licence test	automatic Face verification and liveness detection	NIL	5560677	22464519
Meghalaya's Pensioner life certificate	automatic Face verification and liveness detection	NIL	8188	13018
FRBAS-MeitY	It is a generic solution for capturing contactless attendance of employees of an Organisation	NA	NA	NA
FRBAS-PBSSD	Trainees and Trainers Attendance System under Utkarsh Bangla programme of Govt of West Bengal	NA	NA	15,30,267

Implementation

a. Implementation Coverage achieved in comparison to the plan / target

Geographical Area

1. National level
    - NTA's Candidate registration system uses AI Satyapikaanan API for quality assessment of photos uploaded in nationwide exam registration.
    - FRBAS-MeitY: contactless solution for Attendance Monitoring in Meity Organisations
2. State level
    - SARATHI's Online learners license test: Assam, Delhi, Karnatak, Punjab, UP Meghalaya's Pensioner life certificate: Meghalaya
    - FRBAS-PBSSD:contactless solution for Attendance Monitoring Utkarsh Bangla programme of Govt of West Bengal

Improvements / Enhancements

b. Indicate improvements/ enhancements specifically rolled out during the last one year and those which are planned to be rolled out during next one year.

1. Rolled out during the last one year:
    - integrated pose detection, mask detection, dedupe and quality assessment
2. planned to be rolled out during next one year
    - Improving face recognition, anti-spoofing and other face-analytics tools
    - Integration of gender and age detection Video analytics tool

ENABLER

Processes Re-engineered

Situation before Initiative

1. SARATHI's online learners license test
    - National Informatics Centre standardizes & deploys the software SARATHI for Driving Licenses and compilation of data with respect to Vehicle Registration and Driving Licenses of all the states in State Register and National Register.
    - For the learner's license test, citizens had to visit the RTO office. This included manual verification and allotment of seats for the exam. Each RTO office has limited capacity to hold exams due to which there were long delays in getting learner's license.
2. Utkarsh Bangla
    - Utkarsh Bangla scheme is the flagship scheme launched by the West Bengal government to provide wage/self-employment linked skills training to the residents of the state of West Bengal.
    - To ensure proper and effective functioning of the scheme, it is important to record the daily attendance of trainees and trainers in terms of In-Time and Out-time and no proxy attendance. Department had to maintain an attendance register or biometrics system for attendance.
3. FRBAS Meity
    - Attendance was marked using a biometrics system which posed a serious health threat during COVID-19. Need of Contactless Attendance system was arised.

4. Meghalaya's Pensioner life certificate
    - Life certificate Verification is a process in which the Pensioners (Service/Family) of the State Government have to appear in front of the Treasury Officer or Pension Disbursing Authority to prove that they are still alive to receive the pension. The pensioner can do this either by Paper based Life Certificate, Physical Appearance, Biometric Finger print verification system services the pensioner using Kiosk or Jeevan Pramaan. However to avail most of these has to visit the Treasury Office. This posed a hindrance and inconvenience to pensioners due to old age, sickness and taking the travel to Treasury Offices. Further, during the current pandemic situation added to the difficulties of a pensioner for live verification.
5. National Testing Agency (NTA):
    - National Testing Agency (NTA) has been established as a premier, specialist, autonomous and self-sustained testing organization to conduct entrance examinations for admission/fellowship in higher educational institutions. In the Candidate's Registration System (CARES), candidates have to upload their photographs as part of the application form. At times, candidates don't provide proper Images either by mistake or due to some other intentions and the user department has to manually verify those images as of now. It becomes a tedious and erroneous task to verify photographs of so many candidates in the short time span available. So online verification of such uploaded photographs was needed to upgrade the system efficiency.

Situation after Initiative.

1. SARATHI’s online learners license test

   AI based face authentication for home based Learners License test. The launch of Faceless Services is a quantum leap in the system as it facilitates complete elimination of RTO visit, freedom from standing in queues and hassles from middlemen. This online proctoring service include – face verification, anti-spoofing etc.
2. Utkarsh Bangla and FRBAS Meity.

   NIC developed FRBAS (Face recognition based attendance system) where any organization can be onboarded with minimum efforts. FRBAS offer a generic attendance management solution through mobile app as well as web application. This developed android application can automatically record attendance along with prevention of spoof attacks
3. Meghalaya's Pensioner life certificate

   NIC in collaboration with Finance Department, Government of Meghalaya has developed a Mobile App called ‘The Pensioner’s Life Certificate Verification’ which offers pensioners a secure, easy and hassle-free interface for verifying their liveness to the Pension Disbursing Authorities from the comfort of their homes using smartphones. The App uses DEEP LEARNING Artificial Intelligence technology whereby it can detect the liveness of a pensioner from real time photographs of living pensioners and the pensioner’s identity will then be verified with the help of Face Verification Technology
6. National Testing Agency (NTA) :

   An AI based solution is deployed which automatically performs assessment of uploaded images in real time.

Face Quality assessment include, assessment such as :-

1. Real human face check
2. Occlusion such as a mask.
3. Size and coverage
4. Quality such as brightness, contrast, blurriness etc
5. Pose estimation - pitch, yaw roll etc

Also to avoid duplicate photos/registration, dedupe service is provided which detect similar photos.

Our service not only made assessment process fast but also facilitated candidate to get feedback in real time thus save efforts and time,

Technologies

Name of Technology	Purpose of use	Observed Impact
Artificial Intelligence	Machine learning model are the core component which process input and produce results	Automated delivery of service without human Intervention became possible
Cloud Technologies	containerization and container orchestration for deployment of application	effective deployment and management of application
infrastructure	For high throughput AI accelerator i.e. Nvidia GPUs are used	Performance and throughput improved
web technologies	use of web server, visualization dashboard, Analytics using GUDAPPS specifications	provide admin & user access, analytics dashboard
mobile technologies	application for both iOS and Android device are build	application available for variety of devices

VALUE INDICATORS

Learning's for sharing

Key Learnings.

1. AI Systems can make mistakes

   Stakeholders should be well informed about the shortcoming. Proper system of feedback should be installed along so that the system can be updated.

2. Identify problems suitable for AI

   Not every problem can be solved by AI. Some problems can be solved easily by changing workflow etc

Best practices

1. Human in the loop

   While delivering critical service using AI, keep humans in loop. If not possible make feedback system available to user so that problem can be mitigated if arise

2. Focus on low hanging fruits

   Identify generic problems for which models or dataset are easily available

3. Design system to Scale effectively
4. Create A Data-Driven Culture in organization

Digital Empowerment

Any user can access service using their internet enabled smartphone. It allowed organizations to avoid purchase of Biometrics systems for attendance. It reduced the load of service providers.

Green e-Governance

Service has a very low Carbon footprint. It has reduced the need for users to go to government offices for getting services such as learner's license etc, thus saving fuel on transportation and time. It has led to timely delivery of service without maintaining a paper based attendance register or biometric system.

Ms. Sharmistha Dasgupta, *Scientist-G, National Informatics Centre, New Delhi, sharmi@nic.in*

Shri Anil Choubey, *Scientist-B, National Informatics Centre, New Delhi, MIETY, anil.choubey95@gov.in*

Telangana State Police Human Resources Management System

Office of Director General of Police, Govt. of Telangana & Centre for Good Governance, Telangana

M. Mahender Reddy, K. Sreenath Reddy and Rajendra Nimje

PROJECT OVERVIEW

- TS Police HRMS stands for Telangana State Police Human Resource Management System
- Fully automated HRMS application launched in the police department to create an exhaustive and accurate database of employees of the department on the digital platform for effective administration with improved productivity and efficiency. In the application, various modules have been designed to enable easy management of human resources by combining necessary functions to rule out inconsistency, reduce redundancy and improve accountability, transparency through the system.
- It is also aimed at enhancing the performance of employees associated with the administration to meet the responsive needs of the field staff immediately, which in turn enhances the efficiency of the police force in the field.
- TS Police HRMS Application is a culmination of Telangana State Police Department's desire to have a unified system for all the 9 Commission rates, 20 Districts and 12 other Wings. The application caters to not only the Police Department's conventional needs such as- New/Existing Employee Registration, Employee Service Register Management, Probations, Employee Leave Application Management, attachments, Internal Transfers, Grievance Redressal, Home Guards On boarding, Daily Progress Report, Order Book, Increments, 5S Implementation, Inward Tracking, File Tracking (Office File Management), DSC Integration, Issues & Feedback Module, Rewards and Penalties.
- The salient features of the application include- Anywhere access, Mobile Compatibility, Master data Management, Role based Access and Administration, MIS Reports and Dashboards, Dynamic updation of Employee Service Register. TS Police HRMS application has approx.1, 00,000 users at the moment and can operate at scale with Police Department's requirement. Each user has a unique pre-configured Login ID, using which he/she can access the various services at their disposal.
- Each application user interface is meticulously designed such that it provides feedback and prompts to the user in the form of pop-ups and SMS where necessary, so that the user is always aware and informed of the interactions made in the application. Since the application is mobile compatible, it can be accessed through mobile browsers.
- TS Police HRMS also designed APIs with user identity and access management as a keystone offering for TS Police department applications such as TSCOPS and CCTNS for leave applications through mobile application and for filing FIRs from police stations by SHOs respectively.

Stake holders:

- Officials of Police Department
  - DGP Office Officers

- Commissionerate officers
- District Officers
- Addl.SP/DCP
- SDPO/ACP/DSPs
- Station House Officers
- Sub-Inspectors
- Asst.Sub-Inspectors
- Head Constables
- Constables Officers
- Administrative Officers
- Superintendents
- Senior Assistants
- Junior Assistants
- Record Assistants
- All Ministerial Staff

- CGG Project officials

Hardware/Software

- Java 1.8
- Spring 4.x
- PostgreSQL 12

Certification (Certifying Agency)

✔ Deccan InfoTech Pvt Ltd

Disaster Recovery and Service Continuity

- CGG, as the technology partner, has its own datacentre and uses information technology to process information quickly and effectively. CGG processes information and stores large amounts of data in its state-of-the-art datacentre at its premises.
- An information technology disaster recovery plan is being implemented by CGG in conjunction with the business continuity plan. Priorities and recovery time objectives for information technology are developed during the business impact analysis. Technology recovery strategies are developed to restore hardware, applications, and data in time to meet the needs of CGG business recovery.
- CGG uses the following technologies for Disaster Recovery and Business Continuity:
  - DC-DR replication between and within the same datacentre at the storage level with latest technologies such as "Synchronous Mirror Business Continuity" for high-availability of services to the citizens.
  - Data Centre- Disaster Recovery (DC-DR) replication between datacentre is within 20 km radius using OEM proprietary technologies with VMWare for high-availability of services to the citizens. The Disaster Recovery Centre for CGG's datacenter, equipped with state-of-the-art Hardware, Software and Control Infrastructure to achieve optimum operational performance, safety and security is located within its premises (STPI, Jubilee Hills).
  - CGG Business continuity is achieved by VDI (Virtual Desktop Infrastructure).
  - CGG has its own infrastructure of power source like multiple 500 KVA, 250

KVA generators in place and GRID POWER (300 KVA) for its datacenter along with a renewable energy source through Solar Carport Plant (289.75 KWp) to reduce Carbon Intensity is in place

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Service	Brief e-Service description with benefits	Volume (Nos) of Services year wise		
		2020-21	2021-22	2022-23 (Up to date of nomination)
Employee Registrations	Employee Personal and service details like postings, transfers, attachments, rewards, penalties are captured. Employee can view his service particulars (Profile).	69,236	16,748	128
Leave Module	Different types of leaves like, CL, Optional Holiday, PL, ML, EL, HPL, MCL, CCL, EOL, Compensatory Casual Leave, Special Casual Leve, Extraordinary Leave, Sick Settlement, LTC & surrender leaves are applied and processed through HRMS until issue of order	56 ,415	3,38,644	2,10,765
Grievance Module	All Employee related and service-related queries are raised and resolved through Grievance Module	423	15,020	13,798
Inwards	Inward Entry Inward Approval	30,528	2,68,608	1,69,546
Increments Module	Annual Grade Increment, Special Grade Increment and details of Employees are confirmed and processed through HRMS Application	1,599	22,867	17,141
File Created	File Mapping i. Move to existing file ii. Create new file	63,077	1,49,979	92,594
Documents Generated	Doc Format Entry	10,043	94,200	62,996
Digitally Signed Documents	DSC	0	1,244	60,160
Rewards Module	Appreciations and rewards are awarded to the Employees for their meritorious work and good	1,055	13,847	

	service through rewards module			35,187
Minor PR	Disciplinary action procedure is processed through Minor PR module and update the Penalties details in Employee Wallet	0	0	91(charge memos)
SMS Alerts	Several SMS alerts being sent to employees and Reporting Officers on day-to-day basis for various modules of TS Police HRMS Portal	3,07,644	11,92,849	11,03,764

Implementation

- Implementation Coverage achieved in comparison to the plan / target
  - An innovation in the form of TS Police HRMS (Human Resources Management System) was conceived and nurtured by the DGP office, Telangana to create a breakthrough reform in Police Employee Friendly services. This initiation has pioneered to introduce HRMS, in the year 2020. The major stakeholders of the Project are about 1,00,000 employees of TS Police and Centre for Good Governance (CGG), who have undertaken the massive exercise to consolidate accurate Data and devise a method for onboarding of all kinds of employees into HRMS. The process addresses goals and objectives as follows:
  - Easy access to every employee for online services and Mobile App to apply and Approve Leaves
  - Saves Time and Money
  - Reduces Cycle Time for file creation, processing and tracking
  - Transparency in Service Matters of employees
  - Availability of required documents in online in respective users Logins
  - Simultaneous Updation of respective service Registers with single click for increments, Rewards, Surrender Leaves etc.
  - Accurate Data and onboarding of various types of Employees
  - Workflow and File Processing for each module
  - MIS & Dashboards for reporting officers
  - For each online Employee (State treasury code is Employee User id) request, workflow has been incorporated for dynamic updating of Service Register (SR) for each transaction.
  - Reduces the drudgery of processing officer.
  - Online strength Particulars enables the department for deployment of staff to meet the emergency duties.
  - Drastically reduced the Manual intervention and cycle time for file processing.
  - Online Reporting and Relieving of employees enable officers' quick action against their day-to-day duties.
  - Around 1,00,000 user base using the application on daily basis for day-to-day transactions.
  - Enables Inward Entry, File Tracking and various documents generation for Employee personnel services

- Facilitates to avail all kinds of Leaves
- Digital Signature Incorporation
- SMS alerts for employees and reporting officers
- CCTNS and TSCOP applications users are being authenticated through TS Police HRMS
- Integrated Leave Module with TSCOP Mobile App

HRMS has simplified the conventional Govt process to just a few user-friendly processes.

Drawings from Pilot level implementation did not only emphasize the magnitude of strategic requirement for deployment of application at larger arena. But also, the necessity to conform the modifications in the system. Workflow of the system is developed strategically by separating the Stakeholder at every module as an entity.

Improvements / Enhancements

- Minor PR Module>>In previous version of this module, Offline entry of charge memo screen is provided, in new version charge memo generation and the entire process of Minor PR up to the DO generation is developed to complete the minor PR process online
  - PR Report Entry
  - PR charge memo entry
  - Charge Memo Signed File Upload
  - Upload Acknowledgement Details
  - Employee Punishment explanation Extend Date Request
  - Update Unit Officer Remarks
  - Minor PR DO Generation
  - Minor PR Upload Signed Doc
  - Upload PR Explanation
  - Employee Punishment Appeal/Revision
- Reporting & Relieving Module>> In the previous version of Leave Relieving & Reporting, only Relieving and Reporting dates were captured and updated in the Employee Wallet; however, in the new version, a leave passport is generated, and extended leave days are regularised, and a separate order is generated and updated in the Employee Wallet. This is also implemented for all kinds of Leaves
- Compensatory Casual Leave >> This Leave flow is intended for ministerial staff to benefit them for the days they worked during the holidays; a service is provided for Administrative Officers to register the days ministerial staff worked during the holidays.
- Special Casual Leave>>This leave is applicable for all the Govt servants, on various reasons mentioned below
  - Donating Blood
  - Summons to give witness in a court
  - Family planning Operation
  - Hysterectomy Operation
  - Participating in Sporting Events
  - Principal Office bearers

- Participate in Rallies, Camps organized by Bharath scouts
- Elected as President or Secretary of National Sports Bodies

- Extraordinary Leave >> When no other leave is available
  - When leave is available, but the Govt. servant request for grant of EOL, in writing
  - The sanctioning authority can treat the period of absence without leave as EOL
  - Only permanent employees in superior service are eligible and employees in last grade service are eligible in special circumstances
  - Maximum period of EOL can be given (exclusively EOL or in combination with any other leave) at a time is 5 years.
  - The EOL period will not be counted as qualifying service and no annual Increments during the period.
  - EOL granted on medical certificate counts as qualifying service (counts for increment & pension)
  - HOD can permit EOL on medical certificate for grant of Increment for the period not more than 6 months.
  - In case of EOL on medical certificate exceeding 6 months Govt. is competent for grant of increment.
  - Gazetted Officers are to submit medical certificate from a doctor not below the rank of Civil Surgeon.
  - NGOs and Last Grade employees are to submit medical certificate from any registered medical practitioner.
  - EOL on private affairs - not count for increment. But counts for pension up to 3 years.
  - This leave is applicable to both non-regular and regular employees and the leave period counts toward pension. This leave is beneficial to employees who are undergoing medical treatment or pursuing higher education because the leave period is counted as service.
- Sick Settlement>> No max limit. Can be availed on private affairs & medical purposes, can be combined with other leave. Temporary employees' avail this after completion of two (sup.) or one (inf.) years of service, Sick Settlement is a combination of EL, HPL, Commuted, and EOL; the employee's sick period is regularised through this service; and when a government employee intends to resign/retire, this service is used. After using commuted leave, it should be converted to HPL and the HPL salary recovered. When it is sanctioned, an employee should be given an undertaking.

Proposed Modules during next one year:

- Promotional Increment>>An increment awarded to the Employee at the time of promotion, an option form is provided to the Employee to opt the Annual Grade increment at the time of promotion date
- Major PR>>This module is proposed to take the Disciplinary action on the Employee for his negligence or absence of duty, the entire process from penalty initiation to penalty imposing order generation is to be facilitated online
- Probation Module >> Employee probation period declaration/terminated/ extended process has to be developed online

- State Pathakams>> Few Pathakams are awarded for the Employee by Central & State Government for his meritorious service, the entire process has to be developed online
- Pension Module>> This module is facilitated to award pension to the Employee at the time of retirement.
- Order Book>> Order Book module is proposed to be integrated with Leave and Absence taking reporting service is the basis.
- Copy To/Copy Forward To>>this Modules is proposed to do away with sharing Tappal/information through Post across the state. Even Police stations can send Information to Districts and cc to DGP office or any concerned Office. This will be a game changer for HRMS module and saves time and amount spent on hard copy communication. During Process reengineering, outward sections resources may be utilized for other duties.
- Enhancement of Dashboards & Reports>>Enhancements need to be incorporated in dashboards based on the new modules implementation from time to time and to have better visibility.
- Integration with state treasury>>It is proposed to integrate HRMS data with state treasury Data for reconciliation. Treasury ID is being used as Employee ID in TSP HRMS Portal.
- Integration with Increment, Leave and Punishment>> It is decided to integrate Increments with Leave and Punishments.

ENABLER

Processes Re-engineered

- Re-engineering process involves source code translation, reverse engineering, program structure improvement, program modularisation and data re-engineering. Re-engineering involves adding effort to make them easier to maintain and reorganise data structures. TS Police HRMS has been implemented for monitoring the real time data for ensuring transparency and to enhance the internal efficiency of staff. The implementation of this system provides the following benefits:
  - Digital repository of the Inwards, Files and various kind of Documents
  - Efficient tracking of Leave pendency, Strength particulars, Punishments status, Reward Proposals and Sanctions
  - Dynamic Updation of Service register of Employee
  - Reduction of Cycle time and better coordination for sending and receiving Documents through system.
  - Dashboard and reports for efficient monitoring and quick decision making
  - Reduced costs spent on Stationary for printing and disbursing
  - Process Reengineering improved the effectiveness of governance by

attaining Transparency, accountability and efficiency. Ex. Inward and Outward Sections may become redundant and concerned resources may be utilized effectively

- Integration of Treasury portal provided pay slip service to employee in each individual login
- Suggestion & Feedback Module, enabled Process Improvement

- The effectiveness and success of the HRMS system depends on the collective responsibility of officers and staff. Therefore, the Administrative Officers/ CAOS/ Addl. SsP (Admn.)/ Addl. DCP (Admn.)/ Jt. CP (Admn.) of the respective Units are made responsible for implementation of all the Modules in HRMS System by the administrative staff working under their charge without fail.

Technologies

- Tableau Tool is being used for Data Analytics and Dashboards are provided
- Mobile app integration
- Integration with TSCOP and CCTNS
- Digital Signature Enablement
- Involvement of Domain Experts for knowledge Sharing

People

Capacity Building:

Training was given to all the users and especially Ministerial Staff on usage of TSP HRMS application. The user interfaces of the application are made very simple and self-explanatory. User instructions manuals are also provided in the application itself for reference. Also, online support is being provided by CGG team and the users from all the districts across the state approach the team on ticketing tool and get the issues (if any) rectified.

The project Rollout was initiated across the state of Telangana in the month of Jan 2020. A detailed requirement study was made in details for all processes through various HRMS committees comprising all cadre officers. Automation requirements were identified. Implementation discussions conducted on fortnight basis in detail. Improvement requirements were identified.

Developed application as per the workflow indicated by the department. A test application is hosted for taking user acceptance for prototype and application. Regular discussions, Video Conferences, Short meetings and trainings are incorporated in software development process. Complete implementation support being extended to all the Districts/Commissionarates/Other Wings.

Software development life cycle as mentioned below is followed for deployment and implementation of the project.

Proposal / Contract	Competent Authority	High level Features list from Department Proposal Review	Approved Technical and Commercial Proposal

Project Initiation and Kickoff	Proposal/contract signed by Client Draft Plan	Plan review Meeting with HRMS Committees and Nodal Officers	Project initiation and Kickoff meeting conducted Project dependencies agreed upon Meeting minutes circulated
Requirement Analysis	Technical proposal-Features list Initiation Meeting minutes	Understand current business processes and systems Identify additional processes and systems that could come in scope Review of Software Requirements Study (SRS)	Approved SRS Project Plan
Design Prototype	SRS	Review of Design	Approved Design Prototype
Implementation	Approved & Tested Module	User Acceptance Test Address issues that arise during implementation w.r.t to the validations or minor modifications required User training and collecting feedback	Approved module with the modifications carried out

VALUE INDICATORS

Learning's for sharing

- Data entry effort is minimized and populated useful information by connecting to the real time databases while entering employee details
- Real time monitoring across the Commissionarates, Districts, Other wings and DGP Office
- SMS alerts for urgent communication with the users of the system
- Revamping, Re-engineering made the system for smooth maintenance
- Modular design achieved incorporation of new initiatives
- Achieving the goal of Paperless office to save time and money
- Continuous training of employees
- Workflow designs with Process Re-engineering
- Involvement of Domain experts

Digital Empowerment

- All the employee related data such as personal details, spouse details, children's details, service details, promotions, rewards, increments, Leaves etc being captured into the system
- Repository is available in digital format
- Enables them to apply Leaves through Mobile app
- Enables integration of various systems through web services

Green e-Governance

- Reduces Paper Usage as there is no need to maintain Employees service data
- As per IT Policy, Data is being maintained on tapes
- Used minimum required IT Infrastructure
- Data is available for audit Logs

Shri M. Mahender Reddy, IPS, *Director General of Police, Telangana state, Home Department jyothi.v@cgg.gov.in*

Sri. K. Sreenath Reddy, *Director General of Police, Telangana state, Home Department jyothi.v@cgg.gov.in*

Shri Rajendra Nimje, ex-IAS, *Centre for Good Governance, Government of Telangana jyothi.V@cgg.gov.in*

HP Large Dams Safety Analysis MIS for Department of Energy and HP State Disaster Management Authority, Government of HP

Department of Disaster Management, Govt. of Himachal Pradesh & National Informatics Centre Himachal Pradesh State Centre

Sudesh Kumar Mokhta and Ajay Singh Chahal

PROJECT OVERVIEW

Background and Area of operation:-

The Broad Aims and Objectives of Department of Energy, Government of Himachal Pradesh, is to provide conducive policy framework and directions to promote, develop and harness optimally, the huge hydro potential of the State on the one hand and to coordinate/facilitate the programs/policies which leads to conservation of energy and its efficient use and also to maximize the revenue by sale of free/equity power of the state. Presently the following 23 no. of large dams comes under the control of this department:-

1. Bhakra
2. Pong Dam
3. Pandoh Dam
4. Baira Dam (NHPC)
5. Chamera-I (NHPC)
6. Malana-I
7. Kuppa Barrage
8. Chamera-II (NHPC)
9. Larji Barrage
10. Nathpa
11. Chamera-III (NHPC)
12. Karcham
13. Kol Dam
14. Malana-II
15. Parbati-III (NHPC)
16. Bajoli Holi
17. Budhil
18. Chanju-I
19. Sainj Barrage
20. Allain Barrage
21. Jateon Barrage
22. Neogal Barrage
23. Sawra Kuddu

In the manual process, parameters related to Daily Reservoir Operation are reported by each dam site, with its Directorate located at Shimla and HP State Disaster Management Department, thrice on daily basis at 09:00AM, 02:00PM and 07:00PM,

through fax. Moreover, the parameters related to Dam Safety, are shared with its directorate as well as the HP State Disaster Management Department, on periodic basis. These parameters help the HP State Disaster Management Department, to take timely actions, to mitigate any chance of occurrence of disasters, in the area located in the vicinity of these dams.

Objective:-

Large Dams Safety Analysis MIS application is web-based and work flow based application software that can be accessed through the web browser. The software and database reside on a central server rather than being installed on the desktop system and is accessible over a network. https://hpsdmaplan.nic.in/dams is the URL to access this web application. Various modules in this software, have been developed. The objectives behind the development of this application is to achieve the following goals:-

- To identify and suggest an appropriate Government process re-engineering model
- To identify systems enabled mechanism that reduces and substantially removes redundant processes which otherwise delay flow of information among various stakeholders
- To identify and suggest an appropriate technology model that is both user friendly and which withstands the tough field conditions
- Induction of transparency and accountability in operations
- Improving efficiency in Government administration by fixing responsibility
- Improve decision making in view of better reporting mechanisms on funds utilization
- Unable to recover data in case lost, accident etc
- No alert system, in case of abnormal data
- Less preparation time for disaster prevention
- Lot of Manual Intervention
- Difficulty in maintaining up to date Records
- Repetitive efforts
- Wastage of Time, Money and Efforts
- No standardization and uniformity of the working methodology

Advantages of Large Dams Safety Analysis MIS System

- Web-enabled and work-flow based system for automation, standardization and uniformity of the working methodology
- Enhanced search features to query by selecting known parameters
- A friendly, speedier and efficient interface
- Dynamic search engine which generates several number of reports on a single
- Reports showing alerts , in case of abnormal data
- Less chances of data loss, accident etc and easy recovery in case of any disaster
- More preparation time for disaster prevention
- Less Manual Intervention

Current status:- The system is being used by all the offices of the department, wef Since 9th July 2020

Key Stake Holders:-

- Department of Energy, Govt. of HP

1. The Broad Aims and Objectives of this Directorate is to provide conducive policy framework and directions to promote, develop and harness optimally, the huge hydro potential of the State on the one hand and to coordinate/facilitate the programs/policies which leads to conservation of energy and its efficient use and also to maximize the revenue by sale of free/equity power of the state.
2. Presently 23 large dams have been identified by the state Government, for safety and thrice daily (at 09:00 AM, 02:00PM and 07:00PM) for water flow, weather, temperature etc, so that timely steps can be taken, in order to combat any disaster
3. Daily Reservoir operation related information is entered online by all the 23 dam sites, thrice daily
4. Dam Safety Parameters related information is also entered/updated, by all the 23 sites, in case there is aby change in the existing information/ parameters for that dam

- HP State Disaster Management Department, Govt. of HP

5. HP State Disaster Management Department, GoHP monitors all the 23 large dams identified by the state Government, for safety and thrice daily(at 09:00 AM, 02:00PM and 07:00PM) for water flow, weather, temperature etc, so that timely steps can be taken, in order to combat any disaster
6. This department approached NIC, HP State Centre, Shimla, in order to develop a web application for online data entry of daily parameters and safety related parameters, by the concerned dam site, facilitating them to monitor these parameters online on 24x7 basis, with the help of data analytics and data related reports

- National Informatics Centre, HP State Centre, Shimla(Himachal Pradesh)

1. This web application has been developed by NIC, HP State Centre Shimla

2. This web application has been hosted over at NIC State Cloud, Shimla (HP)

Service:-

G2G (Government to Government)

Hardware/Software

The Large Dams Safety Analysis MIS is a work flow and role based web application. It is hosted over IIS, has database in MS SQL server 2008. The application has been developed in asp.net.

This application has been developed by the National Informatics Centre, HP State Centre, and Shimla (HP), free of cost and has been hosted over at the NIC, servers.

Certification (Certifying Agency)

The web application is being audited for security in a third party security audit undertaken by AAA Technologies. The url of this application is https://hpsdmaplan.nic.in/dams

Disaster Recovery and Service Continuity

This application is hosted at the NIC web servers. Daily, weekly, fortnightly and monthly backup of data is taken by the NIC network group. A copy of these backups is also being kept in NIC Pune data centre.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Service	Name of e-Service description with benefits	Volume (Nos) of Services year wise		
		2020-2021	2021-2022	2022-23 (Upto date of nomination)
Daily Reservoir Operation information	Data Entry of parameters identified by Govt. of HP, to be Monitored, for prevention of occurrence of any likely disaster. These parameters are to be entered by each of the Large Dam site, thrice a day at 09:00 AM, 02:00PM and 07:00 PM everyday	5,715	18,035	11,901
Dams Safety Parameter Information updation	Data Entry of parameters identified by Govt. of HP, related to safety of large dams identified by Govt. of HP · These parameters are to be entered by each dam site, every time there is some change in any of these parameters	16	3	3

Implementation

a. Implementation Coverage achieved in comparison to the plan / target

Large Dams Safety Analysis MIS has been implemented in all the concerned offices of the department.

b. Indicate improvements/ enhancements specifically rolled out during the last one year and those which are planned to be rolled out during next one year.

Improvements / Enhancements

- Enhancements carried out in the software in last one year:-

1. Security Audit of this Web application, by third party security auditing agency, in progress
2. Data Analytics added, as per the requirements of the Department of Energy and HP State Disaster Management Department, Govt. of Himachal Pradesh

Enhancements planned for the next one year:-

1. Provision to made for auto synchronization of Large Dams Safety Analysis MIS Data from IOT devices, installed at each of the sites of 23 projects, with the central database, in place of the existing manual data entry process
2. Auto alerts to be sent to the concerned disaster management cells, Sub Divisional Magistrates, Deputy Commissioners and HP Disaster Management Department officers, in case of abnormal rise in water level of any dam etc

ENABLER

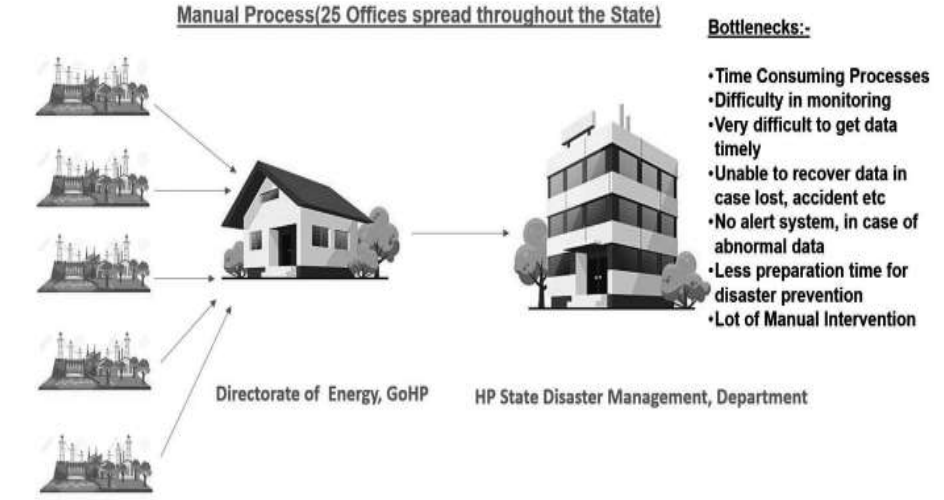
Processes Re-engineered

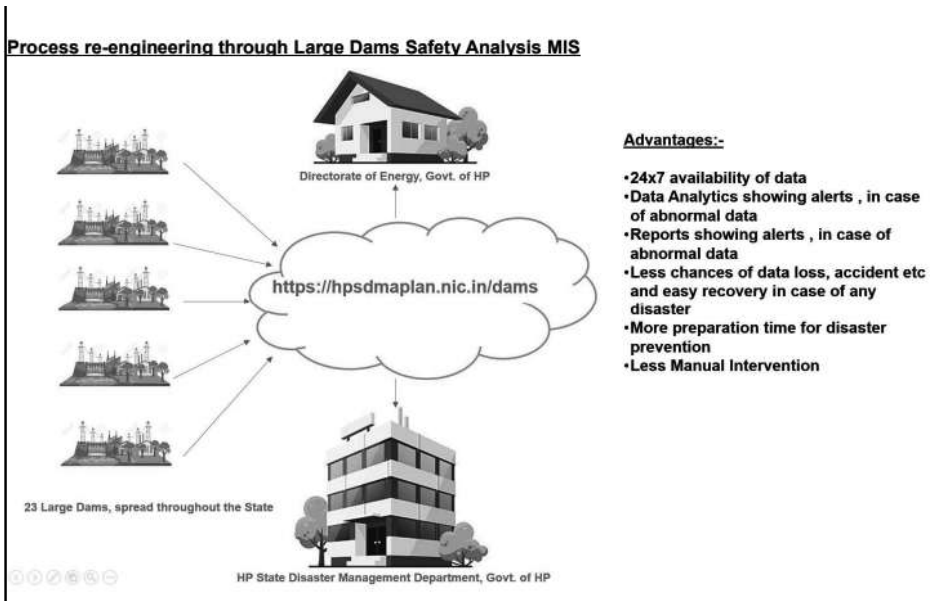
ICT processes

1. Standardization of forms and procedures
2. Reducing the usage of paper
3. All JSV offices linked together with central solution concept
4. Discontinuation of manual AA/ES, Technical Sanction, Inspection report, Potential creation return, Potential Utilization return and GI Pipes return

Non-ICT processes

1. Centralized solution for all government departments
2. Unique code for every scheme throughout the state





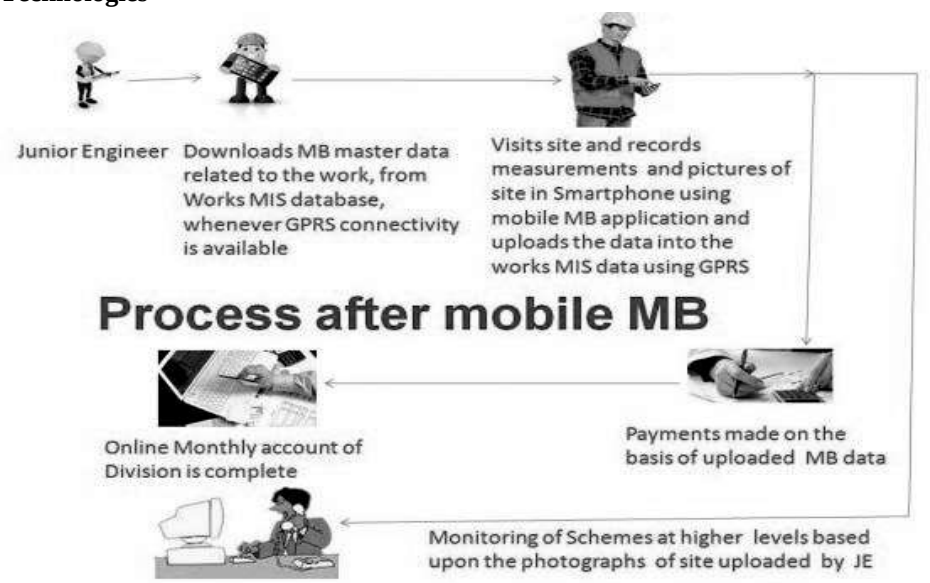
3. Unique code for every work throughout the state
4. Unique contractor id being generated for new contractor during registration. Every Contractor blacklisted by an IPH office, appears as blacklisted throughout all the IPH offices in the state
5. Integrated with budget data of Finance department, HP
6. A desktop/laptop based web service and Android Tablet/Smartphone based app developed for the Junior Engineers to enter the Measurement Book data into these

applications and upload this data into the central database on availability of Wi-Fi / Internet connectivity.

7. All the monthly account reports (more than 20) are generated automatically on the click of the mouse, after the entry of payment and receipt vouchers
8. Auto generation of stock account based on the issue of material in response to the raised indents
9. Online Issuance of Administrative Approval and Expenditure Sanction
10. Online Issuance of Technical Sanction
11. Online upload and monitoring of Inspection reports
12. Online generation of Contractor bill based on the MB (measurement book) data uploaded and the RSOQ (Revised Schedule of Quantity) entered corresponding to a work

All these processes have been successfully incorporated and are being used successfully by the user department.

Technologies



1. electronic Measurement Book:-Measurement related data is recorded by the Jr. engineer of the department, in Measurement book(MB) manually, and it was a challenge to digitize this data with the main data, as this data plays a major role in generation of the contractor bill, against which the payment is released to the contractor. Moreover, the site of various works where this data is recorded are very remote and there is no internet connectivity in these places. So, the following approaches were adopted to synchronise this MB data with the central database:-

(a) DTS (Data Transfer Service) Web Service:- This utility helps the Junior Engineer, in recording the data related to the measurements and material consumption at site in MS-access file in offline mode, since there are connectivity issues at sites where the works are going on. This utility can be used on a laptop or desktop. It helped the Junior Engineers (JE's) of the department to digitize, the measurement book data. Earlier JE's had to use calculators, to make calculations. Now they make entries directly into the electronic MB, which then gives the result of complex calculations, which helps in

saving a lot of time. This data is uploaded to the central database, from their office/sub divisional office/ Division office, wherever the internet connectivity is available.

(b)App for Android based Smart phones and Tablets: - This app has been developed for recording of data related to the measurements and material consumption at site, since there are connectivity issues at sites where the works are going on. This data is uploaded to the central database whenever connectivity becomes available and data has been recorded using this Electronic MB android app. It helps the Junior Engineers (JE's) of the department to digitize, the measurement book data. Earlier JE's had to use calculators, to make calculations. Now they make entries directly into the electronic MB, which then gives the result of complex calculations, which helps in saving a lot of time. Moreover, it is easy to carry these handheld devices (Android smart mobile phones and tablets), to any location wherever the works of departments are going on. It also helps the Jr. Engineers to take the snapshots of this work and synchronize these photographs along with the geo positional coordinates.

2. Dashboards: - Dashboards have been developed, according to the requirements specified by the Engineer-in-Chief, JSV department, which helps him/her to monitor the various activities, which are very important and needs timely intervention. Dashboards helps the higher levels officers of the department, to monitor various hectic and time consuming activities of their subordinate offices easily, on the click of mouse.

Social media platforms used to popularize the project.

This software was made popular by providing its link in the official web portal of the department.

By providing training on this software to almost 99% of the staff employed in the department.

People

Leadership support:-

- Department has appointed a Nodal Officer (IT) of the level of Executive Engineer. He acts as a mediator between the department and NIC
- Periodic incremental trainings on various modules of software are held for the employees of department

Management of change:-

- The monitoring of this software is being done by the Special Secretary(Disaster
- Management), GoHP
- Department has appointed a Nodal Officer (IT) of the level of Executive Engineer. He acts as a mediator between the department and NIC
- Whenever any change or any new requirements are to be incorporated into the software, the requirements are sent to the Nodal Officer(IT) of the department, who after checking the authenticity and feasibility of requirement, get in touch with NIC

Capacity Building:-

- Hands on trainings on various modules of this application was provided to various officers and officials of the department using this software
- Support is being provided to the various offices of department, by NIC HP State Centre, Shimla, between 10:00AM to 5:00PM, on all working days, on telephone and e-mail

VALUE INDICATORS

Learning's for sharing

Technology choices

ASP.NET technology is one of the best technologies available for developing online systems

Implementation strategy

This software was implemented in the first phase, in 21 project locations, followed by its implementation in 2 more project locations, when they were commissioned completely

Challenges

People who were provided with hands on training on this software, either retired or were transferred to some other office level

Non seriousness of some of the employees, who were trained to use this software

Digital Empowerment

People living in this state converse only in two languages i.e., Hindi and English. Since literacy rate of our state is very high (about 87%) and the work of this department was being done in English only in manual process, so there was no request received from this department , to use this software in bilingual form or to incorporate Hindi language in this software.

Green e-Governance

This software enables the Department of Energy and HP State Disaster Management Department, GoHP in moving towards green governance as it encourages the users to work on this software in online mode, followed by online monitoring of this data, on 24x7 basis, by HP State Disaster Management department, GoHP and other higher authorities, with the help of data Analytics and data reports. This online monitoring of data, help in taking preventive measures for prevention of disasters.

Shri Sudesh Kumar Mokhta, IAS, Special *Secretary (Disaster Management), Government of Himachal Pradesh, Disaster management, Government of Himachal Pradesh, mokhta_sudesh@yahoo.co.in*

Shri Ajay Chahal, *Deputy Director General and State informatics Officer, National Informatics Centre Himachal Pradesh State Centre, sio-hp@nic.in*

eAbkari (Computerization of State Excise, Govt. of Odisha)

Excise Department, Govt. of Odisha & National Informatics Centre Odisha State Centre

Ashish Kumar Singh, Nihar Ranjan Biswal and Mainak Mukhopadhyay

PROJECT OVERVIEW

The e-Abkari system has been proved to be successful in implementing an end-to-end Supply Chain Management System (SCM) which is unique of its kind - not only in the Alcoholic Beverages Industry, but also in SCM industry - using innovative practices. The project has been able to streamline entire operations of Excise Dept, Govt. of Odisha covering all the Importers, Manufactories and Retailers (around 4000 in total) comprehensively. Following features have made e-Abkari system a unique solution among all available SCM/ERP in government sectors. Apart from SCM the project is instrumental of license management, issue, renewal with online collection of duties etc. Registration of suppliers with brand/label management is also one of the major functionalities of the project with nearly 1631 labels being registered. The transition of the wholesale business in liquor from private players under a strong command of under Government monitoring mechanism with quick revenue realization has seen a tremendous success because of e-Abkari system. Many states visited to study their requirement and inspired by the success story of Excise Dept. many States have approached in recent time for its replication in their states.

Revenue collection is almost doubled w.r.t. previous year by rendering prompt G2B services and through arresting revenue leakage points. Following are some important Applications of e-Abkari portal which makes it a unbeatable platform to being the most paramount of e-Governance in the state of Odisha.

1. Grant of new license system
2. Renewal of licenses
3. Brand and supplier registration
4. Permit/pass for import/export/transport of spirit
5. Permit/pass for import/export/transport of mahua flower:
6. E-lottery system
7. Public grievance monitoring system
8. Daily preventive raid reporting system
9. Criminal case information system
10. Serious irregularity report
11. Issuance of LOI
12. Permission of late closing/ serving
13. Offender management system
14. Issuances of temporary license
15. Shifting of shop
16. Transfer of ownership etc.

eAbkari project covers all stakeholders in the excise value chain in the state of Odisha. Excise Offices spread out across the State and licensees approx. 4200 in nos. of nearly a dozen categories.

Benefits The unique initiative through development and adoption inherently became a much success story with immense Social-economic impact and can be summarized as below.

- 24x7 location independent with faceless and contact less services.
- Reduced Cost of Compliance for excise licensees – time and cost
- e-Abkari portal works as a mentor for licensees/applicants for licenses - what, how, when - user friendly guide for licensees and citizens regarding all aspects of Odisha State Excise
- Availability/tracking/alerts with Quick Service towards faster RTI and to stakeholders
- Reduced cost of collection for each rupee of Excise Revenue generated - less time to reconcile, reduced follow-ups, prompt collections
- Real-time supervision & monitoring of work done at different levels in all excise offices by the Excise Commissioner - availability of real-time work task information at all levels of hierarchy – completed, pending, ageing, etc.
- Real time complete data - latest positions of revenue collection, generation and availability of uniform and accurate data
- Policy making and decision making - MIS, detailed analysis, slicing-dicing available which assists the department in reviewing policies and decisions
- Exchange of Information - between different government departments / agencies this bringing WoG- Whole of Govt approach.
- Increase in compliance/scrutiny/reconciliation- while arresting revenue leakages.
- Electronic workflow systems to augment speed and ensure service delivery with central system with decentralized actions.
- Reduction in opportunities for corrupt practices/costs by allowing ‘anywhere’ and ‘any time’ access for excise licensees & members of citizens. Online Tracking of Status of different processes viz. Grant of License, Issuances of Transport Pass, Import Permits thus facilitating Rights to Service act.
- Payment Integration has been made with Treasury and Bank
- Simplification and standardization of government processes and procedures, elimination of unproductive/ non-value-adding work, and reduction in paperwork.

The project is in adoption in almost all functions of State Excise Department and geographical locations primarily in the State of Odisha including PAN India reach as well. All the 30 administrative districts, 33 Excise District Offices/ 58 Excise Range Offices/ 192 Excise Station Offices, in the State of Odisha are covered under the project.

Though the project is primarily targeted at businesses engaged in manufacture, distribution and trade in potable liquor and industrial spirits as also the health care sector in so far as procurement and distribution of life saving narcotic medicine is concerned, the benefits accrue to the entire population of the State. Also, 100 per cent of the population can access the citizen centric services offered under the project.

Stakeholder Coverage

- State Level: Officials of the Excise Department located in the State

Secretariat, Excise Directorate, District level, Range/Zone level, and Station level and also those officials posted in the Excise Licensed Premises like Distilleries, Manufactories etc. Besides, the State Level Stakeholders of eAbkari comprises of the Industry, Police, Public Sector Banks.

- Business Level: Around 4200 Excise Licensees of Distilleries, Manufactories, Wholesalers, Retail outlets including all Off & On Shops/Hotels located in the state of Odisha. Besides liquor companies located outside Odisha can also access the services offered under the project.
- Individual Level: Common Citizens applying for Excise Licenses or, in search of information pertaining to the prices of any liquor brand, or interested in providing any information or registering any complaint etc.

Hardware/Software

eAbkari is developed as a web-enabled application and hosted in the National Data Centre (NDC). The stakeholders access it through a web browser (client application) on an anytime, anywhere basis.

The project is developed with ASP.NET 4.5 as Frontend and MS SQL Server 2014 as the Backend Database. The database is mounted on Windows Server 2012. The related ICT solution also constitutes of JavaScript, CSS, Open-source reporting library iTextSharp, NIC SMS gateway, Android-based Java Application, Adobe Flash Player, IIS Web Server 7.0, XML and Service Oriented Architecture (SOA).

eAbkari is accessible through web browsers from PCs and Smart Phones. The entire solution is hosted in a state of art Data Center with a robust infrastructure.

The design architecture of eAbkari provides required flexibility and scalability as per future needs and requirements of stakeholders.

Prime Organization involved in the implementation: NIC Data center used for the Project: NDC, Hyderabad

Certification (Certifying Agency)

Security Audit has been completed for the State Excise Instance for Odisha.

Certifying Agency Name- Secure Eye, Bangalore

Process for in house Auditing is also being initiated

Disaster Recovery and Service Continuity

NDC, Hyderabad where eAbkari is hosted, has Disaster Recovery facility with DR sites located in NIC, Pune/Delhi. Asynchronous replication over WAN using FC-IP protocol and seamless connectivity with DR site over 100 Mbps leased line minimizes any negative impacts to eAbkari operations.

Proposed Plan for eAbkari is in a process to Migrate State of Art NDC at Bhubaneswar which SAN and Object Storage facility having disaster at LNDC, Laxmi Nagar. New Delhi. The same is being planned to be hosted in VM Ware based cloud with motion-based migration for service continuity.

RESULTS INDICATOR

Name of e-Services	**Brief service description with benefits**	**Volume (Nos) of Services year wise**		
		2020-2021	2021 - 2022	2022-23 (Upto date of

				nomination)
Revenue	Revenue Collection (In Crore)	4053.51	5528.4	1697.95
Grant of new license system (on shop & mohua flower)	Online Workflow based Grant of New Excise License System for to capture all the details of the Firm/Company/Individual and Granting e-License against particular site by collecting proper fees to continue smooth supply chain of liquor throughout the state.	51	128	378
Renewal of licenses	Online Workflow based license renewal for all category of licensees	3861	3758	3780
Label & brand registration	Online Workflow based Label & Brand Registration System to proper regularization of information regarding Authenticated Liquor Brands and Manufacturer throughout the state.	0	1752	1645
Supplier registration	Online Workflow based Supplier Registration System to proper regularization of information regarding Authenticated Liquor Brands sale in the state.	0	24	11
Permit/pass for import/export/transport of spirit	Workflow based Import/Transport/Export of Bulk Spirit system to generate Permit/Pass against each consignment	1032	1427	617
Permit/pass for import/export/transport of mahua flower	Workflow based Import/Transport/Export of Mahua Flower system to generate Permit/Pass against each consignment and to procure Mahua flower in proper channel.	0	0	4703
E-lottery system	Implementation of Online Lottery System for all types of License Category to lease out excise license to authenticated Firm/Company/Individual	0	1482	68
Daily	Online Application for	12456	3426	18613

preventive raid reporting system	maintaining outcomes of Preventive Raids done by the department on a daily basis and thus spotting out the most vulnerable areas on the aspect of fake liquor and illicitly distilled consumables through a robust Information Management System.		2	
Criminal case information system	Online application for registering court cases against the arrestees during preventive raids throughout the state and time to time status updating of such cases.	2012	1003	265
Serious irregularity monitoring system	Workflow based Misc. Case Monitoring System	0	12	349
Issuance of loi	Workflow based Issue of LOI for setting up of Distilleries, Brewery and Bottling Plant	9	10	5
Issue of noc for import/ transport spirit	Workflow based NOC for import/ transport and export	352	498	247
Offender management system	Workflow based offender management system	3645	3104	1153
Issuence of temporary licenses	Workflow based issuance of temporary licenses	9	57	31
Shifting of shops	Workflow based shifting of licensees	0	43	40
Transfer of ownership	Workflow based transfer ownership of licensees	0	39	39

Implementation

a. Implementation Coverage achieved in comparison to the plan / target

The unique initiative through development and adoption inherently became a much success story with immense Social-economic impact and is being implemented across the State and PAN India Level as well.

- 24x7 location independent with faceless and contact less services.
- Reduced Cost of Compliance for excise licensees – time and cost
- eAbkari portal works as a mentor for licensees/applicants for licenses - what, how, when - user friendly guide for licensees and citizens regarding all aspects of Odisha State Excise

- Availability/tracking/alerts with Quick Service towards faster RTI and to stakeholders
- Reduced cost of collection for each rupee of Excise Revenue generated - less time to reconcile, reduced follow-ups, prompt collections

Real-time supervision & monitoring of work done at different levels in all excise offices by the Excise Commissioner - availability of real-time work task information at all levels of hierarchy – completed, pending, ageing, etc. o Real time complete data - latest positions of revenue collection, generation and availability of uniform and accurate data o Policy making and decision making - MIS, detailed analysis, slicing-dicing available which assists the department in reviewing policies and decisions

- Exchange of Information - between different government departments / agencies this bringing WoG- Whole of Govt approach.
- Increase in compliance/scrutiny/reconciliation - while arresting revenue leakages.
- Electronic workflow systems to augment speed and ensure service delivery with central system with decentralized actions.
- Reduction in opportunities for corrupt practices/costs by allowing 'anywhere' and 'any time' access for excise licensees & members of citizens. Online Tracking of Status of different processes viz. Grant of License, Issuances of Transport Pass, Import Permits thus facilitating Rights to Service act. o Payment Integration has been made with Treasury and Bank
- Simplification and standardization of government processes and procedures, elimination of unproductive/ non-value-adding work, and reduction in paperwork.

The project is in place in PAN Odisha level covering all Districts/Range Office/Stations and in PAN India level as well while taking the operations of Out of State Business Entities doing Business with Govt. Of Odisha.,

Almost all functionalities of State Excise Dept. are being automated and is being done in online mode thus making eAbkari as a comprehensive suite-based application.

eAbkari project covers all stakeholders in the excise value chain in the state of Odisha.

Boundary 33 Excise District Offices/ 58 Excise Range Offices/ 192 Excise Station Offices/ 1493 Branch Shop Count (For Out Still License, Branch Out still license)

4000 plus Excise Licensees (various category of License using in the various eAbkari modules), category wise details of which as follows: -

1 Bhang - 90 2 Bottling Plant - 18 3 Brewery - 8 4 Country Spirit (Liquor) - 248 5 Distillery - 4 6 IMFL Off Shop - 1166 7 IMFL ON Shop - 740

CSeGA-2022 Project Category Nomination Page 11

8 M & TP Licenses - 16 9 Military Canteen - 37 10 Mohua flower - 1074 11 Molasses Non-Trading Unit - 46 12 Molasses Trading Unit - 6 13 Non-License - 20 14 Out Still License - 550 15 Pachwai - 4 16 Premium FL-OFF Shop - 15 17 Supplier - 69 18 Tari Shop - 58 19 Whole Sale Trade - 10

State Excise Department became among few dept of State to comply 100% BRAP and 100% SRAP compliances under State 5T mandate and DIPP initiative of Govt. of India.

In a nutshell the Dept. with eAbkari implementation achieved

1. Bringing in a paradigm shift in providing services to its stakeholders in line

of Ease-of-doingBusiness from prevailing Manual System to Online Portal

2. Attitudinal change, Technological skill enhancement, Adaptability to respond to stakeholder requirements in ever demanding scenario and commitment to provide superlative services
3. Processes were not streamlined – different supply chain processes, different format of eChallans in different districts across the State which all got streamlined.
4. For Government Officials: Poor IT awareness, Risk of IT system replacing manpower, Fear of using system and working on system, Risk of information loss. Digital Empowerment was achieved with implementation of eAbkari Project not only in Excise Authority (Permit Issuing Authority) offices across State, but also in Licensee Office Premises.

b. Indicate improvements/ enhancements specifically rolled out during the last one year and those which are planned to be rolled out during next one year. eAbkari modules rolled out during the period with following e-Services: -

G2B Services

- Grant of Licenses for the next period of settlement •
- Issuance of Permits/Passes for Import/Transport of Bulk Spirit, Mahua Flower and Molasses
- Label Registration of Packaged Liquor, which is essential for trading the product in the state
- Introduction of suitable Government Process Re-engineering (GPR) for betterment in delivery mechanism of services by Excise Department
- Enabling hassle free collection mechanism of duties/fees

G2G Services

- The Government can have a view of total Licensees of the State (District wise / Category wise/ Sub-Category wise)
- The Government can have a view of Licensees who have their Licenses renewed / not renewed
- The Government can have a view of total registered products for a particular duration
- The Government can have a view of total Import Permits and Transport Passes issued for the whole state for a particular duration (District-wise) including the number of requisitions that have been submitted by the Licensees for Permits and Passes on daily basis and the number of these have been served.
- The System can help the Government provide better services to the Licensees and assessment of revenue (District-wise for duration) on real time. •
- The Government can also have a ready record on available stock of Liquor and Spirit and consumption of Liquor and Spirit for duration. This will be a planning tool for the Government for fixing targets towards revenue generation.
- Leakage of Revenue can be arrested.
- Streamlining and Systematizing Inter-departmental and Intra-Departmental information resulting in increased efficiency in Administration, cutting down response times and delivering better service, controlling crimes and preventing revenue leakages and knowledge sharing.

G2C Services

- Citizens can have details of Off/On Shop in his/her locality and availability of Liquor (Type/Brand wise) in the shops with their price and all other procedures, rules of the Excise Department.

G2E Services

- The System can help the employees to produce relevant reports in minimum possible time for management purposes and this will substantially improve the office processes thro' the MIS being developed.
- Benefit to employees through' implementation of Generic Application Software (e-Abkari Support System)
- Employees can have access to all the Excise rules regarding their domain of work through State Excise Portal & Knowledge Intranet.

Future expansion plans:

- End-to-End Supply Chain of all Stakeholders coming under the purview of State Excise
- Computerization of relevant processes for Letter of Intent (LoI), Workflow based Processing and Approval
- Online collection of Duties and Fees.
- Integration with GPS Tracking device to track Intra/Inter-State Liquor Movement

eAbkari led to 24x7 Service time Window for licensees - no more bank/government office time constraints for submissions of application, requisition, payment of excise duties/fees. Reduced Cost of Compliance for excise licensees with time and cost savings with no more standing in queues, any time submission, no more stack of papers, no more multiple copies of returns and reduced consumption of stationery. Downloadable certificates thus empowering Stakeholders.

Locational independence for compliance - Abkari portal works as a mentor for licensees/applicants for licenses. User friendly guide for licensees with copy of notices and acknowledgement sent to licensees to their e-Abkari inbox as Govt. as Govt extending service at doorsteps.

Tracking of service delivery of department. Quick Service towards RTI and to stakeholders. Reduced cost of collection for each rupee of Excise Revenue generated - less time to reconcile, reduced follow-ups, prompt collections. Real-time supervision & monitoring of work done at different levels in all excise offices by the Excise Commissioner and Govt. Availability of real-time work task information at all levels of hierarchy – completed, pending, ageing, etc. along with various analytics

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ENABLER

Processes Re-engineered

The number of Processes re-engineered: 18

Comprehensive process re-engineering exercised was carried out in all most all functionality of Excise Department with the objective of transformation to bring WoG (whole of Government) approach in Excise domain. AS-IS, TO-BE, GAP analysis ware under taken followed by massive brainstorming exercised with the objective to make the department leaner & cleaner.

The conceptualization of this portal required a multi-phased study involving a minute

breakdown of the existing frameworks. Through the use of surveys, meetings, and focused group discussions involving direct connections with respondents, data was collected and recorded at various levels. It was further clustered into a set of recommendations. The first phase primarily involved desk research, undertaking a detailed review of the offline process, and interactions with various stakeholders. The key was to remove non-value add activities and streamline the transition from offline to online mode. The second phase focused on preparing the actionable related to stakeholder participation, finalizing the escalation matrix, and outlaying the financial implications of the project. Accordingly, a budget was prepared considering the initial implementation, transition cost, and studying its feasibility. Before roll-out, the project was initially launched on a pilot basis for monitoring its feasibility on a real-time basis.

Under SRAP- State Reforms Action Plan. Dash Board Analytics was designed and made available indicating the performance of various modules and services being rendered by Govt. As the project was successfully implemented Govt. in State Excise Dept introduced half a dozen services to be covered under Right to Public Service Act.

Cross Knowledge sharing practice was promoted and interaction/workshops among various states were also undertaken. This led to idea exchange and faster replication mode of project enhancement/Delivery and implementation.

Major ICT and Non-ICT process changes that were planned and the extent to which the plans have been implemented.

The specific areas where major ICT process changes were planned and implemented are:

a) Import Permits for Spirits used for the manufacture of liquor and for bottled liquor
b) Import Permits for Spirits used for industrial or medicinal purposes
c) Transport Passes for movement of Bulk Spirit and Packaged Liquor within the State
d) Stock Inventory and Stock Transaction management at liquor businesses
e) Registration of brands and labels of Foreign Liquor and Country spirit
f) Grant and Renewal of Excise Licenses
g) Payment of Excise Duties and Fees
h) Collection and aggregation of data regarding revenue, production and sale of liquor, excise-related crimes and enforcement activities

Electronic processing of licenses permits and passes and automated inventory management of liquor. QR code-based authentication and supply chain management of packaged liquor was achieved and were done with click of mouse instead of earlier cumbersome process. GPS based tracking of spirit movement and electronic monitoring of enforcement activities is being planned.

Project undergone any 3rd party impact study: No

Challenges

- Inefficient operating environment leading to unnecessary delays and inaccurate information
- Lack of transparency & control over the movement of excisable goods leading to increased illicit liquor production and loss of Excise revenues
- Lack of a standard reporting/analysis/requirement gathering mechanism/data migration

- Change Management.
- Capacity Building Challenges
- Technology-Related Challenges
  - Changing user mind-sets is a necessary pre-condition before embarking on ICT based process re-engineering.
  - Stakeholder consultation during the stages of development and design are essential for easy post-deployment acceptability.
  - Effecting change has to be an exercise started from higher up in administration and then down the hierarchical set up.
  - Appraising the stakeholders and convincing them of the benefits is more important than just enforcing ICT re-engineering.
  - Accessibility, time and locational independence to users is important.
  - Taking along users not comfortable with technology by arranging suitable training is essential for universal dissemination.
  - Network and Connectivity are crucial and deploying fall back mechanisms as a measure of redundancy is important.
  - Piloting and making necessary course corrections from feedback and user experience before final deployment is essential.
  - Robust Helpdesk support and round the clock troubleshooting should be put in place.
  - Training and capacity building should be a continuous exercise.

Technologies

eAbkari is a complete Technology Driven project with the objective of bringing substantial transformation in Excise Operation across the State.

The vision behind the e-Abkari project envisaged for the implementation of an enterprisewide system in Excise department so as to build a world class liquor distribution ecosystem within the country that: -

1. Is driven by transparent, simple and error- free business processes
2. Minimize chances of pilferage of liquor and non-payment of excise duty/ additional duties
3. Is easily measured by clearly defined key performance indicators.
4. Integrates seamlessly with prevalent systems and devices
5. Uses technology to achieve strategic business objectives e-Abkari is driven to achieve operational efficiency and effectiveness in service delivery to all doing business with the corporation.

Third-party technology assessment of e-Abkari and compliance of their recommendations and security policies with necessary benchmarking e-Abkari were done. 1- Checking authenticity of QR-coded Permits / Passes of in transit consignments 2- Use of Mobile Apps by excise officers using smart phone devices 3. Use of GI tools like GPS mapping of Excise Licensed Premises across the State 4. Integrating the State Treasury portal and Various Bank Gateways to deposit proper duties and fees without failure and on real time reconciliation basis 5. Dynamic Dashboard, Pendency Checker at all hierarchical levels 6. Auto SMS / Email alerts / notifications to stakeholders. 7. Incorporation of standard web technologies and techniques such as HTTP redirects, cookies, JavaScript SOA, XML SOAP etc. strong symmetric key encryption (MD5 Hashing) to deliver the single sign-in service over

https for ensuring secured transactions. 8. Digital signature certificate with PKI technology which is being integrated in the application were incorporated in the project.

Real-time supervision & monitoring of work done at different levels in all excise offices by the Excise Commissioner and Govt. Availability of real-time work task information at all levels of hierarchy – completed, pending, ageing, etc. along with various data analytics and dash board display etc.

eAbkari project has been the single most transformational factor in which Odisha State Excise presently functions. Apart from (a) data collection, aggregation & monitoring of enforcement activities against the manufacture, distribution, sale and possession of narcotics, spurious spirit and non-duty paid liquor and (b) tracking duty evasion by generating a 360 degree profile of the excise licensees, issued permits & passes for movement of excisable goods, the eAbkari project has been able to reduce activity cost, total process cycle time & waiting time for the stakeholders and thereby increasing throughput of the system.

With regards to its technical aspects, eAbkari is designed in the realm of Microservices Architecture incorporating emerging technologies. As each e-Service is designed, developed and tested, they are just plugged into the service framework. This flexible, modular method to software development and project implementation makes the project easily replicable across a range of geographies, user-classes and commodities.

In numerous instances various Process Re-engineering was initiated and adopted which was highly effective. Steps are also being taken for adoption of Enterprise Architecture study and adoption from IndEA framework as well.

People

The very success of eAbkari project lies in its unique strategy of People management and top leadership support.

- **The department was infamous for Inefficient operating environment leading to unnecessary delays and inaccurate information**: Majority of regulatory and enforcement operations of Odisha State Excise were then being performed manually. With limited human resources and increase in business, it was becoming difficult for the department to cope with the workload which ultimately led to delays and inaccuracies in the information provided.
- **Lack of transparency & control over the movement of excisable goods leading to increased illicit liquor production and loss of Excise revenues**: Odisha Excise Department did not have an effective mechanism in place to trace the excisable goods incoming / leaving the manufacturers and wholesalers' premise and keep control of the activities at these premises. The import/transport permits /passes issued to the transporter of goods were done manually on paper, making it difficult for the department to keep track of goods at real time and to decipher patterns of suspicious activities.
- **Lack of a standard reporting/analysis/requirement gathering mechanism/ data migration:** The Excise Department was using multiple reporting formats and no provision was available for performing a real time analysis of the reported data (revenue figures, production data etc.) in order to draw important insights/inferences from them. Requirement Gathering was found to be a major challenge as the rift was huge between the systems-oriented architecture and the current process. The volatility of the requirements was augmented due to the inadequate computer literacy of the end-users.

- **Change Management:** In order to have sustainable e-Governance initiatives, the challenge before Excise Department was in bringing a paradigm shift in providing services to the stakeholders of the department. This necessitated attitudinal change, technological skill enhancement, adaptability to respond to stakeholder requirements in ever demanding scenario and commitment to provide superlative services.

The major challenges in change management before deployment of e-Abkari were

(a) Processes were not streamlined – different processes in different offices

(b) IT awareness

(c) Risk of IT system replacing manpower

(d) Fear of using system and working on system

(e) E-services awareness

(f) Risk of information loss

(g) Process simplification and reEngineering – communication.

Capacity Building Challenges: Imparting training and capacity building was a major challenge for the department owing to the geographical distance and other issues. Staff members were used to the manual way of working and resistance to accept processes after GPR came from the employees who were nearing their superannuation. Skill sets required to handle IT systems were limited. Trained officials and also officials holding various authorities in the computerized business process workflow are often transferred or retire. This in turn necessitated repetitive training leading to delay in implementation.

Liquor manufacturers, wholesalers and retailers can transact business with the department using web bases eServices as per their comfort and convenience. The archaic and manual legacy-based processes, which were the hallmarks of a typical over-bureaucratic licensing department, have been done away with. Electronic processing of service requests and single point simpler duty/fee collection system has ensured transparency and efficiency.

Requisitions and service requests can be tracked on real-time across the process chain by all stakeholders. Monitoring of pendency and traceability of decisions is ensured.

A robust monitoring system of enforcement activities related to detection and prosecution of excise crime has imbibed greater accountability at all levels.

e-Lottery success is worth sharing and can be an eye opener in Digital Governance across the Country. The bold administrative decision and support with proper ICT intervention to a much trouble area of allocation of shops through e-Lottery is a classic case by itself in Digital Governance. The Leadership and Team work has been a point noteworthy in recent eGovernanace scenario in the State.

VALUE INDICATORS

Learning's for sharing

Digital Inclusion

- Local language user interface has been provided for widening of outreach and easy dissemination of information.
- The application is hosted on the World Wide Web which makes access universal. Practically anyone with basic computer hardware and an internet connection can access the services.
- Efforts have been made to make the interface user friendly with online user

manuals available for each process re-engineered.

- Before the launch of the project, a comprehensive Capacity Building initiative was taken by the department to create computer awareness among all officials of the department.
- Prior to the launch of any new software module, the I.T. Cell of the Excise Department, in conjunction with the Training wing of the department, holds multiple workshops to train departmental officers, as well as the external stakeholders – viz. the licensees of the department – on the use of the e-Abkari software module.
- A specially-selected team of officers have been trained on ToT basis to provide handholding support to the external stakeholders.
- A dedicated team of Software Support Personnel and departmental officers has been put in place to provide telephone- and email-based support, as well as on-site support to the stakeholders

User Manuals for the software modules are available for download on the departmental website

The Lessons learnt from Technology choices and implementation strategy adopted

- Successful deployment of information technology requires executive-level support, a structured decision-making process, and a strategy based on an understanding of vision and its enterprise architecture. •
- Comprehensive preparatory work is important to evade mishaps or breakdowns in service delivery, availability and updating of accurate data, adherence to service delivery timelines, monitoring the performance and dynamic evaluation from time to time. •
- Deployment of online change history management system (Change request including the person requesting, request date, scanned copy of request, implementation date etc.) is utmost necessary to maintain/track application changes. Otherwise, it will be difficult to track the changes due to high volume of frequent changes in service delivery. •
- Web-services should be deployed wherever there are scopes. •
- Transactional data should be updated after completion of transaction (posting through batch mode with single connection) to avoid high traffic on server to reduce transaction time and transaction failure •
- Views/Temporary tables should be used to avoid load on the server while accessing various MIS reports by stakeholders to avoid accessing transactional tables for report generations. •
- Mere investment of crores of money towards application s/w development & ICT infrastructure building is not a pre-requisite for e-Governance initiatives. Development of s/w application In-House with technical support from Government Organizations and Re-using the existing ICT infrastructure of Government (IDC, MPLS, SWAN etc.) can make e-Governance mission successful with possible replication.

Digital Empowerment

- Desktop PCs and peripherals, procured through budgetary allocations made by the Government, have been made available at all district, range- and circle-level excise offices.
- Network connectivity at Excise offices has been made available through a state-

wide Wide Area Network commissioned by the Finance Department, Government of Odisha, and through landline broadband connections.

- A significant feature of the project is that it did not involve additional infrastructure creation exclusive to the project. The existing I.T. hardware and network connectivity available at the excise offices were re-purposed for the implementation of the project.
- Local language user interface is being provided for widening of outreach and easy dissemination of information.
- The application is hosted on the World Wide Web which makes access universal. Practically anyone with basic computer hardware and an internet connection can access the services.
- Efforts have been made to make the interface user friendly with online user manuals available for each process re-engineered.

Green e-Governance

The entire project has been developed in-house with the technical assistance from the National Informatics Centre, Govt. of India. No private third party was engaged at any stage for the same which has made the project cost effective with minimum investment and maximum output. Also, the use of advanced but easily accessible ICT tools like barcodes and QR codes, GIS, SMS etc. has ensured wide outreach of the project.

- The project has been designed for achieving paper-less office.
- Electronic Information Management System has ensured easy retrievability of data at any time and hence obviated the need for taking print outs.
- The Electronic Inventory Management at business premises has reduced the need for physical visits to such premises by officers which in turn has reduced fuel consumptions and vehicle use for such exercises.
- Information sharing and communication amongst offices at all levels using BI tools built into the project has reduced the need for manual delivery of information which in turn as further rationalized vehicle use and reduced carbon footprint.

These tools and technologies substantially helped while assisting the overall goal of Green eGovernanace.

The cloud deployment of the project thus encouraging shared hosting of the application substantially reduced the e-waste otherwise could have been increased because of colocation / in-premises deployment.

The department archived paper less in all most all functionality and for all stakeholder in PAN India level.

Shri Ashish Kumar Singh, *Excise Commissioner, Excise Department, Govt. of Odisha, ecborctc@gmail.com*

Shri Nihar Ranjan Biswal, *Senior Technical Director NIC, Scientist-F, National Informatics Centre Odisha State Centre, nihar@nic.in*

Shri Mainak Mukhopadhyay, *Senior Technical Director NIC, Scientist-F, National Informatics Centre Odisha State Centre, mainak@nic.in*

HPAPPP – Himachal Pradesh Agriculture Produce Procurement Portal

Directorate of Food, Civil Supplies & Consumer Affairs Govt. of Himachal Pradesh & National Informatics Centre Himachal Pradesh State Centre

K. C. Chaman, Ajay Singh Chahal and Vijay Kumar Gupta

PROJECT OVERVIEW

SAHI FASAL - SAHI DAAM - Government of Himachal Pradesh decided to provide a complete electronic system for process of procurement of Agriculture Produce from Farmers in the year 2021. NIC Himachal Pradesh was assigned the activity of designing and developing a comprehensive and user-friendly online web portal and the development work was completed before the start of Kharif 2021 procurement season. The system has been implemented from Kharif season 2021 which allows Farmers to register themselves on the portal, add their Land details where the cultivation was done during the year, book a slot in the procurement center of their choice on a date which suits the farmer, and provide the facility to get the online payment of their produce in their bank accounts.

Objectives:

- Farmer's self-registration for the procurement of Agriculture Produce online. Mobile/OTP based verification of Farmer.
- Online entry of Land being cultivated by the farmer with true integration with Land Records. Just need to mention the District, Tehsil, Revenue Village and select name of owner to pick the Land Details.
- Online Verification of data by the Revenue and Agriculture Department field level officials to assess the maximum yield against the cultivated area.
- Generation of token/booking of slot by the farmer for date and place of farmer's choice after verification by the Revenue and Agriculture officials.
- Generation of Bill of Sale by Procurement agency and its intimation to Farmer.
- Online payment of produce in Farmer's Bank account.
- Integration with Central Food Procurement Portal/CFPP to send all figures using APIs of CFPP

Scope - functional and geographical

It is desired to develop a web Portal for the Department of Food, Civil Supplies and Consumer affairs so as to ease the process of procurement of paddy. The farmers can online self-register themselves on the portal using their mobile number authentication. They can link their land details on the portal from land records data available online using OTP authentication. The farmers can refer to the general instructions before registration. The authorized officials from the Department of Agriculture and Revenue will access the portal for the verification of online registered farmers. The agriculture department and FCI officials will access the portal during procurement of paddy in October for receiving paddy produce, doing the quality checks and generating the bills of sale and thereafter making online payments and then further processing of the procured paddy through the portal. API based integrated with CFPP will be carried out as per API Integration document received through the Department. Payments will be

made as per existing State/ FCI procedures but data will be shared and captured in the HP APPP through Excel/ API integration. A comprehensive Dashboard will show the main statistics to Government, farmers, citizens.

Key stake holders – intended benefits:

The web application would be role based with departmental officials authorized to carry out the task as per their jurisdiction. The system will keep track of various activities carried out by the department officials. The application stakeholders are:

Farmers

- View Season wise (Kharif/ Rabi) number/ names of Markets procuring Paddy, number of Registered Farmers, total Paddy procured in Metric Tons, Total Payments made in rupees, date-wise Token slots available for booking during procurement period.
- View above mentioned information Market wise (operational markets).
- Register online through Mobile and OTP.
- Set PIN/Password for subsequent Login to view own data.
- Check PM KISAN database for availability of own record for faster registration.
- Link land details from digitized Land Records data.
- View status of verification of Online Registration.
- Generate Token by selecting a date on which to take Paddy to market for procurement.
- View status of Sale (Bill of Sale)
- View Payment Details (Payment Details)

Department of Food, Civil Supplies and Consumer Affairs, Himachal Pradesh

- Administrator Role to generate IDs/ initial passwords for other Department users based on their District and Department/FCI.
- View Market wise (District wise) complete status of Farmers registered/ approved, tokens generated, paddy procured, paddy rejected, payments made/ pending etc. Market Operations for Market users of Department.
- View Tokens generated for the assigned market (date wise).
- Generate additional tokens or change dates, if required.
- To help/ assist farmers to Register online/ generate tokens.
- Accept/ Reject paddy by making entry in the software for every procurement (generate Procurement ID).
- Generate Bill of Sale, print it and give a copy to farmer as Receipt.
- Transfer Procurement ID wise data to CFPP on generation of Procurement ID.
- Transfer Bill of Sale data to Department's internal system for making online payment to farmers.
- Enter payment details into the system either through Excel sheet or farmer wise.
- Transfer payment details data to CFPP through API.
- After procurement, detailed entry of Paddy transferred to Miller and received back from miller will also be made in the software

Department of Agriculture

- View crop and land details of Online Registered Farmers in the jurisdiction.

- Approve / Reject online registered farmer form.
- View Total Registered/ Rejected/ Approved farmers.
- Approved farmers' data to be transferred to Central Food Procurement Portal (CFPP) through API.

Revenue

- View Land details and cultivated land area of Online Registered Farmers in the jurisdiction.
- Approve / Reject or Refer back online registered farmer form.
- View Total Registered/ Rejected/ Approved farmers.
- Approved farmers' data to be transferred to Central Food Procurement Portal (CFPP) through API.

FCI officials

- View Tokens generated for the assigned marked (date wise).
- Generate additional tokens or change procurement dates, if required.
- To help/ assist farmers to Register online/ generate tokens.
- Accept/ Reject paddy by making entry in the software for every procurement (generate Procurement ID).
- Generate Bill of Sale, print it and give a copy to farmer as Receipt.
- Transfer Procurement ID wise data to CFPP on generation of Procurement ID.
- Transfer Bill of Sale data to FCI internal system for making payment to farmers as per FCI system.
- FCI to provide payment details data to CFPP through their API.
- After procurement, detailed entry of Paddy transferred to Miller and received back from miller will also be made in the software.

Current Status

- Kharif (October – December 2021)
  - Number of Farmers Registered – 10515
  - Number of Tokens Generated – 5889
  - Paddy Procured – 27,628 MT
  - Bill of Sale Generated – 5842
  - Online Payment made in Farmer's Bank Account by FCI – Rs. 54.15 Crore
- Rabi (April – June 2022)
  - Number of Farmers Registered – 2822
  - Number of Tokens Generated – 1700
  - Wheat Procured – 2,931 MT
  - Bill of Sale Generated – 1041
  - Online Payment made in Farmer's Bank Account by FCI – Rs. 5.91 Crore.

Hardware/Software

The HPAPPP is web-enabled software that has been developed under Windows platform with MS SQL Server 2016 at the back-end and .Net 4.5 technology at the front-end.

Compliance of the Technology adopted with e-Government standards notified /

recommended by the GOI [URL Reference: https://egovstandards.gov.in/]-The software application take care of this data.

Compliance of the Cyber Security guidelines as per recommendations by OWASP [URL Reference: https://owasp.org/]- The software application take care of this data.

Security and confidentiality standards: The Web application and the Core module are cyber security audited by NICSI empanelled vendors. Any addition of modules also gets audited at an interval of every 6 months. The web application is standard and robust, running across the state. There are proper audit trails to monitor the SW access. The confidentially aspects are strictly implemented, as per direction of client for information shown in public domain.

Strategy for Disaster Recovery and service continuity: The application and database are all hosted on NIC web-servers with SAN, with DR site assigned at NIC Pune DR in Maharashtra (Far DR) and all sectoral databases are replicated from local applications to the Near DR site at Shimla. Therefore, even if the services completely fail, the DR site at Pune (where data is replicated daily in night-time) will be able to provide continuous service (with minimum data loss in worst case).

Technology: web-based application developed using latest versions of Bootstrap, JQuery and HTML under Windows platform .Net technology at the front-end and with Microsoft SQL Server 2016 at the back-end. Email integration is done through NICSI and SMS integration is done through Department of Information Technology to send important notifications and updates as and when required. Rest APIs are used for data exchanges between land records, CPPP and HPAPPP.

Certification (Certifying Agency)

Yes, cyber security audit of MIS has been done by CERT-In empanelled auditor AAA Technologies Pvt. Ltd and also audited by NIC cyber security team, NIC Audit certificate is issued and then Site is hosted over cloud.

Disaster Recovery and Service Continuity

- The HPAPPP is standard and robust web application, running across the state and hosted on NIC web-server at HP State cloud, with DR site assigned at NIC Pune DR in Maharashtra (Far DR). Therefore, in any case, if application fails, the DR site at Pune (where data is replicated daily in night-time) will be able to provide continuous service (with minimum data loss in worst case).
- Three tier security like logins, roles and database level.
- There are proper audit trails to monitor the SW access.
- Disaster Recovery scheme is implemented at NIC DR sites having virtual servers to handle extreme traffic loads.
- The software application is web-based and security audited to handle a number of transactions simultaneously without hampering the performance in any way using load balancer.
- No additional costs are incurred on Hardware. Application is hosted on NIC HP State cloud.

RESULTS INDICATOR

Name of e-Services	**Brief service description with benefits**	**Volume (Nos) of Services year wise**		
		2020-2021	2021-2022	2022-23 (Upto date of nomination)

Farmer's Registration	Farmer can register online through Mobile and OTP to Link land details from digitized Land Records data, to View status of verification of Online Registration, to generate token by selecting a date on which to take Paddy to market for procurement, to view status of sale (Bill of Sale)		10515	2822
Token Availability and Token Generation	Farmer can view date wise token availability in a particular mandi. Farmer will select the mandi center, date and enter the estimated quantity of the crop. Farmer can view and generate the token as per the feasibility and availability. Token rescheduling also possible		5889	1700
Paddy Procurement	Accept/ Reject paddy by making entry in the software for every procurement (generate Procurement ID), quality check, agriculture produce quality/grade, rate, quantity procured, total MSP etc details are being captured.		27628 MT	2931 MT
Bill of Sale	Bill of sales are generated having complete details of seller, buyer, quantity procured, total MSP given to farmer etc.		5842	1041
Online Payment	Procurement ID wise data is transferred to CFPP on generation of Procurement ID, Transfer Bill of Sale data in Excel/ PDF file to Department's internal system for making payment to farmers, payment details entered into the system either through Excel sheet or farmer wise, Transfer payment details data to CFPP through API		Rs. 54.15 Crore	Rs. 5.91 Crore

Implementation

a. Implementation Coverage achieved in comparison to the plan / target

The Model is self-sustainable as the Project execution has been carried out by NIC State Centre with minimum investment, 24x7 technical supports, thereby incurring no extra cost to the stakeholder organizations. Most of the stakeholders were already having enough hardware, Internet connectivity, trained technical resources. The only requirement was a Web-enabled Interface which would use web-services to exchange information as per Acts/Rules/Requirements. Every farmer in Himachal Pradesh has benefitted from the MIS. Farmers registration is made easy by integrated it with land records application, token availability and token generation is easy process helps farmers to transport produces to mandi. Till date approximately 13000 farmers registered, 7000 tokens are being generated, 30000

MT produce procured and approximately Rs. 60 crore transferred online to farmers.

b. Indicate improvements/ enhancements specifically rolled out during the last one year and those which are planned to be rolled out during next one year.

One Time Registration Farmers registration is OTP based and linked with land records for total cultivated land.

Token Management Farmer can view date wise token availability in a particular mandi. Farmer will select the mandi center, date and enter the estimated quantity of the crop. Farmer can view and generate the token as per the feasibility and availability. Token rescheduling also possible.

Mandi Management Generation of Bill of Sale by Procurement agency after quality check and its intimation to Farmer. Online payment of produce in Farmer's Bank account.

Data exchange using Rest APIs Integration with Central Food Procurement Portal/CFPP to send all figures using APIs of CFPP

ENABLER

Processes Re-engineered

In Himachal, the paddy is procured by the State government agencies for which FCI and various State agencies in consultation with the State Government establish a large number of Purchase Centers at various mandis and key points. The stocks brought to the Purchase Centers are purchased at the fixed support price. If the farmers get prices better than the support price from other buyers such as traders/ millers etc., they are free to sell their produce to them. The FCI and the State Government/ its agencies ensure that the farmers are not compelled to sell their produce below support price. The activity is carried out on time to time and it's a very tedious and time-consuming process. Without computerization government does not know about how many farmers will come to procurement centers, storage facility is limited, take more time for payments.

So, Government has decided to automate all the transactions with respect to paddy procurement at the Market Yard level so at to reduce the workload of agencies and keep track of the progress of procurement. All transactions of the procurement operation at a Mandi/Paddy Procurement Centre starting from arrival of a farmer with paddy to delivery of paddy to millers and payment of paddy cost to farmers through online account transfer was proposed to be digitized and done through computer.

NIC Himachal was assigned the task to conduct the system study and design an application for the above proposal. NIC Himachal did the same and developed the application. also provided necessary technical assistance for implementing Agriculture produce Procurement Automation System.

Common Platform: HPAPP provides common platform for all the State agencies procuring paddy, namely food and civil supplies, agriculture, revenue, HP State agriculture marketing board & Food Corporation of India. All can use the same application software to procure paddy from farmers.

Efficiency and Ease of Operation: The use of the HPAPPP application has made maintaining the books of accounts of farmers as well as that of the Mandis convenient, simple, accurate and up to date in real time. The records are readily available for verification by authorities at any point of time. Quick updating of records has helped agencies to ensure timely payment to farmers. Less time and effort are spent by farmers at PPCs/ Mandis in comparison to the earlier system as paper work has considerably reduced using token management and availability. Error Free **Transaction:** Chances

of errors in recording transactions have been eliminated due to use of verified data of Farmer Registration module, token management module and limited data entry regarding quality & quantity of paddy and vehicle details of the Miller at the Mandi/PPC on date of procurement. The modules available in the software reinforces verification and ensures correctness of data on real-time basis.

Effective Monitoring and Decision making: Paddy procurement transactions are recorded on real time basis. The MIS reports are automatically updated and made available to the users and the inspecting officers at different levels on real time basis to make the monitoring effective. application ensures better coordination among all stakeholders and helps in better decision making for improvement of procurement process.

Increased Farmers' Participation: Participation of farmers has been increased and their satisfaction is ensured due to transparency regarding farmer registration, verification status, advance token system, on-thespot Bill of Sale and quicker disbursement of payment. The delay in payment has been reduced to a greater extent after introduction of HPAPPP. As the application focuses on farmer's convenience, it is expected to improve his experience over time.

All mandi details, token availabilities, user manuals, dashboards are available online helping every stakeholder.

Technologies

Hosting at State Cloud: Application is hosted at HP State Cloud Center. The benefits of cloud computing services include the ability to scale elastically. In cloud speak, that means delivering the right amount of IT resources—for example, more or less computing power, storage, bandwidth—right when they're needed, and from the right geographic location.

Coping with transaction volume growth: Elastic Load Balancing on the load balancer automatically distributes your incoming traffic across multiple targets, such as EC2 instances, containers, and IP addresses, in one or more Availability Zones.

Dashboards: Online dashboards available for every stack holder indicating different KPIs achieved. farmers registered, produce procured, payments released during every seasons mandi wise is available online in public domain.

Framers Helpline: for farmers help various manuals are available online in hindi and English. A toll free no 1967 also launched for farmers help and guidance.

Rest APIs: Rest APIs has been developed for data exchange between HPAPPP, Land Records and CFPP portals.

SMS and Email facility also integrated at portal.

People

Food and civil supplies department organizes time to time separate training programs (online as well as offline mode) to train and guide officials and awareness programs for farmers. All mandi transactions are uploaded instantly and made available to people in real time. If a farmer in remote district registers and sells his produce to the nearest mandi, the procurement figure gets automatically updated. Once the farmer deposits his paddy in the mandi and its quality has been checked, his payment is on its way. The system has reduced the anxiety of the farmer as he can now check the entire process of payment online.

The model is self-sustainable too because of the following reasons:

- Project execution has been carried out by NIC State Centre with minimum

investment, 24x7 technical supports, thereby incurring no extra cost to any of the stakeholder organization.

- All the software applications are hosted on robust NIC web-server with scalable databases. Disaster Recovery scheme is implemented at NIC DR sites having virtual servers to handle extreme traffic loads.
- Access to online applications is through NICNET/ Himachal State Wide Area Network which has high up-time even in difficult terrain of the State.

VALUE INDICATORS

Learning's for sharing

Phased manner development approach & its implementation have helped in success of project. Stakeholders have easily adopted the new applications. Duplication of efforts has been reduced to minimum after integration of application/modules. Data once captured at source and validated is shared by all. Efficiency of employees has been improved through automated & simplified processes. Information is readily available at the secretariat and head office level for analyzing, planning the human resources. It helps in quick and effective decision making at the Government level.

Digital Empowerment

Language, demographic and Cultural differences may result in certain types of stakeholders not getting fully benefitted from e-Governance initiatives. This project aims to bridge that gap, by providing quality training on online processes, so that everybody can learn about e-governance and get benefitted from initiatives. Farmers /Citizens empowered to register online to create profile, enter bank account detail to receive payment, attached their Land detail without approaching to revenue authority. Update cultivated area and approximate yield of their produce and carry their produce at any nearby procurement centers as per date /slot booked by farmer. Once the farmer deposits his produce in the mandi and its quality has been checked, his payment is on its way. The citizens/farmers in rural areas can make use of Common Service Centers so that they are not excluded from the system, rather they are assisted.

Green e-Governance

This project also qualifies for Green e-Governance initiative as it does away with conventional (paper consuming) method. Here everything is online. Even the reconciliation of payments to each stakeholder is available online. Data once captured is available to all stakeholders, without seeking information from field offices. Standard format is used. Information is readily available at the secretariat and head office level for analyzing, planning the human resources. It helps in quick and effective decision making at the Government level.

Shri K. C. Chaman, *Director, FCS & CA, Directorate of Food, Civil Supplies & Consumer Affairs Govt. of Himachal Pradesh, dfs-hp@nic.in*

Shri Ajay Singh Chahal, Deputy Director General and State Informatics Officer, *National Informatics Centre Himachal Pradesh State Centre, MeitY, ajay.chahal@nic.in*

Shri Vijay Kumar Gupta, *Scientist-F/ Sr Technical Director, National Informatics Centre Himachal Pradesh State Centre, MeitY, vijay.gupta@nic.in*

Finalist

Panchayat Darpan Portal & Mobile App: Digital Panchayat Platform of Madhya Pradesh

Panchayat & Rural Development Department, Govt. of Madhya Pradesh & National Informatics Centre Madhya Pradesh State Centre

Amar Pal Singh, Vinod Yadav and Ajay Kulkarni

PROJECT OVERVIEW

Panchayati Raj Institutions (PRIs) have often been criticized for poor administration, representation, failure to implement the participatory decisions**, lack of transparency in functions / operations & mismanagement of funds.**

The credibility and capability of PRIs is frequently questioned because of offline and manual operations, lack of transparency and absence of a single source of authentic information regarding receipts, revenue, expenditure, works and non-effective implementation of schemes and programs. Due to lack of credibility, the government and departments often hesitate in devolving their powers to the PRIs and even transferring their funds for various works / activities. This is primarily due to the limited skills and acumen of the elected representatives and non-availability of a reliable and authentic technology-based solution for operations.

The limited liability of Gram Panchayats is further crippled by the lack of adequate mechanisms, both robust and lucid, to monitor and track the expenditures, progress of works, receipts of funds from different sources, generation of revenue, utilization of funds for various development works & activities and implementation of welfare schemes. This has led the Department of Panchayat & Rural Development (DoP&R), GoMP to realize the dream of Digital Panchayats and to facilitate the operations of PRIs to run in a rule-based and transparent manner.

Objectives of the initiative:

DoP&R in partnership with NIC has envisaged, designed, developed & implemented an e-Governance and mGovernance Platform named "Panchayat Darpan Portal & Mobile App" to facilitate transformation of various processes involved in the functioning of PRIs and realize the dream of Digital Panchayats.

The objective was to design, develop and implement a technology-based yet simple to use platform for eGovernance, M-Governance, e-Payment, Digital & Financial Inclusion with the aim of establishing the credibility and capabilities of PRIs.

Major objectives of the initiative are as under:

1. Enforcing rule-based operations in PRIs.
2. Enforcing 100% transparency in all operations, payments, works and benefits.
3. Enforce accountability in all operations
4. Discontinue the practice of operating multiple bank accounts and parking of funds. Enforce the rule that each PRI will operate ONLY one bank account. This is aimed at better and optimal utilization of financial resources available with PRIs.
5. Publish the Panchayat bank Statement / bank passbook in public domain so as to enable the residents to view the financial transactions, payments, receipts related to their grams panchayats.
6. Publish the balance amount available in the bank account of PRI for public

dissemination.

7. Ban the use of cash /cheque payment and enforce e-Payments
8. Enforce an online system for centralized database of all payment receivers by undertaking online registration of detailed profile and bank account details of all vendors, suppliers, staff, PRI functionaries, elected representatives and all other entitles who receive payments for any purpose from panchayats. Generation of a unique vendor ID for each payment receiver.
9. Online registration Detailed Project Report / Development Plan of all GPs. The Plan contains a bank of development works that are to be taken up in the GP as per the availability of funds.
10. Registration of detailed profile AS, TS of all works
11. Generation of e-Payment Orders for all types of payments being made by the panchayats and their automated payments by the bank using the NACH system of NPCI
12. Eliminate the need to the payment receiver to visits the Panchayat office for collection of payments
13. Eliminate the need of GP Sarpanch / Secretary to visit the Bank branch for payments.
14. Disseminate the detailed information of each and every bill being paid by any Gram Panchayat in public domain
15. Disseminate the details of payments made against any works, list of bills and amount paid.
16. Implement rule-based mechanisms for identification of PRIs performance and incentivize them..
17. Implement a system for concurrent audit, Social Audit, Public Scrutiny
18. Transform the Panchayats into Digital and Smart Panchayats

Stakeholders of the project

- 5.26 Cr Rural residents residing in 51,380 villages of State (2011 Census Figures) 2.
- 22,812 Gram Panchayats, their elected representatives, Panchayat Secretary and other functionaries 3.
- 313 Janpad (Block) Panchayats, their elected representatives & Government functionaries
- National Payment Corporation of India .
- 11,000 bank branches
- Corporate offices and IT teams of Banks: State Bank of India, Central Bank of India, BoB, PNB, BoI, BoM, UBI, Indian Bank 7.
- 52 Zilla (District) Panchayats, their elected representatives & Government functionaries
- 52 District Collectors
- 10 Divisional Commissioners
- Department of Panchayati Raj
- Office of Development Commissioner, Madhya Pradesh
- Department of Panchayat and Rural Development, Madhya Pradesh
- Ministry of Panchayat and Rural Development, Government of India

- Program offices under Panchayat & Rural Development Department i.e. MG-National Rural Employment Guarantee Council, Rural Engineering Services, National Rural Livelihood Mission, Rural Road Development Authority, Watershed Mission, PM Grameen Awas Mission MDM Council etc.

Coverage – Geographical and Demographic

Geographic: - The Initiative was implemented in all 22,812 Gram Panchayats, 313 Janpad (Block) Panchayats and 52 district panchayats of the State.

Demographic: - The initiative has benefitted all sections of rural society which include 5.26 Cr. residents residing in 51,380 villages of 22,812 Gram panchayats. The target population that has been benefitted directly / indirectly by the initiative comprise of women, SC, ST, Minority, Forest dwellers, Below Poverty Line families, Social Security Pensioners, Person with Disabilities over 1.5 lakh elected public representatives and functionaries of PRIs.

Intended benefits

- The Initiative was implemented all over the state in 52 Districts, 313 blocks, 22,812 Gram Panchayats and more than 10 line departments at state level.
- Initiative benefited more than 23,200 offices under the umbrella of department of Panchayati raj, as it provided the services for automation of their manual works and practices.
- Vendors are now sure of timely and hassle-free payments in a transparent manner.
- Earlier there were no system which would ensure timely, transparent, accountable and hassle free delivery of services and automation of PRIs. Now this Portal ensures real-time availability of information. The system also ensures that each and every activity is recorded and used for accounting and other purposes.
- Database driven, auto generation of the reports, proactive and real-time intimation using SMS, online tracking of the financial transaction and automated Updation of payment status without any manual intervention.
- Before the initiative, it was a very difficult task to track status of ongoing activities at a Gram Panchayat, know the status of ongoing works and estimate the availability & requirement of funds for the Gram panchayats and to commence the audit process.
- In the later stage of the initiative, a well work flow based online system of tax assessment and collection for Gram Panchayats (GP) has also been designed and developed, which identifies, asses and help in Billing, collection & record keeping of the various taxes which are being levied by the GPs.
- The online TAX Assessment & Collection Management System for Panchayats has been proved very useful for the GPs to become self sustainable by its own source of revenue. The System has the following Modules and facilities: Water Tax Management, Sanitation Tax Management, Property Tax Management and Other Taxes Management. The system has been used to levy more than Rs. 20.73 Cr as Water Tax, Rs. 10.05 Cr as Sanitation Tax and Rs. 2,268 Cr as Property tax during a short span of time. Rs. 10.5 Cr. has been collected by the GPs.

Current Status Panchayat Darpan Initiative as a suite of Web Portal and Mobile App has played a key role in the digital transformation of PRIs of the state and all

its processes. Improvement/ improvisation need not wait for or be dependent upon receiving a complaint/ grievance. It could be carried out through regular feedback as well. Inputs on necessary improvements to the system can also be sought from representatives and citizens.

Panchayat Darpan is designed keeping the motto "A Move Towards Commitment" with Public funds propriety, accountability, performance and transparency on public domain through way of simple process of accounting.

Initiative has helped in achieving better financial control, monitoring and over all governance by putting the financial transaction data of all PRIs in public domain and has been running successfully since last few year.

Hardware/Software

The project uses mix of Web and Mobile technologies. Portal has been developed using Service Oriented Architecture so as to facilitate easy replication and scale-up.

SQLite, ANDROID, ASP.Net, JQUERY, Bootstrap, Public Key Infrastructure (PKI) DSC Token, MS-SQL have been used; the concerns like Inter-operability, Security etc. were appropriately handled. SFTP protocol used for securely communicating with the bank server for processing e-payments. The Project also exploits the GPS, Camera, QR code Reader, Wi-Fi features of the smart phone. The concerns like Interoperability, Security etc. were appropriately handled.

Certification (Certifying Agency)

Security Audit has been carried out by the CERT-In empanelled audit agency Madhya Pradesh Agency for Promotion of Information Technology (MAPIT) with reference number MAPIT-SA-201800138.

The platform was developed and operational in secured manner and complying with various security protocols & guidelines

Disaster Recovery and Service Continuity

The portal has been hosted on Secured Servers of Madhya Pradesh State Data Centre (MPSDC).

State Data Centre (SDC) was envisioned as the shared, reliable and secure infrastructure services center for hosting and managing the e-Governance Applications of State and its constituent Department/ Organization.

SDC's State-of-the-Art hosting environment along with the breadth of functionality and depth of expertise, provide secure, reliable and efficient delivery of G2G, G2C and G2B services. The Data Center is designed to provide Tier III equivalent services.

State Data Center team takes care of mirroring and DR site as per the policy of the State Government.

RESULTS INDICATOR

Name of e-Services	**Brief service description with benefits**	**Volume (Nos) of Services year wise**		
		2020-2021	2021-2022	2022-23 (Upto date of nomination)
e-Payment of Expenditures of Gram Panchayats	Service facilitates registration, management and epayments of expenditures of Gram Panchayats against any work,	Bills: 6,45,981 Payment : 1433.8 Cr	Bills: 6,00,648 Payment : 1120.78 Cr	Bills: 2,41,167 Payment: 422.25 Cr

	office expenditures, materials purchased or any other activities.			
e-Payment of Expenditures of District & Block Panchayats	Service facilitates registration, management and epayments of expenditures of District & Block Panchayats.	Bills: 1,65,205 Payment : 1852.26 Cr	Bills: 1,29,511 Payment : 1260.97 Cr	Bills: 46,901 Payment : 270.84 Cr
Assessment & Collection of Taxes levied by the Gram Panchayats	The System helps in identification, assessment, billing, collection & record keeping of the various taxes which are being levied by the Gram Panchayats.	Bills Registered: 4,63,343 Tax levied: 31.97 Cr. Tax Collected: 1.12 Cr	Bills Registered : 43,73,341 Tax levied: 100.57 Cr. Tax Collected: 6.23 Cr	Bills Registered: 23,84,475 Tax levied: 64.72 Cr. Tax Collected: 98.77 Cr (* Includes previous year dues) Bills Registered: 23,84,475 Tax levied: 64.72 Cr. Tax Collected: 98.77 Cr (* Includes previous year dues)
Property Tax Assessment & Collection System	Service is used by the Gram Panchayats for registration of properties and assessment & collection of Property Tax.	Properties Registered: 1,997 Tax levied : Rs. 81,421 Tax Collected : Rs. 45,208	Properties Registered: 7,93,594 Tax levied : Rs. 2277.92 Cr Tax Collected : Rs. 8.08 C	Properties Registered: 2,38,770 Tax levied : Rs. 12.64 Cr Tax Collected : Rs. 4.86 Cr
Online Building Construction Permission and New TAP water Connection System	The system automates the process of granting permission for the building construction in the rural areas & facilitates online application registration for new TAP water connection		Applications Received : 1893	Applications Received : 895
e-Payment of Salary & other allowances		Bills : 3,48,783 Amount: 377.79 Cr	Bills : 2,57,366 Amount: 259.18 Cr	Bills : 945 Amount: 2.05 Cr

e-Payment of Administrative Expenditures	Service facilitates management and epayment of bills of administrative expenditures by the district and block panchayats		Bills: 36,713 Payment : 46.11 Cr	Bills: 4,427 Payment : 6.15 Cr
Online Integrated Works Management	Work Management System offers a provision to register detailed profile of all development/ construction works such as the location of the work, funding scheme and timelines involved, Administrative and Technical Sanctions and geo-tagging etc	Works: 72,885Geo-Tagged Photos: 12,431 Bills Registered against works: 3,15,080 Amount Spent: 1107.83 Cr	Works : 47,919 Geo-Tagged Photos: 37,022 Bills Registered against works: 2,08,609 Amount Spent: 765.15 Cr	Works : 26,157 Geo-Tagged Photos: : 35,318 Bills Registered against works: 88,561 Amount Spent: 269.71 Cr 4

Implementation

a. Implementation Coverage achieved in comparison to the plan / target

The geographic and demographic coverage of Panchayat Darpan posed a unique challenge as it was to be implemented in 22,812 Gram Panchayats of the Madhya Pradesh. A number of issues have been encountered during the study of the existing manual system. Some of them were:

- Improper, Untimely & Incomplete Recording of transactions.
- Lack of transparency and mechanisms for social audit.
- Huge amount lying unutilized in bank accounts being maintained by the GPs.

This often resulted in under utilization of the financial resources available with the PRI, Unfair view of accounts, In-built slippage audit objections, Imbalances in whole process and Impact on Performance.

The project started with a State Kick-off chaired by the Additional Chief Secretary, Department of Panchayati Raj and attended by senior officials from various stakeholders of line departments. The Initiative was implemented in all 22,812 Gram Panchayats, 313 Janpad Panchayats and 52 district panchayats of the State.

Use of technology-based solution that allows the automation of processes, enforcement of rules, auto-compilation, brings in transparency in service delivery has resulted in significant cost and time savings for all stakeholders including the department.

Initiative has made the whole process Paperless, resulted in significant reduction in expenditure incurred in stationary. Initiative helped in achieving better financial control, monitoring and over all governance by putting the financial transaction data of all PRIs in public domain. Key information captured related to schemes, expenditure of funds, grants of funds helped in organizing financial data for concurrent auditors so that more thrust on auditing then accounting. It further resulted in significant cost savings.

The initiative has transformed Panchayats into Digital & Smart Panchayats in true sense as they are now functioning in a paper-less, cash-less, cheque-less and face-less mode. The distinctive feature of the initiative is that it has benefitted all sections of

rural society which include 5.26 Cr. residents residing in 51,380 villages of 22,812 Gram Panchayats. The target population that has been benefitted directly / indirectly by the initiative comprise of women, SC, ST, Minority, Forest dwellers, Below Poverty Line families, Social Security Pensioners, Person with Disabilities over 1.5 lakh elected public representatives and functionaries of PRIs.

Delivery channels; Service Delivery channels include: Web Interfaces, Mobile App and SMS.

The penetration of smart phone has gone very high due to availability of economic bandwidth and economic smart phones. Keeping this in mind all the key information and services related to works, payments, receipts, expenditures, vendors, staff, salaries, balance available in PRI bank account, bank Statement of PRI etc is available to common man on his smart phone using the "Panchayat Darpan Mobile App". It has further enhanced the transparency in the system by dissemination of all key information in public domain and also established the credibility in operations of PRIs.

Unique in functionality;

- The initiative is unique in purpose/ goal as it aims at digital transformation of PRIs and all its activities that involve financial transactions i.e. receipts and payments. The system is used to generate e-Payment Orders for carrying out financial transactions. 2.
- The initiative is unique as compared to other common e-governance projects as it involves integration with Core banking system of 8 nationalized banks and NPCI for automated processing of system generated e-Payment Orders and their responses are plough back into the software. 3.
- Administrative process reforms :
  - A practice of payments by cheque or cash by panchayat was prohibited.
  - All bank branches were instructed that they will NOT entertain any request from panchayat for cheque / cash payment.
  - All the payments are necessarily to be undertaken through Panchayat Darpan Portal generated e-Payment Orders.
  - Payments now do not involve any manual process or interaction of payment receiver with PRI office, PRI functionary or bank branch.
  - All e-Payments orders generated by the panchayats using the portal are being pushed to the bank server for payments and the amount gets credited to the bank account of the vendors/agencies as per the system generated e-Payment Order.
  - Discontinue the practice of operating multiple bank accounts and parking of funds. Enforces the rule that each PRI will operate ONLY one bank account. This is aimed at better and optimal utilization of financial resources available with PRIs.
  - Publish the Panchayat bank Statement / bank passbook in public domain so as to enable the residents to view the financial transactions, payments, receipts related to their grams panchayats.
  - Publish the balance amount available in the bank account of PRI for public dissemination.
  - Ban the use of cash /cheque payment and enforce e-Payments
  - Enforce an online system for centralized database of all payment receivers by undertaking online registration of detailed profile and bank account

details of all vendors, suppliers, staff, PRI functionaries, elected representatives and all other entitles who receive payments for any purpose from panchayats. Generation of a unique vendor ID for each payment receiver.

Result Achieved/ Value Delivered to the stakeholders of the project

(i) Organization

- The system has resulted into significant improvement in the functioning and governance of PRIs.
- The system has enforced rule-based operations, transparency and accountability.
- The system has ensured that 100% accurate, authentic and updated information on al works, payments, bills, e-Payment Orders, Vendors, Suppliers, receipts, employees etc. is readily available in public domain for social audit and concurrent audit.
- System has encouraged more participation from various vendors and agencies as their payments are being processed through the system and the payments have been made directly into their bank accounts.
- Now there is no or less-paper and manual implementation of scheme that would have required compilation. Now compilation, record keeping, resource sharing and financial are done in automated manner.
- Use of technology-based solution that allows the automation of processes, enforcement of rules, autocompilation, brings in transparency in the governance has resulted in significant cost savings to the department.
- Initiative made the whole process Paperless resulted in significant reduction in expenditure incurred in stationary.
- Now the department can easily access each and every information on a single click. There were no RTIs after adoption to automated systems.
- Detailed profile of more than 8, 53, 220 development and community works created and registered on Portal.
- The Gram Panchayats have created 1, 00, 61, 843 bills for payments to vendors, agencies, employees and other agencies for work, salaries, services and other purposes under various schemes using the portal.
- The Gram Panchayats have created more than 24,63,294 e-Payment orders that involve payment instructions to bank for electronic transfer of the amount into the account of the vendor, staff, supplier and other payment receivers.
- e-Payment orders of more than Rs. 21, 531.77 Cr. have been generated by the Gram Panchayats for epayment to 23, 45, 248 Vendors/ suppliers/ agencies / payment receivers registered on Portal.
- 8, 90, 796 Bills of expenditures have been booked by the district and block panchayats for the epayment of Rs. 7255.06 Cr.
- Centralized bank account for processing of salaries of employees working in GPs, Janpad and Zilla Panchayats is being prepared online and disbursed directly into their bank accounts every month.
- More than 400 offices are preparing and processing bills of their administrative expenditures using the portal. The payment of these bills is being credited directly to the accounts of vendors/agencies.

- 22,812 Gram panchayats are preparing and processing bills of their works, purchases and all other payments. These bills are clubbed to generate an e-Payment order and pushed to the SFTP server of the concerned bank after applying digital signatures for payment on daily basis.
- Bank statement of all GPs are being imported from the concerned bank SFTP server and imported into the portal for public dissemination.

(ii)Citizen

- Users can easily access the complete profile of their Gram Panchayat, Janpad Panchayat & District Panchayat and contact the designated officials and public representatives.
- Development plan of the Gram Panchayat, status of ongoing works, payment against the works and purchased materials, funds available in the Panchayat and details of events organized at the various levels can be easily accessed on a single click.
- Various circulars, orders and documents published by the departments, technical and administrative sanctions of the works, photos and press releases of the events organized and other relevant documents are available as a repository and can be easily accessed at any time.

(iii) Other stakeholders

- Vendors/Agencies/ Suppliers/ Firms are now sure of timely and hassle-free payments in a transparent manner.
- System encouraged the Vendors for more participation in procurement process, as it eliminates possibility of delay in payments. They are not dependent on local offices for certification to claim their payments
- Employees are getting their salaries and allowances in their bank accounts at the end of every month.

b. Indicate improvements/ enhancements specifically rolled out during the last one year and those which are planned to be rolled out during next one year. To make the village panchayats self-sustainable in own finances, the recovery of taxes is very important. Property tax is an important source of revenue for the local governments across the world. While it has high potential, it is difficult to ensure corresponding realization.

Panchayat Darpan Portal has been enhanced with the introduction of a new system for property tax assessment and collection during the last year. The Online Property TAX Assessment & Collection Management System for Panchayats has been proved very useful for the GPs in accessing and collecting the property tax thereby becoming self sustainable by its own source of revenue.

More than 10 Lakh Properties have been registered on the Panchayat Darpan Portal in a very short span of time and Rs. 13.08 Cr. property tax has been collected.

A few other Online Services for the rural residents have also been delivered through the Panchayat Darpan Portal; these are:

- Application for Building Construction Permission: The system automates the process of granting permission for the building construction in the rural areas.
- Application for new TAP connection: The system facilitates the rural residents with an online service to apply for the new TAP water connection. The application is automatically routed to the concerned gram panchayat for further processing.

Gram Panchayats used to maintain a number of electricity connection for different purposes like TAP water Scheme, Street light, Panchayat Bhawan, office etc. Timely payment of bills of these connections has always been a challenging task due to absence of a proper mechanism and payment system. The department has now taken-up the task of integration with the electricity companies for fetching the electricity bills and facilitating e-payment of these bills. It is also planned to facilitate UPI/ QR code based payment of taxes by the residents. This will enable consumers to scan and pay instantly.

ENABLER

Processes Re-engineered

Process re-engineering: a. Strict Ban on payments by cheque, cash. b. Closure of multiple bank accounts that were being maintained by the GPs and operations using ONLY bank account for each GP, JP, ZP. c. One-time Registration of all vendors, suppliers, staff, agencies and other payment receivers. d. One-time Registration of all works. e. Online registration of all bills, online generation of e-Payment Orders f. Online submission of the e-Payment order to bank SFTP server for processing of the e-Payment Order suing NACH platform of NPCI. g. Submission of the response file by the bank against each e-Payment Order h. Automated consumption of the response file by the Panchayat Darpan Portal i. Bank to push the bank statement of panchayats on to the SFTP server j. Automated consumption of the bank statements and import into portal. k. Publication of all transactions, e-Payment and real-time bank statement on the portal and mobile App. l. To strengthen the system, works approval, budget sanction and technical approval and field visits has to be recorded on the system.

Technologies

Ready availability of upbeat technologies such as online banking, digital payments, NACH platform of NPCI, Mobile Apps, JAM trinity, Digitally Signed e-Payment Orders, GPS-enabled smart-phones, internet connectivity, laptops, tablets, Cloud, etc. has now made it possible for PRIs to leverage the technologies to transform their processes and conduct operations online in a fair, transparent and rule-based manner and achieve the much-needed credibility and respect in their operations.

As per the guidelines and recommendations of Digital India program of GoI, Department of Panchayat & Rural Development, GoMP in partnership with NIC has leveraged these upbeat technologies to facilitate transformation of various processes involved in the functioning of PRIs and realize the dream of Digital Panchayats.

People

E-Governance initiatives are required to re-design and re-structure departments and programs to change the way they plan and manage their affairs for better delivery of services and stronger interactions between the various stakeholders.

A series of orientation and capacity building programs were organized for Sarpanch, Panchayat Secretary and other functionaries. It helped them to welcome the change and adopt the technology-based solution which enforce accountability in all their operations/expenditure and allows only rule-based operations, eliminate the possibility of exercising discretion in decision making & payments and brings in highest possible level of transparency in operations & financial transactions.

Meeting with concerned stakeholders, conducting training at Divisional and District levels, Message disseminated at larger level through Circulars, Notice Boards and Newspaper Advertisements, formation of Social Media Groups etc. were carried out

as part of Information and educational campaign to spread awareness about the initiative.

VALUE INDICATORS

Learning's for sharing

A lot of financial irregularities used to be reported during the financial audit of the panchayats due to the limited skills and acumen of the elected representatives and non-availability of a reliable and authentic technologybased solution for operations. This was further constrained by the mindset of the elected representatives and PRI functionaries to adopt a rule-based & transparent system and make all financial transactions and bank statement available in public domain.

It was also a challenging task to integrate the system with a wide pool of nationalized banks so as to prevent monopoly and wide range of choice for selection of bank by the panchayats.

A few other challenges were:

- To Make the PRI functionaries agree to discontinue the practice of cash/ cheque payments and adopt ePayment system.
- To ensure that all vendors, shop-keepers to open bank accounts for receiving the payments in electronic mode.
- Making the Panchayats agree to close all accounts that were being operated by them for different schemes and maintains only one account for the panchayat.
- Make the PRI functionaries having their bank accounts in cooperative / rural banks to switch their accounts to nationalized banks having Core Banking Solutions.
- Integration of Panchayat Darpan Portal with Core Banking System of banks for processing e-payments through National Automated Clearing House (NACH) platform of National Payment Corporation of India (NPCI) in a secure and trusted manner.
- Making the corporate offices of banks to agree to participate in the project that required customization of their Core Banking Solution (CBS) and host-to-host integration of their CBS with NACH platform of NPCI.
- Making the banks to agree to common e-Payment order format.
- End-to-End & secure Integration of the Panchayat Darpan Portal with the Core Banking System of 8 different Nationalized banks for automated e-Payments. Integration of the Panchayat Darpan Portal with CBS required changes in the CBS and active participation of the IT teams of the banks located in their headquarters and data centers.

Rule-based and transparent implementation of the project, integration with banks and NPCI was a challenging task as it involved activities and works that are different in nature, process which has multiple stages of execution and number of stakeholders.

Following process changes were carried out to accomplish the goal of digital transformation of panchayats and all its processes:

- All Panchayats were asked to close all accounts and shift the funds available in different bank accounts in a single bank account. More than 76,000 bank accounts were closed.

- All the panchayats that were having accounts in non-core banking branches were told to migrate their account in the branch having core banking facility.
- A practice of payments by cheque or cash by panchayat was prohibited. All bank branches were instructed that they will NOT entertain any request from panchayat for cheque / cash payment. All the payments are necessarily to be undertaken through Panchayat Darpan Portal generated e-Payment Orders.
- All e-Payments orders generated by the panchayats using the portal will be pushed to the bank server for payments and the amount will be credited to the bank account of the vendors/agencies as per the system generated e-Payment Order.

The adoption of a simple yet technology-intensive solution resulted in a number of innovative achievements, some of them are as follows:

1. Payments now do not involve any manual process or interaction of payment receiver with PRI office, functionary or bank branch. .
2. All e-Payments orders generated by the PRIs using the portal will be pushed to the bank server for payments and the amount will be credited to the bank account of the vendors/agencies as per the system generated e-Payment Order.
3. Discontinued the practice of operating multiple bank accounts and parking of funds. Enforcement of the rule that each PRI will operate ONLY one bank account. This was aimed at better and optimal utilization of financial resources available with PRIs.
4. As the system generated e-Payment Order are being pushed electronically to the banks for e-Payment by the using the integration with the Core banking system of 8 different banks in a automated manner without involving any human intervention, 100% complete and authentic information about the payments, bills, expenditure, receipts etc. is ensured.
5. Each and every work, its commencement detail and phase-wise progress along with the bills prepared and payment done against the work has been captured at the time of preparation of e-Payment Order and disseminated in public domain for social & concurrent audit. All such information has been enriched with QR code, scanned copy of the physical documents and basic details of the vendor/agency.
6. Published the panchayat bank Statement / bank passbook in public domain so as to enable the residents to view the financial transactions, payments, receipts related to their grams panchayats.
7. Published the balance amount available in the bank account of PRI for public dissemination.
8. Enforced an online system for centralized database of all payment receivers by undertaking online registration of detailed profile and bank account details of all vendors, suppliers, staff, PRI functionaries, elected representatives and all other entitles who receive payments for any purpose from panchayats.

Digital Empowerment

As the system facilitates dissemination of all key information related to receipts of funds/revenue, financial transactions/ payments, works, bank statements of panchayat bank account, vendors and payment receivers etc. in public domain and hence it was expected to be seen by panchayat representatives as an exercise that restricts the autonomy of the panchayats.

A series of orientation and capacity building programs were organized for Sarpanch and Panchayat Secretary to enforce accountability in all their operations/expenditure and allows only rule-based operations, eliminate the possibility of exercising discretion in decision making & payments and brings in highest possible level of transparency in operations & financial transactions.

Change management was an important aspect of the initiative to overcome the possible resistance and to change the mindset of other functionaries. It helped them to welcome the change and adopt the technologybased solution.

Green e-Governance

The initiative has been design and developed in-house by NIC. In-house design and development allows the flexibility of easy scale-up, making the last minute changes and enhancements in the software. Also, it does NOT involve any financial implication, purchase of costly hardware, software and any other additional infrastructure. It has been hosted on existing infrastructure available at the State Data Center.

Initiative also leverages the ubiquitous presence of Smart Phones by encouraging users to carry out their activities with BYOD.

Every possible effort has been made to leverage the use of environmentally friendly practices and resources for the day-to-day operations on the web portal and mobile app thereby reducing the procurement/ promotion of any potential e-Waste.

Green e-Governance not only needs to be implemented, it also needs to be managed and governed as it is a part of overall IT governance. A systematic, rule based system with proper methodology, effective & analytical reporting system automatically creates a green e-governance friendly environment by encouraging paperless practices.

Shri Amar Pal Singh, *Director, Panchayat & Rural Development Department, Govt. of Madhya Pradesh, dirpanchayat@mp.gov.in*

Shri Vinod Yadav, *Dy. Director, Panchayat & Rural Development Department, Govt. of Madhya Pradesh, vinod.yadav70@mp.gov.in*

Shri Ajay Kulkarni, *Scientist-F, National Informatics Centre Madhya Pradesh State Centre, kulkarni.ajay@nic.in*

eAbkari - Punjab

Excise Department, Govt. of Punjab & National Informatics Centre Punjab State Centre

Varun Roojam, Sarabjeet Singh Duggal and Devendra Kumar Singh

PROJECT OVERVIEW

The reengineering initiative involved the implementation of Information Technology solutions for departmental processes. This was done through the "eAbkari" project developed and implemented with the technical assistance of National Informatics Centre, and it has been the single-most transformational factor in the way the Excise department functions.

eAbkari was developed as an I.T.-enabled platform that would make it easier for liquor retailers, wholesalers and manufacturers to transact business with the department, while, at the same time, provide the departmental authorities an effective and efficient mechanism to regulate the manufacture and sale of liquor in the state. It has been designed as a system which, while ensuring timely and transparent delivery of the department's services to its stakeholders, would also check the evasion of state excise taxes and ensure that all liquor available in the state is sourced and sold through legal channels.

Specifically, e-Abkari was designed with the objectives to render the following e-Services:-

G2B Services

- Grant and renewal of State Excise licenses
- Issuance of Permits/Passes for Import/Transport/Export of Bulk Spirit & Packaged Liquor
- Registration of labels for Packaged Liquor
- Enabling hassle free collection mechanism for State Excise duties and fees through ePayment Gateway
- Automated inventory management at business premises

G2C Services

- Web based universal access to services offered by the department
- Enhancement of enforcement activities through use of GI tools, use of anti-evasion tools like GPS based tracking of spirit movement and real time monitoring of preventive operations of the department
- Hassle free and easy availability of laboratory spirits for educational institutions
- Availability of information related to administrative process flows for services rendered
- Pendency checker and service request status information through the web and SMS services

G2G Services

- 360-degree profile of licensees of the department, brands registered in the State, and various permits and passes requisitioned and executed
- Use of Business Intelligence tools in data aggregation for administrative intervention and policy formulation Plugging of revenue loopholes
- Streamlining and systematizing Inter-departmental and Intra-Departmental information resulting in increased efficiency in Administration, cutting down response times and delivering better services

- Dynamic dashboards for officers for monitoring of pendency and traceability of decisions across the hierarchical set up for fixing up responsibility and accountability
- Reconciliation of every drop of spirit imported or manufactured.
  G2E Services
- Digital archiving of documents and information and easy and error free record maintenance and data retrieval.
- Easy access to rules regarding their domain of work through State Excise Portal & Knowledge Intranet

Hardware/Software

- ASP.Net Framework
- Microsoft SQL Server
- SMS Gateway – PUSH and PULL
- Sandes – Government Messages Information System Gateway Integration System
- Email Integration

Certification (Certifying Agency)

Yes, SecurEyes Techno Services Pvt. Ltd. # 3S, 3rd Floor, 51/27, Swamy Towers Chinapanahalli, Outer Ring Road, Bangalore- 560037
The company is NIC and CERT-In empaneled

Disaster Recovery and Service Continuity

Since the portal is hosted at Punjab State Data Centre so it is following the Disaster Recovery Policy which has been adopted by Punjab State Data Centre. Moreover eAbkari is having minimum downtime.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	**Brief service description with benefits**	**Volume (Nos) of Services year wise**		
		2020-2021	2021-2022	2022-23 (Upto date of nomination)
Online Import Permit Module	The entire process, right from the raising of requisition by the importer to the approval and grant of Import Permit by the competent authorities, is handled online using the web based eAkgari platform.	5,203	10,144	4,248
Online Export Pass Module	The entire process, right from the raising of requisition by the Exporter to the approval and grant of Export by the competent authorities, is handled online using the web based eAbkari platform	81,633	82,988	61,483
Online Transport Permit/Indent/Pass Module	All movement of liquor within the State is handled online using this module. Information regarding issue, despatch, unit wise stocks and liquor in transit is captured on a real-time basis. All information starting from the number of bottles to the specific attributes like liquor type, brand name, measure, batch number, batch date, strength, duty and fee involved	91,773	5,93,195	2,72,284

	with details of deduction etc. are logged into the system which are aggregated to generate intelligent reports.			
Inventory Management System	Inventory data of liquor imported into or manufactured in or transported within the state is managed online using electronic supply chain management tools. The movement of each bottle of liquor can be tracked and traced across the supply chain.	4,95,307	5,59,724	2,73,663
e-Alerts through SMS,Email, Sandes	Alerts to all the stock holders is being sent from eAbkari system at every level of processing of each and every request for granting of license, export of PFL,Spirit etc	4,38,426	29,45,558	19,00,950
Online module for Import/Transport of Spirits for Medicinal/Industrial purpose	The entire process, right from the raising of requisition by the importer/licensee to the approval and grant of Import Permit by the competent authorities, is handled online using the web based eAkgari platform.	0	2,337	2,047
Online Application for New Excise License	In keeping with the expedient eGovernance initiatives of the government, a dedicated Citizen's Corner has been developed and deployed in eAbkari, whereby ordinary citizens can access an online eService for preparing and submitting applications for new retail excise licenses. The workflow based system facilitates tracking the entire movement of the application from end to end. Also, the Renewal of License module, which has been in operation for the last three years, ensures that all applications for renewal of existing licenses are processed online is proposed.	1,915	2,501	809
Online Label Registration /Renewal module	In keeping with the expedient eGovernance initiatives of the government, a dedicated Licensee's Corner has been developed and deployed in eAbkari, whereby Licensee can access an online eService for preparing and submitting applications for Label Registration. The workflow based system facilitates tracking the entire movement of the application from end to end.	2,152	2.121	2,156
Is-Hologram Application for verification of Liquor	Mobile application developed for scanning of Hologram to check authenticity of Liquor sold in Punjab	28	12,697	0
Daily Preventive	The Daily Preventive Raid Reporting System ensures that data regarding	179	154	60

Raid Reporting System	enforcement activities of the department are logged into the system on a daily basis by all the revenue and preventive units. All data regarding number of places raided, cases detected, seizures and arrest figures are available on a real-time basis. Such data is processed, consolidated and aggregated by the system to generate unit wise, district wise and state wise intelligent M.I.S reports			

Implementation

a. Implementation Coverage achieved in comparison to the plan / target

All the administrative districts, with all Excise Circles, in the State of Punjab are covered under the project.

Though the project is primarily targeted at businesses engaged in manufacture, distribution and trade in potable liquor and industrial spirits as also the health care sector in so far as procurement and distribution of life saving narcotic medicine is concerned, the benefits accrue to the entire population of the State. Also, 100 per cent of the population can access the citizen centric services offered under the project.

Stakeholder Coverage

- **State Level**: Officials of the Excise Department located in the Excise Directorate, District level, Range/Zone level, and Circle level and also those officials posted in the Excise Licensed Premises like Distilleries, Manufactories, wholesalers, retail vends, bras, clubs etc.
- **Business Level**: Around 4000+ Excise Licensees of Distilleries, Manufactories, Wholesalers, Retail outlets including all Off & On Shops/Hotels located in the state of Punjab.
- **Individual Level**: Common Citizens applying for Excise Licenses or apply for permission to serve liquor at private places, marriages etc or in search of information pertaining to the prices of any liquor brand, or interested in providing any information or registering any complaint etc.
    - Applications are submitted online
    - The processing of application has been cut down to 1-3 days
    - The applicant can check the status of their applications online, and they also get automated SMS alerts regarding the status of their applications
    - The authenticity of most information provided by the applicants can easily be verified by excise officers. For example, the authenticity of tax-payment challans can be verified online.
    - The authenticity of documents like permits, tax-challans etc. can easily be verified by excise officers through a “pull SMS” service, or online, or, in case of Import Permits and Transport Passes, by scanning the barcodes printed on the permits and passes
    - Data is collected electronically through various mechanisms viz.
        - Data regarding the sale of liquor and payment of excise taxes is captured and aggregated through the electronic returns that liquor wholesalers and retailers have to mandatorily submit online on a monthly basis
        - Data on the collection of excise revenue is captured through an

M.I.S. linked to the government's online payment system

- Data regarding inventories of liquor are captured and aggregated through M.I.S. linked to the electronic Import Permit and Transport Pass modules
- Data regarding licenses, registered brands of liquor etc. are captured through the relevant application processing systems
- Data regarding pendency of applications for grant of new Excise licenses and status remark trails are available both to the applicants as well as the departmental officers through the relevant applicant processing systems for monitoring and administrative intervention
- Data related to processing of Miscellaneous Cases against erring licensees, including offences committed, date of hearing fixed by the competent authority, date and manner of disposal with details etc. are available through the electronic case handling and processing systems
- Data regarding excise raids, seizures and arrests are collected through a mechanism of uploading the figures by officers concerned through specific software modules
- The authenticity of liquor bottles can be verified by scanning barcodes on liquor bottles or through a "Pull SMS" service With the implementation of this project, several milestones have been achieved in different phases.

- The following functionalities of this project have been implemented successfully till date.

b. Indicate improvements/ enhancements specifically rolled out during the last one year and those which are planned to be rolled out during next one year.

a. Description of Time and cost efficiency improvements in delivering and availing of ICT enabled services

The implementation of the project resulted in significant savings to all stakeholders, in terms of effort, time and cost.

1. Businesses and citizens can now access the department's services from anywhere and at any time, by submitting their servicerequests online. They no longer have to make repeated visits to the department's offices to submit their applications and to follow up on the status of their applications.
2. The licensees of the department do not have to visit banks to pay their taxes and fees to the department, and do not have to visit the department's offices to produce their tax / fee-receipts; all payments to the department are processed online.
3. The time taken for the fulfilment of service-requests by the department has been reduced to the extent of 1-3 days in place of an average of 15-60 days. This translates to huge cost savings for the stakeholders.
4. Electronic validation processes built into the system, online flow of information and the data generated through the system has significantly reduced the time and effort required by the department's officials to process service requests.
5. One of the most significant aspects of eAbkari has been that no project specific equipment or hardware had to be procured by the service recipients. The basic

computer hardware already used at businesses could be re-purposed for accessing the services offered under the project. For all practical purposes the costs incurred by the service recipients for project access have been zero.

6. The web-based model of service-delivery has ensured that the department's external stakeholders incur minimal costs in accessing the services offered through the project. Accessing the services require only basic I.T. hardware (computers / smartphones) and internet connectivity.
7. Cost-benefits accrue to the government by way of reduced service-delivery and transaction costs and optimum utilization of resources. With many of the routine administrative tasks now handled through the software, administrative manpower which was earlier engaged in those routine tasks, can now be redeployed for manual-intensive tasks like carrying out enforcement operations. 8. As indicative example of how the reengineered processes have reduced costs is the way applications for the registration of brands of liquor was being handled earlier, and is being handled now.

In the earlier scenario, making an application for registering a brand of liquor for manufacture or sale in Punjab would require the applicant to submit a paper application with multiple documents and hard copies of the labels; payments for the application required the applicant to go to his bank. The applications would then be cycled through a minimum of 6 to 7 administrative "desks" over a period of 7 to 30 days, and the outputs would need to be sent through couriers to 20 administrative districts.

In the present proposed scenario, the similar application is made online, and the fee is paid through online banking channels. The processing of the application involves just two officials, and the output is electronically transmitted to the applicant and to all the administrative units. The entire process, from the preparation of the application to the dissemination of the output to all concerned stakeholders, is completed within 1-3 days. .

ENABLER

Processes Re-engineered

The specific areas where major ICT process changes were planned and implemented are:

- Import Permits for Spirits used for the manufacture of liquor and for bottled liquor
- Import Permits for Spirits used for industrial or medicinal purposes
- Transport Passes for movement of Bulk Spirit and Packaged Liquor within the State
- Export passes for movement of Bulk Spirit and Packaged Liquor
- Stock Inventory and Stock Transaction management at liquor businesses
- Registration of brands and labels of Foreign Liquor and Country spirit
- Grant and Renewal of Excise Licenses
- Payment of Excise Duties and Fees
- Collection and aggregation of data regarding revenue, production and sale of liquor, excise-related crimes and enforcement activities

Technologies

Implementation Status: Online Service Delivery and Electronic Collection of Data

In general, the introduction of ICT tools re-engineered the department's processes in two ways:

- The department's services are now delivered online. This has eliminated entire administrative layers involved in the processing of service requests. Earlier, service requests had to be made through paper applications, which had to travel from table to table and involved an enormous amount of paperwork. After the implementation of eAbkari, liquor manufacturers, wholesalers and retailers make most service requests – applications for Import Permits, Export Pass, License Renewals, Registration of Brands etc. – online. The eAbkari software validates the requests for compliance with existing rules and procedures. Fewer officials are involved in the processing of the requests. This has drastically reduced application processing times as well as chances of error.
- Collection of data – regarding revenue, sale, imports, export crime etc. – is now done electronically. Relevant, actionable data is now available in real-time to Excise officials across the entire hierarchy.

People

i. Leadership support for capacity building, visibility of actions with current status

The project is being implemented under the able guidance of Sh.Varoon Roojam, Commissioner, Excise, Government of Punjab and spearheaded by Sh. Sandeep Rishi. Additional Excise Commissioner, Govt. of Punjab and Sh. Nresh Dubey, Joint Commissioner, Joint Commissioner. The top administration was sensitised and trained in the initial stages of project implementation and given defined roles for co-ordination with the stakeholders. Project Monitoring Units were set up under officers of rank of Additional Excise Commissioner and Joint Commissioner of Excise who can be reached over telephone and e-mail 24 x 7. Innovating use of social media platform Youtube was made for awareness and expanding reach of the project.

ii. Change management and Capacity building strategy defined and status thereof

- Support services are made available to all stakeholders round the clock.
- Resource personnel identified at all levels – including State and District Levels – and trained under the TOT model.
- Regular training sessions at the Excise Directorate HQs and online.
- On-site support to businesses and officers posted at distillery, manufacturing units etc.
- District level orientation and training exercises with all stakeholders conducted at regular intervals.
- Hands on support facilities made available throughout by hiring software support personnel.

iii. Project management & Monitoring adopted [whether full or part-time programme management teams in place, roles and responsibilities of department officials / consultants etc.]

- A full time dedicated team comprising of Senior Software Developers, Software Developers and Software Support Personnel has been engaged by

the department which works under the guidance of a Scientist of the rank of Senior System Analyst of NIC.

- Project Monitoring Units comprising of senior department officers work round the clock and review implementation status.
- Helpdesk support and troubleshooting units have been set up.

VALUE INDICATORS

Learning's for sharing

a. The Lessons learnt from the process re-engineering exercise

- Changing user mind-sets is a necessary pre-condition before embarking on ICT based process re-engineering.
- Stakeholder consultation during the stages of development and design are essential for easy post-deployment acceptability.
- Effecting change has to be an exercise started from higher up in administration and then down the hierarchical set up.
- Appraising the stakeholders and convincing them of the benefits is more important than just enforcing ICT reengineering.
- Accessibility, time and locational independence to users is important. Taking along users not comfortable with technology by arranging suitable training is essential for universal dissemination.
- Network and Connectivity are crucial and deploying fall back mechanisms as a measure of redundancy is important.
- Piloting and making necessary course corrections from feedback and user experience before final deployment is essential.
- Robust Helpdesk support and round the clock troubleshooting should be put in place.
- Training and capacity building should be a continuous exercise.

b. The Lessons learnt from Change Management and Capacity building exercise[s]

- Motivation plays an important role in bringing about change in mind-sets and accepting change.
- Peer learning is important and goes a long way in bringing about change.
- Selecting the right team leaders is essential for driving change.
- Appraising the benefits to all stakeholders, especially the end users, is important before process re-engineering.
- Initiative and perseverance of the top management is necessary to bring about major process changes.
- Training has to be a continuous exercise with hands-on workshops.

c The Lessons learnt from Technology choices and implementation strategy adopted

- Successful deployment of information technology requires executive-level support, a structured decision-making process, and a strategy based on an understanding of vision and its enterprise architecture.
- Comprehensive preparatory work is important to evade mishaps or breakdowns in service delivery, availability and updating of accurate data, adherence to service delivery timelines, monitoring the performance and dynamic evaluation from time to time.

- Deployment of online change history management system (Change request including the person requesting, request date, scanned copy of request, implementation date etc.) is utmost necessary to maintain/track application changes. Otherwise, it will be difficult to track the changes due to high volume of frequent changes in service delivery.
- Web-services should be deployed wherever there is scope.
- Transactional data should be updated after completion of transaction (posting through batch mode with single connection) to avoid high traffic on server to reduce transaction time and transaction failure
- Views/Temporary tables should be used to avoid load on the server while accessing various MIS reports by stakeholders to avoid accessing transactional tables for report generations.
- Mere investment of crores of money towards application s/w development & ICT infrastructure building is not a pre-requisite for e-Governance initiatives. Development of s/w application In-House with technical support from Government Organizations and Re-using the existing ICT infrastructure of Government (IDC, MPLS, SWAN etc.) can make e-Governance mission successful..

Digital Empowerment

A single platform to do all the activity related to Excise Department for all the stake holders involved in Excise Eco System of State. Beginning from Granting of License, Approval of Label Registration, Collection of Duty or fees, Maintenance of Production details of Liquor/Spirit, Import of Packaged Liquor/Bulk Spirit, Export of Packaged Liquor/Bulk Spirit/ Transport of Packaged Liquor to Wholesale(Civil/CSD), Transport of Packaged liquor to Retail vend and bard Licensees/Clubs/Drought Beer bars etc., Transport of Bulk Spirits to Distilleries/Bottling Unit and Retails Vends for SDS.

At every stage of process work flow and alert related to application is being sent to end user as well as to excise officials for processing the request through SMS,Email and Sandes 24*7 round the clock portal to avail the services of Excise Department to the users.

Integrated eAbkari with IFMS portal for submitting excise fee and duty.

Integrated eAbkari with single portal for EoDB to get the services of Excise Department

Green e-Governance

Due to implementation of eAbkari , the following documents which have to be generated ,printed and provided to Licensees are now digital.

1. License Grant –
   i. Taking Online Application
   ii. Processing of Application in work flow based module
   iii. Grant of License
   iv. Digitally Signing of License Grant Document
   v. Sending signed Document to Licensee over email or through logging into the system over internet.
2. Import Permit for Packaged Liquor/Bulk Spirit –
   i. Workflow based system to processing of Import Permit Application.

Ii. Issuance of digitally signed Import Permit

iii. Issuance of EVC digitally

iv. eStock management

3. Export Pass for Packaged Liquor/Bulk Spirit - –

i. Workflow based system to processing of Export Pass Application.

Ii. Issuance of digitally signed Export Pass

iii. Issuance of EVC digitally

iv. eStock management

4. Transport of Packaged Liquor/Bulk Spirit - –

i. Workflow based system to processing of Transport Permit/ Pass Application.

ii. Issuance of digitally signed Transport Permit as well as Pass

iii.Intimation of receipt of Liquor and Bulk Spirit and Digitally signed EVC

iv. eStock management

5. Different Excise Registers made online.bengalit reduces the paper work.

6. Mobile application for Hologram checking for authenticity of Liquor

7. Creation of online e-Wallet and online payment of Excise Duties and Fees, it reduces the paper work as every licensee is having online transaction details for verification of GRN Receipts.

8. Label Registration application and process to approve the Labels. Online module is there to have all the documents online. No physical file is being submitted in Excise Department now.

- The project has been designed for achieving paper-less office.
- Electronic Information Management System has ensured easy retrieval of data at any time and hence obviated the need for taking print outs.
- The Electronic Inventory Management at business premises has reduced the need for physical visits to such premises by officers which in turn has reduced fuel consumptions and vehicle use for such exercises.
- Information sharing and communication amongst offices at all levels using BI tools built into the project has reduced the need for manual delivery of information which in turn as further rationalized vehicle use and reduced carbon footprint.

Shri Varun Roojam, IAS, *Excise Commissioner, E Excise Department, Govt. of Punjab, excomm.pb@punjab.gov.in*

Shri Sarabjeet Singh Duggal, *Scientist-F, National Informatics Centre Punjab State Centre, duggal.ss@nic.in*

Shri Devendra Kumar Singh, *Scientist C, National Informatics Centre Punjab State Centre, devendra.singh@nic.in*

DUARE TRAN (Government Relief at the Doorstep)

Planning and Statistics Department, Govt. of West Bengal & National Informatics Centre West Bengal State Centre

Manoj Pant, Choten Lama and Mainak Mukhopadhyay

PROJECT OVERVIEW

The state of West Bengal is vulnerable to many different types of natural disasters and has regularly experienced devastation caused by floods, cyclones, landslides, earthquakes etc.

A Very Severe Cyclonic Storm (VSCS) Yaas, equivalent to category-3 hurricane, which hit the state on 26th May 2021, brought significant impacts to West Bengal causing largescale devastation across many districts of the state. It came at a time when the state had been battling a deadly second wave of Covid-19 infections, and healthcare systems were already overworked. The cyclone lashed coastal areas with ferocious wind and rain damaging homes and bringing waves that swamped villages and towns.

With the objective of ensuring quick disbursement of certain specific relief to those impacted by YAAS, Government of West Bengal decided to launch "Duare Tran (Relief at Doorsteps)" in the affected areas of the districts of South 24 Parganas, North 24 Parganas, Purba Medinipur, Paschim Medinipur and Howrah. Tornado affected areas in the districts of North 24 Parganas, Birbhum and Hoogly were also covered.

Duare Tran was an ICT driven initiative to facilitate monitoring, coordination and management of various activities and functions in order to speedy disbursement of relief to affected citizens in a transparent manner. NIC, being the Technology Partner of Government of West Bengal, was entrusted with the design, development and hosting of online system as well as Mobile Apps for smooth execution of field-level inspection of submitted relief applications.

Under Duare Tran, outreach programmes / camps in the affected areas at the levels of Gram Panchayat and Municipal Ward were organized to enable eligible citizens to submit applications to get benefit/relief/compensation under specified schemes of the Departments of Agriculture, Disaster Management and Civil Defence, Animal Resources Development, Horticulture, Fisheries and Micro, Small and Medium Enterprises and Textiles.

Camps started from 10 am and continued till 4 pm. The beneficiary household submitted applications along with supporting details of Identification Cards & Bank Accounts at Registration Counters/Desks for receiving all benefits that she/he was eligible for. All camp arrangements were made keeping in mind COVID-19 Protocols.

The state government announced compensation for the victims of Cyclone Yass. Farmers, fishermen, handicraftsmen all would get compensation money directly in the bank account. The state government would provide compensation to each family starting from a minimum of Rs. 300 to a maximum of Rs. 30,000.

The main objectives of Duare Tran initiative were as follows:-

- To adopt best relief application procedures that can be processed quickly, accurately, can be accounted for and ensure that public services relating to the management of mechanisms of aid distribution can be channeled well and well-targeted is required

- To manage the relief disbursement process in quick and precise, priorities, coordination and cohesion, efficient, transparent and effective manner
- To build suitable mechanism so that the assistance must be timely, to the right location, target, quality, quantity, and needs
- To disburse financial assistance to the affected citizens based on only evaluated losses with the least inconvenience to them
- To disburse the financial assistance in shortest possible time
- To ensure that no fake application was entertained
- To improve the effectiveness and efficiency of monitoring of mining and transportation of sand
- To use emerging technologies for efficient monitoring of relief disbursement and enforcement of compliances connected therewith

Task forces at different levels were constituted at the State, District, Sub Division and Block levels with the objective of smooth implementation and seamless coordination between various stakeholders of the "Duare Tran" campaign. The task force was constituted comprising of following members:-

At State Level:

a) Additional Chief Secretary, Home & Hill Affairs & Planning Department – Chairperson
b) Additional Chief Secretary, Panchayats and Rural Development Department
c) Additional Chief Secretary, Animal Resources Development Department
d) Additional Chief Secretary, Food Processing and Horticulture Department
e) Principal Secretary, Finance Department
f) LRC and Principal Secretary, L&LR Department
g) Principal Secretary, Fisheries Department
h) The Principal Secretary, Disaster Management Department
i) Principal Secretary, MSME Department
j) Principal Secretary, Urban Development and Municipal Affairs Secretary, Agriculture Department
k) Secretary, NRES Department-State Nodal Officer
l) Secretary, I&CA Department.

At District Level:-

a) District Magistrate – Chairperson
b) Commissioner of Police / SP
c) ADM (in charge of Disaster Management)
d) ADM – LR
e) ADMs looking after the respective schemes identified for Duare Tran (f) District Head/Nodal Officer of the Directorates of Fisheries/ Agriculture/ ARD/ MSME / FPI&H
f) All concerned SDOs
g) District Information and Culture Officer (i) District Disaster Management Officer. At Block Level: - (a) Block Development Office

Duare Tran scheme was implemented in all the affected areas of districts of South 24 Parganas, North 24 Parganas, Purba Medinipur, Paschim Medinipur, and Howrah. Other than that, affected areas of the district of North 24 Parganas, Birbhum, and

Hoogly were also covered under this scheme.

It was decided that the government would receive applications from June 3 to July 18, 2021 in the camps to be held at in that Gram Panchayat and Municipal Ward levels. All eligible citizens would submit applications to get benefit/ relief/ compensation under specified schemes of the relevant nodal departments of the government meant for disaster mitigation.

The field level enquiries would be done over the next 12 days and then the beneficiaries, depending on the extent of damage, would receive benefits from July 1 to July 7, 2021 through DBT.

Duare Tran scheme aimed to disburse a total amount Rs 1,000 crore as immediate relief to the affected citizens through direct bank transfer to meet up their losses for Crops, Fully and partially damaged dwelling houses, Animals, Damage betel vine structures, For repair or replacement of Hundis, boats and nets and for replacement of damaged tools, equipment, raw material, goods in process, Finished goods, showrooms, go-downs etc.

It was also decided to adopt ICT-driven suitable mechanism to ensure that Yaas cyclone relief reaches actual beneficiaries based on field-level evaluations.

A total of 3,59,487 people, affected by the cyclone and the flooding that followed, applied for compensation at the Duare Tran camps for damaged homes, crops etc. that were put together by the state government from June 3 to June 18, 2021.

Following spot verifications by the field-level inspecting officials, financial assistances were transferred to them through DBT, while fake/bogus applications were rejected.

The backbone of the Duare Tran campaign was an integrated portal hosted at https://excise.wb.gov.in/dwt/Portal_New_Default.aspx, designed & developed by NIC, West Bengal, the Technology Partner of Government of West Bengal, wherein an array of ICT technologies (Online system for relief application registration, Mobile App for field-level inspections, SMS Gateway for sending Alerts/Notifications, Geo-Tagging of Camps, AI for predictive analysis etc.) were seamlessly integrated across various operational units for real-time data capturing and monitoring of every activity and the processes of the campaign enabling results of such magnitude possible within such a short time. Description of Solution Designed Implemented To provide immediate financial help to the citizens of the state who were affected by Yaas cyclone, Government of West Bengal launched Duare Tran (Relief on Doorsteps) scheme - an innovative ICT driven administrative mass outreach initiative to bring the government machinery closer to citizens through community camps in village/habitation levels.

It was decided to organise outreach programmes / camps in those Gram Panchayat and Municipal Ward levels affected by Yaas, for eligible citizens to submit applications to get benefit/relief/compensation under specified schemes of the relevant nodal departments of the government meant for disaster mitigation.

The use of IT technology is the most potent tool for innovation used to design a transparent, responsive and user friendly end to end management for Duare Tran scheme. A detailed analysis was done of the state government policy which followed the design and development of the online system and the Mobile App for Duare Tran.

The sectors belonging to 7 departments were identified for the benefit of the Duare tran scheme

a. Department of Agriculture

b. Disaster management and civil defence department
c. Animal resources development department
d. Department of Horticulture
e. Department of Fisheries
f. Micro small and medium enterprises department
g. Department of Textile.

The calculation of relief amounts in Duare Tran online system was based on following logic:

1. If the crop was damaged in the storm, a minimum of 1 thousand rupees and a maximum of 2 thousand 500 rupees would be paid.
2. In case of the death of cattle in a cyclone, each cow and buffalo would be given compensation of some 30 thousand rupees.
3. In case of death of sheep, goat, or pig, compensation of Rs. 3,000 would be given for new purchases.
4. Compensation of Currency (according to lost)
5. And if the calf dies, 18 thousand rupees would be paid as compensation.
6. If the cyclone damages the house, the government would compensate 20 thousand rupees per family.
7. If the house was partially damaged, 5 thousand rupees would be paid as compensation.
8. If the drinking waste of any size was damaged, 5 thousand rupees would be paid.
9. Fishermen would be compensated 300 rupees for buying new fish.
10. 2,600 rupees would be paid for fishing nets.
11. If the boat was damaged in the storm, 19 thousand rupees would be paid per boat.
12. And in case of partial damage, 5 thousand rupees would be paid per boat.
13. The state government would pay 4,100 rupees to buy handicrafts equipment.
14. In addition, if the warehouse shop and storage space were damaged, compensation of Rs. 10,000 per unit would be given.

SOP was circulated by the Government as a reference guideline for execution of Duare Tran scheme.

Duare Tran online system provisioned for category wise capturing the losses due to cyclone e.g. Crop Loss, Damage to Dwelling Units, Loss of Livestock, Assistance to Fisherman, Assistance to Artisan, Damage to Paan Boroj etc.

The online system facilitated to capture the details of victims

(a) Name of the applicant

(b) Gender - Male, female, or other

(c) Name of Assistant Applicant (if any)

(d) Applicant's Relationship with Assistant Applicant (if any)

(e) Applicant's mobile number to which Notifications sent through system generated SMS

(f) Category of Applicant – SC / ST / General

(g) Address of Applicant (Village, Region, Block, District, PIN Number, etc.)

(h) Aadhaar number of the applicant

(i) Bank Account details of the Applicant e.g. Bank Name, Branch Name, IFSC, Account No

(j) Amount of damage – Partially (partial) or Fully (complete)

(k) Quantities of loss for Cow / Buffalo / Goat / Sheep / Calf / Pig / Bullock / Duck / Poultry.

A unique Registration Id. was assigned to each relief application in the online system.

Then for 15 days from June 19 to June 30 2021, the state government officials checked in-spot whether the amount of loss / casualties recorded was true or false and digitized the relevant data using Duare Tran Mobile App. The approving officials checked everything subsequently using the online system.

Government officials, tasked with verifying applications for the state's Duare Tran scheme, had to cross damaged roads and overflowing rivers to reach remote pockets to meet people affected by Cyclone Yaas. At a few places, officials waded through knee-deep water and muddy embankments to verify beneficiaries. Some had to take boats to reach coastal islands amid rain.

Stung by complaints of malpractices over relief in cash and kind after Cyclone Amphan last year, the state government had this time started Duare Tran to make relief distribution transparent.

For this, Mobile App based solution was designed using which the government officials captured the Photographs, Geo-Locations and other metadata during spot verification as per requirements of the scheme.

While acting on the inspection report, the relief recommending authorities had the facilities in the online system to see the followings against each & every Registration Id.:-

For Disaster Management Sector:- Submitted Number of Damaged Dwelling Units (Partial / Full), Inspected Number of Damaged Dwelling Units (Partial / Full). Based on such data, Relief Amount was recommended through online system calculated procedures.

For Horticulture Sector:- Submitted Number of Damaged Number of Betel Vine Structure, Inspected Number of Betel Vine Structure. Based on such data, Relief Amount was recommended through online system calculated procedures for DBT.

For Fisheries Sector:- Submitted Number of Hundi Lost, Submitted Number of Net Lost, Submitted Number of Partially Damaged Boats, Submitted Number of Partially Damaged Boats, Submitted Number of Partially Damaged Boats, Submitted Number of Fully Damaged Boats, Inspected Number of Hundi Lost, Inspected Number of Net Lost, Inspected Number of Partially Damaged Boats, Inspected Number of Partially Damaged Boats, Inspected Number of Partially Damaged Boats, Inspected Number of Fully Damaged Boats. Based on such data, Relief Amount was recommended through online system calculated procedures for Lost Hundi, Lost Net, and Partially Damaged Boats & Fully Damaged Boats for DBT.

For Animal Husbandry Sector:- Submitted Number of Lost Cow, Submitted Number of Lost Buffalo, Submitted Number of Lost Goat, Submitted Number of Lost Sheep, Submitted Number of Lost Calf, Submitted Number of Lost Pig, Submitted Number of Lost Bullock, Submitted Number of Lost Duck/Poultry, Inspected Number of Lost Cow, Inspected Number of Lost Buffalo, Inspected

Number of Lost Goat, Inspected Number of Lost Sheep, Inspected Number of Lost Calf, Inspected Number of Lost Pig, Inspected Number of Lost Bullock, Inspected Number of Lost Duck/Poultry. Based on such data, Relief Amount was recommended through online system calculated procedures for Lost Cow, Lost Buffalo, Lost Goat, Lost Sheep, Lost Calf, Lost Pig, Lost Bullock, Lost Duck/Poultry for DBT.

For Micro, Small & Medium Enterprises Sector:- Submitted Number of Damaged Equipment, Submitted Total Loss of Raw Material Goods, Submitted Total Damaged Work-Shed / Go-down / Showrooms, Inspected Number of Damaged Equipment, Inspected Total Loss of Raw Material Goods, Inspected Total Damaged Work-Shed / Godown / Showrooms. Based on such data, Relief Amount was recommended through online system calculated procedures for Damaged Equipment, Lost Raw Material Goods, Damaged Work-Shed / Go-down / Showrooms for DBT to the Artisan Bank Account.

For Agriculture Sector:- Submitted Total Area of Crop Loss in Acre, Inspected Total Area of Crop Loss in Acre. Based on such data, Relief Amount was recommended through online system calculated procedures (e.g. if Inspected Total Area of Crop Loss in Acre >= 0.40, then Recommended Relief Amount would be: Inspected Total Area of Crop Loss in Acre * Rs. 2500. if Inspected Total Area of Crop Loss in Acre < 0.40, then Recommended Relief Amount would be = Rs. 1000).

Innovative usage of technology

West Bengal state government believes that ICT should be used for benefiting millions and that it is a tool for development and not an end in itself. So, gaps seen in execution of relief disbursement in previously occurred were sought to be removed through the Duare Tran campaign through the optimal use of IT.

From the very outset, a strategic approach was taken of disassociation and integration. By disassociation, it was ensured that work-flow based online processing of relief applications of the victims designed in a manner to cut through all possible red tapes and disassociate and discourage any possibility of manual intervention/subvention. At the same time, all the modules of Duare Tran online system were integrated in a way to speak to each other. These nitty gritty to the finest of details was superbly designed and implemented by the able team of NIC.

What makes the project unique was the vast field experiences and catering to each and every requirement of the natural calamity affected citizens, disaster management authorities and district administration while ensuring absolute transparency, efficiency and strict adherence to legal norms in the process.

To overcome any communication gaps due to the depth and expanse of Duare Tran, multiple channels of communication including the internet, Push SMS, email, Mobile Apps and Helpdesk were set up. The digital environment created for Duare Tran, enabling continuous real-time updation even from the remotest corners of the state, and monitoring of coverage, participation and disposal of applications displays the state's commitment to create a robust ICT infrastructure. Daily reports/snapshots of camps and visitors were put in the public domain and shared on the official state government website. Internet enabled mobile phone-based delivery of services, online applications, digital receipt to reduce usage of paper and contactless delivery are signatures of the state moving in the direction towards Green Governance.

The Web-enabled mechanism of Duare Tran Scheme had following features:-

- Configurable, Customizable using front end interface paving easy on-boarding of new benefits
- Based on Responsive Design using CSS3 & HTML5 for optimized Look & Feel of the portal as per device environment & screen size
- Solution also constitutes of Java Script, CSS, Open source reporting library iTextSharp, XML and Service Oriented Architecture (SOA)
- BI for generation of intelligent MIS
- AI driven trend and future prediction & prescription for better management of citizen que in Camps
- Mobile Apps to facilitate
  - Field-level Inspections,
  - Real-time Status Reports
  - Geo-Tagging of Duare Tran Camps and also of Cyclone Affected Spots
- Integration with Departmental Portals through Web API
- Online dynamic dashboard
- Auto SMS notifications to applicants acknowledging receipt of relief application
- Auto SMS/Email alerts / notifications to appropriate authorities for needful updates
- Cost-effective solution: Re-use of available ICT Infrastructure and systems
- User friendly design, adequate testing to ensure flawless smooth execution of portal and thereby building higher degree of confidence of its users at all hierarchical levels.

Security aspects of Duare Tran Portal:-

- VAPT Test of Servers prior to deployment
- Implemented over HTTPS using SHA-256 with RSA Encryption TLS 1.2 SSL
- OTP/CAPTCHA based 2 Step Authentication to prevent DOS/robot
- Application S/w developed as per OWASP guidelines; uses standard Web technologies and techniques such as HTTP redirects, cookies, JavaScript and strong symmetric key encryption (MD5 Hashing) both in code level & database level, role-based access to deliver the service, encoded HTML and URL outputs

The Duare Tran portal had enabled the capturing of a large volume of data emanating out of the registration process of the overwhelming number of people who attended the camps. The seamless flow of information through the portal had facilitated faster response time and improved delivery of services to the people in record time.

The huge database created during the registration of these citizens will provide evidence and ideas for improved planning and for execution of Relief operations, if needed, in future.

With the information that has been generated in the Duare Tran portal and after analysing and comparing the same with the secondary data available with the local government, the field administrators are in a position in planning for future planning, in a much more informed manner, anticipating sector wise services demand in localities, preparing for household wise targeting in the long run. This will pave the way for governance which is truly for the people.

While designing the portal, due consideration was paid to important elements like need for thorough preparatory work to avoid breakdowns in service delivery, availability and updating of accurate data, adherence to timelines indicated in Citizen Charters, periodic monitoring of performance and dynamic evaluation to ensure achievement of desired outcomes. These have held it in good stead. The portal also owes its success to active involvement of multiple stakeholders with specific motivations, whose constructive inputs help to seamlessly work towards a common goal and eliminate the tendency of functioning in silos.

The Data Analytics which were made available in Duare Tran portal are

- Data Visualization to provide graphical and tabular representation of consolidated reports providing multiple choices, such as, daily/weekly time series analysis of footprints, sector-wise comparative loss-demand visualization, and many other visualization subject to what is required to be captured and displayed within the data set boundary obtained from the reports
- Visualization tools to provide users to filter, drill down, roll up, sort features as per their own preference.

The Predictive and Prescriptive Analytics using machine learning engine which are being provided through Duare Tran portal are

- Time series analysis of location/sector wise pattern of loss / demand – location wise, trend of loss / demand
- Detect pocket of inefficiency in the system from the available data as well as combination of all report elements
- Perform trend analysis to nullify dissatisfied citizens
- Perform remedial analysis to prevent or trap failure points where from possible poor performance can occur.

The software tools which were used in Duare Tran are

- Dashboard for Visualization – Tableau
- Data Scrapping & Mining – R. We have used machine learning in Duare Tran that enables the portal to learn and advance based on Duare Tran camp data, Census data, ICMS data without being clearly programmed. Machine Learning Predictive Algorithms using open source R language is incorporated in the project to predict demands using the historical data of such sources. The historical data are being used for data mining and showing trend and future prediction & prescription.

Such mechanisms in the Duare Tran Portal have helped to predict future queues at registration counters and Earmarked Sector Counters using the historical data obtained from initial camp data. This has helped deploy requisite officials in counters for delivering efficient services and minimising discomfort to citizens attending the camps. The analysis has also led to the identification of peak hours or camps where congestion is highest.

The Duare Tran portal has enabled the capturing of a large volume of data emanating out of the registration process of the overwhelming number of people who attended the camps. The seamless flow of information through the portal has facilitated faster response time and improved delivery of services to the people in record time.

Multiple channels of communication were put in place to allow real time flow of information to the service recipients, thereby enabling better crowd management.

Seamlessly integrating a wide array of modern ICT technologies - the Web, SMS

Gateway for Auto Notifications, Mobile App, Data Analytics & AI driven trend, this Duare Tran eGov initiative has significantly reduced service-delivery times to cyclone affected citizens and has greatly enhanced the government's regulatory capabilities. Benefits Disasters can occur anywhere, anytime. In the aftermath of disaster, everyone who is affected by disaster has the right to get assistance in fulfilling their basic needs. The government has an important role in attending to the needs of victims in the form of disaster relief. To support the community resilience, the operations of disaster relief distribution must be carried out in agile and accountable way.

In the pre-deployment scenario of Duare Tran, the manual, low or no-tech operations of disaster relief distribution in West Bengal with many actors involved caused disaster relief distribution activities to take a long time and were not accountable. The long waiting time for victims to get their relief and an uneven distribution with oversupply or undersupply to some affected people was clearly problematic to the intended purpose of an agile and accountable relief distribution system.

The evolution of information system and the growth of innovative technologies open up new possibilities for better operations of disaster relief disbursement by digitization and providing near real-time information for anyone at any time.

Duare Tran aimed to reduce time and improve accountability of disaster relief distribution operations using innovative technology and Relational Database through disaster relief disbursement with DBT support.

To support the community resilience aftermath of disaster, the operations of disaster relief distribution needs to be carried out in agile and accountable way. Based on needs, an information system is needed as an enabler to increase the speed and accountability of disaster relief disbursement system. Pre-deployment:-

- There was no standardized online system for tracking of relief measures, submitting applications post-disasters, and providing DBT transfers to all affected people.
- There were differences in strategies & methodologies adopted for providing relief by different District Magistrates depending on the extent and nature of the disaster.
- With thousands of people affected in different areas, it was time taking to process relief applications and chances of some documents & applications getting missed/lost, etc. apart from higher time required for processing the cases for providing aid & assistance.
- Huge pressure on Government resources and manpower which were otherwise stressed post-disaster to restore a semblance of normalcy. Many a times the Government staff & officials despite themselves also being affected by the disaster personally because of themselves living in the same geographical area could still not attend to their families due to the intensified work pressure of a post-disaster situation to serve public in disaster mitigation.

Post-deployment:-

- Easy to use, standardized system for all affected Districts with completely only application processing and DBT has been developed, thus easing filing of relief applications, their online tracking, allocating budget requirements, reducing duplication as well as expediting relief distribution.
- Completely transparent system for mitigating disasters, with entire record keeping online and no possibility of delays, missing any applications or any errors.

- Much less time taken to restore normalcy of public life at large after a disaster situation. Lesser pressure on already strained Government resources and manpower.
- Higher efficiency in relief distribution through DBT building higher trust between public & Government, and lesser chances of any Law & Order issues.

Hardware/Software

Following major products/services are availed by Duare Tran portal:-

- HP Servers: Total 4 nos. of High-end HP Servers (2x2 App. Server and DB Server) are installed in SDC, Kolkata. Specification of each Server: HP DL560 Gen8 - 4 x Intel E5-4610v2 @2.3GHz Processor (32 core, 64 threads) - 768GB Memory - SAN Boot - Total 4 no of Gigabit ethernet ports - 2 Nos. of dual Port 10 Gbps Fiber Channel over Ethernet (FCoE) CNA for connecting storage and network with redundancy - MS Win2012.
- Network equipments: Cisco
- OS: Microsoft Windows Server 2012
- DB: Microsoft SQL Server 2014
- Frontend: Microsoft Visual Studio 2012, ASP.NET 4.5
- ICT Infrastructure development support Service: Webel Technology Ltd.
- Internet Services: 54 Mbps MPLS provided by Reliance
- Integration with Payment Gateway
- Application Software Security Audit Service: KPMG
  - VA/PT testing Service of Servers: KPMG
- Software/DB Premium Support Service: Microsoft. Service Level Agreements (SLA), 2x2 App and DB Servers with Load Balancing and SQL Server Always ON are there for ensuring 24x7 availability of Duare Tran portal without any downtime.

Duare Tran (DT) is hosted at West Bengal State Data Centre (WB-SDC). The project is based on inter-operable, browser based application. The application complies with Interoperability Framework for e-Governance in India (IFEG). The technological aspect datasheet of Duare Tran is as follows:-

- Hosting environment at WB-SDC equipped with Hardware Firewalls and other network equipment, security patches are updated regularly
- Followings are the deployed to implement Duare Tran project:- o Microsoft : Visual Studio 2015, SQL Server 2014, Windows Server 2012 R2, Web Server: IIS 7.0 o HP DL 560 Gen8 Servers (2 x 2 App Server and DB Server) o Dlink Datacenter FCoE Switches (Rijie RG S6220-48XS4QXS) - 2 numbers o EMC VNX8000 Storage o Checkpoint CPAP-SG12400-NGFW Firewall - 2 numbers
- Browser based Application. Accessibility, Platform & Browser Independent. Security Standard followed: OWASP
- Open Source Reporting Tool ITextSharp is used for generation of reports for viewing online.
- Robust backup & disaster recovery mechanism with DR at National Data Centre, New Delhi
- Load-Balancing &Always On methodologies are implemented for the Application and DB Servers (2 + 2) at WB-SDC to ensure uninterrupted

access of Duare Tran

- Configurable, Customizable using front end interface paving easy on-boarding of new schemes/benefits
- Based on Responsive Design using CSS3 & HTML5 for optimized Look & Feel of DS portal as per device environment & screen size
- Solution also constitutes of Java Script, CSS, Open source reporting library iTextSharp, XML and Service Oriented Architecture (SOA)
- AI driven trend and future prediction & prescription for better management of DS camps e.g. Queue management during peak hours, Ensuring availability of specific departmental officials for handling high demand of certain beneficiary schemes in certain localities etc.
- Mobile Apps to facilitate:- o Geo-Tagging of DT Camps across the State for ease in monitoring o Real-time Status Reports to ensure robust monitoring and control mechanism o Field level Inspection with geo-tagged photo capturing etc.
- Integration with Departmental Portals through Web API • Online dynamic dashboard
- Hourly auto SMS alerts / notifications to appropriate authorities for needful updates
- Cost-effective solution: Re-use of available ICT Infrastructure and systems •
- Ensuring multiple channels of communication including Online, Push SMS, Email, Mobile Apps and Helpdesk
- User friendly design, adequate testing to ensure flawless smooth execution of portal and thereby building higher degree of confidence of its users at all hierarchical levels

Security aspects of DS Portal:

- VAPT Test of Servers prior to deployment
- Implemented over HTTPS using SHA-256 with RSA Encryption TLS 1.2 SSL
- OTP/CAPTCHA based 2 Step Authentication to prevent DOS/robot
- Application S/w developed as per OWASP guidelines; uses standard Web technologies and techniques such as HTTP redirects, cookies, JavaScript and strong symmetric key encryption (MD5 Hashing) both in code level & database level, rolebased access to deliver the service, encoded HTML and URL outputs Seamlessly integrating an wide array of modern ICT technologies - the Web, SMS Gateway for Auto Notifications, Data Analytics & AI driven trend and future predictions on Queue & Beneficiary Scheme Demand management in Camps, Mobile Apps for Geotagging of Camp Venues and aiding Field-level Inspections, Integration with Departmental Portals through Web APIs – this e-Gov initiative has significantly reduced service-delivery times and has greatly enhanced the government's regulatory capabilities

Certification (Certifying Agency)

Departmental Portals through Web APIs – this e-Gov initiative has significantly reduced service-delivery times and has greatly enhanced the government's regulatory capabilities. 3.3 Has any formal certification been obtained with respect to Cyber Security? If yes, please furnish details of certifying agency Cyber Security Certificates

received from CERT-In empanelled agency declaring the project free from Cyber Security Vulnerabilities e.g. Cross Site Scripting (XSS), Injection Flaws, Malicious File Execution, Insecure Direct Object Reference, Cross Site Request Forgery, Information Leakage and Improper Error Handling, Broken Authentication and Session Management, Insecure Cryptographic Storage, Insecure Communications, Failure to Restrict URL Access, Buffer Overflows and Denial of Service

Disaster Recovery and Service Continuity

Duare Tran is not a standalone ICT intervention, but rather one with the potential of creating a ripple effect on the working of other departments as well, by providing feedback for improving their response to the demand of natural disaster affected citizens.

RESULTS INDICATOR

The key 3 benefits of Duare Tran were:-

1. State Budgetary resource planning and allocation was simplified and standardized.
2. Higher efficiency in relief distribution, lesser time required in fire-fighting post disaster, thus allowing Public Life and Local Economy to get back on its feet faster and reducing strain on Government resources and better disaster mitigation.
3. Deduplication of applications, benefits distributed DBT, etc. thus reducing errors, reducing budgetary outgo, improving Audit compliance, etc.

The ICT-driven Duare Tran programme could ensure that not a single genuinely affected person got left out from receiving the financial assistance of the state government.

The verification process ended on June 30 and the direct transfer of benefit started from 1st July, 2021. With such a robust task to attain completion when the state government had reached the doorstep of affected people to help them get financial assistance under the said programme, it was ensured that not a single genuinely affected person was left out. However, it was also possible to ensure that fake and duplicate applications were weeded out with the help of the photography and geotagging features.

Duare Tran had made it possible to cover the genuine persons affected by disaster through a scalable /replicable model that can be adapted/adopted by other governments at all levels - seeking to render relief disbursements in quickest possible time.

A total number of 1420 Outreach camps were setup. The total victims of cyclone who visited such camps were 3,81,774. The Sector wise Counts of Relief Sought in such camps were:-

Agriculture - crop loss – 34,991

disaster management - pucca house -fully damaged – 22,299

disaster management – kutcha house - fully damaged – 82,206

disaster management - pucca house - partially damaged- 54,361

disaster management - kutcha house - partially damaged – 1,18,301

animal resources development - milch animal loss – 42,832

animal resources development - draught animals loss – 54,464

horticulture - paan boroj loss – 20,978

fisheries - hundi loss – 9,879
fisheries - boats – 5,916
fisheries - nets loss – 6,646
fisheries - inputs – 99,591
artisan/weaver - tools loss – 2,462
artisan/weaver - raw material loss – 5,769
artisan/weaver - workshed loss etc. – 3,588
grand total count of relief sought - 5,64,283

The features of transparency that had been brought into the entire exercise through the enquiry system (mobile app) ensured that the government only made payments to the genuine cases, saving expenditure of tax payers money.

The figures of the final number of persons that the state gave compensation to under some of these heads are as follows:

- House building – 84,737 (all together) against more than 2.16 lakh claims received
- Horticulture – Paan Baroj Loss – 5,897 of 20,978 claims
- Loss of animals - 5,311 persons benefitted with DBT though there were more than 97,000 claims.

Duare Tran is not a standalone ICT intervention, but rather one with the potential of creating a ripple effect on the working of other departments as well, by providing feedback for improving their response to the demand of natural disaster affected citizens.

Implementation

A Very Severe Cyclonic Storm (VSCS) Yaas, equivalent to category-3 hurricane, which hit the state on 26th May 2021, brought significant impacts to West Bengal causing large-scale devastation across many districts of the state. It came at a time when the state had been battling a deadly second wave of Covid-19 infections, and healthcare systems were already overworked. The cyclone lashed coastal areas with ferocious wind and rain damaging homes and bringing waves that swamped villages and towns.

To expedite the relief disbursement in Yaas cyclone affected state, Government of West Bengal decided to launch ‘Duare Tran’ camps in all the affected blocks and gram panchayats. These camps did function to receive claims from the affected people. Subsequently, the claims were verified which followed disbursement of relief funds directly into bank accounts of affected citizens through DBT. The entire machinery of the State government worked in a mission-mode to ensure the success of ‘Duare Tran’. Utmost care was taken so that no actual beneficiary deprived of relief and compensation.

“Duare Tran (Relief at Doorsteps)” was launched in the affected areas of the districts of:-

- South 24 Parganas
- North 24 Parganas
- Purba Medinipur
- Paschim Medinipur
- Howrah.
- Birbhum and

- Hoogly. Duare Tran was an ICT driven initiative to facilitate monitoring, coordination and management of various activities and functions in order to speedy disbursement of relief to affected citizens in a transparent manner. NIC, being the Technology Partner of Government of West Bengal, was entrusted with the design, development and hosting of online system as well as Mobile Apps for smooth execution of field-level inspection of submitted relief applications.

Under Duare Tran, outreach programmes / camps in the affected areas at the levels of Gram Panchayat and Municipal Ward were organized to enable eligible citizens to submit applications to get benefit/relief/compensation under specified schemes of the Departments of Agriculture, Disaster Management and Civil Defence, Animal Resources Development, Horticulture, Fisheries and Micro, Small and Medium Enterprises and Textiles.

Camps started from 10 am and continued till 4 pm. The beneficiary household submitted applications along with supporting details of Identification Cards & Bank Accounts at Registration Counters/Desks for receiving all benefits that she/he was eligible for. All camp arrangements were made keeping in mind COVID-19 Protocols.

Duare Tran is a first of its kind system in West Bengal and perhaps the country. Following WHOLE OF GOVERNMENT and WHOLE OF SOCIETY approaches, Duare Tran is executed for bringing government machinery closer to Cyclone affected citizens through outreach camps in village/habitation levels.

The backbone of Duare Tran campaign was an integrated portal where an array of ICT technologies (AI, Mobile App, SMS Gateway, Geo-Tagging of Camps) are seamlessly integrated across various operational units for real-time data capturing and monitoring of every activity and the processes of the campaign enabling results of such magnitude possible within such a short time.

A total of 1420 camps were organised in which 3,81,774 citizens registered for relief in different sectors for which they were affected (total count 5,64,283) and the relief was disbursed in a time bound manner through DBT.

Through possibly one of the largest ICT-driven outreach programs in the realm of disaster relief management, Duare Tran was able to bring in simplification and transparency in Disaster Management administration by using tools of IT and DBT.

The immense success of Duare Tran initiative demonstrates its potential, holding much promise, for re-imagining “disaster relief disbursement management of government" as accessible, accountable and responsive, matching victim citizens’ expectations.

Improvements/ enhancements

Disasters can occur anywhere, anytime. In the aftermath of disaster, everyone who is affected by disaster has the right to get assistance in fulfilling their basic needs. The government has an important role in attending to the needs of victims in the form of disaster relief. To support the community resilience, the operations of disaster relief distribution must be carried out in agile and accountable way.

In the pre-deployment scenario of Duare Tran, the manual, low or no-tech operations of disaster relief distribution in West Bengal with many actors involved caused disaster relief distribution activities to take a long time and were not accountable. The long waiting time for victims to get their relief and an uneven distribution with oversupply or undersupply to some affected people was clearly problematic to the intended purpose of an agile and accountable relief distribution system.

The evolution of information system and the growth of innovative technologies open

up new possibilities for better operations of disaster relief disbursement by digitization and providing near real-time information for anyone at any time.

Duare Tran aimed to reduce time and improve accountability of disaster relief distribution operations using innovative technology and Relational Database through disaster relief disbursement with DBT support.

To support the community resilience aftermath of disaster, the operations of disaster relief distribution needs to be carried out in agile and accountable way. Based on needs, an information system is needed as an enabler to increase the speed and accountability of disaster relief disbursement system.

In the month of May – June 2021, the state government launched "Duare Tran" to deal with time bound relief/compensation claims after the severe cyclonic storm Yaas hit several districts of the state.

The portal was used to schedule and organise de-centralised outreach camps for recording the number of visitors including repeat visitors and the different reliefs which they wanted to access in the camps. Subsequently, it was also used to monitor progress of disposal of applications submitted by citizens, thereby ensuring delivery of reliefs in a time bound manner.

Due to the immense success of the Duare Tran campaign, where 99% of eligible relief seekers were subsequently delivered the services as desired, it was decided by the state government that Duare Tran would become a standard methodology to handle the relief disbursement requirements during future disasters.

It is felt after the experience of Duare Tran campaign, the tools/features that we have used can be used across single or multiple government departments as users, where time-bound schedules have to be maintained and constant monitoring and reporting can be done through the portal's MIS.

It is imperative that the evolution of Duare Tran will need be a standard methodology. This is due to the fact that the needs and requirements of the citizens are constantly changing in the ambit of disaster nature and the government must keep on evolving more efficient and effective ways of catering to their demands and needs.

Also, having raised the expectations of the citizens through the campaign where convenience and speed were combined to get the citizens their due within the stipulate time period, the citizens will not be satisfied with repeats – they will want improvement and enhancement of their experiences while dealing with the government. This is definitely an idea whose time has come.

ENABLER

Processes Re-engineered

Duare Tran is an initiative of the West Bengal state government to transform the process of delivery of compensation to disaster affected citizens by catering to their needs through outreach camps which physically take the administrative machinery to the intended service recipients.

Instead of relying on the old "supply driven" government compensation delivery model, claims for compensation was accepted at the outreach camps set up in the grassroots level. Information about available schemes under which relief could be sought including eligibility criteria etc. was disseminated locally before the holding of these outreach camps. This citizen-centric approach required a shift in the thinking of government officials from seeing themselves as approvers to seeing themselves as

deliverers of services at the comfort and convenience of service seekers.

The "convergence mode" design of the camps allows citizens to apply for different types of compensations / relief that are being offered by various departments under relevant schemes offering such relief:

Since the application for all the different types of reliefs/compensations are to be applied for simultaneously (on a plain paper) by the citizen, s/he does not have to go to different offices to file their claims. Also, when the enquiry is conducted, there is an integrated enquiry team that visits one time, so the citizen also does not have to waste time remaining present for different enquiry teams to visit for different types of compensations. This system is also beneficial over all for the State government. At the end, the applications are being disposed of from one office (local level) so the citizen is also able to follow up in one office itself instead of having to spend time, energy and money going to different offices. Ultimately, it is the citizens at the grassroots that is at the very heart of Duare Tran and the state's government's genuine intention to stand beside them during their time of crisis.

Technologies

Duare Tran is developed as web enabled application and hosted in the West Bengal State Data Centre (WB-SDC). The stakeholders access it through web browser (client application).

The project is developed with ASP.NET 4.5 as Frontend and MS SQL Server 2014 as Backend Database. Database is mounted on Windows Server 2012.

The related ICT solution also constitutes of Java Script, CSS, Open source reporting library iTextSharp, NIC SMS gateway, Android based Java Application, Adobe Flash Player, IIS Web Server 7.0, XML and Service Oriented Architecture (SOA).

People

Leadership Support: -

"Duare Tran" has been ideated by Smt. Mamata Banerjee, Hon'ble Chief Minister of West Bengal as an initiative for her government to reach the cyclone affected citizens of the state and to deliver to them government relief services and entitlements at their doorsteps through the organization of local level outreach camps.

After this idea was shared by the highest political executive of the state and responsibility of implementation thrust upon the shoulders of the state government machinery, the Duare Tran campaign was launched in right earnest to achieve the goal.

Under the overall guidance of the Chief Secretary of the State, extensive day to day monitoring by the Additional Chief Secretary – Planning & Statistics Department, Government of West Bengal and competent secretariat support of the team under the State Nodal Officer, Duare Tran, it was possible to achieve the outcomes that had been desired by the state government – speedy disbursal of all possible relief/compensation amounts available under different departments' schemes to all persons who are genuinely disaster affected

Project Management & Monitoring adopted: There were four types of teams who worked under close supervision of the Additional Chief Secretary to the Government of West Bengal, Planning & Statistics Department for smooth implementation of Duare Tran. Their respective heads and nodal officers are presented in the below table:

Task Force / Project Monitoring Team	**Head**	**Nodal Officer(s)**

Tier-I	Chief Secretary to the Government of West Bengal	Ms. Choten Lama, IAS, Secretary to the Government of West Bengal& State Nodal Officer, Duare Tran
Tier -II	Additional Chief Secretary, Planning, Statistics & Programme Implementation Department	
Tier -III	District Magistrate of concerned districts	Officer Nominated by DM
Tier -IV	Block Development Officer (BDO) of concerned Blocks	Officer Nominated by BDO

- Task Force / Project Monitoring Units worked round the clock and reviewed implementation status.
- A full time dedicated team comprising of Senior Software Developers, Software Developers and Software Support Personnel were engaged by the Planning, Statistics & Programme Implementation Department which worked under the guidance of NIC
- Help Desk support and trouble-shooting units were set up under a team of young IAS officers, given geographical and subject jurisdictions. This team of officers worked in close association with the Technical Team. The PMU of Tier-II was responsible for
  - Creation of User Credentials for Tier-I and the Heads of Tier-III. Duare Tran system generated Secret Pins for the registered Mobile numbers were sent as SMS to concerned users
  - Creation & Maintenance of Master tables of Duare Tran under their purview
  - Arranging Training/Workshops on Duare Tran
  - Submitting Implementation Status Reports to the higher level PMUs for review of Duare Tran
  - Interacting with NIC for Technical issues as and when required.

Considering the criticality, reach and extent of Duare Tran and to ensure its smooth execution, State Government issued notification towards formation of Duare Tran Monitoring Committees was constituted at different levels:

There was initial top-down push from the Duare Tran State level leadership to drive adoption and filtrate, beyond which it became a self-fueled engine driven by the field level officials who executed the outreach camps.

Capacity Building:-

A comprehensive capacity-building exercise, designed to train participating departmental officials and the field level officials of the Gram Panchayat / Municipal Ward levels(identified for operating Duare Tran beneficiary registration system in Camps or Mobile App based Field-level Inspections) to use the new system, preceded the implementation of the project.

The related approach also focused on attitudinal change, technological skills enhancement, adaptability to respond to stakeholder's requirements and commitment to provide superlative services.

From organizational sustainability standpoint, the Duare Tran State Nodal team has taken necessary measures to ensure the following:-

- Departmental Officials earmarked as Duare Tran Project champions are not transferred during the entire project period.
- Creation of IT cells with suitable technical manpower in central location (Duare Tran State Coordination Centre, West Bengal State Secretariat, Nabanna) to provide service to all stakeholders on call basis.
- Necessary budgetary provisions towards recurring costs of all types like maintenance, consumables etc. are made by the Planning & Statistics department.
- Advance and timely action are being taken to renew/revise service contracts wherever applicable so that there is no dislocation in service.

Besides, special attention was given by the department to incorporate following features in Duare Tran project to ensure sustainability of this project methodology towards its usage to address such kind of issues:-

- Demand-driven IT system which increases the degree of adoption by various stakeholders
- Development of the system in modular fashion
- Designed in such way so as to allow flexibility to scale up horizontally or vertically based

VALUE INDICATORS

Learning's for sharing

To overcome the challenges, the following measures were initiated: -

- Responsive design of the Duare Tran portal to make it accessible even through Mobile devices
- Mobile App to capture Duare Tran Camp transactions
- State of the Art Web Server, Application Server and Database Servers installed at WB-SDC with disaster recovery facilities are being used for providing seamless e-Services to the external stakeholders.
- 2x2 App and DB Servers with Load Balancing and SQL Server Always ON were made available for ensuring 24x7 availability of DS portal without any downtime
- Measures are taken at application level to generate database view-level MIS reports on real-time transactions from the MIS (replica DB) server.

Digital Empowerment

Introduction of Duare Tran has resulted in the following positive externalities in the area of digital inclusion:-

- In the Duare Tran project, no hindrances have been faced yet due to cultural, language and demographic differences. As User Creation, Camp Scheduling, Beneficiary Registration, Collection of Service Delivery data from Departments and other related operations are basically G2G operations using Duare Tran portal and is conducted mostly in English. Also, to add to the localization of the campaign to ensure maximum impact and outcomes, the information of camps – locations as well as schedules, relief schemes – what is included and what are the eligibility criteria and documents required were

publicized in the local language.

- Government functionaries carry out most of their Duare Tran related functions in English and beneficiaries too, get SMSes in English from the system stating the registration information. Besides utility Mobile Apps too serve the stakeholders in the English language. However, critical training sessions with field level team members were also held in Bangla for greater conceptual clarity and understanding the "why" of the design / process. Enquiry were also held in local language.
- All officials have been provided username/password on their mobile/email to enable them to work with Duare Tran. However, the authorization to certain modules has been restricted to officials of certain levels. Nonetheless, this has ushered in digital inclusion process and all employees have been co-opted as part of this grand transition to a modern digital environment.
- Trainings and workshops have been organized to bring employees on the same page regarding usage of the new application. Thus deficiencies in term of skill sets on the use of ICT are being ironed out. This will pave the way for a fully modern workforce that is geared to meet newer challenges of governance involving greater use of ICT in the coming days.

Green e-Governance

ICT facilities created under the Duare Tran project have taken care of Green eGovernance to the extent possible:-

- Obviated the need for taking print outs by ensuring easy retrieval of data at any time through electronic information management system
- Online scheduling of Duare Tran camp venues & dates, online registration of beneficiaries at DT camps and availability of DBTs in dematerialized form to all stakeholders has substantially reduced use of paper.
- Huge savings in terms of travel due as camps were held at the habitation level and citizens did not need to make multiple trips to administrative departments/offices to submit their claims to multiple offices of various departments.
- Departments that did not have presence in the block level also used the services of the officials available from other related departments (agriculture department officers were given the responsibility of the food processing and horticulture department related works as well).

Dr. Manoj Pant, IAS, *Additional Chief Secretary to the Government of West Bengal, Planning and Statistics Department, Govt. of West Bengal, fs-wb@nic.in, manojpant65@yahoo.co.in*

Ms. Choten Lama, IAS, *Secretary Tribal Development Departmnet and State Nodal Officer, DUARE TRAN, Government of West Bengal, chotenlama@gmail.com*

Shri Mainak Mukhopadhyay, *Scientist-F & o/c, NIC state secretariat, National Informatics Centre West Bengal State Centre, mainak@nic.in*

Kullu Permits

Tourism Development Council, Govt. of Himachal Pradesh & National Informatics Centre Himachal Pradesh State Centre

Ashutosh Garg and Ajay Singh Chahal

PROJECT OVERVIEW

Kullu Permits issuance system is easy to use software for the facilitation of the visitors to visit Rohtang Pass & Hamta Pass. It strictly adheres to the guidelines laid by NGT for Tourism at Rohtang Pass and the norms finalized by district administration. The software solution provided facility to take vehicle permit from his/her desktop form anywhere in the world on first come first term basis without any human intervention. The software is integrated with HDFC payment gateway so that all the charges can be paid online and permit is issued on successful receipt of payment. Till date around 13.63 lakh applications were received out of which 7.36 lakh permits has been issued using the web solution. Approximately 27.34 Crore of the Charges has been collected. The concurrency of request on the application is so as the permits for a day are issued within 30-35 minutes. The web application enables the Common Citizen to apply for the permit well in advance as per days fixed. Also two mobile apps were developed to assist the tourist as well as administration for the better management of traffic and to facilitate them.

This system is only way to get permits.

The system has been improvised by extending it to cover the following permits

- Rohtang Permit (one trip)
- Special Rohtang Pass Permits (100 permits daily are issued to Outside Manali Region Vehicles with restriction that permit is issued once in the entire season to particular vehicle)
- Hamta Pass (520 permits daily)
- Manali Entry Tax (validity 7 days)

Beneficiary of the Project:

The main beneficiary is the mankind and environment. As it is a proven fact that mountains' eco-system is about two and half times more vulnerable to environmental change and impact is felt downstream. So the main concern was degradation of eco-system due to pollution which has direct impact on flora and fauna and leads to extinction of species. With this in mind National Green Tribunal (NGT) issued guidelines to control the degradation of eco-system being caused due to pollution. With the cleaner and balanced eco-system the human beings stand to benefit by achieving better living condition and standard of living.

Other main beneficiaries of the project are the tourists visiting Rohtang Pass or Hamta Pass, taxi/ tour operators of the region, the District Kullu administration, which was directly in the line of fire, HP Transport Department and the NGT. The specific benefits to each of these categories are:

Tourists visiting Rohtang & Hamta Pass are hugely benefitted as follows:

- Easy to get permits for common citizen without human intervention
- Facility to get the permit in advance, as per guidelines

- Facility to pay Fees/Charges online using Credit Card/Debit Card/ Net banking
- Reprint of permits as and when required
- Facility to check the availability of permits for desired day
- Facility for logging of Check-In and Checkout
- Facility to check the validity of permit
- Self initiation of refund in case excess payment or permit not issued due to technical issues
- Simple, transparent functional system as all data is shown live while making an application for permit issuance
- User friendly and easy interface
- Mobile application to assist Citizen as well as authorities

For taxi and tour operators, it is a transparent system and they don't have to bribe any officials for getting out of the way permits. The entire system is online and permits are issued on the basis of first come first serve basis only. The residents of areas around Rohtang and Hamta also stand to benefit in the long run as their livelihood depends upon the regular and steady inflow of tourists to the Manali area. If the un-controlled inflow of tourist during particular times had continued, there won't be snow round the year on Mountain Passes and in due course of time it would have turned into a garbage dump. So regular influx of tourists will keep the economic activities going to aid the residents.

The Kullu Administration benefits by:

- Timely and effective implementation of NGT Guidelines, meeting the timelines
- No parallel manual system of permits
- Printing of Secure QR code & Barcode on permit to check fraudulent permits and for easy checking of permits at the barriers
- Real time reporting of Vehicular traffic to Rohtang and Hamta Pass for traffic management
- Control over law breakers by Black listing the vehicles not adhering to law.
- Real time monitoring of amount collected as various charges
- Role based logins for department users
- Multiple MIS reports to track defaulters, multiple bookings, vehicle / phone wise reports which allow for analysis of data for control purposes
- No cash handling issues at the barriers due to facility to pay online fee or other two types of entry taxes too along with Rohtang and Hamta permit.
- Lesser stoppage times at barriers result in less pollution and lesser wastage of fuel due to idling of many vehicles.
- Lesser additional staff required for managing the permits issue
- The software has provision to control the number of vehicles, fuel and types of vehicles to be allowed and to declare a day as no vehicle day through the software itself, which also announces this on the website for the tourists and taxi/tour operators.
- No crowds and queues of people at SDM office, Manali for getting the permits

- Transparent and trustworthy system of permit issuance

Hardware/Software

Deployed in State Data Centre on Windows Environment

1. Operating System: Windows Server 2016 Data Centre Edition.
2. Data Base : Microsoft Sql Server 2016
3. Application Framework : .Net Framework (MVC)
4. Mobile Application Framework : Xamirin

Certification (Certifying Agency)

Web Application: The web application is Security Audited and is patched for all the vulnerabilities found.

Mobile Application: The mobile application and its web APIs are under security audit and cleared 2 phases of security audit.

Deployment Environment: All the security patches were applied to the deployment infrastructure as per the recommendation of NIC-CERT. The application is hosted with SSL implementation and is available on secure http protocol only

Disaster Recovery and Service Continuity

Centralize database of app is kept in database server at NIC HP State Data Centre. As per State data Centre backup policy, daily back of data is taken and kept in explicit storage device. Daily back up of data is also kept in the Disaster Recovery site at Pune. The backup of database as well as the VMs is scheduled to ensure zero data loss and is replicated to DR site for minimum downtime.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	**Brief service description with benefits**	**Volume (Nos) of Services year wise**		
		2020-2021	2021-2022	2022-23 (Upto date of nomination)
	Rohtang Permit	Pass closed during Pandemic	Permits 41.7 K Applications 64.9 K Fee 2.29 Cr	Permits 68.65 K Applications 1.06 Lac Fee 3.83 Cr
	Special Rohtang Permit	Pass closed during Pandemic	Permits 3913 Applications 8041 Lac Fee 21.5 Lac	Permits 6.12 K Applications 13.75 Lac Fee 34.1 Lac
	Hamta Pass Permit	Not Implemented	Not Implemented	Permits 390 Applications 523 Fee 2.32 Lac
	Manali Entry	Permits 335 Applications 1078 Fee 67800	Permits 2201 Applications 9523 Fee 4.73 Lac	Permits 4794 Applications 20 K Fee 10.67 Lac

Implementation

a. Implementation Coverage achieved in comparison to the plan / target

In the manual system one had to visit the office during working hours for issuance of Permit. So it was planned to get entire mechanism human intervention free and available 24X7. The application is the only mode to get the permit and is available round the clock for permit issuance and one can get permit from his / her own home using internet.

Improvements/ Enhancements

The application initially aimed to serve the issuance of permits for Rohtang Pass but after successful implementation it was extended for Manali entry, Special Rohtang Pass Permits and for the vehicles visiting places beyond Rohtang Pass (Discontinued after opening of Atal Tunnel). In current year the application has further extended to cater the issuance of permits to Hamta Pass one of the other well sought after tourist destination of the District.

With the expansion of Telephone network and availability of the affordable Smart Phones the need of mobile application was felt. For this two mobile applications have been also developed in the last one year for the help of tourists as well as administration.

ENABLER

Processes Re-engineered

Before the deployment of the application, the permits were issued manually from the counter deployed by the administration. This lead to long queues and great rush on these permit counters as there was huge demand for permits which were quiet less in number. The heavy rush of permit seekers frequently led to fights, creating law and order situations, lathi charge etc and throwing of stones on the Manali SDM/ Tourism office. Further there was no mechanism for checking the vehicle permit details as all the details are present in the single location as hard copy. The whole process created inconvenience to the tourists visiting Rohtang Pass, who practically had no chance of getting these permits. But after the deployment of the application following benefits have been realized:

- Any time anywhere application for the permit.
- No human intervention in generation of the permit.
- Online payments have resulted in saving of time, no cash handling and lesser reconciliation of payments
- Total transparency of the whole process.
- No need of special counters for permit issuance.
- Real time MIS of vehicular traffic to Rohtang Pass.
- Real time MIS of fund collected as charges of permit issuance.

Technologies

The various technologies used to make the system efficient are as under:

- **Cloud based deployment:** The application is deployed over cloud infrastructure and hence making the application and web services accessible without any downtime.

- **Mobile application:** Android Mobile application is hosted on Play Store to maximize the outreach.
- **Use of web APIs**: The application also exposes the secure web service to share data with mobile application, national reporting channels and departments different initiatives.
- **SSL implementation:** Secure HTTP channel is opted for secure communication for web interaction.

People

The capacity building is one of the major prospective of the successful implementation of any project. For proper capacity building following channels were opted: 1. Virtual trainings: The Video Conferencing system is one of the easiest ways to extend the outreach of the communication. Many sessions of the Video Conference were carried out to provide the elaborative trainings sessions on the functioning of web application. 2. Interactive Training session at HIPA: Many courses were arranged in HIPA to get the users feedback and interactive session for the brainstorming to carry out process re-engineering and to make the system as a end to end solution 3. Training videos were made to extend the information disbursement to the citizen and CSCs and LMKs All the changes and addition of new requirements is monitored by the team created at head office. The recommendations made by the team are implemented in the application.

VALUE INDICATORS

Learning's for sharing

[Financial Inclusion, Language, demographic and cultural differences may result in certain types of stakeholders not getting fully benefitted from e-Governance initiatives. Please describe the specific steps taken to address these indicators.]

The main challenge was to build the trust of every stakeholder on the end to end solution. With the successful implementation of the application now the stakeholders are more willing to opt for such mechanism and one more tourist destination is added to the system for the issuance of the permits. Initially the main challenge was to replace the manual system to entire digital end to end solution and the benefits were realized after the completion of one successful tourist season.

Digital Empowerment

[Financial Inclusion, Language, demographic and cultural differences may result in certain types of stakeholders not getting fully benefitted from e-Governance initiatives. Please describe the specific steps taken to address these indicators.]

Entire process is transparent and without any human intervention. This builds the trust of tourists as well as other stakeholder of the system. With the integration of Payment Gateway no manual receipts is made. So every bit of transaction is made digitally. This initiative is a good example for Digital Empowerment

Green e-Governance

[Green e-Governance is about application of Green computing practices to the domain of eGovernance. It involves adoption of environmentally friendly practices with respect to creation, use, and disposal of ICT gadgets / infrastructure. There are several dimensions to green e-Governance and prominent among these relate to disposal of e-

Waste. Describe the specific steps taken and other Green Governance initiatives.]

Entire process is online from permits issuance till verification of permits. This helps is usage of less resources like manpower and paper etc. This helps the Green e-Governance initiative.

Shri Ashutosh Garg, *Deputy Commissioner-Cum-Chairman, Kullu Tourism Development Council Manali, Govt. of Himachal Pradesh, dc-kul-hp@nic.in*

Shri Ajay Singh Chahal, Deputy Director General and State Informatics Officer Himachal Pradesh, *National Informatics Centre Himachal Pradesh State Centre, MeitY, ajay.chahal@nic.in*

Road Transport Authority - FEST

Department of Information Technology, Electronics, and Communication Govt. of Telangana & Electronic Services Delivery Wing – ITE&C Department, Government of Telangana

Jayesh Ranjan and Anshuman Mohanty

PROJECT OVERVIEW

RTA Fest aims to achieve the ultimate objective of Utopian Governance, which is, A citizen can apply for DL renewal service using a smartphone from his / her home on a Sunday without having the need to visit RTO.

It is currently in usage for 17 services across 4 categories.

It is an initiative undertaken jointly by IT E&C dept and Transport department.

In the current context, the initiative has received positive response from the citizens clocking ~1L transactions since its inception.

3 factor authentication using AI, ML and Deep Learning renders FEST higher degree of accuracy which can be a game changing aspect in digitalization of a no of manual government driven processes requiring identification authentication.

Hardware/Software

Software Net Framework	Net Framework v4.5	
	Java 8	
	Tomcat 8.4.0	
	Nginx and IIS	
	Net beans, Eclipse, Visual Studio, Android Studio, Xcode & Dex Protector , Native Apps	
	Hyperverge SDK, Digitlocker, SSO, Signup with Facebook and google and NIC SMTP	
Database	DB	Version
	Maria DB - Notification APIs	10.1.22
	MSSQL - Service APIs	11.0.6251.0
	MySQL – Payment Gateway APIs	8.0.4
Hardware	GOT Servers	36 (Active and Active/Passive)
	RAM	16/32 GB
	HDD	200 + 200 GB (Internal + External)
	Cores	02-04-08-16
	OS	Windows Server 2012 R2 Std Edition/RHEL 7.4 & 7.6

Certification (Certifying Agency)

Yes, AKS IT Services Private Ltd.

Disaster Recovery and Service Continuity

Backup infrastructure is in place leading to 99% uptime.

Maintenance / Service distortion activities are undertaken in the period where usage is considered to be low.

RESULTS INDICATOR

Name of e-Services	Brief service description with benefits	Volume (Nos) of Services year wise		
		2020-2021	2021 - 2022	2022-23 (Upto date of nomination)
Learning License Renewal	N/A			34049
Driving License Renewal				18196
Address Change in Driving License				7656

Implementation

a. Implementation Coverage achieved in comparison to the plan / target

Implementation plan is followed on a quarterly basis where services having high demand among citizens are gradually onboarded on RTA Fest.

b. Indicate improvements/ enhancements specifically rolled out during the last one year and those which are planned to be rolled out during next one year

RTA FEST runs on identification authentication mechanism powered by emerging technologies such as AI, ML, Big Data.

Based on the feedback received from the citizens and the errors identified while authentication, necessary changes in the rules of the identification mechanism are being made.

ENABLER

Processes Re-engineered

Manual process of physical identity authentication mechanism is replaced by 3 factor authentication mechanism through AI, ML and Deep Learning.

Citizen need not visit RTO office in the entire process making the whole process as virtual as against the popular perception of multiple RTO visits for availing transport department services

Technologies

Citizen Identification and verification services includes

- Photograph matching & Facial Recognition
- Liveness Checking
- Demographic data matching

1. Photo Matching and Facial Recognition T APP Photo Matching and Facial recognition solution performs fallowing types of comparisons as part of the citizen identity and validation services
   - VERIFICATION- The system compares the given individual with who they say they are and gives a yes or no decision. ▪ IDENTIFICATION- The system compares the given individual to all the other individuals in the database and gives a ranked list of matches.

   Process Steps
   - Image acquisition
   - Image processing
   - Distinctive characteristic location
   - Template creation

- Template matching

2. Liveness Checking

   Liveness detection is the technique used to identify whether the captured facial image is a live human being or a fake before disbursing the service to the citizen as part of the citizen identity and verification solution.

   Steps

   1. Face Capturing
   2. Face Recognition
   3. Liveness Validation

3. Demographic Matching

   Demographic matching solution verifies the citizen provided demographic details (Name, DOB, Gender and address including the photograph against the data available in the department backend system. It can be done in two ways

   - For Data available in the department backend system.
   - AADHAAR based authentication Services (Photo and demographic data not available cases

People

Training / Knowledge Transfer sessions are being planned for respective departments whose services are onboarded.

Change Management is planned in a strategized manner with the help of SOPs (Standard Operating

CSeGA-2022 Project Category Nomination Page 7

Procedures) where the processes are documented for knowledge management purpose.

VALUE INDICATORS

Learning's for sharing

[Projects throw up challenges and opportunities for the teams involved in conceptualizing, planning and executing / maintaining / supporting the projects. Briefly cover key learnings, best practices, from these aspects including any innovative / disruptive technologies, process changes that have been used.]

Change Management is planned in a strategized manner with the help of SOPs (Standard Operating Procedures) where the processes are documented for knowledge management purpose.

Frequent demonstrations to delegations from across states / centre help in receiving feedback on the existing setup which are then incorporated on the basis of priority.

Digital Empowerment

[Financial Inclusion, Language, demographic and cultural differences may result in certain types of stakeholders not getting fully benefitted from e-Governance initiatives. Please describe the specific steps taken to address these indicators.]

As an initiative which was launched during Covid 19 era, ease of usage propelled organic growth of RTA FEST.

Citizens provide feedback about RTA FEST through various channels (e.g., Social Media platforms etc.) which get incorporated, if deemed fit.

Green e-Governance

[Green e-Governance is about application of Green computing practices to the

domain of e-Governance. It involves adoption of environmentally friendly practices with respect to creation, use, and disposal of ICT gadgets / infrastructure. There are several dimensions to green e-Governance and prominent among these relate to disposal of e-Waste. Describe the specific steps taken and other Green Governance initiatives.]

The whole service delivery of RTA FEST is paperless in nature making it a green governance initiative

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Shri Jayesh Ranjan, *Principal Secretary to Government, Department of Information Technology, Electronics, and Communication Govt. of Telangana, secy_itc@telangana.gov.in*

Shri Anshuman Mohanty, *Consultant to the Government, Electronic Services Delivery Wing – ITE&C Department, Govt. of Telangana, anshuman.mohanty@auctusadvisors.in*

Himachal Online Seva

Department of IT, Govt. of Himachal Pradesh & TerraCis Technologies, Himachal Pradesh

Chandan Parmar, Sandeep Thakur and Jitendra Kumar

PROJECT OVERVIEW

The Himachal Online Seva also known as e-District is a Mission Mode Project (MMP) is envisaged to strengthen the district administration of the States by providing ICT support to the participating departments and district administration in terms of providing centralized software application for citizen services and trainings for staff of the departments with a view to improve delivery of the citizen-centric services being rendered by these departments. Services developed under Himachal Online Seva/e-District project are delivered through various delivery channels like: Direct access by Citizens through Himachal Online Seva portal as a registered user. Existing Lok Mitra Kendra's / Common Service Centers which are being established up to Grama Panchayat Level of the State of Himachal Pradesh.

Hardware/Software

The SW environment is JAVA, Microsoft SQL, DB2 and Windows 2012/R2 are used in Himachal Online Seva.

Certification (Certifying Agency)

The formal certification has been obtained from The Third Party Auditor of Himachal Online Seva.

Disaster Recovery and Service Continuity

Server and DB backup

RESULTS INDICATOR

Name of e-Services	Brief service description with benefits	Volume (Nos) of Services year wise		
		2020-2021	2021-2022	2022-23 (Upto date of nomination)
Bonafide Himachali	Bonafide certificate is certification provided to the citizen by the government confirming and testifying their place of residence in the district of Himachal Pradesh. This certificate establishes the identity of citizen for all legal and official purposes like admission to educational institutes, etc.	233615	310574	232046
OBC Certificate	A OBC Certificate is the proof of one"s belonging to a particular caste, especially in case one belongs to any of the "Other Backward Castes", as specified in the Indian Constitution.	1,01,248	1,37,110	95,735

Character Certificate	Character Certificate is given for an individual to certify the proof of an individual. It is normally like a recommendation letter which deals with the positive, good character and the overall abilities of a person.	2,44,378	2,07,713	2,21,950
Income Certificate	Income certificate is issued to certify the family income of the applicant. Income certificate is often necessary to obtain concessions meant for poor persons or families below poverty line. Income certificates are needed for the following purposes like getting Ration card, Government subsidies, allotment of house sites, weaker sections housing, scholarships, etc. More importantly weaker section of society can use this to avail government benefit from various schemes.	3,07,718	3,99,381	2,75,134

Implementation

a. Implementation Coverage achieved in comparison to the plan / target

The whole State of Himachal Pradesh is covered by Himachal Online Seva. The door-step delivery of services makes it easier for the users. The approved/rejected service is deflected in the account of the applied user as well as the officer dealing the application.

b. Indicate improvements/ enhancements specifically rolled out during the last one year and those which are planned to be rolled out during next one year

The expansion of the number of services provided in Himachal Online Seva. The services of Himachal Online Seva

Improvements / Enhancements

ENABLER

Processes Re-engineered

Automation of the old manual process into the online mechanism. The old process has been adopted in the flow of applications provided in Himachal Online Seva.

Technologies

Data Analytics & Dashboards including the Geographic Information System are the new adopted technologies.

People

Awareness programs and trainings are been given from time to time for capacity building. The jingles are also published on radio and the newspapers are also assigned to print the project benefits from time-to-time

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VALUE INDICATORS

Learning's for sharing

The baseline study was done initially to verify the possibility of the online solution. The old orthodox method was studied in order to begin with an online mechanism.

Digital Empowerment

Himachal Online Seva has led to on-demand services and Government- on demand.

The digital empowerment has spread awareness assuring that the citizens have access to digital infrastructure and its facilities/benefits. It ensures that all citizens of the State are moving positively towards various digital improvements.

Himachal Online Seva has also increased the usage of the services provided by various departments. Himachal Online Seva has also helped increase in Revenue of the State & digital empowerment of the people. The digital empowerment has led to ease of living as the citizen are getting door-step delivery of the services applied through Himachal Online Seva. Moreover, the services provided under the project are cashless as well as paperless. The services are mapped with Parivar Register, Digital Locker and CSC kiosks so the applicant receives a hassle-free response which adds to the ease of living.

Green e-Governance

Himachal Online Seva is fully online, cashless & paperless service. In other words, it can easily be stated that it is a go-green initiative reducing the paperwork to zero. The cashless service also makes it one of the kind beneficial as there are less chances of revenue leakage. Himachal Online Seva has minimized the carbon emissions since it is a paperless service. Going digital reduces this pressure to control air pollution. The waste produced by paper-related industries also does great harm to our ecosystem. Simply taking a digital initiative by saving the files onto a computer or online or in a secure database instead of on paper goes a long way in protecting the Earth. The details of the applied service are saved in the user's as well as the concerned officer's account also and can be accessed from anywhere and anytime

Shri Chandan Parmar, *Deputy Manager IT GoHP, State Department of IT, Govt. of Himachal Pradesh, Chandan.parmar@hp.nic.in*

Shri Sandeep Thakur, *Con SeMT, Scientist-F, State Department of IT, Govt. of Himachal Pradesh, Sundeep.thakur@semt.gov.in*

Shri Sh Jitendra Kumar, *Manager TerraCis Tech, TerraCis Technologies, Himachal Pradesh, Jitendra.kumar@terracistech.com*

Shram Sewa Portal

Labour Department, Govt. of Madhya Pradesh & National Informatics Centre Madhya Pradesh State Centre

Sachin Sinha, Sanjay Jain and Pushpankar Chand

PROJECT OVERVIEW

Objectives:

The project is focused on to replace existing manual system of registration of workers with Online system in order to ensure fast, effective, transparent, convenient and hassle-free service delivery to citizens in term of Registration and renewal of construction workers and benefit disbursement to them under various schemes under BOCW.

- To replace manual system of registration, renewal and issue of registration cards to construction workers with a computerized system.
- To link this registration process of workers with Household Verification Survey.
- To ensure financial inclusion and e-Payment, Digital signature bases payment to workers.
- To facilitate service delivery to construction workers from any place of his convenience.
- To ensure fast, effective, efficient service delivery in a transparent manner.
- To facilitate Knowledge management & Online Submission of suggestions and complaints

Major components of the system include:

- Online CESS Collection using payment gateway interface, reconciliation.
- Online registration & renewal of workers and their family members, online generation of the BoCW membership card, management of the profile of workers & their family members for scheme benefits, cancellation of the membership card, auto-expiry of the card as soon as the worker lose the eligibility as per rules.
- Online management of application of 19 welfare schemes being run by board, processing of applications.
- Online management of processes related to sanction of applications for benefit of schemes.
- e-Payment Authority Management, Digital signature management.
- e-Pay Order Generation management.
- Host to host integration of portal with banking system of Nodal bank for automated processing e-Pay Orders to facilitate DBT from single bank account of the Board.
- Online management of budget to be allotted to district labour officers for meeting Administrative expenses for MPBOC activities, online management of administrative bills for administrative expenses, online e-Payment management system for administrative expenditure by labour offices from MPBOC bank account.

Stakeholders The portal is meant for and useful to various stake holders including workers in the unorganized sector, entrepreneurs, Industries and Commercial

Establishments, Labour Department Headquarters (Labour Commissioner Office), Around 53 District / Field Offices of Labour Department, 313 Janpad Panchayats, Directorate of Industrial Health and Safety (Factory Inspectorate) & its field Offices, Various Government Boards, Corporations, 336 Local bodies and Departments, Construction Agencies, Registering Authorities, Sanctioning Authorities, Factories, Trade Unions, Association of Employers, Media, NGOs and Public.

Benefits:

System now ensures following benefit/convenience to citizens:

- Improvement in services by improvement in response-time
- Cost reduction, both to Government and beneficiaries
- Online availability of all records and continuous automatic updation.
- Unique Portal Code to registered beneficiary resulted in weeding out 6.85 lacs fake/ duplicate cards
- Elimination of agents, middlemen

Minimum travel for citizens to avail services:

- Applicants are relieved from frequent visits to the office reducing cost and time.
- Applications are mostly received either online or from PSG Kendras and MP Online Kiosks thus More convenient and easier process (24 x 7, no constraint for place);.
- The applicant gets acknowledgement through SMS alerts at various stages. He can track the status of application online, gets SMS alerts about date of sanction and sanctioned amount. Any shortcoming is communicated during entry of the application itself.

Process simplification: In terms of reduction in administrative costs & efforts as

- Simplified procedures, electronic movement of processes and submissions
- Minimum file work, System Generated and Digitally signed certificates.
- Reduced administrative burden (department with less number of staff is performing the same task with more accuracy and efficiency).

ICT interventions/Initiatives undertaken: The initiative tried to harness the use of IT/ITES to improve the delivery of citizen services/governance by

- Online registration, delivery of benefits directly to the beneficiaries' bank account from any point of convenience
- Incorporation of QR Code & Digital Signature.
- SMS Alerts, Application Tracking & downloading certificates by applicants
- Integration with Samagra, a state population database with a strong search engine
- Integration with Lok Seva Guarantee Act for service delivery in prescribed time.
- Integration with CSCs & MPOnline Kiosks

Current Status: The ShramSewa Portal has been functional for more than 3 years handling more than 2 lakhs applications/year. Services of the Portal have been brought under Public Service Guarantee Act guarantying services within a prescribed time limit of 30 days. The Portal has been able to deliver services in average time of 7-12 days through 753 service providers i.e. District Labour Officers, Block Panchayats & Urban Local Bodies. Financial support for maintaining and upgrading the Portal is available with Labour Department as well as the Board of Construction Workers of the State. Development and integration of portal with Samagra (SSSM) Portal has resulted in

weeding out 4.32 lacs fake/duplicate cards resulting in a huge saving to the M.P. Building and other Construction Welfare Board and also inclusion of genuine beneficiaries. Now fast & efficient services are available to citizens in a transparent manner.

Achievements/ Major Milestones

- Issue registration and renewal of cards to building and other construction workers and delivery of social welfare benefits to them. Online management of database of over 66 lakh beneficiaries that include 13.75 lacs registered workers and 54 lacs family members of registered workers.
- To improve the delivery and quality of these services, Labour portal (labour.mp.gov.in) has been developed and implemented in April 2018 with a purpose of ensuring transparent, effective and citizen friendly services. For effective and successful running of this portal an intensive state-wide training drive was conducted for the officials of Labour Department and Urban & Rural Bodies.
- Online collection of CESS of Over Rs. 250 Cr. per year through payment gateway.
- 6.5 lacs applications for benefits of 19 schemes have been processed and sanctioned.
- e-Payment of Rs. 600 Cr approx has been made to 6.5 lacs beneficiaries as scheme benefits.
- During the covid lockdown period, financial assistance / relief of Rs. 177 Cr. was released as e-Payment to 8.85. lacs workers registered with board.
- During Lockdown One click event was held for disbursing benefits. One click was done by Honorable CM.

Hardware/Software

Platform Components	**Sub- components**	**Technologies used**
Web portal & Backend	Database Layer	MS SQL Server/Postgres
	Business Logic	Microsoft Asp.net
	Service Layer	REST
	Presentation Layer	Asp.net, Jquery, HTMLS, CSS
	Middleware	Microsoft Asp.net
Android Client	Database Layer	SQLite
	Business Logic	Java
	Service Layer	REST

Certification (Certifying Agency)

Hosted on National Informatics Centre Data Center (as per the Govt. norms

Disaster Recovery and Service Continuity

Data Centre - National Informatics Centre (as per the Govt. norms

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RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	**Brief service description with benefits**	**Volume (Nos) of Services year wise**		
		2020-2021	2021-2022	2022-23 (Upto date of nomination)
Issuing new	New Registration of	1201821	1234508	158434

MPBOC Cards	Building and other Construction Workers Cards including Family Members			
Renewal of MPBOC Cards	Renewal of Building and Other Construction Workers Cards	3223	1072	182
Applications for Scheme Benefits	Registration of application under 19 schemes of Board	53158	92964	7913
Scheme Benefits Sanction	Sanctioning of application after scrutiny	53158	92964	7913
Scheme Benefits Disbursal.	Creation of Electronic Pay order and Digitally signing of EPOs	53158 cases 258.58 crore	92964 cases 559.52 crore	7913 cases 59.76 crore
Disbursal of Administrative Expenses	Budget allotment for District Offices and creation of Electronic Pay order and Digitally signing of EPOs	2473 bills 4.25 crore	2379 bills 4.85 crore	880 bills 1.63 crore
CESS Collection	1% Collection of CESS on construction works through Payment Gateway.	73 crore	110 crore	69 crore
Shramodaya Vidyalaya	Online application for exams, enrollment and admissions.	24000	6000	4800

Implementation

The portal is meant for and useful to various stake holders including workers in the unorganized sector, entrepreneurs, Industries and Commercial Establishments, Labour Department Headquarters (Labour Commissioner Office), Around 53 District / Field Offices of Labour Department, 313 Janpad Panchayats, Directorate of Industrial Health and Safety (Factory Inspectorate) & its field Offices, Various Government Boards, Corporations, 336 Local bodies and Departments, Construction Agencies, Registering Authorities, Sanctioning Authorities, Factories, Trade Unions, Association of Employers, Media, NGOs and Public.

Improvements/ Enhancements

1) Integration of service with different department to facilitate the benefits under different schemes run by other departments e.g. Health, Higher Education,Ayushman Bharat - National Health Protection Mission, Social Justice & Empowerment and Food Department.
2) Integration of Services with e-Shram Portal Government of India.
3) Design and development of Mobile Application for household survey.
4) Department has taken KUA license for e-KYC of the Beneficiaries. The process of e-KYC is under process and will be implemented soon.

ENABLER

Processes Re-engineered

- Manual system was revamped to convert it into online application and service

delivery. Now in case of online application, applicants need not to visit the offices at all and need not to stand waiting in queues that has increased citizen satisfaction.

- No affidavit/attestation of documents required, thus service delivery on the basis of self-attested documents. The no. of documents required was also reduced making the process easier.
- Downloadable and digitally verifiable certificates/cards leading to ease as well as authenticity.
- Various welfare schemes being run by different departments/boards of the State have been now rationalized, converged and grouped into various logical groups.
- The responsibility of implementing the schemes of similar natures / group has now been designated to one nodal department that will now implement the schemes on behalf of the other departments.
- It may be treated to be a huge convergence and BPR exercise in any Government set-up.
- Building Construction Employers • Construction Workers and delivery of social security benefits through ECT.
- All services under Public Service Guarantee (PSG) Act F. Mobile App [m-Shram Sewa App] launched available on Google Play Store}
- MP-Online Kiosks (Around 8k Kiosks across State) permitted for accepting cash for application fees / security.
- Integration with Household verification survey of SSSM (Serva Samajik Suraksha Mission). J. Risk based regulated inspection system.

Technologies

- Technological solution adopted [including the maintenance model]
- Compliance of the Technology adopted with e-Government standards notified / recommended by the GOI [Please refer to https://egovstandards.gov.in/] including security and confidentiality. 3.
- Strategy for Disaster Recovery and service continuity. 4.
- Briefly describe the impact and value addition thru adaption of Social media platforms for the project.

Methodology/technology of implementation.

- Base line study: Team from IBM was invited to conduct a base line study in the month of April 2012 and recommendations were duly incorporated.
- Selection of System Integrator : NIC was identified to develop and maintain the portal
- Problems identification: SRS Developed. The main problems identified were related to Slow Manual processes, Procedural delays, long pendency, lack of transparency
- Stakeholder Consultation: Meetings held with representatives of various categories of stake holders during conceptualization and design of the project. Feedback was also obtained at various stages of development.
- Roll out/implementation model: Pilot in selected districts and final roll out throughout the state after obtaining and evaluating valued feedbacks from users.
- Communication and dissemination strategy: Meeting with concerned

stakeholders, conducting training at Divisional and District levels, Message disseminated at larger level through Circulars, Notice Boards, and Newspaper Advertisements.

.**People**

- Leadership support for capacity building, visibility of actions with current status
- Change management and Capacity building strategy defined and status thereof
- Project management & Monitoring adopted [whether full or part-time program management teams in place, roles and responsibilities of department officials/consultants etc]

The entire system is broken down into functional & independent sub-systems called modules. The nodal officers nominated by the Labour Commissioner coordinated the designing and Development team of NIC for finalizing the requirements and desired functionality of the modules. NIC submitted the details of expected requirements and functionality to the department for approval. After development of modules the UAT was conducted and the portal was launched along with the training to all concerned officers and computer operators. In 2018 the responsibility of BOCW module was shifted to local bodies so strategy was planned for smooth transition to the designated officer in local bodies of all districts. For that training and handhold support was provided and resource support was also provided for a month.

VALUE INDICATORS

Learnings for sharing

These services implemented by Labour Department, M.P. have led to a step ahead towards Citizen-centric, Fair, Transparent, Fast & efficient system, proving to be among the build blocks of Digital India Initiatives.

Digital Empowerment

- Bilingual and Unicode supported portal
- Facilitation to citizens through loksewa Kendra/kiosk operators.
- Contact details and other instructions/information's displayed at portal.
- Awareness through media and notices at field offices.

Green e-Governance

Taking into account Green e-Government as described above, describe the specific steps taken to address the factor.Less paper work and storing digital data (including MIS as well as scanned documents) has considerably reduced the paper consumption leading to sincere contribution towards Green e-Governance.

Shri Sachin Sinha, *Principal Secretary, Labour Department, Govt. of Madhya Pradesh, pslabour@nic.in*

Shri Sanjay Jain, *Secretrary, M.P.Building and other construction worker welfare board, Labour Department, Govt. of Madhya Pradesh, bocboard@mp.gov.in*

Shri Pushpankar Chand, *Scientist, National Informatics Centre Madhya Pradesh State Centre, chand.pushpankar@nic.in*

e-BEVCO

WBSBCL, Finance Department, Govt. of West Bengal & National Informatics Centre West Bengal State Centre

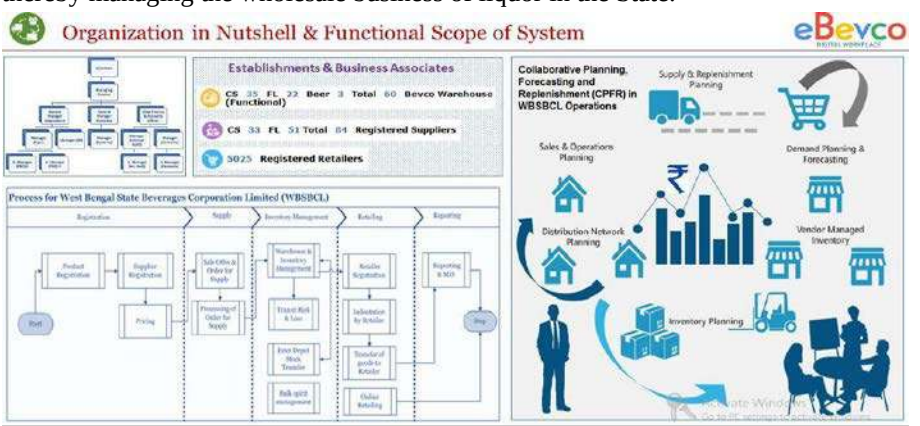
Umashankar S, Subhmoy Goswami and Mainak Mukhopadhyay

PROJECT OVERVIEW

West Bengal State Beverages Corporation Limited (WBSBCL) was established on 25th January 2017 to take over the business aspect of the supply chain management of liquor throughout the state of West Bengal to curb the problem of illicit liquor and hence to make available proper quality and quantity of liquor to the consumers at a uniform rate throughout the state and to remove middlemen between manufacturers/suppliers and retailers so that the state could avoid revenue leakage.

WBSBCL has become the sole wholesaler for all kinds of liquor in the State of West Bengal with exclusive rights for sourcing and pricing of packaged liquor and beer in the state.

The corporation is basically an intermediary between the liquor suppliers, manufacturers, distributors and brand owners located within or outside the state on the one hand and the 6000 odd retailers spread across the state on the other. It procures packaged liquor from the registered Distributors and sells the same to the retailers thereby managing the wholesale business of liquor in the State.



This policy pronouncement has initiated a new model in liquor business of the state to regulate the manner and method in which sourcing of all kinds of Country Spirit, Foreign Made Foreign Liquor (FMFL), Indian Made Foreign Liquor (IMFL) from manufacturers would be done by the WBSBCL.

Technically and legally the corporation operates independently and is a separate entity from the Excise Directorate. The directorate enforces State Excise Policy and collects State Excise Taxes. The corporation on the other hand is a corporate entity tasked with running the wholesale business of liquor in the State. It strives to earn enough cash to sustain itself and enough surplus to pay dividends to the Government.

However, given the fact that liquor is a restricted substance whose business is highly regulated by the state government, and given that the Intermediary is a government-controlled entity, there are very close linkages between, and even some overlapping

of functions of, the Excise Directorate and The Intermediary.

For example, the entities in West Bengal that the Corporation procures bottled liquor from, and sells bottled liquor to, is limited to the universe of entities licensed / registered by the Excise Directorate. Likewise, the products that the corporation is able to trade in, is limited to the products registered with Excise Directorate.

To manage the operations of WBSBCL, an integrated enterprise wide solution became essential. This solution would cover the functions of Corporation as well as the supply chain management of liquor from production to point of sale at retail outlets. NIC was entrusted to design, develop and deploy a suitable online solution in line with the goals defined by WBSBCL.

The eBevco system (available at https://excise.wb.gov.in/WBSBCL) is made operational from July 2017 across the state of West Bengal. The functional scopes of e-Bevco project are as follows:-

- To regulate the revenue generation for the West Bengal State Beverages Corporation Limited.
- To monitor movement of spirits, beer and Liquor (Indian Made Foreign liquor or Country Spirit, Foreign Liquor etc.)To maintain and access key information from a centralised system. Act as deterrence to non- compliances during the entire manufacturing as well as dispatching process.
- To record and regulate the dispatch of Country Spirit and Foreign Liquor and prevent illegal dispatch of liquors
- To ensure that all dispatched against Orders for Supply from the Corporation are made from stocks in respect of which Excise Duties and Additional Duties have already been realized.To ensure that payable pass fees and applicable duties are realized at the time of processing requisition for import against supply orders from the Corporation.
- Real Time status of all the Licensed units with respect to manufacturing and supply chain.
- To ensure that non-functional or suspended retail outlets cannot book stocks from the Corporation.

The key e-Services covered under e-Bevco project are:-

- Registration of Suppliers (for Supply through Import & Transport)
- Automated Order for Supply based on Business Analytics
- Indents for Supply by RetailersInvoice by Suppliers & Warehouses

- Integrated Online Payment Gateways powered by banks and third party aggregators for Payments by Retailers & WBSBCL

Business Intelligence for decision making

- Know e-Service Status Through SMS (Pull SMS Service)
- Integrated Messaging (Push & Pull SMS) Service and e-Mail Service for Alert/Notifications 9. Mobile App 8. Bottle & Cartoon level QR Code for Track & Trace of Packaged Liquor using Hand Held Terminal (HHT)
- Real timeInventory for Reconciliation of manufactured /imported packaged liquor
- Key Performance Indicator (KPI) to provide valuable drill down capabilities to fully examine data till bottom level
- Reporting and analytics of key operational & financial parameters of Beverage Corporation.
- Facility for inventory management & forecasting for
    - Stock turn over details for bottled liquor at depots and
    - Average Inventory value in depots/warehouse.

The corporation being the exclusive wholesaler of packaged liquor in the state, any Distributor desirous of marketing its products in West Bengal must do so through the Corporation and hence must register with the Corporation. This is done through the Distributor Registration Module.

The entire process flow starting from preparation of application, upload of essential documents and payment of requisite registration fee, approval or rejection of the online application by the corporation and delivery of user credentials in case of approval by automated SMS to the registered mobile number of the applicant is handled through this eModule. There is absolutely no need to visit the corporation office physically.

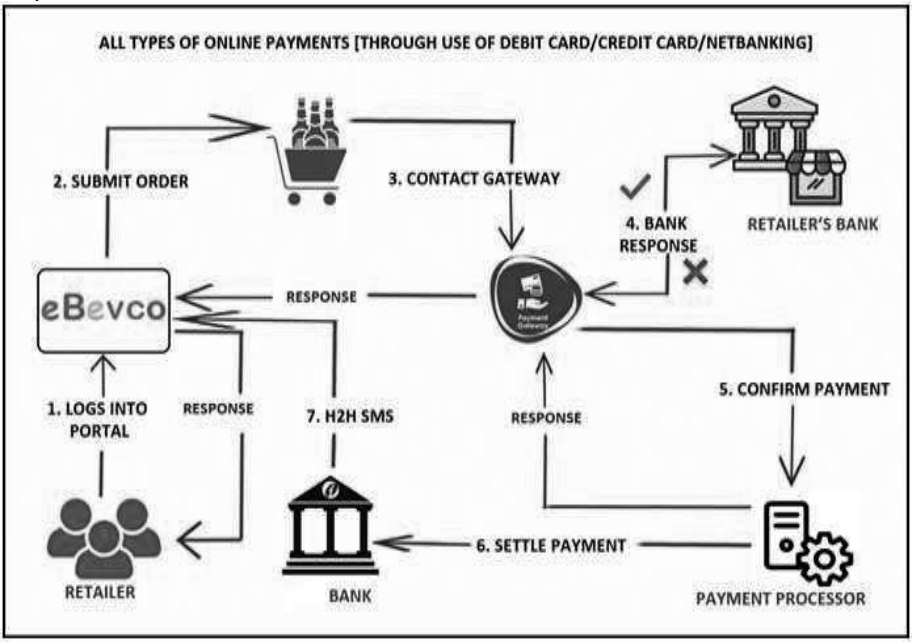
The Corporation operates 21 foreign liquor depots, 35 country spirit depots and 6 exclusive beer depots across the state for procurement of packaged liquor from 17 registered Distributors and wholesale among 5200 licensed retailers. Manufacturing units and liquor brands are mapped to each Distributor based on online mapping requests. Supplies to the depots of the corporation are based on orders for supply from the corporation against sale offers or requisitions raised by the distributors.

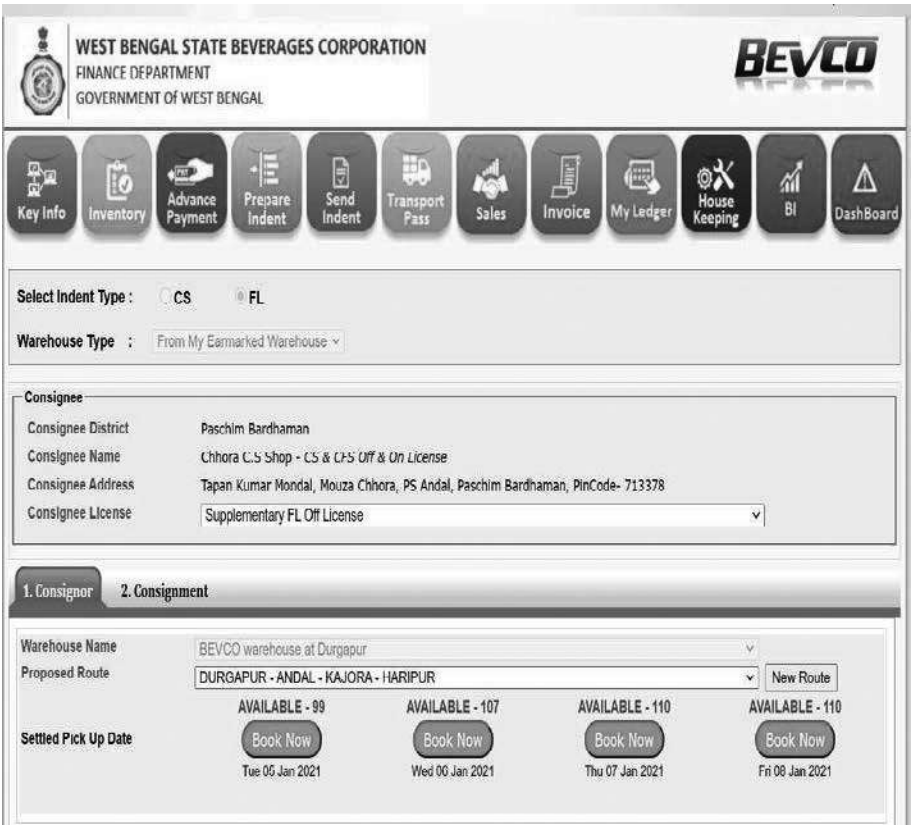
The e-Bevco software intelligently calculates demand against a particular product on the basis of warehouse wise historical transaction data of that product during a certain number of days and other factors like supply, secondary sales, pending orders, booked and free stocks, and some logic inputs by the corporation management. Sale offers are generally restricted to the projected demand quantities as assessed by the software with a certain allowance over and above the assessed quantity to factor in sudden fluctuations in demand.

The corporation deals with around 2000 registered products of IMFL, BIO, OSBI, country spirit brands including supply of some BIO brands through the Customs Duty free channel. Each SKU is mapped to the distributor and secondary sales are booked against the concerned distributor for eventual payment of landed costs. The entire iventory of liquor in all the warehouses including each stock credit or debit transaction is managed using the eBevco application

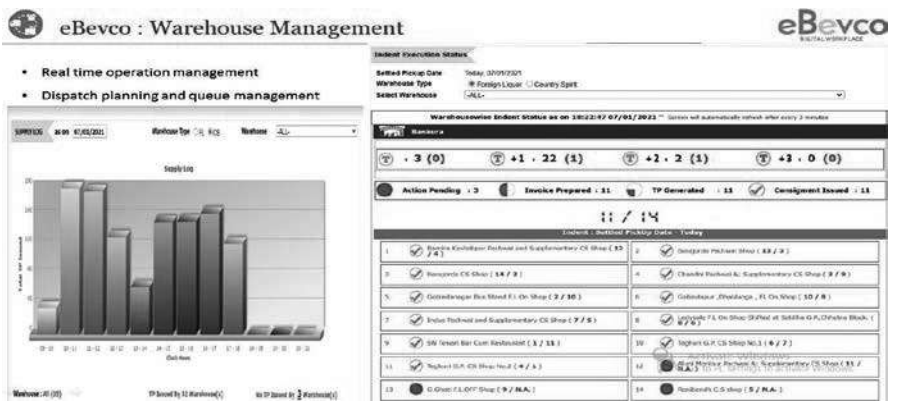
All the retailers have access to the eBevco portal. The portal offers them a system guided consignment basket for booking of stocks from a depot.

The system works on a shopping cart model where retailers can add items of their choice to the cart. The products are listed with all details like brand name, pack size, package type, MRP, brand owner and manufacturer information, product ID, cost price, retailer margin per case etc. Only the stocks not yet booked and thereby free for indenting are shown to the retailers. Stocks are blocked in favour of a retailer only once the payment of procurement costs have been successfully made to the corporation.





Real time operation management, dispatch planning and queue management facilities are an integral part of the eBevco application.

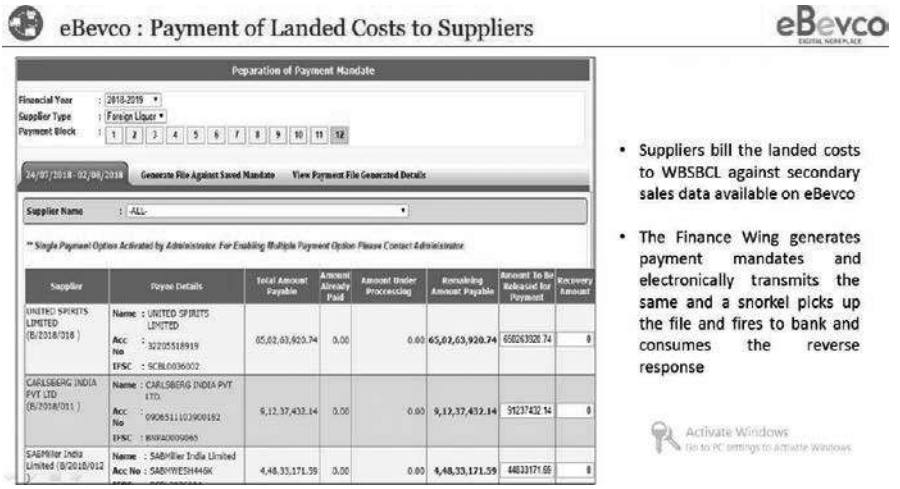


Once a payment successful indent is placed to the Depot, the Depot Manager generates a loading advice from the system. The loading advice is basically a batch and manufacturer wise list of products available at the depot corresponding to the products for which indent has been placed and the Depot Manager or the concerned floor assistant has to choose the particular batch from which the delivery has to be made.

The secondary sale, i.e., sale from a corporation depot to a retail, against each product is mapped to the concerned distributor. At the end of each billing cycle the system calculates the landed cost payable by the corporation to a distributor based on secondary sales.

The bank account information against each distributor is mapped to its profile. At the end of the billing cycle the finance wing of the corporation generates electronic payment mandate on the basis of the system data and the mandate is fired to the bank through the necessary administrative layers and SMS OTP based authentication.

The entire process is handled using the eBevco application. Once the mandate is fired to the bank, the payments are transferred to the distributors' accounts and the bank fires a reverse MIS showing payment status. This information is then posted against the supplier which completes the accounting.



In fact, eBevco includes the entire financial package necessary for financial accounting of the company and preparation of balance sheet.

The retailers, distributors and manufacturers are also provided various MIS reports under Business Intelligence for maintaining accounts at their end.

Certification (Certifying Agency)

Cyber Security Certificates received from CERT-In empanelled agency declaring the project free from Cyber Security Vulnerabilities e.g. Cross Site Scripting (XSS), Injection Flaws, Malicious File Execution, Insecure Direct Object Reference, Cross Site Request Forgery, Information Leakage and Improper Error Handling, Broken Authentication and Session Management, Insecure Cryptographic Storage, Insecure Communications, Failure to Restrict URL Access, Buffer Overflows and Denial of Service.

Regular Application Security Audit is done to search & mitigate new cyber security threats in e-Bevco.

Disaster Recovery and Service Continuity

WB-SDC, Kolkata where e-BEVCO Portal is hosted, has Disaster Recovery facility with DR site located in IDC, Shastri Park, New Delhi.

Asynchronous replication over WAN using FC-IP protocol and seamless connectivity with DR site over 34 Mbps leased line minimizes any negative impacts to e-Bevco

operations. In a nutshell, following strategies are in place:-

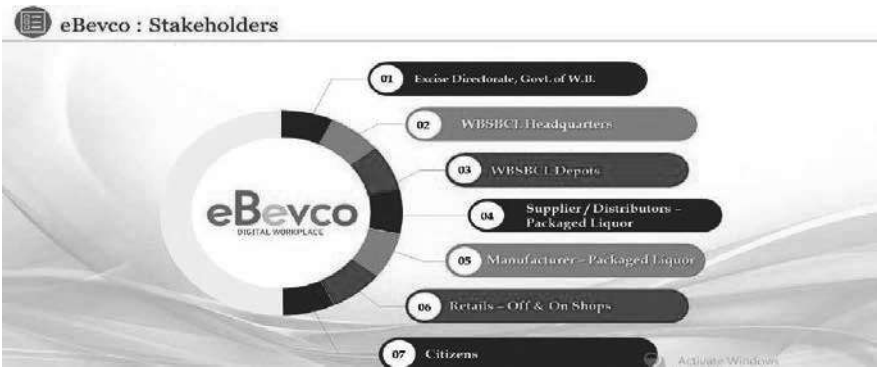
- Co-located System in State Data Centre
- 2 App & DB Server with SAN Storage
- Load Balancing (Array Load Balancer) through 2 App Server following Least Connection Algorithm
- SQL Server Always On Failover Clustering between 2 DB Servers. If one of the servers, or nodes, fails, another node in the cluster can take over its workload without any downtime
- SQL Server Transparent Data Encryption
- DR at Shastri Park, New Delhi

Till date, e-Bevco is Scalable System as it has been able to handle (a) increasing concurrent users (b) increasing workload on DB & App Server without affecting its performance. STQC has conducted Load & Stress Testing. In production environment, we have deployed 2x2 App & DB Server to achieve horizontal scalability through Least Connection Load Balancing.

RESULTS INDICATOR

The end-to-end solution through e-Bevco system comprises among others systems for Registration of business associates, Automated Supply Order to Suppliers based on system driven demand assessment, systems to regulate and monitor movement of packaged spirits upon receipt at warehouse and up till shipment to Retail Outlets, release of payment to supplier on receipt of sale information from retailer based on indentation, Invoice management, Tracking, reconciliation of bottles/cases with alerts & exception reporting, Reporting and analytics of key operational & financial parameters, Management of supplies and inventories of packaged liquors, Integration with banking payment gateways etc.

The system enables Track & Trace of Packaged Liquor through adoption of Case & Bottle level QR Coded Labels & Hand Held Terminal (HHT) for ease in Dispatch, Receipts & Sales and thereby the Stock Inventory.



Operations being implemented using e-Bevco are at WBSBCL, Headquarters are:- Processing of electronic requests for Supplier Registration and Renewal; Brand and bottler mapping against products with Suppliers / Brand Owners; Receiving Online Request from Suppliers for issuance of OFS & Inter-depot transfers; Issuance of OFS (automated); Consuming payment settlement MIS from different Payment Gateways

for reconciliation of receipts; Periodical Supplier payments including payment mandate generation and bank response reconciliation; Inactive Stock

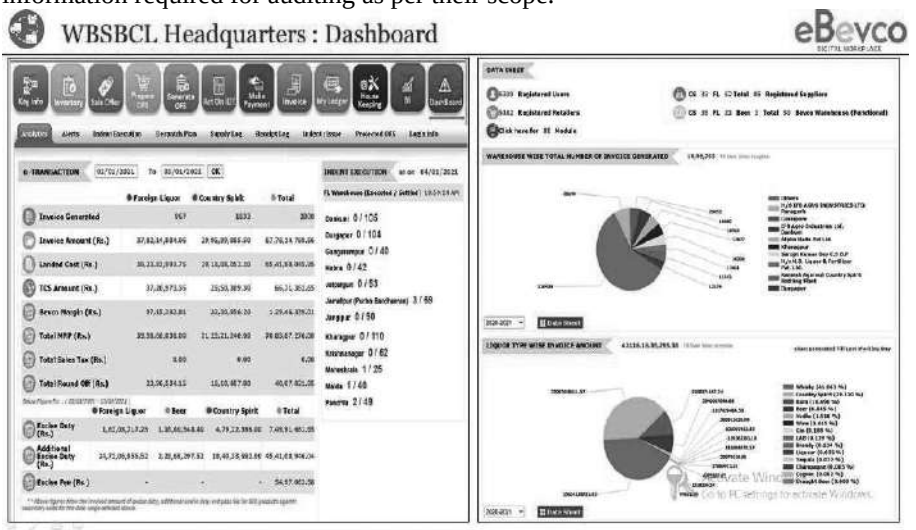
Penalty Calculation; Generation of various types of reports / information; Inventory Management of WBSBCL Depots; Issuance of Special Orders for Supply under certain circumstances; Issuance of Transfer Out Order (TOO) for Inter-Depot Transfer; Receipt of Stocks at WBSBCL Depot; Crediting Amount deposited by Licensee to her/his ledger / eWallet; Sale of IMFL, Beer & FMFL to Retail Licensees; Executing Inter Depot Transfer Transactions; Online Payment of Excise Fee to Government; Payment to Suppliers through RTGS; Integration with banks for getting real time details of funds deposited by licensees through Cash, Internet Banking, NEFT and RTGS; • Financial Accounting; Store Management of Finished Goods of WBSBCL; Payment to supplier against secondary sales data generated by e-Bevco; Tax collect at source (TCS); Demurrage calculation; Product cost card generation based on MRP and Ex-Factory Price as declared by the Supplier.

Operations being implemented using e-Bevco at Depots are:- MIS of Materials Received; Crediting amount deposited by licensee into his / her ledger maintained in S/W; Issuance of Secondary Sales Invoice to Retailers; Generation and issuance of Transport Pass for movement of goods from depot to retail outlets or to other Depots in case of Inter Depot Transfers; Batch-wise Liquor Stock Management; Licensee Ledger Management; Transferring Stock to Other Depots; Liquor Stock Position, Ledger of each brand available at depot; Liquor Inward & Outward Transactions i.e. MIS, Transfers.

Operations being implemented using e-Bevco by Suppliers are:- Request for Issuance of Order for Supply to WBSBCL; Request for Issuance of Order for Inter- depot Transfer to WBSBCL; Receiving OFS approved & issued by WBSBCL; Getting details on Availability & Sale of stock from WBSBCL depots; Request to Excise Directorate for Granting Approval for Importing Packaged Liquor; Submission of Invoices; Inactive Stock Penalty Calculation

Operations being implemented using e-Bevco by Retailers are:- Real time Stock Position at WBSBCL Depots; Product selection and Cart preparation; Transferring funds electronically through Internet Banking / Debit Card / Credit Card; Transferring funds to WBSBCL through NEFT / RTGS / Net banking etc. for credit to eWallet; Blocking of stocks against payments and allotted pick up date; Intelligent reports for accounting and business summary. Besides, with e-Bevco, the Auditors can get all

information required for auditing as per their scope.



The project has become an indispensable tool in analyzing and improving the corporation's revenue through sales and transaction analytical capabilities where the solution components like SCM are integrated with this decision support system.

Also, the WBSBCL is in a position to analyze the available data and come to logical conclusion which helps the management in increasing the revenue and have better control on the movement of liquor-both legal and illegal. WBSBCL has seen savings in cost of transfer of funds, reduction of floats, better stock management improving revenues and less time spent in chasing paper.

Warehouses under WBSBCL have seen savings in space and reduction of over stocking/stock out situations. They are able to serve Retailers with speed and with brand of choice along with accuracy in billing and payment resulting in enhanced satisfaction.

The e-Bevco system has been able to bring in transparency of the operations by use of QR-code based bottle label and GSI bar code based carton labels to automate the maintenance of inventory registers at liquor manufactories, WBSBCL depots and retail outlets, in real time. e-Bevco has been able to create a win-win situation for all the stakeholders involved in day to day activities at WBSBCL.

The project is proved to be beneficial to suppliers and retailers, as it has helped them maintain statutory registers easily, apart from giving them an electronic platform to transact with WBSBCL and the Excise Directorate.

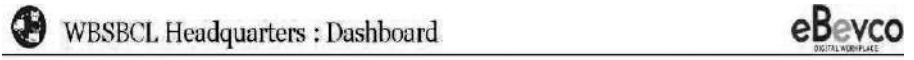
The e-Bevco system has been proved to be successful to analyse and improve the corporation's revenue through sales and transaction analytical capabilities where the solution components like SCM is integrated with this decision support system. Also the Excise Directorate is in a position to analyze the available data and come to logical conclusion which helps the Directorate of Excise in increasing the revenue and have better control on the movement of liquor-both legal and illegal.

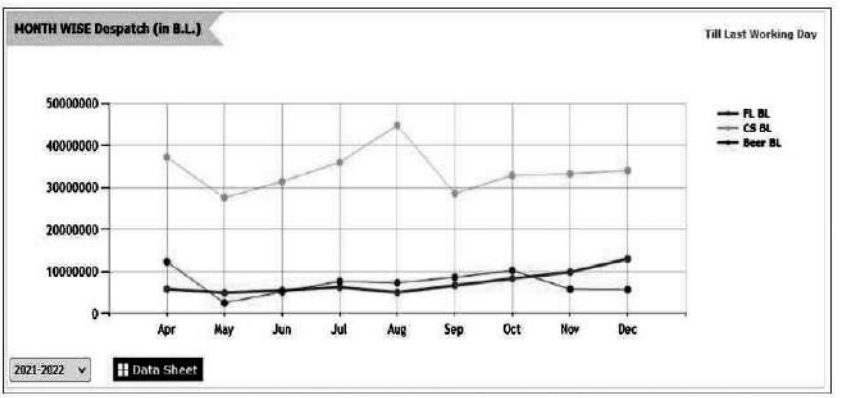
The solution – e-Bevco – has been able to cover the functions of Corporation and Excise Directorate as well as the supply chain management of liquor from production to point of sale at retail outlets. The system has been able to bring in transparency of the operations by use of QR-code based bottle label and GSI bar code based carton

labels to automate the maintenance of inventory registers at manufactories, WBSBCL depots and retailers, in real time. The project has been proved to be beneficial to suppliers and retailers, as it has helped them to maintain statutory registers easily, apart from giving them an electronic platform to transact with WBSBCL and the Excise Directorate.

With eBevco, it has been possible for

- Reconciliation of every drop of spirit imported or manufactured
- Automated Supply Chain Management for excisable goods
- Tracking duty evasion by generating a 360 degree profile of around 7000 licensees, 4,000 registered brands, Issued Permits & Passes for movement of excisable goods
- eneration of Judgment Notes, Collection of Penalty
- Seamlessly integrating a wide array of modern ICT technologies - the web, bar-codes and QR codes, PUSH/PULL SMS, Email, AI driven Supply Chain Management, BI, GIS, Mobile Apps, Hand-Held-Terminal (HHT) based Track & Trace - eAbgari has significantly reduced service-delivery times and has greatly enhanced the government's regulatory capabilities
- The features like Data Analytics for rendering Predictive services and Trend Analysis of the project has proved to be an indispensable tool for the Government to render effective G2B & B2B services and arrest revenue leakage points as well, thereby able to augment government revenue in remarkable manner
- Minimum Consumption Maximum Revenue ensured - while consumption of intoxicants in the State have risen by only about 5-6 percent annually since 2014-15, the collection of Excise revenue has gone up from Rs. 3581 Crores during 2014-15 to around Rs. 13,650 Crores during 2021-22 registering a CAGR of over 25 percent.





During last 5 years, State Beverage Corporation (WBSBCL) has seen a business of over Rs. 55,000 Crores with a wholesale margin of over Rs. 1200 Crores. This is a

remarkable achievement in the PSU.

In fact, eBevco includes the entire financial package necessary for financial accounting of the company and preparation of balance sheet. The retailers, distributors and manufacturers are also provided various MIS reports under Business Intelligence for maintaining accounts at their end.

e-TRANSACTION 01/04/2019 To 31/03/2020 OK

	Foreign Liquor	Country Spirit	Total
Invoice Generated	2,78,432	2,95,475	5,73,907
Invoice Amount (Rs.)	9935,96,19,176.18	4771,75,14,194.09	14707,71,33,370.27
AED Collected (Rs.)	0.00	0.00	0.00
AVM of Wholesaler (Rs.)	9588,93,41,614.57	4674,77,47,371.60	14263,70,88,986.17
TCS Amount (Rs.)	98,37,57,937.35	47,24,50,361.09	145,62,08,298.44
Distributor Margin (Rs.)	0.00	0.00	0.00
Bevco Margin (Rs.)	248,65,19,624.26	49,73,16,461.40	298,38,36,085.66
Total MRP (Rs.)	10414,72,73,732.00	4973,16,46,140.00	15387,89,19,872.00
Total Sales Tax (Rs.)	0.00	0.00	0.00
Total Round Off (Rs.)	0.00	0.00	0.00
Total Special Fee (Rs.)	0.00	0.00	0.00

Below Figure For : (01/04/2019 - 31/03/2020)

	Foreign Liquor	Beer	Country Spirit	Total
Excise Duty (Rs.)	3787,80,80,092.08	717,94,33,623.46	2588,60,66,827.74	7094,35,80,543.28
Additional Excise Duty (Rs.)	2360,84,62,528.50	453,96,99,475.74	1349,27,37,535.68	4164,08,99,539.92
Excise Fee (Rs.)	0.00	0.00	0.00	115,01,44,264.22

** Above figures show the involved amount of excise duty, additional excise duty and pass fee for BEO products against secondary sales for the date range selected above

Implementation

WBSBCL is operationalized over phases since July, 2017 and the entire State was covered during January, 2018.

In order to take over a business with an annual turnover of around 16000 crores at that time, we needed a complete ERP package.

We had experience in Excise administration but we did not have any business

experience. This was the main challenge that we had to overcome. We studied the corporation models already implemented in various other states and we went through the liquor sourcing policies of such corporations and then created our own by borrowing partly from other states and creating a customized solution to suit our own purpose.

NIC was entrusted to design, develop and deploy a suitable online solution in line with the defined goals. The eBevco application is seamlessly integrated with the eAbgari application of the Excise Directorate of the Government of West Bengal. With the eBevco application we have computerised critical operations and functions like Supply Chain Management of packaged liquor, Retailer ePayment & eProcurement, Invoicing, Inventory Management, Warehouse Management, Finance & Accounts etc.

As of now, the Corporation operates 23 Foreign Liquor Depots, 3 Exclusive Beer Depots and 35 Country Spirit Depots that cater to all retailers (around 7000 in total) located across the 33 Excise Districts in the State. From day one, the entire operations of the WBSBCL, including the Corporation HQ as well as the depots, have been automated under the e-Bevco application. In fact, none of the operational areas of the WBSBCL are outside the e-Bevco application.

The end to end operations involved in the Supply Chain of packaged liquor, from supplier registration, sale offers, supply orders, secondary sales, invoicing, financial accounts management etc. have been brought under the ambit of the e-Bevco application. The implementation coverage achieved is 100 per cent as per plan / target. The Geographical coverage of e-Bevco system is:-

- All the 23 administrative districts of West Bengal, including the 344 Development Blocks within such districts, in the State are covered under the eBevco project, viz., Bankura, Bardhaman (East), Bardhaman (West), Birbhum, PurbaMedinipur, Hooghly, Purulia and PaschimMedinipur, Jhargram under Burdwan Division; Coochbehar,Darjeeling, Kalimpong, Alipurduar, Jalpaiguri, Malda, Uttar Dinajpur and Dakshin Dinajpur under Jalpaiguri Division; and Howrah,Kolkata, Murshidabad, Nadia, North 24 Parganas and South 24 Parganas under Presidency Division.
- e-Bevco also covers rest 28 States & 7 Union Territories of India from which packaged liquor is imported by Suppliers of WBSBCL. Besides, Nepal, Bhutan, Bangladesh and other foreign countries are covered in eBevco Supply Chain Management. The Key Stakeholders of e-Bevco system are:-
    - Over 7,000 Excise Licensed establishments (Liquor Manufacturers & Retailers) located across the state work with e-Bevco for Supply of Packaged Liquor to WBSBCL owned Depots and Procurement of Packaged Liquor from WBSBCL owned Depots.
    - Over 300 Officials posted at WBSBCL Depots located all over West Bengal administering the depots
- Almost all agency Banks in West Bengal are integrated with e-Bevco through its payment gateway portal for deposition of invoice amounts online/ NEFT/ RTGS by Retailers procuring packaged liquor from WBSBCL and also for payment to Suppliers of WBSBCL
- Excise Directorate of West Bengal Government

In order to have sustainable e-Governance initiatives, the challenge before WBSBCL was in bringing a paradigm shift in providing services to its stakeholders in line of ease-of-doing-business through e-Bevco. This necessitated attitudinal change,

technological skill enhancement, adaptability to respond to stakeholder requirements in ever demanding scenario and commitment to provide superlative services.

The major challenge was that the Government in West Bengal State Excise did not have experience of doing business. The other challenges in change management before deployment of e-Bevco were:-

- Processes were not streamlined – different supply chain processes in different manufactories & retail outlets
- IT awareness
- Risk of IT system replacing manpower
- Fear of using system and working on system
- e-Services awareness
- Risk of information loss
- Process simplification and Re-engineering – communication.

Imparting training and capacity building was a major challenge for e-Bevco owing to several issues. Staffs of Private Manufactories as well as Retail outlets were used to the manual way of working. Skill sets required to handle IT systems were limited. As regards of WBSBCL, trained officials and also officials holding various authorities in the computerized business process workflow are often transferred or retire. This in turn necessitated repetitive sensitization programs leading to delay in implementation

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ENABLER

Processes Re-Engineered

In keeping with the progressive policy reforms of the Government of West Bengal and in order to strengthen state finances, a state owned and operated beverages corporation for managing the business aspect of the supply chain of packaged liquor was formed by the Government during 2017. The West Bengal State Beverages Corporation Ltd. was notified on 5th January, 2017 and the company was incorporated on 25th of January the same year.

The West Bengal State Beverages Corporation Ltd. was operationalized over the e-Bevco platform from Day-One and as such the processes were initiated keeping set parameters. The vision behind the e-Bevco project envisaged for the implementation of an enterprise wide system in WBSBCL so as to build a world class liquor distribution eco-system within the country that:-

- Is driven by transparent, simple and error-free business processes
- Minimize chances of pilferage of liquor and non-payment of excise duty/ additional duties
- Is easily measured by clearly defined key performance indicators
- Integrates seamlessly with prevalent systems and devices Uses technology to achieve strategic business objectives e-Bevco is driven to achieve operational efficiency and effectiveness in service delivery to all doing business with the corporation.

The main objective of the project was to track and monitor the illicit liquor at each production and transaction stage of Indian Made Foreign Liquor, Country Liquor, Bulk Spirit etc which in turn would help the department and their stakeholders in monitoring the entire supply chain. Key focus areas as identified were as follows:

- To regulate the revenue generation for the West Bengal State Beverages

Corporation Limited.

- To monitor movement of spirits, beer and Liquor (Indian Made Foreign liquor or Country Spirit, Foreign Liquor, Bulk spirit etc.)
- To capture production of both Foreign Liquor and Country Liquor in the state by real time verification.
- To maintain and access key information from a centralised system. Act as deterrence to non- compliances during the entire manufacturing as well as dispatching process.
- To record and regulate the dispatch of Country Spirit and Foreign Liquor and prevent illegal dispatch of liquors.
- Real Time status of all the Licensee units with respect to manufacturing and supply chain
- ntegration with eAbgari application of Excise Directorate.

While addressing the above mentioned mandates successfully during its implementation during last 5 years, this end to end Supply Chain Management System (SCM) has been able to streamline entire operations of WBSBCL covering all the importers, manufactories, distilleries and retailers comprehensively. This system also covers the shared services like finance, HR and other processes necessary for day to day operations of WBSBCL

eBevco incorporates emerging technologies like AI driven collaborative planning, demand forecasting and replenishment techniques, data mining for showing trends and future predictions, anticipate purchase orders from retailers, automated OFS for Demand-Supply Management through overcoming supply flaws like overstocking or under stocking, creating supply chain visibility and gaining supply risk insights etc.

To ensure its sustainability, following measures were taken prior to its implementation:-

1. Setting up of a separate IT Cell under a senior officer – GM (Systems) - (a) to find out the requirements from the stakeholders of WBSBCL through repeated interactions so as to deliver the services in right manner (b) to examine the service delivery mechanisms in the realm of increasing demand of innovative practices
2. Third-party assessment of e-Bevco and compliance of their recommendations
3. Assessment by PWC for benchmarking e-Bevco and evaluating project road map
4. Assessment by Microsoft India for benchmarking e-Bevco and evaluating project road map
5. Assessment by Cyber Security Division (CSD) of NIC(Hqrs.) and Cert–in certified agency (STQC) to ensure application level security. e-Bevco is developed & deployed as per guidelines for Open Web Application Security Project (OWASP).

It is made operational from West Bengal State Data Centre (WBSDC-Kolkata) and made available at https://excise.wb.gov.in/WBSBCL. WB-SDC, Kolkata where e-Bevco is hosted, is in a highly secured environment, where all the security policies are under implementation. N/w Monitoring S/w (NMS) is in place and firewalls are functional. Always-On methodology is implemented here at both Application & Database level to ensure service continuity. WB-SDC, Kolkata has Disaster Recovery facility with DR site located in IDC, Shastri Park, New Delhi. Asynchronous

replication over WAN using FC-IP protocol and seamless connectivity with DR site over 34 Mbps leased line minimizes any negative impacts relating with service continuity.

Adoption of information technology within liquor corporations has not reached to the desired level. There are still a number of paper-based workflows currently in some of the larger Beverage Corporations which amount to inefficiencies. With eBevco system, the West Bengal State Beverage Corporation (WBSBCL) has computerized critical operations and functioning which include supply management, retailer e-payment, invoicing and certain critical functions within depots like warehouse management, finance, payroll, attendance among others.

Changing fiscal environment in Post-GST scenario and the utmost need for compliance with the FRBM Act to ensure sustaining long-run fiscal health through transparency in fiscal operations, the State Governments have started to explore the possibilities of augmenting its revenues by mobilizing state own revenue resources through adoption of ICT driven schemes.

In most of the States in India, ICT enablement in State Excise is in basic stage. Presently, the States have started with utmost importance to explore suitable e-Governance solutions for adoption in State Excise

- to arrest revenue leakage points and
- to control excise crimes for better revenue realization from State Own Revenue Source.

Through successful implementation of eBevco system since last 1 year, West Bengal has earned the distinction of becoming the lead state in the country to implement all activities of State Excise Beverage Corporation under an umbrella e-Governance project. It has proved to be a Classic example of cost-effective solution in comprehensive transformation of government processes for empowerment of the Government and for ease of doing business as well.

Inspired by the success story of West Bengal State Excise, many States have approached in recent time for replication. This includes Uttar Pradesh, Maharastra, Assam, Haryana, Tripura, Sikkim etc.

Besides, following features have made Bevco system a unique solution among all availale SCM/ERP in government sector:-

- Anticipating Purchase Orders From Excise Retailers Before they are Placed - Machine Learning for Supply Chain Planning (ML-SCP) forecasting within inventory, demand & supply and thereby balancing demand & supply based upon intelligent algorithms and machine-to-machine analysis of big data sets
- Machine Learning for Warehouse Management through overcoming supply flaws (overstocking or under stocking)
- Creating Supply Chain visibility and gaining supply risk insights through usage of cognitive technology to track and predict supply chain disruptions based on gathering and correlating external data from disparate sources such as social media, newsfeeds, weather forecasts and historical data
- Supply Chain Optimization (a) through baseline forecast of new product during its introduction in supply chain and (b) determining more accurate demand behavior towards optimized inventory levels and replenishment plans Supply Chain Logistic Management by tracking the real-time movement of shipments to calculate their estimated time of arrival, factoring the impact of weather conditions and natural disasters through Satellite data collection & its

analysing.

Various tools for monitoring operations at the depots including breakage analysis reports are available. Whenever there is any breakage in excess of the mean of breakage for a particular day, the system flags the same for corrective action. Such monitoring tools ensure accountability and responsibility.

With eBevco we have been able to put in place a transparent and hassle free system for managing the supply chain of packaged liquor in West Bengal. We have been able to do away with any kind for favouritism. Market forces decide which product does business and which does not. All retailers have equal access to products and stocks. Distribution bottlenecks have been cleared and transparency and efficiency have been ensured.

Technologies

BEVCO is developed as web enabled application and hosted in the West Bengal State Data Centre (WB-SDC). The stakeholders access it through web browser. The project is developed with ASP.NET 4.5 as Frontend and MS SQL Server 2014 as Backend Database. Database is mounted on Windows Server 2012. The related ICT solution also constitutes of Java Script, CSS, Open source reporting library iTextSharp, NIC SMS gateway, Android based Java Application, Adobe Flash Player, IIS Web Server 7.0, XML and Service Oriented Architecture (SOA).

In e-Bevco, WBSBCL has adopted a unique mix of technologies for overcoming operational obstacles using an innovative method.

- HHT & QR Code based Shipment & Receipt of Packaged Liquor Cases
- Mobile App to facilitate Asynchronous Data Capture in text format with the facility to store it temporarily in Mobile Device Storage and upload the data when Mobile Network is available for providing seamless e-Services to Excise Retail Licensees of Rural Bengal suffering from lower bandwidth, intermittent internet connectivity and interrupted power supply
- QR Code based Hologram labels to ensure authenticity of Packaged Liquor through web services Mobile App based solution to capture Real-time Sales at Retail Outlets (both Asynchronous & Synchronous modes) through scanning of QR Code / GTIN Application software driven Business Analytics on historical data for showing trend and future prediction & prescription in

State Excise Supply Chain to

- Anticipate Purchase Orders From Retailers
- Supply Chain Planning forecasting
- Automated OFS for Demand-Supply Management in Warehouses through overcoming supply flaws (overstocking or under stocking)
- Creating Supply Chain visibility and gaining supply risk insights
- Analytics driven purchasing recommendations to Retailers

- Integrating the services of depot wise logistics service providers for loading, unloading and transportation of packaged liquor to and from the depots with systems calculated rates
- Robust backup & disaster recovery mechanism with DR at National Data Centre, New Delhi.
- Load-Balancing &Always On methodologies are implemented for the Application and DB Servers (2 + 2) at WB-SDC to ensure uninterrupted access of e-WBSBCL
- Based on Responsive Design using CSS3 & HTML5 for optimized Look & Feel of DS portal as per device environment & screen size
- AI driven trend and future prediction & prescription for better management of e-Services.
- Integration with Bank Payment Gateways / Treasury Portal through Web API
- Ensuring multiple channels of communication including Online, Push SMS, Email, Mobile Apps and Helpdesk
- Dynamic Dashboard, Pendency Checker at all hierarchical levels

e-BEVCO is designed in such way so as to allow flexibility to scale up horizontally or vertically based on future needs and requirements of stakeholders. AI driven trend and future prediction for better management of Excavation of Minor Minerals have been implemented. In the e-BEVCO portal, we have used machine learning, an application of Artificial Intelligence (AI) that enables the Portal to learn and advance, based on initial excavation data without being specifically programmed. Machine Programme Predictive Algorithms using open source R language is incorporated in e-BEVCO Portal to predict future demand of the market.

People

The success of e-Bevco is triggered by the transformative leadership exhibiting the realities of purposeful, progressive and visionary governance is a critical driver to implement changes.

The project is being implemented under the able guidance of Dr. H.K Dwivedi, IAS, Chief Secretary – Finance Department, Government of West Bengal and spearheaded by Dr. Manoj Pant, IAS, Additional Chief Secretary, Finance Department, Government of West Bengal.

Leadership has been critical to enhance motivation, morale and performance of reluctant stakeholders and induce them to accept the changes. It was ensured that leadership exhibited purposeful, progressive and visionary governance and moved on to become a critical driver for implementing changes.

The initiation, operationalization & ongoing implementation of e-Bevco has been closely monitored by a team of Senior Government Officers – as Board Members of WBSBCL:-

- Additional Chief Secretary, Finance Department
- Secretary, Industries, Commerce & Enterprise Department
- Secretary, Land & Land Reforms Department
- Commissioner, Commercial Tax Directorate and
- Excise Commissioner & MD, WBSBCL.

Without such extensive active support from the leadership, it would have been impossible to make e-Bevco a success.

VALUE INDICATORS

Learning's for sharing

In order to have sustainable e-Governance initiatives, the challenge before WBSBCL was in bringing a paradigm shift in providing services to its stakeholders in line of ease-of-doing-business through e-Bevco. This necessitated attitudinal change, technological skill enhancement, adaptability to respond to stakeholder requirements in ever demanding scenario and commitment to provide superlative services.

The major challenges in change management before deployment of e-Bevco were

a) Processes were not streamlined – different supply chain processes in different manufactories & retail outlets
b) IT awareness
c) Risk of IT system replacing manpower
d) Fear of using system and working on system
e) e-Services awareness
f) Risk of information loss
g) Process simplification and Re- engineering – communication.

Imparting training and capacity building was a major challenge for e-Bevco owing to several issues. Staffs of Private Manufactories as well as Retail outlets were used to the manual way of working. Skill sets required to handle IT systems were limited. As regards of WBSBCL owned trained officials and also officials holding various authorities in the computerized business process workflow are often transferred or retire. This in turn necessitated repetitive sensitization programs leading to delay in implementation.

e-Bevco is driven to achieve operational efficiency and effectiveness in service delivery to all doing business with the corporation. To ensure its sustainability, following measures have been taken:-

- Setting up of a separate IT Cell under a senior officer – GM (Systems) -
  - to find out periodically whether e-Bevco is delivering the services in right manner
  - to re-examine the service delivery mechanisms in the realm of increasing demand of new e-Services, switching over to new technologies etc.
- Periodic Third-party assessment of e-Bevco and compliance of their recommendations
- Assessment by PWC for benchmarking eBevco and evaluating project status & road map
- Assessment by Cyber Security Division (CSD) of NIC(Hqrs.) and Cert–in certified agencies to ensure application level security

The lessons learnt during e-Bevco life cycle journey are:-

- Motivation plays an important role in bringing about change in mind-sets and accepting change.
- Peer learning is important and goes a long way in bringing about change.
- Selecting the right team leaders is essential for driving change.
- Appraising the benefits to all stakeholders, especially the end users, is important before process re-engineering.
- Initiative and perseverance of the top management is necessary to bring about major process changes.
- Training has to be a continuous exercise with hands-on workshops.
- Technology enables SMART (Simple, Moral, Accountable, Responsive & Transparent) goal setting for the officers and employees to facilitate and support better planning and decision making. It is an enabler and motivator for improved output paving towards quality G2C services.

The Lessons learnt from the process re-engineering exercise & implementation in e-BEVCO:-

- Changing user mind-sets is a necessary pre-condition before embarking on ICT based process re-engineering.
- Stakeholder consultation during the stages of development and design are essential for easy post-deployment acceptability.
- Effecting change has to be an exercise started from higher up in administration and then down the hierarchical set up.
- Appraising the stakeholders and convincing them of the benefits is more important than just enforcing ICT re-engineering.
- Accessibility, time and location independence to users is important.
- Taking along users not comfortable with technology by arranging suitable training is essential for universal dissemination.
- Network and Connectivity are crucial and deploying fall back mechanisms as a measure of redundancy is important.
- Piloting and making necessary course corrections from feedback and user experience before final deployment is essential.
- Robust Helpdesk support and round the clock troubleshooting should be put in place.

Training and capacity building should be a continuous exercise.

Digital Empowerment

Introduction of *e-Bevco* has resulted in the following positive externalities in the area of digital empowerment:-

- In *e-Bevco* project, no such hindrances have been faced yet. Cultural, language and demographic differences do not apply here as Indents, Invoices, Permits/Passes and other related operations are basically G2B & B2B operations and is conducted mostly in English.
- On one hand, the WBSBCL functionaries carry out most of their business functions in English, while on the other hand, the stakeholders too, get SMS/emails in English from the system. Besides utility Mobile Apps too serve the stakeholders in English language.
- The financial inclusion vision of *eBevco* to deliver e-Services pertaining to

liquor supply chain at no-cost and its integration with the Bank Payment Gateways for payment of invoice amounts, duties & fees electronically have been able to provide intensified impetus for further momentum and progress for this e-Governance initiative.

- The application is hosted on the World Wide Web which makes access universal. Practically anyone with basic computer hardware and an internet connection can access the services.
- Efforts have been made to make the interface user friendly with online user manuals available for each process re-engineered.
- All officials have been provided username/password on their mobile/email to enable them to work with *e-Bevco*. However, the authorization to certain modules has been restricted to officials of certain levels. Nonetheless, this has ushered in digital inclusion process and all employees have been co-opted as part of this grand transition to a modern digital environment.
- Trainings and workshops have been organized to bring all stakeholders including WBSBCL officials on the same platform regarding usage of the new application. Thus deficiencies in term of skill sets on the use of ICT are being ironed out. This will pave the way for a fully modern workforce that is geared to meet newer challenges of governance involving greater use of ICT in the coming days.

The innovative technologies used in e-BEVCO are focused to its stakeholders:-

- Incorporation of Hand Held Terminal (HHT) based solution for Packaged Liquor Case level Track & Trace
- Mobile App to facilitate Asynchronous Data Capture in text format with the facility to store it temporarily in Mobile Device Storage and upload the data when Mobile Network is available for providing seamless e-Services to Excise Retail Licensees of Rural Bengal suffering from lower bandwidth, intermittent internet connectivity and interrupted power supply
- Checking authenticity of Bar-coded Permits / Passes of in transit consignments through eAbgari Mobile Apps by excise officers using smart phone devices
- QR Code based Hologram labels to ensure authenticity of Packaged Liquor through web services
- Use of GI tools like GPS mapping of Excise Licensed Premises across the State
- Application software driven Business Analytics for predictive services and automated Supply Chain
- Dynamic Dashboard, Pendency Checker at all hierarchical levels
- Free auto SMS alerts / notifications through Push SMS to stakeholders.
- Extracting process status information or validating authenticity of permits / passes / packaged liquor through free SMS Pull service

Reporting of excise related crimes by Citizens (along with Photographs) using eAbgari Mobile Apps

- Incorporation of standard web technologies and techniques such as HTTP redirects, cookies, JavaScript SOA, XML SOAP etc. strong symmetric key encryption (MD5 Hashing) to deliver the single sign-in service over https for ensuring secured transactions.

The solution – e-Bevco – has been able to cover the functions of Corporation and Excise Directorate as well as the supply chain management of liquor from production to point of sale at retail outlets.

- Dashboards of WBSBCL Managing Director and officers show only the information relevant for the designated officer.
- Key Performance Indicator (KPI) provides valuable drill down capabilities to fully examine data till bottom level.
- Facility to show graphical representation of any business critical data and also automatically send notification and exception messages.
- Facility for inventory management & forecasting for (a) Stock turn over details for bottled liquor at depots and (b) Average Inventory value in depots/ warehouse

The system has been able to bring in transparency of the operations by use of QR-code based bottle label and GSI bar code based carton labels to automate the maintenance of inventory registers at manufactories, WBSBCL depots and retailers, in real time.

The project has been proved to be beneficial to suppliers and retailers, as it has helped them to maintain statutory registers easily, apart from giving them an electronic platform to transact with WBSBCL and the Excise Directorate.

Green e-Governance

ICT facilities created under the e-BEVCO project have taken care of Green e-Governance to the extent possible:-

- Obviated the need for taking print outs by ensuring easy retrieval of data at any time through electronic information management system.
- e-Services under this project maximize transportation efficiencies, reducing carbon admission, since Lessees can avail various services from their own home/offices. In general, online services use around 30% less energy than manual services.

The e-Bevco project of the Department has resulted in saving around 18 Crores papers of stationery till now from the launch of the project.

- The project has tried to popularize its motto of “THINK BEFORE PRINT - save trees” among stake holders and citizen.
- Special care has been taken to reduce number of statutory documents which can be printed.
- Special training sessions are conducted for participants on Green ICT and its impact.
- Adjust settings of IT systems to save power when not in use for short periods.
- Schedule tasks that need computer processing to be done in a block of time
- For printers that have duplex capability, set their default settings to duplex and grey scale to reduce the amount of electricity, paper, ink and toner used
- Avoid printing files if reading the same on the monitor will suffice.
- Operate computers, printers and other IT equipment with proper ventilation.
- Use virtualization on servers, when available, to allow multiple operating systems to run on each machine.

- Use e-mail when possible rather than fax to save on paper and energy used. To save towards resources and power, the existing ICT facilities like West Bengal State Data Centre and the existing PCs/Laptops already available through departmental budgetary provisions have been repurposed.

Shri Umashankar S, IAS, *Excise Commissioner, Government of West Bengal and MD, WBSBCL, Finance Department, Government of West Bengal, ec.wb-excise@gmail.com*

Shri Subhmoy Goswami, *WBRS, Deputy Commissioner of Revenue and Joint Manager, WBSBCL, Finance Department, Government of West Bengal, subhamoy@wbexcise.gov.in*

Shri Mainak Mukhopadhyay, *scientist-F & o/c, NIC state secretariat, West Bengal, National Informatics Centre West Bengal State Centre, mainak@nic.in*

Uttarakhand Transport Corporation Fleet Management System (UTCFMS)

Uttarakhand Transport Corporation, Uttarakhand & National Informatics Centre Uttarakhand State Centre

Rohit Meena, Mukesh Singh and Narendra Singh Negi

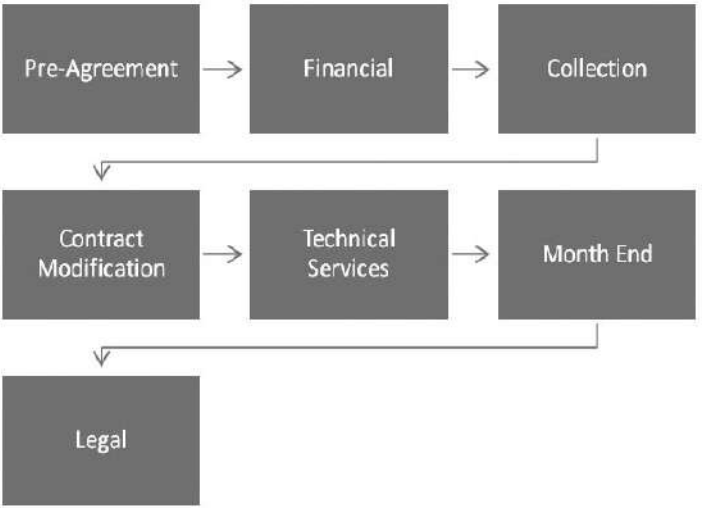
PROJECT OVERVIEW

Uttarakhand Transport Corporation Fleet Management System (UTCFMS) is a complete Online Fleet solution for Various Manual Actions Performed in UTC in a very Ease Manner thereby reducing Paper Work. It's a web based solution to manage day to day activities related to Common Activities such as Route Scheduling, Diesel Management, Maintenance Management, Material Management, Tyre Management etc.

The modules can be divided into Business and Non-Business as shown below:

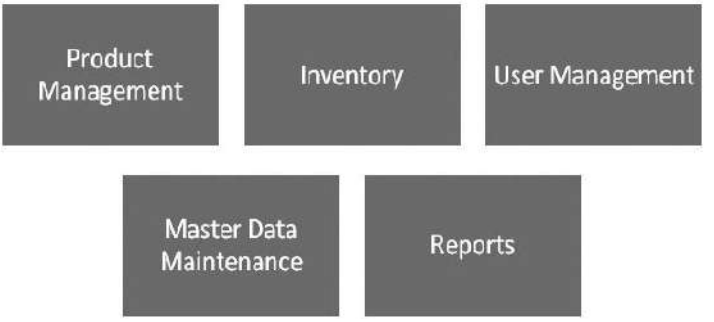
Business Modules

Business Modules of UTCFMS are as listed below:



Non-Business Modules

The Non-Business Modules of UTCFMS are as listed below:



Hardware/Software

Front-end:- **Visual Studio 2010(.Net Framework 4.0)**

Back-end:- **Oracle 11g**

Reporting Tool:- **RDLC**

Web Server- **IIS (Internet Information Services)**

Operating system:- **Microsoft Windows Server 2008, Linux RHEL 6.5**

Certification (Certifying Agency)

Cyber Security Audited by- Xiarch Solutions Private Limited

A CERTIN Empanelled Information Security Auditor

Corporate Office- Suite 352,2nd Floor, Tarun, Piampura U74140DL2008PTC176846 Delhi 110034

Mobile: 9509532273 Email: tanveer@xiarch.com www.xiarch.com

Disaster Recovery and Service Continuity

Application Server and Database Server have been configured in separate machines.

Taken Daily Backup in another Machine.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	Brief service description with benefits	Volume (Nos) of Services year wise		
		2020-21	2021-2022	2022-23 (Upto date of nomination)
Onboard Cashless Ticketing (Integration of Dynamic QR Code in Android Based Electronic Bus Ticketing Machines)	Total Fleet (Buses) 1346 (Owned Buses 993 Contractual Buses 353)	Rs 1.00 Crores	Rs 2.00 Crores	Rs 2.50 Crores
Two Payment Gateway integration (Paytm, PhonePe)	Online fee deposits			

Implementation

- Approx 5000 employees of Uttarakhand Transport Corporation
- Approx 500 Spare Parts Suppliers
- Approx 19 Depots and 6 Division
- Approx 100 Operators whose Buses are operating under UTC
- Uttarakhand Govt.

Indicate improvements/ enhancements

1.No scope of corruption and pilferage

2.Ticket amount goes directly to bank, less cash handling

3. Increase in revenue

4. Reduction in complaints

ENABLER

Processes Re-engineered

Comparison of the pre-deployment scenario and post deployment benefits. Explain how the solution has helped:

- First and foremost value of any system overhauling is an opportunity of correcting various legacy challenges of old system and practices. In this exercise, entire data was verified, validated, and unique identification was assigned to each employee & Bus record. This gives us most valuable set of employee records which is having varied high degree of accuracy. It can be scaled up for knowledge base for multiple usage and domains.
- Daily Duty Chart of all Buses and Drivers and Conductors for all Depots are available online for all Level Management.
- Online Duty Slip, Diesel Issue/Receipt, Cash Collection, Maintenance of Fleet is doing by this system.
- Inventory Management is online.
- Financial Management is online we can get balance sheet and profit loss statement at once on the very next day.
- SMS alerts for Monthly Salary payment, Arrears payment, Advances payment, Pension payment, Daily crew allotment to Bus, for payment of suppliers is sent at the time of work.
- UTCFMS are not location specific.

  It has triggered a cascading reaction for inducting governance in planning, registration, budget and other related departments.
- It enables a better HR management scenario for maintain transfer and postings across the state in hassle free environment.
- Entire system should be seen in perspective of a hilly terrain. At Bus Station In-Out system we can locate the vehicles position without GPS.
- Cyber-highways help in bridging the geographical divide and reaching to unreached.

Technologies

UTCFMS **Integration of Dynamic QR Code in Android Based Electronic Bus Ticketing Machines**

- UTC is using Keypad EBTMs since 2005
- 90 % of UTC's revenue is collected through these EBTMs in cash
- UTC changed old EBTMs with new GPRS enabled Android Touch screen EBTMs in all buses.
- UTC has developed a software for creating a dynamic QR code for a ticket with unique ID.
- By scanning this QR code a passenger can pay with any UPI (Google pay, Bhim, Paytm, Amazon etc) the ticket amount

People

The UTCFMS replaced so many manual activities/process into automated process. With the help to various training sessions there are so many operators are perfectly perform their works/tasks.

VALUE INDICATORS

Learning's for sharing

- The major challenge of this Web-Application is that the project has to modify/update according to Transport policy of Uttarakhand government.
- This Web-Application tries to provide the complete IT solution and improve the overall efficiency, effectiveness, transparency and accountability in the process of the Uttarakhand Transport Corporation.

Digital Empowerment

The web-application has provision for the login based accessibility of the stakeholders with the bilingual (Hindi/English) interface features. Easy accessibility of the various required software utilities also provided over the portal.

Green e-Governance

The UTCFMS saved thousands of paper which has used in past manual system.

Mr. Rohit Meena, IAS, *Managing Director (UTC), Uttarakhand Transport Corporation, utc.gmtech@gmail.com*

Mr. Mukesh Singh, *Deputy General Manager (Tech.), Uttarakhand Transport Corporation, utc.gmtech@gmail.com*

Mr. Narendra Singh Negi, *Technical Director/Scientist-E, National Informatics Centre Uttarakhand State Centre, ns.negi@nic.in*

e-Mitra - A Unified Service Delivery Platform

Department of Information Technology & Communications, Govt. of Rajasthan

Umesh Chand Joshi

PROJECT OVERVIEW

e -Mitra project was started with an objective of providing all Government services to the common man in their locality, through a one-stop-shop (integrated service delivery), ensuring efficiency, transparency, & reliability. The idea was to link the residents of the state, especially in the rural areas, to a basket of information and services through an IT-enabled service delivery platform. Assessment of local needs, Filed-studies, Process reengineering were carried out to simplify and automate the processes.

Modes of Delivery

Residents can avail the services through below service delivery points:

➢ **Online** web-based e-Mitra application (http://emitra.rajasthan.gov.in).

➢ e-Mitra **mobile app** available in Windows, iOS and Android versions that can be downloaded from e-Mitra application or Google Play Store.

➢ **IT enabled physical kiosks** set up on Public Private Partnership (PPP) model in both - urban and rural areas of Rajasthan close to the doorsteps of the residents. These kiosks act as the front end service delivery points for various Government Departments and Organizations and also private service providers.

➢ **e-Mitra Plus: Interactive Self Service Kiosk (SSK):** In alignment with the "Digital India Mission'' and towards making Rajasthan a digital leader Rajasthan has become the first State in India to introduce high-end technology based, next generation e-Mitra kiosks "e-Mitra+". Installation of "e-Mitra+" is in progress at Gram panchayat level.

➢ **e-Mitra@Home**: For applicants who cannot avail the services online on their own and have limitations to visit e-Mitra kiosk such as Sr. Citizen, physically challenged/handicapped etc., they can avail services directly at their home through e-Mitra@Home. Home delivery is based on PIN CODE mapping wherein docket status can be monitored on real-time basis.

Presently, more than 80000 kiosks are delivering 600 plus G2C & B2C services with approx. 75 lac transactions per month across State, collecting revenue of around Rs 700 Crores. New services are being added to its fold regularly.

Total kiosks	80000 plus
Rural kiosks	55000
Urban kiosks	25000
LSPs	75

Services such as online submission of application forms for various recruitment exams; digitally signed certificates for bonafide, caste, minority; pan card; ration card; character certificate verification etc. are being provided through e-Mitra.

List of newly added services:

• COVID ex-Gratia
• PM Kisan e-KYC
• Rajasthan Government Health Scheme
• Chiranjeevi Yojana
• Pensioner Verification under Social Security Pension Scheme
• Home Services under B2C
• Doctor Consultation
• e-Waste Collection
• ITR Filing
• GST Return
• Travel Booking
• Seed Selling
• Smart Stickers
• Fast Tag
• e-Learning
• Insurance
• Mutual Funds
• Legal Consultation

Result Achieved / Value Delivered to the beneficiary of the project –

(i) Citizens

• Serving 70 Lakhs residents per month through a network of 80000 kiosks
• A multi-modal service delivery platform
• A self-sustained model promoting rural entrepreneurship

(iii) Other Stakeholders

• Establishment of an integrated & unified service delivery platform:

e-Mitra is a completely online and integrated platform to provide services of various departments/ organizations through a single-window. The application is integrated with various other applications of the state & central govt. private service providers to enable online service delivery and real-time transfer of funds to stakeholders. The complete reconciliation process is online.

The application is also integrated with various other IT platforms like e-Vault (digital Locker) and other applications to ensure online verification of documents to minimize submission of supplementary documents along with application form for the ease of end customer.

e-Mitra is a ready-to-plug software solution for easy integration with third-party applications. The software solution is integrated with various banks and payment gateway aggregators to provide all net banking, credit/ debit cards and mobile wallet payment solution for the ease of customer in availing services.

• Transparent & efficient service delivery

e-Mitra provides a real-time MIS in public domain to ensure transparency and has led to reduced time and cost for availing services by the citizens near their doorsteps through a single –window.

• **Non-exclusive arrangement**

e-Mitra provides the flexibility for the end customer to choose from a bouquet of

services with a non-exclusive agreement for service delivery.

• Capacity Building & Grievance Redressal.

The entire kiosk network is connected through video conferencing facility for training & Jan-sunwai purposes. An online helpdesk and training module is integrated with e-Mitra software solution for training of stakeholders. The application is also integrated with centralized call centre of the State Govt and Rajasthan Sampark (an integrate Grievance Redressal portal) for immediate support to the users.

Hardware/Software

- **Database:** Oracle Exadata
- **Operating System:** Linux 6.3
- **Web-server:** Apache 2.2

Certification (Certifying Agency)

The web enabled e-Mitra application software complies with the guidelines issued by DolT&C, Govt. of Rajasthan for development of websites and available at http://doitc.rajasthan.gov.in and Guidelines for Indian Government Websites (GIGW) issued by Department of Information Technology (DIT), Government of India (Gol) and available at http://doitc.rajasthan .gov.in and http://web.guidelines.gov.in.

The application is designed and developed by incorporating security features as per the best industry practices. The specific elements of the application are provided access to authorized personnel. Wherever required, the data is encrypted. The application is guided by the standard information systems security policies and guidelines or suitable Industry standards. Appropriate access and authorization controls are incorporated into the software. There are configurable User and Role-based security for the Menu Options of the application.

The architecture is secure with Safe of host and SQTC implemented. Safe to Host third-party audit certificate for e-Mitra application dated 15th March 2019 is issued by Yoganandh & Ram LLP**.** (Certifying Agency).

Disaster Recovery and Service Continuity

Real time backup facility available at Jaipur SDC & DR at Jodhpur.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	**Brief service description with benefits**	**Volume (Nos) of Services year wise**		
		2020-21	**2021-2022**	**2022-23 (Upto date of nomination)**
G2C services	Services from Government departments that are being delivered to citizens directly via eMitra, thus reducing footfalls in Government offices	400	450	500
B2C Services	Manage users who are collaborating for data collection	50	60	100

Implementation

There are approximately 80,000+ eMitra kiosks in the urban and rural areas of Rajasthan; covering all 10000 Gram Panchayats in addition to web and mobile interfaces.

The eMitra platform provides almost all Government services along with services from private organizations through the eMitra portal. Over 600 services are getting delivered through this platform.

Indicate improvements/ enhancements

- Kiosk assessment criteria and kiosk certification policy added to ensure kiosks deliver quality services
- On-door delivery of services
- Periodic inspections to ensure compliance by uploading kiosks photos through Mobile App (Geo-tagging of Kiosks)
- Launched eMitra Plus that are self-service kiosks providing all services to citizens and the objective is to install eMitra Plus machines at maximum public places for easy access to the public

For the coming year, focus will be more on eMitra Plus Service ATMs, providing complete GST services on this interface and delivery of more & more services through mobile interface.

ENABLER

Processes Re-engineered

Rajasthan State Government, in synergy with NeGP, has undertaken a holistic approach to reengineer its business practices to facilitate a citizen-centric system of e-Governance that can overcome geographical, time and physical limitations and provide a 365x24x7, anywhere-anytime access to the common man, particularly to those people living in the rural areas.

In compliance to State IT and ITES Policy 2007, and to ensure long-term success of e-Governance, structured BPR processes have been undertaken in all the key departments. External consultants have been hired to monitor implementation of BPR and change management in key public dealing departments.

Listed are the key Processes that have been reengineered:

1. Online Fund Transfer and Payment through integration of Payment Gateways, aggregators and mobile e-wallets with eMitra:

Integration of online payment gateways, aggregators, and mobile e-wallet integration with eMitra portal has enabled citizens to make anytime anywhere payment for availing various services through eMitra portal, fund disbursement to bank accounts/ e-wallets of citizens by the govt. With more than 70 lac transactions a month, collecting about 700 crores of revenue, accounting and reconciliation of funds, with respect to multiple stakeholders, had become a tedious task. With above integration, eMitra now supports online fund transfer between various stakeholders which enables real-time flow of money to destinations accounts, real-time release of credit limit & commission amounts to the kiosk owners/ LSPs along with real-time MIS leading to simpler and transparent accounting process.

2. Standardization of Application Forms and minimization of document & other verification requirement:

Lot of applications which require application form along with various attachments for the purpose of identification/ eligibility and verification have been reassessed to have a common application form with minimum documents requirement. Also the application is being integrated with state eVault for creating an online space for resident documents which would eliminate the need for subsequent document submission once it has been saved in their eVault.

3. End-to-end digitized and centralized Service delivery of Digitally Signed Certificates:

Complete digitized workflow for the delivery of Digitally signed certificates (Caste, Bonafide, solvency, Death, Birth, Marriage, etc.). Standardized application and certification formats and processes across all districts in the state. Online verification and tracking of applications has minimized the number of trips to far-off government offices. SMS acknowledgement and tracking at every stage.

Technologies

Web-based eMitra portal (www.emitra.rajasthan.gov.in) is hosted at SDC, Yojana Bhawan, Jaipur. All the G2C services at kiosks are being delivered through this portal. All the participating departments and service counters hook-on to this portal for their day to day transactions.

Other eMitra Web Pages are:

mis.emitra.gov.in; reports.emitra.gov.in; rajonline.rajasthan.gov.in

The application is based on Java platform using J2EE technology with Linux Operating System platform. Server farm comprises of hardware for Directory service, Antivirus software, DNS and DHCP Service, Backup service and Server for Enterprise Management suite. Apart from the core infrastructure components listed above, Hardware for Database service, Mid-tier application and front-end application is also deployed. The diagram below illustrates the application infrastructure for e-Governance application.

Feature List

- A dynamic application generating the content real time.
- New services can be created on the fly without any external interference through the modules given in the application.
- Application status can be viewed at any level anytime, adhering SLAs and escalation matrix.
- Complete digitized workflow for the delivery of digitally signed certificates
- Automation of Accounting, Reconciliation & Fund Transfer through online fund transfer module ensuring timely payment of commission charges to DeGS, LSP & kiosk holders.
- Integration with payment gateway aggregators / digital wallets for online payment by citizen / kiosk.
- User Management of all Stakeholders
- 24X7 helpdesk available, Support on email

  The e-Governance applications has Tier-three architecture, RDBMS software is used at backend, in-house application or commercial application are at mid-tier and web servers are at the front-end of Tier-three architecture of e-

governance application. Application at the all levels of Tier-three architecture is in highly available mode. All the Servers that are part of IT infrastructure are organized into different zones.

The benefits of the architecture are as follows:

- Interoperability is provided
- The architecture is secure with Safe of host and SQTC implemented

Social Media:

- Facebook: https://www.facebook.com/doitcrajasthan/info
- Twitter: http://twitter.com/doitcjai pur
- Wordpress: http://doitc.wordpress. com/

People

Capacity Building & Training:

For capacity building trainings are carried out by the following modes:

1. Online Training:
   - Learning Management System is implemented and videos outlining the processes for delivering services to the citizens, as well as service guidelines are maintained.
   - Training modules consist of:
     - Videos
     - eBooklets/ Margdarshika
     - Service specific guidelines issued and published before starting any service
2. Train the Trainer programs: Trainings are carried at all the levels:
   - State level
   - District level
   - Panchayati Samiti level
3. Training is conducted at LSP level to its kiosks (which is a continuous exercise)
4. Hands on training is imparted through Video Conferencing
5. Additionally, 24X7 Helpdesk is maintained that provides call and email support
6. A centralized call center is maintained and online grievance redressal is provided.

VALUE INDICATORS

Learning's for sharing

E-Governance reform is a slow process- requiring engaging with governance institutions and bringing about both attitudinal and constitutional changes.

E-Governance models should offer more interaction between Citizens and the Governance mechanisms, and should be oriented towards improving the Efficiency of governance tasks currently being done through other means. Since the initiation of this eMitra project, several learnings have emerged out of this project. The key ones are:

1. Citizen centricity is the success key for any e-Governance Project. Thus, eMitra provides over-the-counter Service Delivery till the last mile - eMitra counters are present in all Atal Seva Kendras (IT facilitation Centres) till Gram Panchayat level across Rajasthan.
2. Maintaining a strong and cohesive relationship with all stakeholders is the

necessity towards successful roll out of the project. To ensure this complete automation of service delivery processes along with complete process reengineering providing online-real time commission payout to stakeholders in their e-wallets is maintained on eMitra portal.

3. Sensitization and awareness about the scheme, services being delivered and other initiates is of paramount importance. Thus, all kiosks are connected to soft-Video Conferencing facility that is used for training of kiosk owners till Gram Panchayat levels in 33 district of the state, as a service for Citizen Grievance Redressal by local administration.
4. All kiosks working as Banking Correspondents and are MicroATM equipped, ensuring their financial viability with an extensive service basket to offer.
5. Structured BPR is of most importance for success of any project. Rajasthan State Government is undertaking a holistic approach to reengineer its business practices to facilitate a citizen- centric system of e-Governance that can overcome geographical, time and physical limitations and provide a 365x24x7, anywhere-anytime access to the common man, particularly to those people living in the rural areas.
6. Well-defined roles and responsibilities, down to the grass roots level is essential. This was achieved through State level workshops and intensive trainings for bringing about changes in the attitude among departmental staff.
7. With all well-defined administrative processes, systems should have a strong data back-up mechanism. In order to protect the data from physical threats like fire or calamities, backing up of data was done by way of online replication.
8. m-Governance is not a replacement for e-Governance, rather it complements eGovernance. Thus emitra launched mobile app along with web portal and physical kiosks.
9. eMitra project implemented convenient and transparent service delivery by breaking the monopolistic approach of kiosk holders through transactions based commission charges and performance based approval for operating the kiosks.

Digital Empowerment

- All the services are made available to the Citizens online using the e-Mitra portal (www.emitra.rajasthan.gov.in) and through the kiosk network even in the far-flung areas of the state of Rajasthan thus making it convenient for the citizens thereby reducing the number of trips to the various government departments and the transportation cost attached.
- The application software has a user friendly interface. The labels and the data entry on the form are bilingual (Unicode based), wherever required i.e. in Hindi as well as in English. Also the digitally signed certificates are issued both in English as well as Hindi format.
- The kiosk owners are trained in public dealing and customer-orientation aspects, particularly while dealings with citizens and giving special consideration to old, handicapped and women. Such training is a mandate given to the kiosk roll-out partners by the State government.
- State Government has also issued guidelines to choose only women as the kiosk owner in order to promote **women entrepreneur.** However, in case, no eligible woman entrepreneur is available, the district collector / chairman of

District e-Governance Society may allow the selection of male entrepreneur. o The online portal is **integrated with the web-portal of Line Departments** whose services are being provided through this online e-Mitra Portal. Therefore, the citizen is able to access all information, fill up the forms online.

- Also the e-Mitra portal is integrated with payment gateway of various banks like ICICI, Axis Bank etc. to provide online payment services to the citizens thus making it convenient for them to make any kind of payment online like deposition of exam fees, etc.
- With more than 70 lac transactions a month, collecting about 700 Crores of revenue, accounting and reconciliation of funds, with respect to multiple stakeholders, had become a tedious task. With the integration of online payment gateway, e-Mitra now supports online fund transfer between various stakeholders which enables real-time flow of money to destinations accounts, real-time release of credit limit to the kiosk owners/ LSPs/ SCAs and online reports for complete fund flow. This has led to a simpler and transparent accounting process.

Green e-Governance

Paperless offices are promoted as part of Green eGovernance initiative with easy record keeping/online document management system/ integration with SMS gateway. Also, a further step towards Green Governance, the document requirement has been curtailed. Metadata is used for online validation of data.

Also, to enable the recovery and/or reuse of useful material from e-waste (waste electrical and electronic material) , the State Government has outlaid policies like e-Waste (Management and Handling) Rules 2010, Condemnation of IT Equipment and disposal, thereby reducing the hazardous wastes destined for disposal and to ensure environmentally sound Management/ disposal of e-Waste.

Shri Umesh Chand Joshi, *Jt. Director & Project OIC, Department of Information Technology & Communications, Government of Rajasthan, umeshcj.doit@rajasthan.gov.in*

Post Matric Scholarship Portal

ST & SC Development Department, Govt. of Chhattisgarh & National Informatics Centre Chhattisgarh State Centre

G. R. Markam, Ashish Vadher and Saurabh Dubey

PROJECT OVERVIEW

Objective: To provide a robust online platform where students can apply for payment of scholarships in a smooth and transparent manner and all activities involved till the DBT or payment of scholarships to students bank accounts with efficient reporting and statistical support for state tribal department.

Scope – functional and geographical

Students studying in colleges all over the country but with domicile of Chhattisgarh can apply for scholarship if their post matric courses are entitled by state education policy. If the documentary evidences and certificates expected from them are ok then they need not travel to state capital for processing of application or for enquiring for its status.

Key stake holders-

Institutions through their nodal officers and students along with state tribal department through its commissioner offices across the state

Current status:

Since its inception in September 2021, more than 2.5 lakhs students have applied for scholarships through the portal and for academic year 21-22 scholarship disbursal process is complete by around 95%.

For academic year 22-23, application process has just started and more than 60,000 students have applied till date.

Hardware/Software

Front End: ASP.NET (4.0)

Database Server: MS-SQL Server 2016

Web Server: IIS 10.0

Other Technologies used: Visual Studio, Ajax, CSS, HTML, Java-Script, JQuery

Certification (Certifying Agency)

Security Audit certification from CERT-IN empaneled security auditor M/s AAA Technologies.

Audit certificate issued on 23 September 2021 and valid till 22 September 2023

Disaster Recovery and Service Continuity

Passive backup in of database. DR setup is proposed at NDC Bhubaneshwar.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	Brief service description with benefits	Volume (Nos) of Services year wise		
		2020-21	2021-2022	2022-23 (Upto date of nomination)

Applications Received	SC, ST and OBC category student Application Received on the portal	-[Portal not opened]	347166	61,969
Applications Disbursed	SC, ST and OBC category student Application Disbursed through the portal by districts	-[Portal not opened]	320902	Under Process
Amount Disbursed	SC, ST and OBC category student scholarship disbursed in Rupees	-[Portal not opened]	Rs. 202 Crores 46 lakhs	Under Process

Implementation

With respect to the plan/target of academic year 21-22, 95% scholarship targets have already been met by May 2022 with just 5 % students with erroneous bank details faulty Aadhaar seeding in their bank accounts are remaining.

For AY 2022-23, portal has been opened for application as per the guidelines issued by MSJE, Delhi

Indicate improvements/ enhancements

a. Seamless integration with NSP portal with secure APIs for smooth transfer of central share of 60% of scholarship for SC students.
b. Integration with Digilocker for pulling certificates and mark sheets by students.
c. Integration with state CHIPS portal for online pulling of eligibility certificates like income, domicile and caste for applying students.
d. Integration with AISHE portal for getting updated institution list and their AISHE codes.
e. Aadhaar e-kyc for identifying the genuineness of student's data and blocking the duplicate registration of students by data forging.

Integration with central PFMS has reduced the bank transaction errors by updated beneficiary bank validation steps and log tracking.

ENABLER

Processes Re-engineered

- Automation: E-mail and sms status alerts sent to students upon payment sheet upload by department has made the life of students tension free
- Standardization: LGD code used for the masters as much as possible to get reports and dashboard figures in standard format and so that API integration with other departments in terms of data sharing can be easily done.
- Simplification: Application forms are simplified to standard field labels and usage of radio buttons and drop downs for data input having limited alternatives.

Technologies

Data analytics: Applied on the data accumulated till date has helped the department in identifying in institutions involved in malpractices and marking out students with dubious records.

People

Post Matric Scholarship Portal stack holders:

1. ST & SC Development Department (state nodal)
2. Assistant Commissioner office of tribal department at district level
3. Institutes/colleges
4. PFMS nodal
5. Students[scholarship applicants]

VALUE INDICATORS

Learning's for sharing

Updated help manual/FAQs/ guidelines uploaded in the web portal from time to time.

Training [both physical and virtual mode] imparted to institutions and district nodals for the latest developments and changes made in the portal.

New requirements and suggestions are noted off so that they can be incorporated in the portal withoit much hassle

Digital Empowerment

FAQ/help manuals are bilingual[English and Hindi] which is well versed for most of the population and application forms have proper instruction sets in both languages so that students and institutes can easily grasp the application requirements which is expected to be filled by them.

Green e-Governance

Reduction of e-waste: Number of e-gadgets and devices involved and their usage in manhours was minimized by integrating the stages of application forms seamlessly in single user login.

Green governance initiative: State wise range of user roles saving paper cost, transportation cost of man and materials

Department can now easily access the information which they want, Real time data can be access easily, Time saving, Online payment transfer directly to hostel account.

Mr. G. R. Markam, *Joint director, ST & SC Development Department, Govt. of Chhattisgarh, pmscsstobc @gmail.com*

Shri Ashish vandher, *Assistant Programmer, ST & SC Development Department, Govt. of Chhattisgarh, Ashu.vadher@gmail.com*

Shri Saurabh Dubey, *Scientist-C, National Informatics Centre Chhattisgarh State Centre, saurabh.dubey@nic.in*

Integrated Online Admission Portal for Undergraduates

Department of Higher Education, Govt. of Haryana & National Informatics Centre Haryana State Centre

Vijayendra Kumar, Alok Srivastava and Deepak Bansal

PROJECT OVERVIEW

To counter challenges posed by COVID 19, non-physical contact-less online portal has been developed in record time to provide safe, seamless and effective solution for admissions of Undergraduate programmes in various colleges of Haryana. The entire admission process was shifted to online mode so that students can complete their admissions without requiring to personally visit concerned colleges hereby ensuring the safety of students, their parents and also the college administration.

Main Objective of the platform was to deliver an integrated online common admission portal in contactless mode considering the pandemic year so as to seamlessly cater the admission needs of approx 2 lacs students competing for 329 colleges (Government, Aided and Self Finance).

Salient Features:

National Academic Depository (NAD) integration to fetch CBSE, Haryana, UP, Rajasthan & Punjab

board student verified marks

With this one of its kind integration, student from any part of the country is no more required to go through the manual cumbersome process for taking admission in UG courses. Student just has to enter the Board

Roll No-Passing Year-Student Name and prefilled verified details will be fetched that includes:

• All Personal details of the Student

• 12th Board Marks total as well as subject wise

The time taking manual process has been reduced to mere a 2 minutes application submission period and thus simplified the process.

Integration of Parivaar Pehchaan Patra (PPP) with the Admission Portal

Linking of all the applications onto a single platform – an attempt for a Unified Enterprise Architecture so that to ensure the benefit reaching to the end genuine user by the State government.

Income Certificate (EWS) which is required at the time of taking admission is integrated with

e-District

Student does not have to upload/submit all this certificates to claim any kind of benefit during the admission process. System only asks for the Certificate No (eDisha 15 Digit No) and authenticates the genuineness of the certificate.

Fully transparent system:

- District wise-college wise-courses-Course Seats-Course Fee is made available to the students (in public domain)

- Seat Matrix as per State reservation policy made available to the students (in public domain)
- 100% student verification in Online Mode
- 85 % applications received so far are system verified (i.e. Digi locker verified).
- 15% applications manually filled by the students are going to be verified by colleges through Online Mode only. There is no physical contact of college with student.

Integration with all available Payment options

Due to covid pandemic, there is a mandate to restrict the physical contact of the student. Keeping in view, the admission portal has the provision for the student to make the payment of admission fee from all the options such as – Credit/Debit Card, UPI, all types of wallets, Net Banking and POS.

Geographical Coverage:

Integrated Online Admission Portal for Undergraduates caters to all the districts of the state of Haryana

(a) National level – Number of State(s) covered 1

(b) State/UT level- Number of District(s) covered 22

(c) District level- Number of Blocks covered 142

Key Stakeholders:

- **Directorate of Higher Education, Haryana:** Integrated Online Admission Portal for Undergraduates was started with the vision setting from Directorate of Higher Education, Haryana to shift the entire admission process to online mode.
- **329 Degree Colleges of Haryana (including Government Colleges, Government Aided Colleges and Self-financing Colleges):** To understand the College Administration perspective and take into account the challenges faced there.
- **NIC Haryana Team:** Technical coordination and scoping of the work by product selection, infrastructure designing and setup, driving the development and implementation lifecycles.

As the system is integrated with NAD so authentic details of student i.e marks are auto fetched so need to upload mark sheet for the same. Similarly, integration with PPP and e-District also auto-fetched all verified details of the student, hence no need to upload documents like Caste, Income, EWS certificate etc to claim any kind of benefit.. The platform has become a boon for both students and colleges as student verification is 100% online so no physical presence of student is required in the colleges and college administration also need to verify minimal applications as maximum applications are system verified.

Hardware/Software

Front-end technologies: jQuery, HTML, CSS, Bootstrap

Back-end technologies: ASP.Net MVC, C#, Restful APIs, Windows OS, IIS as Web/App Servers and

MySQL RDBMS

The technology adopted had enough scalability in the sense that there was capability to handle surges of so many concurrent users which was the biggest challenge as due to closer deadlines people tend to login towards end of deadlines. It was cost effective, safe and secured and is user friendly for both developers as well end users

Certification (Certifying Agency)

Security Audit from Haryana Information Security Management Office (ISMO) is in process.

Disaster Recovery and Service Continuity

Adequate infrastructure has been deployed. Four servers out of which two webapp servers are behind

Network Load Balancer and two database servers are in replication mode.

The site is hosted on highly secured NxtGen Datacenter & Cloud Technologies Private Limited and disaster recovery, failover and restore steps are managed by them.

RESULTS INDICATOR

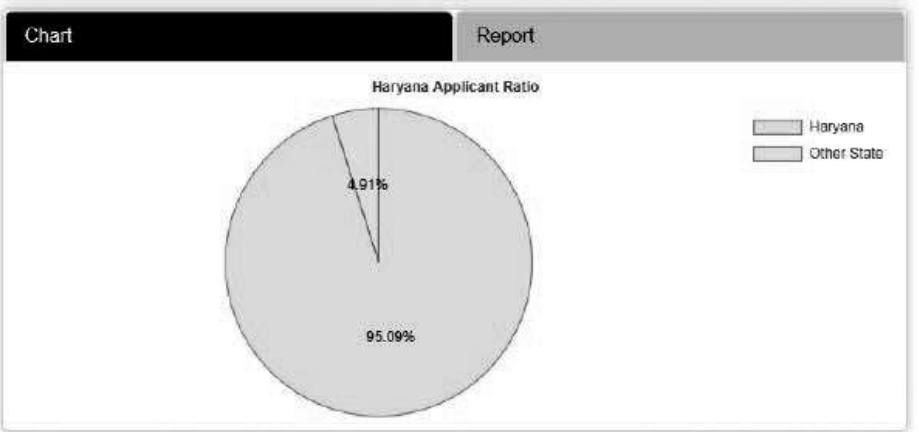
Description of various e-Services, benefits and their Volumes

Name of e-Services	**Brief service description with benefits**	**Volume (Nos) of Services year wise**		
		2020-21	**2021-2022**	**2022-23 (Upto date of nomination)**
Registration	Students seeking admission need to first register themselves on portal which is secured through OTP validation.	194165	223197	195639
Form filling	Once submitted, this form is available for online verification to the Government and Government-Aided colleges. The records are randomly allocated for verification to the colleges so that workload is evenly distributed. College may raise objection on the form. In this case student can remove the objections online and resubmit the application	191060	211695	184225
Merit List Generation	Post verification process, seat matrix & merit list is generated.	183756	205193	188737
Admissions	Students whose name appears in merit list may pay fee online and their admission is then confirmed. At each step of admission process, messages are sent through SMS on registered mobile no. of the candidates and also through email, if provided by candidate as email id is optional.	136327	142420	142420

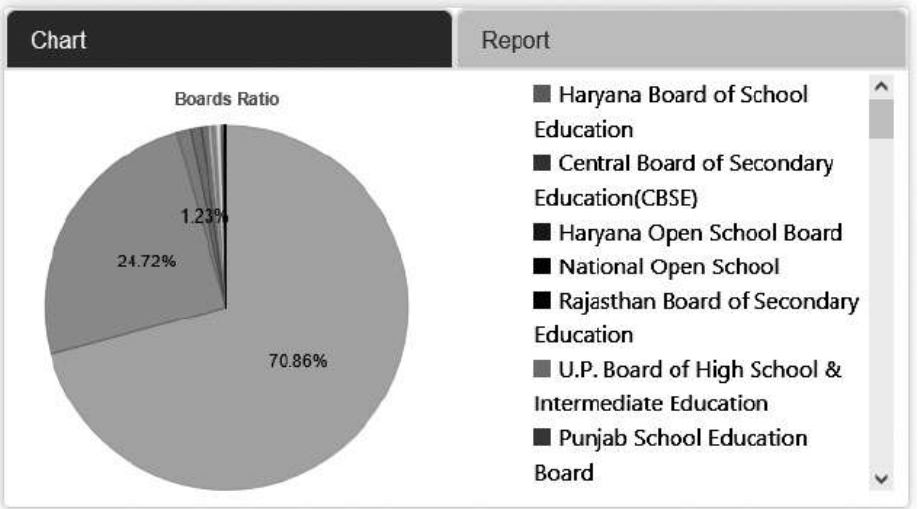
Implementation

Applications were invited from Haryana Domicile as well as All India Open Category where 85% seats were

reserved for Haryana Domicile and rest 15% were for All India Open Category.



Candidates were eligible from All School Boards to participate in the Admission process as
given in the chart below:



Indicate improvements/ enhancements

Integration of Admission Portal has been done with Parivaar Pehchaan Patra (PPP). All Haryana
candidates were verified from PPP which stands out to be 175158 this year. The whole process is
designed as contactless and paperless. Online verification module was provided to colleges. Most of the
documents like Domicile, Caste, Income, EWS, NAD API fetched marks and marksheet were verified
electronically through APIs. Miscellaneous documents like character certificate, NCC, Sports Award
certificate were verified online by the college

ENABLER

Processes Re-engineered

The mandate was to conduct contactless online admission for Higher Education, Haryana.

However the time period left was very short. The target was to develop and roll out the complete solution in a span of 45 days. Since there was no such common automation in

admission process therefore the baseline value for us was to start everything from the scratch after thorough analysis of the current scenarios such as:

- Analysis of the past trends of admissions, their loopholes and challenges faced
- Analysis of the field data and information related to Colleges details, courses and their sanctioned seats, fee details, subject combinations etc
- Analysis of in-depth automation requirement
- Prior to kick-start the development and implementation, preparation of FRS and SRS based upon the clearly defined admission rules and policies

The incumbent process used to be very complex, ambiguous and runs in silos for every college and university and there was no handshake of concerned stakeholders. No transparent Merit system and subjective verification lead to chaos within the State. To fix the problem statement, utmost step was to involve all the stakeholders and subject domain experts. To identify the bottlenecks and provide resolution of the challenges faced were thoroughly discussed, put forth and delivered hassle free services of the portal not only to the students but to all the colleges and universities as well.

Entire solution was designed and developed in such a way so as to deliver the critical and valuable modules continuous in time as per the defined SLA by breaking the application into small chunks of activities using the AGILE methodology.

For instance: The integrated online admission portal was divided into many modules (which are themselves big ERP applications individually) and assigned to respective teams such as:

- MIS data collection module
- Student registration and form filling
- Merit generation module
- Dashboard and reporting
- College ERP
- Seat matrix
- Student login and Fee payment module

Technologies

Dynamic Dashboard has been provided to gain insight into the overall admission process and for managing admission strategies.

People

In-house capacity has been developed in the department to carry out admission process. Multiple whatsapp groups were formed for day to day issues, resolutions and information dissemination.

Ticketing system has been implemented to answer queries and resolve admission related issues.

VALUE INDICATORS

Learning's for sharing

Since the online admission portal involves big database of Students, it was eminent that there will be 100+ parameters with 8-10 documents per transaction to be stored in database which is going to consume lots of space on the server and would lead to either choking of the server or spending huge amount to scale up the heavily configured servers. To deal with such challenges and problems, solution architect played a key role.

For eg; BASE64 schema is introduced which leads to efficient management of server storage.

And Login based role assignment to all the stakeholders and OTP based modification in the existing data with all logs maintained.

Collection of user consent was one of the pillars where the student data was used further to process the verification and merit mechanisms. Implementing consent management platform was the most sensible decision to stay on top of the changing and complex data protection and privacy compliance environment Fetching student data from National Academic Depository (NAD), applying the rules and condition related to reservation, weightage policy and any kind of relaxations are derived based upon the information shared by the students. Consent was taken from the students for the same and recorded. The solution provided thus ensured that all the activities took place under the purview of data protection laws and regulations within the guidelines.

PPP plays a pivot role in terms of verification of student identification, address, DOB, caste, income etc for elimination of paper work thus reduced the burden of uploading PPP verified proofs.

Digital Empowerment

As Haryana is a small state and has no noticeable difference in language, demographic & culture.

Green e-Governance

Do away the physical verification; Most of the parameters were verified from PPP & NAD APIs, hence no physical documents were required.

Shri Vijayendra Kumar, IAS, *Principal Secretary to Government of Haryana, Department of Higher Education, Haryana, vijayendrakumarsingh@gmail.com*

Shri Alok Srivastava, *Scientist-F, National Informatics Centre, Haryana State Centre, alok.s@nic.in*

Shri Deepak Bansal, *State Informatics Officer & DDG, National Informatics Centre, Haryana State Centre, sio-hry@nic.in*

eGreencard and Tripcard

State Transport Department Govt. of Uttarakhand & National Informatics Centre Uttarakhand State Centre

Arvind Singh Hyanki, S. K. Singh and Sanjay Gupta

PROJECT OVERVIEW

As per the mandate by Uttarakhand Transport Department, all commercial passenger vehicles visiting for Char Dham yatra are required to generate and carry Greencard and TripCard during the journey. The GreenCard is issued to a vehicle after checking validity of a vehicle's documents such as registration certificate, permit, pollution & fitness Certificates. The TripCard is generated with all the passengers/pilgrims details along with driver information driving the vehicle during the journey.

The portal is integrated with VAHAN and SARTHI Portals for fetching Vehicle and driver related details for generation of GreenCard and TripCard respectively. The GreenCard and TripCard are checked/ verified by transport authorities at various check points located in Char Dham route. The portal has also been integrated with Tourism Department's portal of Uttarakhand

Government which captures details of each of the pilgrim visiting Uttarakhand for Char Dham Yatra.

Citizens/transporters and drivers from all over india and neighbouring country like Nepal visits Chardham yatra and the portal was extensively utilized by them during 2022 yatra season starting from April 2022 and until closures of Shrines. Online eGreencard portal is still active and eGreencard and Tripcards are being issued to the transporters/drivers.

Key Stake Holders: Transporters/Drivers, Citizens or Pilgrims, State Transport Department,

Tourism Department.

Hardware/Software

Software Environment: Microsoft Asp.net

Database Environment: Microsoft SQL Server

Certification (Certifying Agency)

Site is Security Audited in April 2022 from CERT-in empanelled Agency.

Disaster Recovery and Service Continuity

Scheduled regular backup of database has been configured on the available VM in State Data Centers. Application backup is taken on regular intervals. DR has been configured by SDC. Backup VM with application is available for service continuity.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	Brief service description with benefits	Volume (Nos) of Services year wise		
		2020-21	2021-2022	2022-23 (Upto date of nomination)

eGreencard	Any commercial passenger vehicle visiting Chardham need to obtain this document from the eGreenard portal. Once it is found that all the relevant documents related to vehicles are valid, eGreencard is generated.	Nil	3249	26239
Tripcards	Tripcards is a document containing details about the trip. This document contains information about the driver, eGreencard no., Passenger details, and dates for visit to dhams.	Nil	480	43276
Hill Endorsement	Driver must have to Hill endorse their Driving license from the portal itself.	Nil	NIL (Only Uttarakhand State Drivers were allowed due to covid. They already have hill endorsed in DL)	11235

Implementation

Earlier greencard was issued in offline mode and there had been lot of footfalls of Transporters and Pilgrims at the respective offices. Now the system has been completely online, transporter are applying eGreencard and Tripcard from their designated places, without coming to office. Transporters from all over the country India and neighbouring Country Nepal are applying for eGreencard from their geographical locations.

As per statistics available with the department earlier 15000 Greencard were issued when manual process was in place. Also there was no details of pilgrims were available. After implementing this system there is rise in number of Greencard.

Indicate improvements/ enhancements

Presently the portal is web enabled and there is a dependency on a computer to generate eGreencard and Tripcard. Mobile based solution to generate eGreencard and Tripcard is under development and shall be rolled out for public and transporters for next Yatra season.

ENABLER

Processes Re-engineered

Earlier driver/transporters used to visit RTO office with all documents in physical form. After that Office used to verify all the documents manually. There was no record of passengers and trips for Char Dham Yatra.

Now in existing process the time taken to issue Greencard has been reduced and transporters/drivers need not visit RTO Office. Validities of all required documents are verified from the Parivahan APIs for generation of eGreencard on real time, thus reducing the time in preparation of eGreencard.

Portal is integrated with Payment gateway, enabling collection of fees online for eGreencard. Portal is also integrated with SMS gateway to send alerts to the applicants/drivers/transporters on various phases of the eGreencard and tripcard generation.

Technologies

The portal is integrated with Vahan/Sarathi APIs for fetching real time data of the Vehicle and the driver. Also it is integrate with Tourism department portal for fetching the passenger/pilgrim details during Tripcard generation.

People

Training to the concerned department and other stakeholders were imparted. Guidelines and User manuals prepared for effective utilization of the online portals. Toll free no. helpdesk and support contact details are also mentioned in the portal for any enquiry related to Yatra.

VALUE INDICATORS

Learning's for sharing

After implementing this project we have learned that many of the government services which are given to citizen can be provided in faceless manner in other sectors also. Also verified data which is available with other departments/portals can also be used if required so that data entry can be minimised. We have to take care of data privacy in this type of integration.

Digital Empowerment

Frequently Asked Questions, do's and don'ts, user manuals and eGreencard and Tripcard are provided in bi-lingual to help people understand the system. Questionnaire for issuance of Hill endorsement on DL are prepared in English as well as on Hindi to facilitate the applicants. Orientation video covering as aspects of driving in hilly terrain is also prepared to educate the drivers.

Green e-Governance

The system is completely online and there is no need to take printouts of eGreencard and Tripcards. All the documents related to Vehicle and Driving License are fetched from online Parivahan portal, so there is no need for producing physical documents by the applicants. eReceipts are available on the portal for authenticity and verification for the enforcements.

Shri Arvind Singh, *Hyanki, Secretary/Commissioner Transport Uttarakhand, State Transport Department Govt. of Uttarakhand, tc-trans-uk@nic.in*

Shri S.K.Singh, *Joint Transport Commissioner, State Transport Department Govt. of Uttarakhand, ci-trans-uk@nic.in*

Shri Sanjay Gupta, *Senior Technical Director, National Informatics Centre Uttarakhand State Centre, sanjaygupta@nic.in*

Technology Platform for Management of National Curriculum Framework (TPMaN)

NIC School Education Division, Ministry of Education, Govt. of India

Saba Akhtar and Ashwani Kumar

PROJECT OVERVIEW

The 4 National Curriculum Frameworks (NCFs) - Early Childhood Care and Education (ECCE), School Education (SE), Teacher Education (TE) and Adult Education (AE), envisages to create an outcome-based learning approach for an inclusive learning environment. In view of NEP 2020 recommendations about bringing reform in School Education this framework will be mapped to 25 focus areas covering Curriculum and Pedagogy, Cross Cutting Themes and Other Important Areas under NEP, 2020. Recommendations will be collected from grass root level stakeholders through questionnaires designed for each framework area at district consultations to national consultation in a digital mode. The recommendations from the district will be reviewed at state and then national by the committees of subject experts to derive at 4 State and National Curriculum Frameworks.

NCERT partnered with NIC to build a technology platform for the development & management of NCFs & SCFs in consultation with States/UTs & Ancillary bodies. To meet this massive objective, TPMaN web-based application is developed which is user friendly, collaborative, data driven, highly secure & incorporate extensive functionalities to meet the overall outcome in paperless manner. It has leveraged the Machine Learning capabilities to derive valuable insights from the data generated across 36 States/ UTs in form of District Consultation report, Focus Group Position papers, Steering committee consultations, Mobile consultation and DiSaNC survey

TPMaN detailed functional scope for conducting smooth consultations meetings for various discussions /activities are as follows:

- web-based application, which is user friendly, collaborative, data driven, highly secure & incorporate extensive functionalities to meet the overall outcome in paperless manner.
- It has leveraged the Machine Learning capabilities to derive valuable insights from the data generated across 36 States/ UTs.
- A centralized solution for smooth and hassle-free consultations, document creation, data sharing and conducting meetings at district, state and national level for developing NCFs and SCFs.
- Hassle-free NCF development management with real time alerts and notifications to all relevant stakeholders and management team.
- Easy dissemination of updated information to resources involved in NCF development.
- Assistance to stakeholders for smooth consolidation of information, documenting and draw insights in desired format.
- To drive the input collection, developed the questionnaire-based Survey applications:
  1. Mobile based Consultation: Released in 16 languages-based on the 4 targeted curriculums. Mobile Survey App featured MCQ based

questionnaire, multi-lingual, online and offline mode data capture, OTP based authentication of users, data summarization and reporting, tabular/ visualization reporting etc. Survey conducted for target group of 3000 community members in each state.

2. My Gov survey: State/ UTs targeted MCQ based survey conducted on MyGov Portal, one time data transfer from MyGov portal to TPMaN, analysis and generation of visualization/ reports of MyGov data.
3. A Digital Survey for National Curriculum (DiSaNC) to seek inputs from public at large i.e., target of 1 Crores- Released in 23 languages
    - Standard repository of all documents such as MoM, Guidelines, Circular, notifications, version control and history management of consultations/ reports/ curriculum frameworks etc.
    - **Interactive Dashboard:** Role based interactive dashboard which give real time information against pre-defined timeline based on proposed activities/ milestones. The MIS report generated by the dashboard are both viewable and downloadable (excel/pdf/image/text/graphics etc.) based on the designated roles. It shows a holistic progress starting Onboarding and mapping of the users/ critical roles, module wise progress to develop DCRs, Survey responses (real-time data), creation of district groups (National & State level), focus groups (Nation & State level).
    - **User's & Mapping:** Users are onboarded on the TPMaN & assigned roles based on their role in development of data (example: Surveyors are onboarded to complete the Mobile App Survey) by the administrator roles like National Technical coordinator (NTC) or State technical coordinator (STC) using this section.
    - **Document Stream**: It securely stores and has the provision to add, amend and save the details of the various reports viz. Guidelines and Documents, MyGov Survey Data, Mobile Survey Data, Consultation Reports (from State) and Position Papers (from State Focus Groups), National DCRs, National Focus Group Reports, Documents from Ancillary Groups and the current working drafts. The visibility of the cue cards depends on varies between the function of users in the platforms
    - **Meeting Management**: To conduct meetings in online, offline or hybrid mode for the State & National District group; State & National focus group members.
    - **Analytics:** Includes analysis of responses submitted via Mobile Survey Data, MyGov Survey Data and DiSaNC Citizen Survey Data (Public Consultation for NCF)
    - **Help**: Includes FAQs, information on E- Mail support, and On-call support numbers.
    - User Interface/ User Experience design based on simplified user usage and experience
    - **Alerts and Notifications** (SMS and Email Alerts were sent for any additions and amendments by any role-based users.

Stakeholders/ Beneficiaries:

All School education ecosystem, Ministry of Education, All State Education Dept., Autonomous bodies, Schools, Students, Teachers, researchers and public

The status of the TPMaN platform and its functional module are designated below:

1. Thirty-one (31) states have successfully completed the baseline target of 3000 Mobile survey/s and overall survey completed are 1,31,564 across States/ UTs
2. The total number of DCR submitted are 1516/1608
3. One hundred Thirty-two (132/188) National DCR successfully submitted
4. Five hundred Eighty-Eight (588) PDFs of the State Focus Group position paper/s uploaded by 25 States/ UTs in the NCF tech platform
5. Six hundred Seventy-two (672) State position papers e-templates have been submitted by the States/ UTs
6. Received and uploaded twenty-four (24) inputs from the Ministries/ Ancillary groups
7. Successfully received 10 Lakhs+ responses till date

Hardware/Software

For the development of the TPMaN application following emerging technologies have been used:

a) **Machine Learning:** Machine Learning has been used to summarize documents at District, State and National Levels. Usage of this technology with Hugging face transformer algorithm ensured that all critical and important qualitative points made at any level were captured and summarized as insights and the users at higher levels did not have to go through thousands of documents manually which would have been a massive exercise both in terms of resources and time required.

b) **Directus CMS:** as Opens source Headless Document Management System with API Layer. Usage of Directus as the base API layer ensured that Content versioning both at the individual section as well as document level was easy to manage. The Directus API layer helped with basic CRUD operations that get automatically provisioned substantially reducing API development efforts.

c) **Citus (PostgreSQL extension):** Usage of Citus extension for PostgreSQL ensured horizontal scaling with partitioning was made possible at the DB Layer. PostgreSQL by default does not support horizontal scaling (master – master configurations). Most of the partitioned tables were shared on State Key values that ensured equitable distribution of data across shards.

d) Ubuntu 18.0.4 (64 bit) as Operating system

e) Android 5.1 or later, iOS 12 or later as mobile operating system

f) Angular as Frontend framework

g) Java and Nodejs as Server-side language

h) PostgresSQL12 with Citus data as database

i) Bootstrap, HTML5, CSS3, and JS as Frontend

j) Apache Tomcat as App server

These emerging technologies helped in proactive collaboration, data refinement, data collation and consolidation. The output returned from the chosen algorithm was efficient and delivered final outcome in terms of summarized reports and recommendations faster and helped in effective communication within the application.

Certification (Certifying Agency)

Yes, formal audit performed, and certificate provided. A3S tech & Company (CERT-In empaneled)

- Certificate No: A3S/ASAC/2122/0060
- Issue Date: December 8th, 2021
- Company Name: National Council of Educational Research and Training (NCERT)
- Partner: A3S Tech & Company

Disaster Recovery and Service Continuity

The Disaster Recovery and service continuity is managed in the NCF ecosystem via deployment of backup server at different geographies. The real time data storage is disseminated nation-wide with data streaming at different locations to maintain the serve continuity.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	**Brief service description with benefits**	**Volume (Nos) of Services year wise**
		2022-23 (Upto date of nomination)
Mobile App Survey	To seek inputs state-wise from targeted stakeholders like parents, teachers, community workers etc.	131569
DiSaNC Citizen Survey	To seek inputs from the citizens	100000+ & counting
State & National District Consultation Reports & State Position papers	To collect consultation reports and position papers state-wise	2500
Ancillary/ Ministry bodies suggestion documents	To seek suggestions from different ministries and department for the formulation of NCF	75+

Implementation

It was envisaged that digitization of data collection processes may be done to capture the PAN India consultative data from the granular level i.e. District, State and National. TPMaN platform has successfully helped in meeting this objective and captured and made it available to the roles-based users for viewing, editing, developing, summarizing, consolidating, monitoring pertaining to the NCF & SCFs development.

For a user to start working on the TPMaN platform requires NCF platform registration using their Mobile number & Email ID by the TPMaN administrator. Users registered/ onboarded/ mapped under critical roles have the rights to further onboard other users under their hierarchical levels. This system provides a flexible way to snowball the process of registration and onboarding of required/ relevant users in a hassle-free manner to facilitate the development of NCFs & SCFs.

The target vs overall completion status:

1. Thirty-one (31) states out of 36 States/ UTs have successfully completed the

baseline target of 3000 Mobile survey/s and overachieved the survey target viz. 1,08000 (target) vs.1,31,564 (achieved till date)

2. 1516/1608 number of DCR submitted till date (ongoing)
3. One hundred Thirty-two (132/188) National DCR successfully submitted (ongoing)
4. 588/ 900 PDFs of the State Focus Group position paper/s uploaded by 25 States/ UTs in the NCF tech platform (ongoing)
5. 672/ 900 State position papers e-templates have been submitted by the States/ UTs (ongoing)
6. Received and uploaded twenty-four (24) inputs from the Ministries/ Ancillary groups (ongoing)
7. Successfully received 10 Lakhs+ responses till date (ongoing)

Afterward, Orientation and technical training is provided to end-user at national, state, and district levels by the NCF Technical Team. Till now, NCF technical team was proactive in training management viz physical and online trainings & workshops, provided 4 physical trainings and 120+ virtual sessions based on first cum first training request. The TPMaN platform also has a 24x7 helpline support via toll free number, emails ID and WhatsApp support in resolving the NCF technical and process queries.

TPMaN has a broad range of Stakeholders from the Steering committees, State and National Focus Group members, State and National District Group members, Specialised Surveyors distributed in various pre-defined roles viz. Members, Member Secretaries, focus group Members, Focus group member Secretaries and Chairperson for respective Focus groups, District groups and Steering committees.

Indicate improvements/ enhancements

The improvements and enhancements specifically rolled out for Capacity Building and Awareness regarding the TPMaN Platforms:

- Four (4) National level physical training were organized and conducted for 36 States & UTs during the year 2021.
- In year 2021-2022, 120+ Virtual training session are organized and conducted for District, State level users related to process, collection of survey responses, DCRs reports, meeting management.
- Special Training session is organized for academic queries as well with expert faculty from NCERT.
- 21 User Manuals specific to various roles in the TPMaN platform is available for user's access in their Document stream section under Guidelines and Documents section.
- TPMaN has developed the ticket management module to address the grievances and redressal
- Provision to upload Report in PDF format was added
- Provision to collect inputs and recommendations from the Ancillary groups and Ministries was added
- There is an open feedback section to collect appreciations, grievances, support required etc.

TPMan project has planned to extend 1.5 years maintenance support which covers automation, process-oriented trainings, report consolidations, formulation of NCFs

and SCFs and work on the adhoc request from the Ministry and other relevant stakeholders.

ENABLER

Processes Re-engineered

At the onset of the project, the stakeholders held number of focus group discussion to develop a detailed scope and implementation expectation. Then the series of meeting was concluded by development of the strategy paper. The objective was to develop a platform which would facilitate consultative policy making in a paperless manner and with a bottom-up approach. The strategy paper was developed in consultation with the stakeholders and was focused on broad user base (PAN India- covering granular levels) to seek appropriate information to minimize scope creep. Focus group e-Templates were conceptualised not just to capture data from users but also to map the defined sections across connected documents (District, State and National) to develop a consolidated simplistic, meaningful, futuristic and effective recommendation which can drive the development of the NCFs and SCFs. These scientifically designed e-templates aided users to fill up relevant data which thereby provides an input to other developing areas. The development was agile driven, focused on defining various target segments and extensive navigation in the applications from the perspective of various users. The planning and design phase involved continuous stakeholder engagement, focus group discussion, and develop and design multiple iterations while designing the UI/UX of the website which includes home page, navigation, workflows, cross domain functionalities, etc. The development followed the standard Government prescribed guidelines i.e. Guidelines for development of e-Governance Applications (GudApps), Web Standards for Accessibility (Web and Mobile), Framework for Adoption of Open-Source Software in e-Governance Systems, MeitY, OWASP and CERT-In Security Audit Guidelines.

Technologies

We adopted Microservices architecture for development of the TPMaN application. Usage of this architecture let us adopt both Node as well as Java Spring boot-based services working together. Directus CMS (a headless CMS with an API Layer) works on Node and most of the services were driven via Directus API layer while all the custom services have been handled via Java Spring boot (limited to notifications and alerts). Other components of the architecture include:

A) Load Balancer: HA Proxy 2.5

B) Web Server: NginX 1.16

C**) API Gateway:** KrakenD 2.0

D) API Layer: Node and Java Spring boot

E) UI: Angular

F) Cache: Redis 6.2.6

G) Database: PostgreSQL 12

H**) Log Management:** GrayLog 4.2

The deployment architecture was developed keeping in mind the lift-and-shift requirement from NIC so that the infrastructure could be moved between clouds or to NIC DCs as and when required. All components except the DB and the Cache Layer were deployed in containerized environment. Docker images were used for

containerization and a mix of containers on each VM ensured VM level HA in itself, for example images of webserver as well as API gateway were running together on multiple VMs.

The TPMaN knowledge management module stores and has the provision to add, amend and save the details of the various reports viz. Guidelines and Documents, MyGov Survey Data, Mobile Survey Data, Consultation Reports (from State) and Position Papers (from State Focus Groups), National DCRs, National Focus Group Reports, Documents from Ancillary Groups and the current working drafts. The visibility of the cue cards depends on varies between the function of users in the platforms

People

The TPMaN was created with the vision to create and collaborate the consultative inputs and ease of data exchange from the grassroot levels (from district to state to national) based on the bottom-up approach. The beneficiaries feedback revealed a seamless operational experience involving simplified user management, controlled data flow, ease of data management, monitoring via Analytics and Dashboards while using the tech platform. Users were given the provision to schedule and conduct online meeting/ virtual sessions via meeting management module. The platform further facilitated the collection of data from granular level by maintaining transparency and accountability via user management module. The NCF helpline has provided a 24x7 support in resolving the NCF technical and process queries and was proactive in training management across 36 states/ UTs viz 4 physical trainings and 120+ virtual session based on first cum first training request. TPMaN has delivered a strong governance model to facilitate the collection of the inputs and recommendations across the country. The NCF website has reached 1.5 Lakh+ visitors to contribute to the largest digital grassroot program. The portal has reached and is being used by 28 States & 8 UTs to generate and upload critical data in the form of consultation reports. The portal has successfully received 1516 consultation reports, 668 position papers, 132 national district consultation reports and feedback from 11 Ministry/Ancillary bodies till now. A mobile app poll was published with a target objective to reach 3000 respondents per states/ UTs based on the four NCF domains (ECCE, SE, AE & TE). But we have crossed the numbers by more than 30,000 target respondents. The states/ UTs has onboarded 8300+ surveyors on the NCF platform across the country to facilitate the 1,31,561-survey responses and still counting.

Change Management:

Most recommendations for enhancing user experience that may require minor changes without impacting backend rules are accommodated by the technical team after a feasibility study. Major changes are discussed at the Department/Ministry level/ Stakeholder level i.e., Post confirmation, NCERT implements. Feedbacks are received from Ministry/Department level are incorporated accordingly.

VALUE INDICATORS

Learning's for sharing

The project had several challenges related to data collection, collaboration, Consolidation, role management, e-template mapping and meeting the prescribed timelines. Following are the challenges along with solutions which became learnings:

- The offline data collection system got replaced by the online data capture system via TPMaN
- Lack of accountability due to the absence of an audit trail got improved because of the online data capture system for each process used.
- Earlier the consultative process was in form of manual process. To capture PAN India grassroot level data was a tough challenge, which was solved by developing a strong governance model from the bottom-up approach by deploying various roles-based structure for data collection, consolidation, review and submission.
- Lack of coordination and supervision was absent due to manual processes, but with the bottom-up approach embedded in the TPMaN- centralized data collection, consolidation and monitoring helped in eradicating this challenge.
- TPMaN was conceptualized keeping the digital literacy quotient in mind. This platform is developed on a simplified, user understanding interface which don't require too much technical knowledge and expertise
- Machine learning algorithms helped in easing the number of hours and consolidation of the huge amount of data reports within few hours, without any manual read.

The open architecture framework was used to ease the development process and facilitated the urgent changes without spending hours and diem.

Digital Empowerment

Digital Empowerment in education is the ability to locate, organize, understand, evaluate and create information for using digital technology. It is the basic knowledge of digital medium, to utilize the technology of internet, smart phones, computer tablet. It is the introduction of information technology in every sector of the economy to empower people in education sector.

Presently, in the pandemic situation the provision of online training and knowledge imparting has been explored which was earlier catered through physical trainings.

TPMaN e-templates are provided in 2 languages i.e., English and Hindi. But the data capture mechanism has incorporated 22 language (DiSaNC) and 16 languages (for Mobile consultative process) to facilitate the input collection from the grassroot level. These factors have empowered the citizen to participate and collaborate in this mass consultative process.

Green e-Governance

Drastic Reduction in the printing cost incurred when the NCFs development process was manual. With this advent of this TPMaN platform, a paperless data consolation, data collection, data consolidation approach has saved huge number of paper printing.

With digitization, the printing cost in development of NCF using consultation reports obtained from district, state & national level is saved. The development of NCF is instates an essence of inclusive governance and decision making. The reduced size of the data captured through predesigned questionnaire (developed by the curriculum department of NCERT) in the form of E-templates enables the collection of data in a format that goes a long way in eliminating open-ended suggestions thus make the data more consistent for further analysis by machine learning. This is also applicable to the responses collected through surveys (Mobile App & DiSaNC) in the form MCQs.

Reduction in carbon digital footprint: TPMaN is a digitize platform hosted on Azure intended to develop NCF in a paperless manner. The Surveyor application has a provision to ask the respondents to provide data via BYOD and Surveyor's device.

Mr. Saba Akhtar, *Scientist -F & NIC, NIC school education divison, Ministry of Education, saba@nic.in*

Mr. Ashwani Kumar, *Scientist C, NIC school education divison, Ministry of Education, ashwani.kumar@gov.in*

One Time Settlement (OTS)

Andhra Pradesh State Housing Corporation & APTOnline Limited, Andhra Pradesh

Narayana Bharath Gupta and B. Bala Kishore

PROJECT OVERVIEW

Objective:

"One Time Settlement (OTS) Project is basically meant to deliver the Registration Document to the Beneficiaries "which gives complete rights including transfer of property".

Scope:

1. Secretariat Tagging Module
2. Beneficiary data Updation & Field Status Module
3. Approval of Beneficiaries Module (PS/WAS & VRO/WRS)
4. Payment Initiation Module
5. Loan Clearance Certificate Module
6. Tahsildar Approval Module
7. Printing Module
8. Registration Modules (Pre-Registration Module & Post Registration Module)
9. Scanning Module
10. SRO Approval Module
11. E-Sign Module

The scope of the project is to share the electronically Signed Registered Documents to Registration Department to deliver the service to Beneficiaries in the form of EC (Encumbrance Certificate) and CC (Completion Certificate)

Stake Holders:

1. Panchayat Secretaries
2. Ward Administrative Secretaries
3. Digital Assistants
4. Welfare Education Data entry Secretary
5. Village Revenue Officers
6. Ward Revenue Secretary
7. Tahsildhars
8. Sub-Registrars
9. Line Departments - Printers
10. Joint Collectors

Functional: Interdepartmental Integration right from the stage Beneficiary Selection to the CC Generation

Geo-graphical: State of Andhra Pradesh

Benefits: Registration Document to the Beneficiaries "which gives complete rights including transfer of property".

Current Status: Currently 7,61,266 Registration Documents generated for Beneficiaries and out of which 7,19,220 Encumbrance

Certificates also generated.

Hardware/Software

Frame work used: .Net Framework

Database: MS SQL

Other Reporting Tools Used: SSRS, JQUERY, Power Bi

Certification (Certifying Agency)

Security Audit Certificate from APTS

Disaster Recovery and Service Continuity

This ICT solution is hosted at AP State Datacenter. Since this data centre hosts almost all the flagship IT applications of AP govt, it is fairly safe and the agency maintaining this data center follows all the best practices and laid out procedures. However, as AP was bifurcated recently and hence is in process of establishing its own infrastructure, it is yet to set up a DR site. As part of DR and Business Continuity, there has been proper backup policy in place which is tested frequently for its effectiveness and the servers are configured in High Availability mode. All the Application servers and database servers are configured in Virtual Environment with redundancy. Incremental Data backup, weekly full back up, after one month data copied on tapes and moved to another place for safe keeping.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	Brief service description with benefits	Volume (Nos) of Services year wise		
		2020-21	2021-2022	2022-23 (Upto date of nomination)
OTS	Registration Document to the Beneficiaries "which gives complete rights including transfer of property".	-Nill-	5,85,990 Registration Documents generated for Beneficiaries electronically signed with 1,38,571.	7,61,266 Registration Documents generated for Beneficiaries with 7,01,623 electronically signed documents for which Encumbrance Certificates generated

Implementation

7,61,266 Registrations Achieved out of the total target of ~35Lakhs Beneficiaries

Indicate improvements/ enhancements

Organization based e-Sign Technology 3.2 has introduced for signing the Registered Documents Electronically in the year 2021-2022. Organization based e-Sign Technology is used for the First time in the State of Andhra Pradesh. Currently 12,549 users are utilized the service through digital processing with online audio and video processing.

ENABLER

Processes Re-engineered

Sharing of Data to Line Departments (like Printers) for printing the Registered Documents without middlemen intervention once after approval of the same by the

Functionary at Higher level.

Technologies

Enterprise Architecture: .Net 4.5 - 3-tier Architecture

People

In order to make the One Time Settlement Project successful, Training's were conducted at the grass root level to motivate the Beneficiaries to avail the Scheme benefits by involving the Secretariat Level Staff. Further Motivation programs were conducted every fortnight to achieve the target. Project Management Unit at Head Office has also given more impact for implementing the project in a smoother way by resolving the grievances raised from the ground level on timely basis.

VALUE INDICATORS

Learning's for sharing

Capacity Building is the main challenge to move the project at ground. Two ways of Capacity Building programmes

have been taken up one is Motivation to the Beneficiaries to avail scheme benefits and second one is Training to

the Functionaries on OTS functional process.

Digital Empowerment

1. Measures have been taken that, each and every Beneficiary should be benefited with the Registration Service.

So far, 7,61,266 Beneficiaries as of now Benefited by this project.

2. Measures have been taken to avoid the conflicts between the Beneficiaries for payment of Scheme Amount to

avail OTS service Benefit by incorporating the functionality in OTS end, apart from the Source database

application. So far, ~321 Crores of Rupees accumulated/collected as Financial gain during the implementation.

Green e-Governance

- As most of the processes involved has been automated resulting in shift from manual processes which used to consume lots of paper. Now the use of paper has been minimum, a big step towards green e-Governance.
- Also, department has been using the related IT Infrastructure (servers, network equipment etc used in hosting) along with in house IT equipment at its offices in a very judicious manner helping in extending their life. So, through the efficient use of IT equipment, department is achieving green e-Governance.

***Sri. Narayana Bharath Gupta**, IAS, Managing Director, Andhra Pradesh State Housing Corporation, apshclmdpeshi@gmail.com*

***B. Bala Kishore**, Group Lead, APTOnline Limited, Andhra Pradesh, bala@aptonline.in*

Electric Vehicle Subsidy Disbursement Portal

Transport Department, Govt. of Odisha & National Informatics Centre Odisha State Centre

Prasant Kumar Nayak

PROJECT OVERVIEW

Objective:

Government of Odisha has framed a "Odisha Electric Vehicle Policy 2021" vide Notification No. 1358 on dated 02.09.2021 where Govt. has announced some subsidy to the Electric Vehicle owners in promotion of Electric vehicle in the State and to maximize reduction of vehicular pollution, the policy focuses attention on incentivizing the purchase and use of Electric Vehicles particularly in the segment of two wheelers, three wheelers & four wheelers.

Scope-Functional -Includes the following stages

- Design, Development, UAT (User Acceptance Test) and implementation of development, hosting and maintenance of the website for Electric Vehicles Subsidy Disbursement.
- Cyber security Audit & compliancecertification.
- Migration from staging to production environment.
- Web service/API Integration.
- SMS Integration.
- Training and Implementation support.
- Regular Fund placing to different RTOs for subsidy amount payment to beneficiary.

Purchase incentive at the following rates shall be made available to the Electric Vehicle Owners

Category of vehicle	Percentage of cost of vehicle as subsidy	Maximum amount of subsidy
Two wheelers	15%	Rs. 5,000/-
Three wheelers	15%	Rs.10,000/-
Four Wheelers (LMV)	15%	Rs. 50,000/

Scope-Geographical- Implemented completely in 38 RTOs all over Odisha.

Stake holder – Transport Department-Govt of Odisha, RTO, STA, Electric vehicle Owner, Odisha Treasury, Bank, NIC

Hardware/Software

- Java Spring Boot 2.5 (Backend, API)
- Angular 12 (Front-end Design)
- HTML5,CSS3,BootStrap 4,Javascript,JQuery,Ajax (Scripting Language)
- Postgresql 9.6 (Database)
- Eclipse (Integrated Development Environment)

Certification (Certifying Agency)

Security Audit In process for completion by NIC CERT with id –

NIC/CSD/IA/18042

Disaster Recovery and Service Continuity

DR setup running NDC Delhi

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	Brief service description with benefits	Volume (Nos) of Services year wise		
		2020-21	2021-2022	2022-23 (Upto date of nominatio n)
Total Electric Vehicle Registration (All Category Vehicle)		1359	10392	11319
Total Electric Vehicle Subsidy Category wise Count	Two Wheeler			4572
	Three Wheeler			365
	Four Wheeler			124
Electric Vehicle Registration Benefits	Two Wheeler			22860000
	Three Wheeler			3650000
	Four Wheeler			6200000
MIS for RTO and Public	Share the datasets collected to desired officers/ offices	100	150	217

Implementation

As per policy it is Implemented Completely in the state and electric vehicle subsidy disbursement is doing successfully but to make the process of disbursement seamless by removing the human intervention for account verification and subsidy disbursement , an automated process has been reengineering with an integration with NPCI (National Payment Corporation of India) through IFMS Odisha .In this process beneficiary account validate through NPCI ,On successful validation of account no ,ifsc code final disbursement will be done to applicant .

Indicate improvements/ enhancements

- Implemented in 38 RTOs all over the state of Odisha.
- The portal is functioning with the criteria and requirement of the Odisha EV Policy-2021, with the direct supervision of Transport Commissioner Odisha.
- The field level officers are also highly instructed to regulate the disbursement modalities for subsidy disbursement in a time bound manner.
- Delivery Channels- Electric Vehicle subsidy disbursement to be done directly to the beneficiary bank account seamlessly by the integration of IFMS.
- Category of Stake Holder – RTO,Govt of Odisha,Electric Vehicle Owner,

Bank, IFMS,NIC

- With in last four months more than 5061 vehicle approval done with 3.27 Crore amount disbursement done in the sector of 2Wheeler,3Wheeler and 4 Wheeler.

ENABLER

Processes Re-engineered

- Earlier subsidy amount disbursement done by manual process where vehicle owner was coming physically with vehicle details which was verifying by the registering authority .
- To make the system online EV portal developed for applying EV Subsidy .Electric vehicle Owner can apply for subsidy (registered after 01/09/2021)in the portal .
- On successful verification applicant no show to authority for approval.On approval only beneficiary will get the subsidy amount by RTO after submitting all the approval documents in respective bank .
- NIC doing integration with IFMS team under process for completion for automatic account verification and amount disbursement process.In this process after Electric vehicle owner applied in EV Portal . Directly their account will be validate through IFMS web service. On successfully validation of account bulk disbursement will be done to the applicant with in T+1 day.
- Paperless service.
- Standardization – Proper Client side and Server side validation as per the Govt. Notofication .

Technologies

- Dashboard for each activity of the application provided to the admin and RTO user.
- MIS Report for all category done.
- STA (State Transport Authority) and RTOs are using its social media account for publicity of EV Policy
- All EV Portal related complaints has been handled by dedicated communication cell of STA to resolve and to guide the applicants.
- The portal was inaugurated by Chief Secretary of Odisha to popularize the Electirc Vehicle adaption in the state.

People

- Regular training to RTOs for efficient use of portal for verification, approval & disbursement of subsidy.
- Higher authority can monitor the entire disbursement system.
- In Change management process current manual process of disbursement will be automatic by proper verification of account no by IFMS Odisha (restricting dormat account, wrong account no/ifsc code etc) procedure.
- 100 % online process allow the user to seat in home and get the subsidy amount irrespective of stay in same region or other region
- Creating awareness to EV owners through social media by different types of

creatives time to time.

VALUE INDICATORS

Learning's for sharing

- Validation of vehicle details as per the criteria, where the vehicle details has been validated by VAHAN database of MORTH
- Collecting the detail parameter of electric vehicle of different OEMs.
- Validating the beneficiary bank account no & IFSC code using the IFSC master table of IFMS, Odisha.
- SMS notification for alert and acknowledgement to the electric vehicle owners implemented.
- Integration with NPCI (National payment corporation India) through IFMS for account verification and subsidy disbursement has planned to implement for seamless and 100% automatic disbursement.

Digital Empowerment

- Other than demographic differences financial inclusion, language and cultural differences has no effect in this system.
- Where as demographic differences has overcome doing digital empowerment in this section.
- For Electric Vehicle disbursement process physical presence was impossible for those who were residing far away from the registered RTO offices.
- With the help of this portal, physical presence is completely not require to get the subsidy.

Green e-Governance

- Paperless Service.
- Physical Cash handling process is completely stopped.
- Avoid footfall in office.
- Creating awareness through digital media for benefits of Electric Vehicle.
- Immediate subsidy transfer to beneficiary account.
- Status and notification check by public.
- Instant technical support to public and RTOs for any sorts technical queries by NIC.

Shri Prasant Kumar Nayak, *Technical Director (Scientist –E), National Informatics Centre Odisha State Centre, Ministry of Electronics & IT, pk.nayak@nic.in*

NIC Forms

National Informatics Centre Madhya Pradesh State Centre

Amar Kumar Sinha, Navneet Kumar Gour and Rahul Kumar Chatterjee

PROJECT OVERVIEW

NIC forms is an utility product conceptualized to collect data in organized digital formats, generate and share analytics to individuals for decision making. It allows users to create online forms as easily as creating a document with user friendly drag and drop graphical user interface. The insights generated from the analysis of the collected data is used by the government authorities for effective policy formulation, planning of new programs, schemes, business decision-making, strategic planning, research, analyze performance/outcomes, preparations of the government etc. A wide range of government initiatives and schemes (Central as well as State) are today making extensive use of data and employing best-in-class analytical tools to derive value out of this data. Right from the concept to formulation, implementation to the monitoring of a scheme, data is now being extensively used in almost every aspect of a project or initiative. Data collection is a very crucial part for any government for analytics and making decisions effectively and quickly. Data collection normally involves various stakeholders, individuals, multiple institutions or multiple organizations located geographically away to come together and collaborate to make meaningful datasets for decision making. Following are key challenges involved in the process of data collection.

- Quality of data.
- Dynamic nature of data.
- Easy Availability of data contributors and data collection tools.
- Relevance of data.
- Lack of coordination among contributors/collaborators and slow response time.
- Validation of attributes of dataset.
- Expensive or insecure software solutions (dedicated web portal or Third party software solutions).

NIC Forms is developed to overcome the above challenges and reengineer the process of organized data collection.

Application has been conceptualized in such a way that organized data collection can be performed by generating online forms without having any technical expertise, special software or any special efforts. Following are the key features of NIC Forms web application.

- Easy Form Creation: Create online form by simply drag and drop user interface provided for desired form input element (ie text, number, email, mobile number, file, select combo boxes etc) and share it with targeted audience/Contributors/Collaborators, collect desired data and delete/deactivate the form once it's purpose is served.
- Data Validation: Restrict User from making irrelevant data entries with built-

in form validations and other form element settings.

- Easy reach to contributors: Link to access online forms can be shared by messenger groups, hyperlinks on static websites, email invitations, embedding in html pages, push notifications or with any other print communication (letters) to engage contributors/collaborators.
- Data Analytics & integration: User activities, reports and data captured can be analyzed with built-in analytical dashboards or it can be integrated with any other analytical tools with secure REST APIs.
- Share Live Reports: Live reports of the data captured can be shared with users by email invitation of already available web reports or downloaded excel/CSV/PDF formats. Manage data receivers with admin console.
- Reusability: Editable and reusable (form templates can be used to create another form by simple clicks to avoid rework). Share form designs as template in template gallery and use existing designs.
- Manage Contributors: Create and manage email groups of different target audience for quick form/data sharing.
- Print acknowledgments: Print acknowledgments for every form response for reference Ids.
- Different modes of form sharing: Allow public form sharing to enable anonymous user making data entries or share form with specific users (password protected forms).
- Manage Form Lifecycle: Manage form expiry date, activate/deactivate form for editing, publish a form once editing is done, form themes to improve user experience and much more.
- Mobile application: Mobile App of NIC Forms for always available target audience to capture data.
- Audit Trail: Data audit trails for accountability.
- Local language support (Unicode) for designing forms and collecting responses.

OBJECTIVE:

- Collect organized data with online forms.
- Manage contributors/ collaborators with user friendly console.
- Collect sanitized/validated datasets.
- Manage accessibility of contributors/ collaborators to ensure completeness of datasets.
- Deactivate forms once purpose is fulfilled to avoid misuse or confusion among contributors/ collaborators.

SCOPE:

- Save efforts of government officers/offices who are indulged in creating forms and applications in tedious ways for simple data collection.
- Provide effortless, quick, efficient, secure and organized data collection experience.

STAKE HOLDERS

- Central government ministries/ Departments/ Offices / Officers

- State government ministries/ Departments/ Offices / Officers

(All government employees with @nic.in, @gov.in or email Id or any sub domain of @nic.in, @gov.in holders)

CURRENT STATUS:

- Total Users (Contributors/collaborators): 8262
- Total Form Creators: 406
- Total Forms : 766
- Total Responses: 236296
- Active Form Creator Users: bangla.gov.in, britatom.gov.in, cag.gov.in, cbi.gov.in, cbse.gov.in, censusindia.gov.in, ciet.nic.in, dcmsme.gov.in, delhi. gov. in, fci.gov.in, gembuyer.in, gov.in, gujarat.gov.in, hub.nic.in, icmr.gov.in, incometax.gov.in, indiapost.gov.in, ka.gov.in, kerala.gov.in, mah.gov.in, mapit.gov.in, mea.gov.in, mp.gov.in, mp.nic.in, nadt.gov.in, navy.gov.in, nic.in, pfrda.org.in, prasarbharati.gov.in
- Active Contributors/Collaborators: mp.nic.in, mp.gov.in, medleylab.com, osmic.gov.in, mail.com, leolite.com, kumarmetal.com, kflindia.com, kessentials.com, jk.gov.in, indiapost.gov.in, ias.nic.in, hub.nic.in, hotmail.com, govcontracor.in, gov.in, goldwinmedicare.com, go.in, gmfabrics.com, gmail.com, gmail.com, gmail.co, ginitex.com, fci.gov.in, effectech.co.in, ecolinkindia.com, dsywmp.gov.in, osmic.com, cosmosadp.com, centralbank.co.in, censusinian.gov.in, censusindia.gov.in, camlinfs.com, calyxindia.com, cag.gov.in, borosil.com, boltmaster.in, bajajhealth.com, amkayproducts.com, aixl.co.in, airtel.in, airtechsys.in, airindiaexpress.in, airindia.in,aarti-industries.com

NOTE :-

- Form creator can only be a government entity/officer with a valid email Id holder of @nic.in,@gov.in domain or any sub-domains of it
- Contributors/ Collaborators can be anyone with a valid email id

Hardware/Software

- Operating System RHEL 8.5 (Redhat- Linux)
- Web server APACHE
- Server Side Scripting PHP
- Client Side Scripting HTML, Javascript, jQuery, CSS, ajax, jQuery Validtor
- Database MySQL
- All Open Source technologies.

Certification (Certifying Agency)

Yes formal certification been obtained with respect to Cyber Security.

Security audit of the application is been done by Application Security Group Application Security

Audits and Assessment Division National Informatics Centre New Delhi Subject: Website Audit (Ref ID: NIC/CSD/IA/17734). Following are the recent certifications

- https://asams.nic.in/asams/downLoadReport.aspx?param=561943407

Disaster Recovery and Service Continuity

Application and database hosted on National Cloud at NDC Delhi.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	Brief service description with benefits	Volume (Nos) of Services year wise		
		2020-21	2021-2022	2022-23 (Upto date of nomination)
Form Creation	User friendly user interface to create different type of forms without any technical expertise to collect organized datasets.	140	301	387
Manage Collaborators	Manage users who are collaborating for data collection	1500	2000	4762
Collect Datasets	Collect organized datasets as per the desired structure of forms.	40,000	90,000	1,06,381
Share Datasets	Share the datasets collected to desired officers/ offices	100	150	217

Implementation

The objective of the application is to provide easy, organize, efficient, secure and hassle free data collection and dissemination to all government officers/Offices. Following are the user's id domains of Central government ministries – departments/ State govt ministries- departments

Target: All Government offices to use NIC forms for simple data collection instead of going for traditional ways of data collection or using third party software.

Achievements:

Form Creator's category (user with email id domains):

bangla.gov.in, britatom.gov.in,cag.gov.in, cbi.gov.in, cbse.gov.in, censusindia.gov.in, ciet.nic.in,dcmsme.gov.in,delhi.gov.in,fci.gov.in, gembuyer.in, gov.in, gujarat.gov.in, hub.nic.in, icmr.gov.in, incometax.gov.in, indiapost.gov.in, ka.gov.in, kerala.gov.in, mah.gov.in, mapit.gov.in, mea.gov.in, mp.gov.in, mp.nic.in, nadt.gov.in, navy.gov.in, nic.in, pfrda.org.in,prasarbharati.gov.in

Indicate improvements/ enhancements

1. Improvements rolled out:

- PUSH notification for better use engagement
- Mobile application to access all forms from mobile devices.
- Response receipts, single response, form links with public and secure access, dataset update facilities management up to individual contributor/ collaborator level, REST services to share collected data with TEJASVI and other analytics platforms features introduces to improve data collection experience of form creators.

2. Improvements planned:

- Integration with SANDESH messaging platform for better user engagements

  Integration with COLLABFIES for dataset exchange between NIC Forms and COLLAB Sheets.

ENABLER

Processes Re-engineered

Challenges of traditional ways:

To collect organized data in digital formats following approaches has been in practice by the government officers/ offices

- Collection of datasheets/spreadsheets (Excels, CSVs etc). [laborious and tedious ways, absence of data validation results in poor quality of data]
- Development of web portals and website [Costly in terms of efforts and expenditure (development, Hosting Environment, Security Audit, Domain name and SSLs, Maintenance)]
- Data collection in physical formats and digitization. [laborious and tedious ways]
- Third party software tools. [Data secrecy privacy].
- Validations to ensure quality of data [In absence of data validation rules quality of data cannot be ensured].

Reengineering:

To overcome the above challenges involved in data collection activities, NIC Forms has been conceptualized as a generic application to simplify online form designing, form sharing and management of complete lifecycle of data collection activity in such a way that a person with limited/no technical expertise can also accomplish the task of quick data collection.

- Login to NIC Forms with any government email ID
- Create form with drag and drop user interface available.
- Define set of validation rules to ensure data quality such as rules for numbers only, date only, and mobile number, email id, file type validation etc.
- Engage contributors/collaborators by simply defining their email IDs for each form.
- Manage form accessibility, form expiry date, print response receipts, restrict number of entries per contributors, manage individual contributor to update their response or a particular response.
- Send email notification/ push notification to contributors/collaborators with form links and access credentials to make data entries.
- Monitor real time dashboard reports for form activities, contributor's activities (performance analysis) and datasets collected.
- Data captured can be shared in the form of live web reports, downloadable Excel/CSV formats or REST APIs with authorities.
- Once the purpose of a form is fulfilled it can be deactivated / deleted by clicking a button without going to complex processes.

Technologies

- Enterprise Integration.
- Data Analytics.
- Open Source LAMP framework.
- Responsive device independent web application.
- Mobile application.

People

Capacity Building:

- NIC Forms has empowered government officers/offices with real-time, easy, effective, secure and organized data collection facility without the need of any programming expertise or special software.
- With NIC Forms has enabled government officers/offices easy and effective data collection facility of different kind from sub offices, multiple contributors/collaborators or any targeted set of people located across the globe is possible within minutes.

VALUE INDICATORS

Learning's for sharing

- In many situations urgent and authentic information for analysis of an event such as loss of crop due to flood, Hailstorms, some inputs on different attributes for decision making is required to be collected from multiple sub-offices or multiple contributors geographically located on different places. Making provisions for organized and effective data collection in such short time is a challenge for government offices/officers.
- NIC forms is conceptualized to design form of different kinds with proper data validation to collect the data attributes of different kind and yet the process of designing form is kept so simple for keeping the process simple and user-friendly.
- Creating web portals and websites for simple data collection and analytics are very expensive in terms of efforts involved, consumption of resources and financially. To reduce these repeated efforts and such unnecessary costs a single generic solution is more economic and effective solution.
- With the enterprise integration (government's single sign-on etc) accessibility to the system has to be very easy.

Digital Empowerment

NIC Forms supports Unicode to support different local languages for creating forms and submitting responses. Form labels can be written in any local language in Unicode.

Green e-Governance

NIC Forms eliminates need of multiple websites and portals for simple data collection and analytics and hence reduces redundancy of efforts, redundant ICT infrastructure.

- NIC Forms are device independent and responsive in nature and can be accessed from any mobile
- or desktop device and hence no additional ICT devices are needed.
- It eliminates use of papers for data collection and sharing.

Shri Amar Kumar Sinha, *Deputy Director General and State Informatics Officer, National Informatics Centre Madhya Pradesh State Centre, sio-mp@nic.in*
Shri Navneet Kumar Gour, *Scientific Officer/Engineer SB, National Informatics Centre Madhya Pradesh State Centre, gour.navneet@nic.in*
Shri Rahul Kumar Chatterjee, *Senior Technical Director (Scientist – F), National Informatics Centre Madhya Pradesh State Centre, rahul@nic.in*

Meeseva 2.0

Information Technology Electronics and Communication Department, Electronics Service Delivery wing, ITE&C Department, Telangana

Jayesh Ranjan and Anshuman Mohanty

PROJECT OVERVIEW

MeeSeva is an e-governance initiative that incorporates the vision of National e-Gov Plan "Public Services Closer to Home" and facilitates a single-entry portal for a myriad of G2C&G2B services.

The objective of MeeSeva is to provide smart, citizen centric, ethical, efficient and effective governance facilitated by technology. The initiative involves universal and non-discriminatory delivery of all government services to citizens & businessmen of all strata and improved efficiency, transparency and accountability for the government. The initiative features transformed government - citizen interface at all levels of administration along with a shared governance model

With MeeSeva 600+ services of 60+ different departments are delivered to citizens on a single platform. The various citizen touch points to avail them include 5000+ MeeSeva centers operating on a franchise model, 108 government owned centers, Telangana's mobile app (since 2018) called T AppFolio and a MeeSeva web portal for online users. Government of India's e-Taal website ranked Telangana 2nd, with respect to the highest number of e-transactions, since 2014. 21 crore citizen requests have been successfully served by MeeSeva translating into a whopping Rs 27,000 crores worth of transactions since its inception.

Stakeholders:

ITEC Department

Telangana's ITEC department has the sole goal of 'sustainable economic development' and 'inclusive social development' by leveraging technology

Independent departments

Department(s) that have consented to onboard their services on to the MeeSeva platform are all stakeholders. These departments interact with MeeSeva officials every day to ensure processing/execution of all service requests.

Implementation Agencies

A Service Centre Agency (SCA) is the implementation agency that provides G2C service delivery through MeeSeva's franchise model, in pursuance to NeGP.

VLE

Village Level Entrepreneurs (VLEs) take ownership of MeeSEva services executed through MeeSeva centres in rural areas.

Admin/Operators

They are the staff at the government/franchise centers, who interact with both the citizens and the application.

Collector’s office

Collector’s office includes e-district managers, collector, joint collector, sub collector and MeeSeva admin assistant.

Citizen Telangana’s common man.

Project Management Unit + Technical Teams

These are the contracted teams that work out of government offices working towards realizing all project goals within the given constraints.

Technology Partners

They a technology firms hired on a contract basis, selected through an open competitive bidding process to perform a specific function w.r.t a project. For example, eCentric is responsible for website maintenance.

Hardware/Software

Technical Details:

Windows 2012 R2, APACHE 8.5, CentOS 7.6, ASP.NET 3.5, IIS 8.5, MS SQL 2016, REDIS5.0.7,MULE,VisualSVN Server Manager 4.2,ORACLE 11G

Certification (Certifying Agency)

Certifying Agency - Allied Boston Consultants Pvt. Ltd

Disaster Recovery and Service Continuity

MeeSeva has an uptime of ~99% owing to presence of relevant back up infrastructure

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RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	Brief service description with benefits	Volume (Nos) of Services year wise		
		2020-21	2021-2022	2022-23 (Upto date of nomination)
Income Certificate	N/A			1878717
Community and Death of Birth Certificate	N/A			1281667
OBC Certificate				66140

Implementation

Implementation plan is at par with the expected outcome.

MeeSeva 2.0 is a dynamically evolving initiative where quarterly plan is set to onboard services on the platform based on discussion with concerned departments. All the quarterly plans are duly signed off by concerned parties and religiously followed.

Improvements / Enhancements

- WhatsApp based service delivery /information relay is being planned for MeeSeva in addition to the existing channels of Web Platform and MeeSeva centres.
- Online Grievance System is being planned for MeeSeva where citizens can log their grievances and track the same.

ENABLER

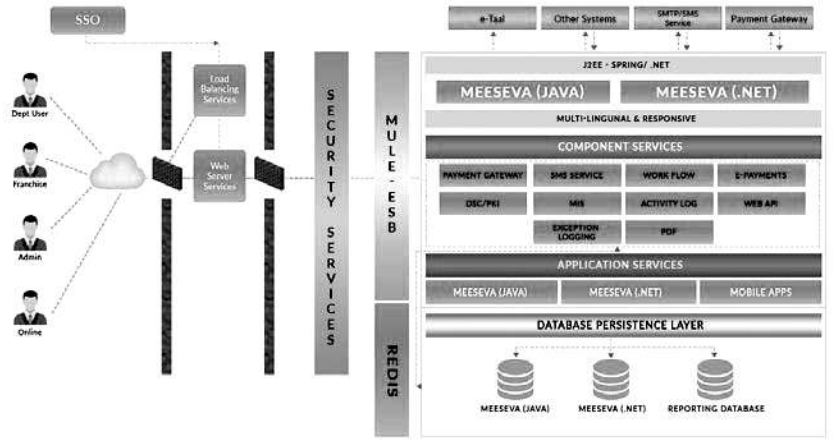
Processes Re-engineered

Process re-engineering was taken up during 2016 – 17 where certain issues were targeted.

SLA adherence was treated as a prime subject and stringent guidelines were built around it. The step came up as a welcome step leading to quick issue resolution.

Incentives were improvised for VLEs (Village Level Entrepreneurs) who, on provision of incentives, provided service delivery of highest order.

Technologies



People

Training / Knowledge Transfer sessions are being planned for respective departments whose services are onboarded.

Change Management is planned in a strategized manner with the help of SOPs (Standard Operating Procedures) where the processes are documented for knowledge management purpose.

VALUE INDICATORS

Learning's for sharing

- Change Management is planned in a strategized manner with the help of SOPs (Standard Operating Procedures) where the processes are documented for knowledge management purpose.
- Frequent demonstrations to delegations from across states / centre help in receiving feedback on the existing setup which are then incorporated on the basis of priority.

Digital Empowerment

- Covid 19 provided the desired thrust for movement of people from offline MeeSeva centres to MeeSeva web portal. MeeSeva centres also help in providing the desired impetus by providing desired information to citizens related to usage of web portal.

Green e-Governance

Service delivery through MeeSeva channels ensure usage of paper only in case of unavoidable situations, promoting green governance.

Shri Jayesh Ranjan, *Prl. Secretary to Govt, Information Technology Electronics and Communication Department, Secy_itc@telangana.gov.in*

Shri Anshuman Mohanty, *Consultant to the Government, Electronics Service Delivery wing, ITE&C Department, Govt. of Telangana, Anshuman.mohanty@auctusadvisors.in*

DISE (District Information System for Elections)

Office of Chief Electoral Officer Punjab & National Informatics Centre Punjab State Centre

S. Karuna Raju, Pushminder Singh and Pirthi Pal Singh

PROJECT OVERVIEW

DISE (District Information System for Elections) has been developed for randomization of polling personnel, Micro-observers and counting staff. The software was designed and developed by NIC Punjab team based on the guidelines of Election Commission of India (ECI). DISE software follows three stage randomization process for polling personnel and has a wide variety of reports. In the first stage 20% or more surplus staff is shortlisted for rehearsals. At this stage the assembly segment where the employee will be deployed for duty is not known. In the second stage the polling parties are formed using the criteria defined in the Election Officer role. At the third stage polling parties are allotted randomly to the polling stations.

The software has feature for two stage randomization of Micro-observers. Three stage randomization of counting staff is also done using DISE.

Hardware/Software

DISE has three tier architecture. Module for data entry known as DISE Capsule is installed in various offices. The data from DISE Capsule is consolidated at the level of every District Election Officer and processed using the core application. DISE uses Microsoft SQL Server as database.

Certification (Certifying Agency)

Security Audit Certification from CyberQ.

Disaster Recovery and Service Continuity

1. Role based access has been used to ensure that only authorized users can perform various operations in the software.
2. All key operations are logged and detailed audit trails are maintained.
3. Automated backup of database.

RESULTS INDICATOR

Description of various e-Services, benefits and their Volumes

Name of e-Services	Brief service description with benefits	Volume (Nos) of Services year wise		
		2020-21	2021-2022	2022-23 (Upto date of nomination)
DISE Software	Random ployment of polling staff, micro-observers and counting staff	1 (Delhi Assembly)	2 (Assembly Elections 2022 in Punjab Elections and Municipal Elections 2021 in Punjab)	1 (Assembly Elections of Himachal Pradesh to be held in November/December 2022)

Implementation

1. All 11 districts of Delhi for Assembly Election held in February 2020.
2. All 7 Municipal Corporations and 109 Municipal Councils of Punjab in February 2021.

3. All 23 districts of Punjab for Assembly Election in February 2022.

Improvements / Enhancements

Web based data entry and data consolidation

ENABLER

Processes Re-engineered

DISE has automated and standardized the process of deployment of staff on election duty. Prior to the implementation of DISE, every district used to adopt different method for randomization and a few were using locally developed applications for the purpose. With introduction of DISE the process not only became more efficient, but also uniform across the districts.

Technologies

Three Tier Architecture and role based access has made the process smooth and easily manageable.

People

Implementation of the software is supported by NIC team at State and district level in coordination with IT Cell of

CEO Punjab. Training and all required technical support is provided right from data entry stage till the counting of votes polled.

VALUE INDICATORS

Learning's for sharing

Following are the best practices being followed:

1. Continuous Change in response to the requirements received from various District Election Officers

and Election Observers

2. Close coordination among all the stakeholders

Digital Empowerment

Not applicable as it is a G2G software

Green e-Governance

Minimized the printing of reports by generating PDF reports which can be distributed electronically to the offices and employees. This has reduced the quantity of paper used for printing of duty orders and lists considerably.

Shri S. Karuna Raju, IAS, *Chief Electoral Officer Punjab, Office of Chief Electoral Officer Punjab, dyceo@punjab.gov.in*

Shri Pushminder Singh, *Systems Manager, Office of Chief Electoral Officer Punjab, dyceo@punjab.gov.in*

Shri Pirthi Pal Singh, *Technical Director, National Informatics Centre Punjab State Centre, pp.singh@nic.in*

SECTION - III

Subject Index

Subject Index

Award of Excellence ***

Award of Appreciation **

Award of Recognition *

Innovative Technologies for Smart Governance

Selected eGovernance Initiatives - 2022

Information Communication Technology is the foundation on which Smart Governance is based. ICT enhances the level of collaboration between government departments and other Stakeholders. It provides a means to deliver services efficiently and sustainably. ICT has given rise to an information-based atmosphere that can be exploited by Smart Governance for routine government businesses and citizens.

This compendium "**Innovative Technologies for Smart Governance: Selected eGovernance Initiatives - 2022**" presents and captures award worthy initiatives of pan India authorities and institutions of Governments at central, state and local level. This compendium is dedicated to the hard work, determination, experience and knowledge of Government Authorities for making appropriate usage of ICT in eGovernance services.

Each project presents the view of critical success factors, results enablers and indicators, the results, the degree of implementation, the key learning, infrastructure development, training of human resources, process reengineering and other related factors, as articulated by various government authorities, form the core content of this compendium.

The projects are further cumulated in to various categories according to their area of implementation such as- Administration, Agriculture, Citizen services, Ease of doing business, education and training, election, energy food and Civil supplies, e-procurement and e-auction, health, law & judiciary, Finance and audit, Travel and Tourism etc.

For egovernance practioners, industry professionals and researchers, compendium published under the series " Selected eGovernance Initiatives in India" by Computer Society of India Special Interest Group on eGovernance (CSI SIG eGov) continues to provide a rich source of information for discerned readers.

Rishikul Prakashan
102/42/6, Jawahar Lal Nehru Road
Prayagraj-211002
email : rishikulprakashan@gmail.com

9 788195 808038

₹1200.00

Special Interest Group
SIG eGov
eGovernance