

ICT solution for NREGA Implemented in Andhra Pradesh

S S Rao

Programme Director, NREGA, TCS, Hyderabad

ABSTRACT

Parliament enacted the National Rural Employment Guarantee Act (NREGA) in September, 2005. This scheme seeks to provide at least 100 days of guaranteed wage employment in a financial year to every household whose adult members volunteer to do unskilled manual work.

The end-to-end information and communication technology (ICT) solution, developed by TATA Consultancy Services Limited (TCS), helps in simplifying complex activities like the issue of job cards to rural households, identification of work to be undertaken, generation of work estimates, work execution and wage payment. Using the solution, the time taken to generate work estimates has been reduced from 15–20 days to minutes. The software is the result of an extensive field study across several districts conducted by TCS in close collaboration with the Andhra Pradesh's department of rural development, involving interviews with various stakeholders in the chain.

The solution also builds in transparent wage payment structures through agencies like banks and post offices, bringing in accountability and minimising opportunities for misuse of funds. Another unique feature is that the solution is web-enabled available both in English and the local language. Irrespective of location, beneficiaries can browse for information about their villages, work status and wage payments. By making the data available for public scrutiny, the web version facilitates social auditing of the NREGA implementation, under the Right to Information Act. Making the information available in the local language would extend the limits of transparency and enable high levels of public scrutiny and social audit.

The ICT was developed with the collaboration of the Rural Development Ministry, Government of Andhra Pradesh. The system has been deployed and successfully used in 657 *mandals* across 13 districts in the state.

Introduction

The Government of India (GoI) launched an ambitious programme by passing the act 'National Rural Employment Guarantee Act' (NREGA) in September 2005. GoI hopes this will be an instrument with major socio-economic benefits for rural India. The act is unparalleled in its scope and vision. Considering the size of the outlay and the vast geographical spread, there is a need for vigorous and foolproof systems and procedures with the

ability to deal with large volume of data across rural India as well as to ensure that maximum benefits flow to the beneficiaries.

The objective of NREGA is to enhance the livelihood security of the people in rural areas by generating wage employment through works that develop the infrastructure of the area. The choice of works suggested addresses causes of chronic poverty like drought, deforestation, soil erosion, etc. Effectively implemented, the employment generated under the act will also build up the long-term livelihood asset base of rural India. NREGA guarantees 100 days employment per household per financial year to adults who are willing to do unskilled manual work. If employment cannot be provided within 15 days of demand, the applicant is entitled to an unemployment allowance. *Gram panchayats* play an important role as NREGA has designated them as the principal agencies for planning and implementation of schemes under the act.

As part of its corporate social responsibility, TATA Consultancy Services Limited (TCS), the largest software company in Asia, carried out a comprehensive study of the act and the Maharashtra experiment in implementing a similar programme. The study revealed that in the absence of any extensive use of information technology, it would be difficult to reconcile progress of work with wages leading to leakage of funds. Analysis of workflow along with the provisions of the bill on NREGA has revealed certain lacunae, which could be exploited by vested interests. These are listed here:

- **Inflated schemes:** This could include inflated quantities of work; depressed person-day productivity and/or inflated person-day estimates.
- **Bogus registration:** This includes registration of non-living persons, minors and medically unfit persons; duplicate and/or proxy registration as well as completely fictitious registration.
- **Inflated muster:** This includes ghost workmen and bogus attendance.
- **Fraudulent requisition of funds:** This would arise due to false measurement of work, inflated progress of works and omitting an operation or work item.
- **Fraudulent wage payment:** This would include underpayment of daily wages, as well as fraudulent wage payment based on issues described.

The ICT Solution

Based on the study, TCS proposed a cost-effective information and communication technology (ICT) solution to address the typical problems in implementing such schemes in rural India. The solution was given shape by developing a comprehensive system with the help of the Rural Development Ministry, Government of Andhra Pradesh. The system has been

deployed in 657 *mandals* in 13 districts of Andhra Pradesh and effectively used for the past 1 year.

The guiding principles for the solution are:

- Minimising administrative costs
- Expediting payments and measurement cycle to ensure timely and correct payments to citizens
- Minimising leakages to ensure that the benefits reach the citizens

The key processes needing re-engineering for positive implementation of the scheme are:

- Enrollment of wage seeker through speedy registration.
- Management of shelf of works, i.e., preparation of estimates and technical sanctions
- Monitoring of work through measurement books and muster rolls
- Management of wages and material payments ensuring accuracy and timeliness
- Management of funds for transparency
- Social audit

Deployment Model

The NREGS solution has two deployment components, viz., the Program Implementation System, implemented at the block/*mandal*/*taluk* level, and the Program Monitoring System, deployed at the state level (Fig. 1).

At each Block there will be a client server system implemented where all the data entry and all the work/wage-related entry is done. This system is called the Program Computer Centre (PCC) and is deployed at each Mandal HQ in AP. All the transactional data at the block is consolidated in the data centre in the state. The Program Monitoring System is implemented at the state level using the consolidated data at the data centre.

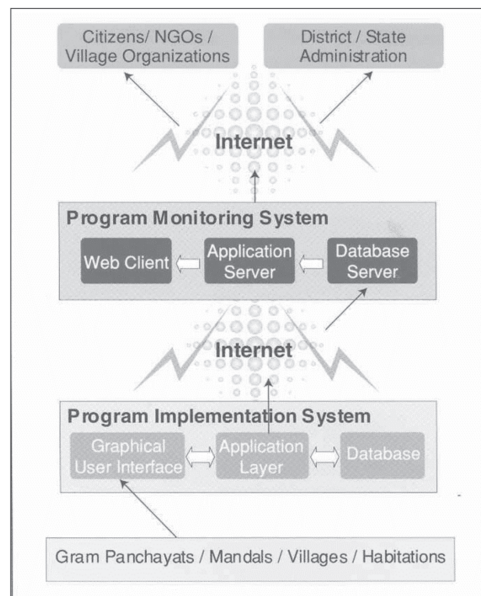


Fig. 1 Deployment model

Features of the Program Implementation System (Fig. 2):

- Job card generation and printing in vernacular languages
- Detailed engineering estimates of works proposed
- Generation of details of task-wise effort and material spent
- Technical and administrative approval processing of proposed works
- Direct payment of wage and material to beneficiaries
- Complete reconciliation of wage payments and work progress
- Real-time tracking of number of days worked and wages paid
- Material indenting, receiving, payment and reconciliation capability
- Close monitoring and tracking of works and payments through 'Dashboards'
- Tracking of inflow and outflow of funds
- Detailed analysis of data for assessing and improving the system implementation
- Generation of Management Information Systems (MIS) reports.

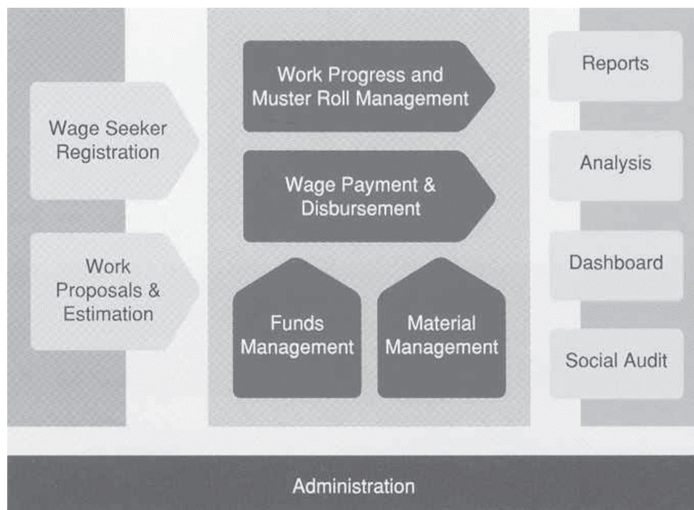


Fig. 2 Program Implementation System features

Technologies include:

- Windows-based software
- Dot Net framework, C# language
- MSDE data base
- Baraha Telugu language tool

Features of the Program Monitoring System (Fig. 3):

- Tracking of program implementation by government officers/any authorised officials/citizens
- Generation of MIS reports
- Viewing of analysis reports
- Grievance management

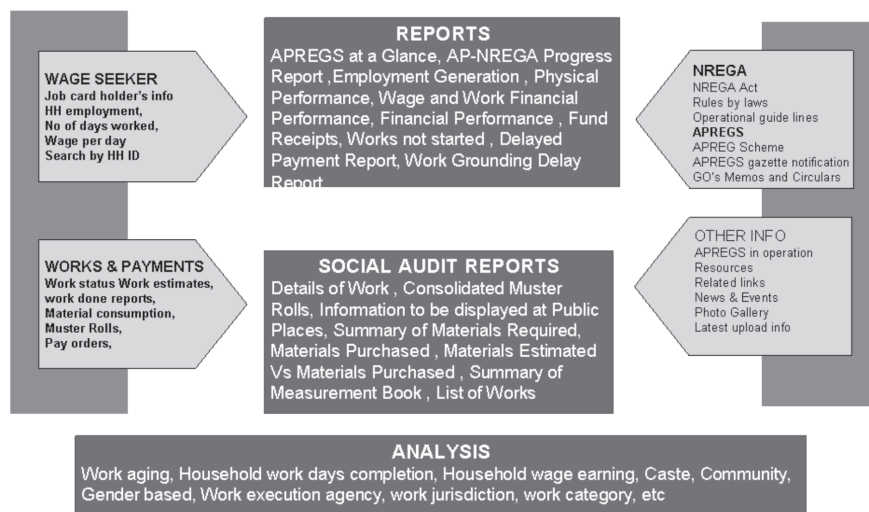


Fig. 3 Program Monitoring System features

Technologies include:

- Web application using J2EE, JSP
- Data base: Oracle 10 g
- Baraha Telugu language

Key Processes

The key processes identified and developed for the system are:

- Registration of wage seeker
- Management of shelf of works
- Work progress monitoring and payment
- Management of funds
- Reports and analysis

Wage Seeker Module

The Wage seeker module is used for the registration of the households in a *mandal*. The respective *gram panchayat*, under the supervision of the *sarpanch* (village head), carries out registration of the households at village level. A wage seeker and his family members can register under this scheme by submitting an application at the *gram panchayat*. A register maintained at the *gram panchayat* will be sent to the PCC for entry of the information of the wageseeker household.

The PCC allocates a household ID that is an 18-digit identification number consisting of 14-digit habitation code (district, assembly, *mandal*, *gram panchayat*, village and habitation) and a 4-digit household number. A household identity card will be generated for each wage seeker and handed over to the *gram panchayat*. The *gram panchayat* completes the household card/job card by affixing the photograph of the household duly attesting the same and hands it over to the household. The whole process is depicted in Fig. 4.

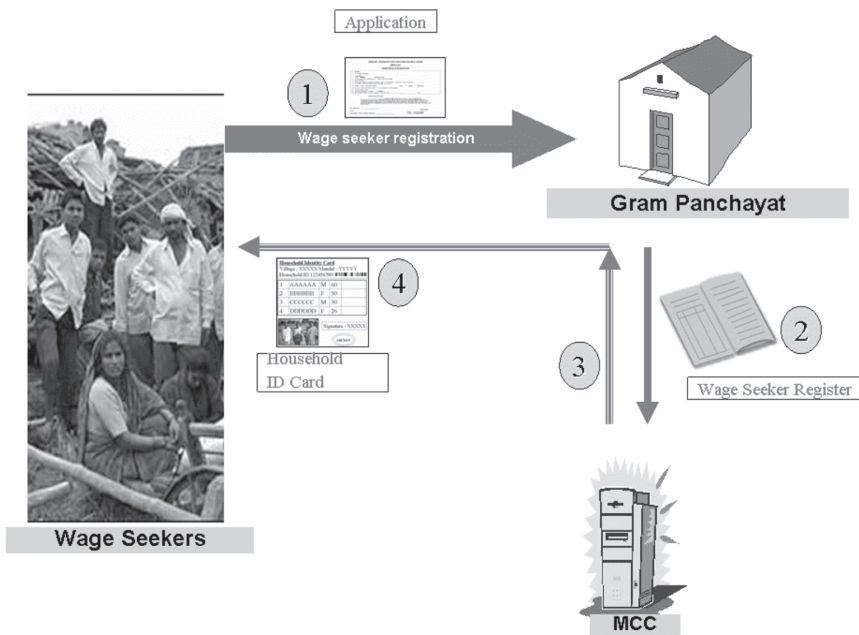


Fig. 4 Wage Seeker Registration Process

Work Proposal Module

Works to be executed at any village need to be identified by the *gram sabha* or village group or village secretary or by all of them together. The identified work will have necessary measurements along with the leads. Prioritised list of such works will be sent to the Mandal Development Officer (MDO) At the *mandal* level, works will be further prioritised after addition of some more works and sent to the PCC. At PCC, the details are entered and estimation by the system is carried out. Depending on its nature and type, every work has a given set of tasks. All these details for a particular work are estimated task-wise and the total estimated effort and material requirements for that work are computed. After necessary technical approval, these works will be sent to the district administration in a pre-defined for-

mat for administrative approval. Final administrative work sanction is issued by the district collector and handed over to the relevant departments for execution (Fig. 5).

Work IDs are generated for all the works, and a list of works is generated for each village, which is sent to the *panchayat* for display at the *panchayat* office, the village para-worker for executing the work and the wage seekers for attending to the desired worksite.

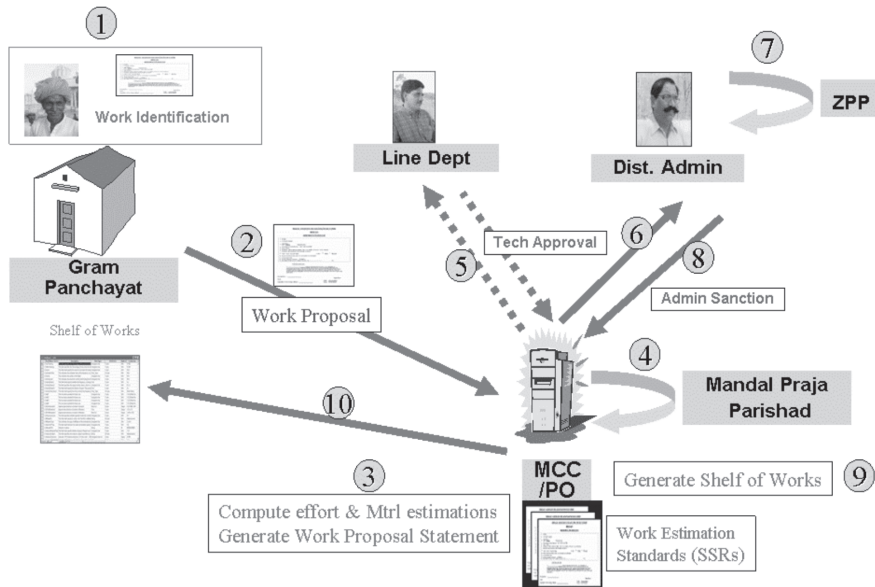


Fig. 5 Work Proposal and Estimation Process

Work Execution Module

Works that are pre-sanctioned for each village are grounded as per demand of work by the wage seekers. A wage seeker willing to work comes to the worksite and performs the work allocated. Once a week, a designated para-worker prepares the progress report and submits the report along with the muster roll at the *mandal* PCC. The para-worker also gives an acknowledgement slip to each wage seeker duly mentioning the weekly work details for the week.

The data is validated and stored in a data base. Based on the reported progress of work and the number of person-days spent, payment to the workers is computed and a wage list generated. The generated wage list is then sent to the paying agency, i.e., a post office savings account or bank account which ever is convenient to the wage seeker.

If the work is completed, the para-worker reports the same to the executing department, which sends an engineer who prepares the work closure

report and submits the same to the *mandal* PCC. Village *panchayat* also endorses their remarks in the work closure report on the quality of work. Based on the work closure report, previously reported progress of work and the number of person-days spent, payment to the workers is computed and a final wage list generated (Fig. 6).

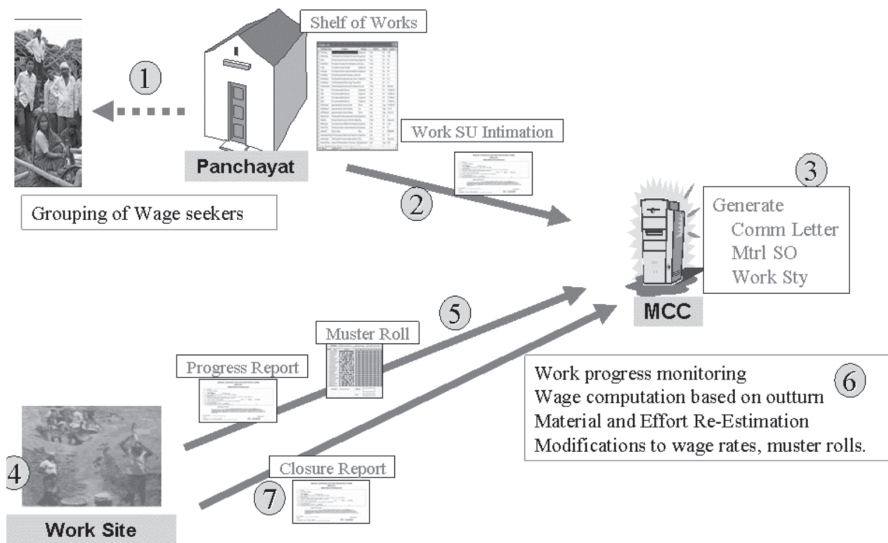


Fig. 6 Work Execution and Reporting Process

Payment Module

The paying agencies directly pay the wage seekers the cash entitled to them as per the wage list. After disbursement of the cash and obtaining a thumb impression, the disbursement statement is submitted at the PCC for wage reconciliation (Fig.7).

If a wage seeker is not provided work within 15 days of application, he or she can apply for unemployment allowance. The system validates the application by checking the availability of vacancies in the ongoing works in the village, and if no vacancy existed, unemployment allowance will be computed and paid to the wage seeker.

Analysis Module

This module is used to analyse the available data in the data base and generate reports for monitoring the implementation of the programmes. This

module is useful in identifying undesirable trends and taking corrective actions. Some of the reports that have been provided are:

- Work ageing (details like elapsed days since start and scheduled completion)
- Household work days completion analysis
- Household-wage-earning analysis
- Caste-and-community-based analysis
- Gender-based work-and-wage analysis
- Nature of work analysis
- Wage and material distribution analysis
- Work Jurisdiction analysis

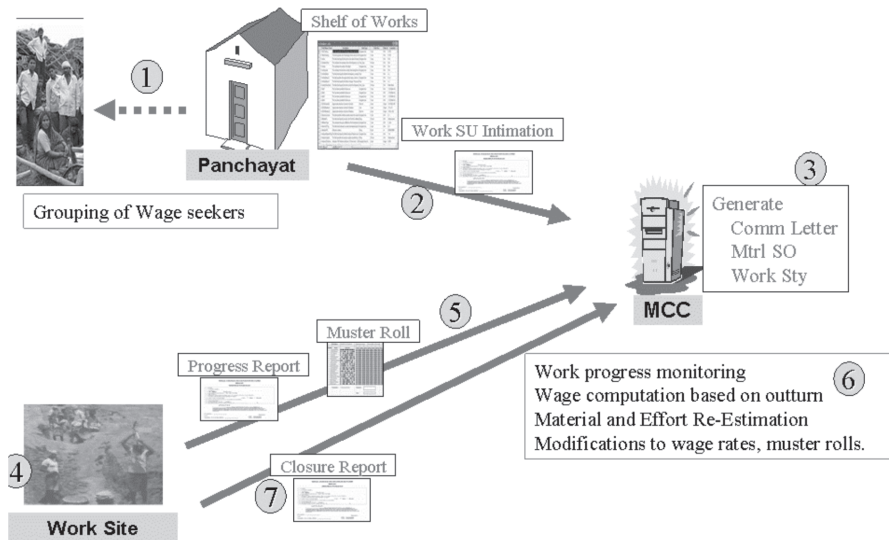


Fig. 7 Wage Disbursement Process

Portal

Data accumulated at the Mandal PCCs is uploaded to the central data centre at regular intervals. The data can be uploaded either by state WAN, dail-up or manually.

All the transactions in the programme are available on the Andhra Pradesh Rural Employment Guarantee Scheme (APREGS) portal. Irrespective of location, beneficiaries can browse for information about their villages, work status and wage payments. By making data available for public

scrutiny, the portal facilitates social auditing of the NREGA implementation, under the Right to Information Act.

All citizens can view the information and download reports from the web site available in both English and Telugu (Fig. 8 and 9). This extends the limits of transparency and enables high levels of public scrutiny and social audit.

Web Site

Anyone can access the APREGS Web site without any password using the URLs <http://nrega.ap.gov.in> and <http://www.nrega.ap.gov.in>

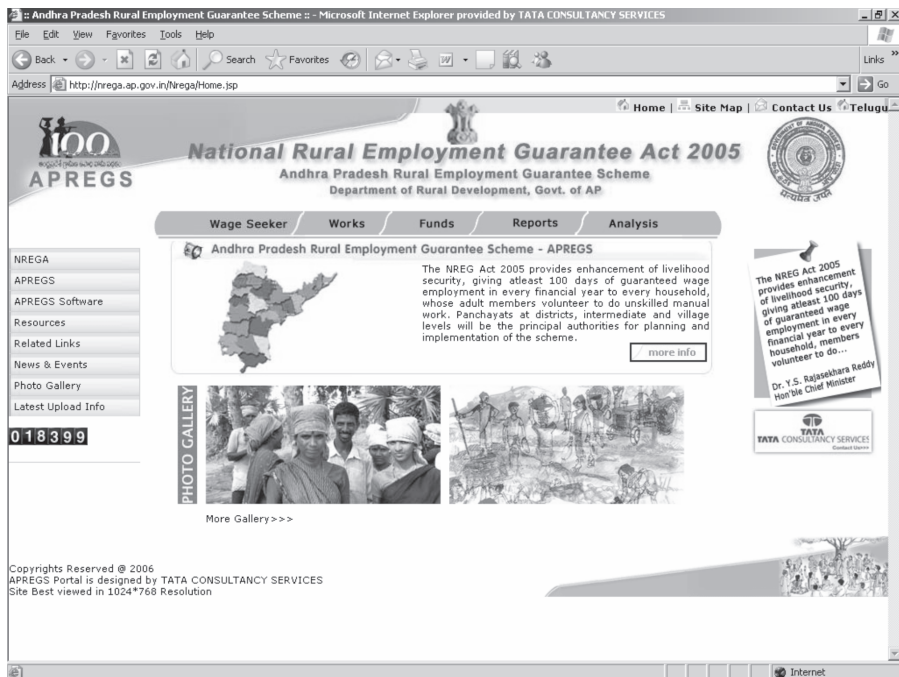


Fig. 8 APREGS home page

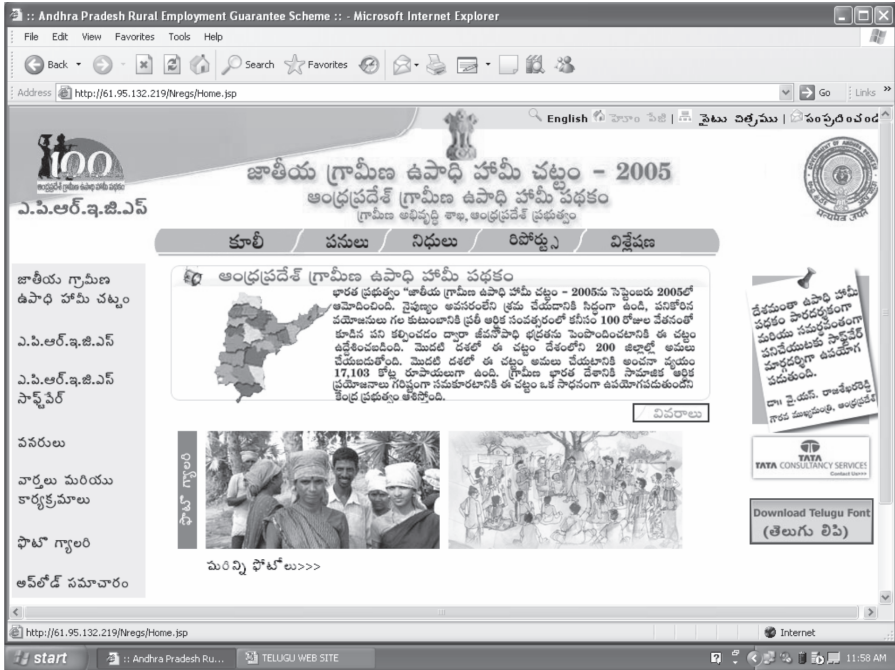


Fig. 9 APREGS home page (Telugu)

Benefits

The Andhra Pradesh experience clearly shows that the TCS' ICT solution has brought out the following benefits.

Elimination of Identified Shortcomings of the Manual System

- Inflated schemes** The system provides a comprehensive work estimation module that facilitates generation of an accurate work proposal based on pre-defined standards and guidelines. Overestimation of effort and material during the work proposal stage is entirely eliminated. Apart from accuracy, the time taken to generate work estimates has been reduced from 15–20 days to a few minutes.
- Bogus registration** Registered wage seekers are verified against previously available identity numbers like voter identity, Below Poverty Line (BPL) or ration card numbers reducing chances of bogus registrations. Details of *gram panchayat* verifying the bona fides of the wage seekers are captured into the system ensuring accountability.

- **Inflated muster** System allows entry of only previously registered wage seekers eliminating the possibility of entering ghost workers. System computes the wage accurately based on per-person out-turn as entered in the muster roll and not based on daily wages, thereby preventing chances of inflated musters.
- **Fraudulent requisition of funds** Progress of each work is monitored week wise and compared against estimated, verified measurements and sanctioned funds. In addition, payment is done directly to the wage seekers through personal savings account, totally eliminating fund handling by intermediary officials.
- **Fraudulent wage payment** Wage disbursement is done entirely through bank/postal transactions. The system makes payment through pay orders and cheques to savings accounts of either the wage seekers or village organisations. All the transactions are made transparent by issuing a wage pay slip specifying the entitlement to the wage seeker, posting the wage list on the *panchayat* board and also posted on the web portal.

Benefits Provided by the System

- **Transparency and visibility** All the stakeholders viz. citizens, media, NGOs, officials, politicians can view the data live on the Internet, and use the information for furtherance of the cause.
- **Increase in accountability** Details of personnel and officials involved in implementation at each stage are being logged into the system increasing the accountability.
- **Minimising fraud** The system has effectively blocked all possible leakages thereby reducing fraud to a great extent. By making available the standard schedule of rates for each locality available online, there is no possibility for excess sanction of amounts and subsequent recoveries at a much later date.
- **Minimising effort and administrative costs** A cumbersome process of preparing estimates has been simplified, duly saving several person-months of unproductive time that otherwise the field officials would have had to spend in the process. Use of this solution enabled the state to reduce overall administrative cost.
- **Accurate and faster wage payments** The payment cycle has been significantly reduced to less than 1 week. Payments to wage seekers are being made entirely through agencies like banks and post offices ensuring that the right amount reaches the worker.
- **Change management of policies, rates, etc** Changes in policies, work estimation standards and payment rates during the course of implementation of the scheme based on ground realities could quickly be adapted.

- **Program monitoring** The program is being closely and effectively monitored using the system. Fulfillment of 100 days guarantee for every household can be monitored. Every work and every rupee spent on EGS can be tracked. All the MIS reports required by the district, state and central administration are readily available, reducing the effort of preparation of such reports and increasing the accuracy of data.
- **Facilitate social audit** Another unique feature is that the entire information is available on the internet both in English and the local language of Andhra Pradesh, i.e., Telugu. Officials can monitor the programme more effectively as the NREGA portal provides features to generate reports and analyse the data. By making data available for public scrutiny, the NREGA portal facilitates social auditing of the NREGA implementation under the Right to Information Act.

Conclusion

For the first time, a programme of this magnitude and social importance is implemented using comprehensive ICT systems. The computer system uses templates for each type of work for arriving at the manpower, material requirement estimates and complete engineering calculation for the works. Computation of payment to the workers is done by the software based on out-turn of the group of workers. The entire programme is monitored using the consolidated data on internet. Data from the *mandals* is uploaded to a district/state server through data network, dial-up connection or even physical media.

Another unique feature is that the entire information is web-enabled, which is available both in English and in the local language. Irrespective of location, beneficiaries can browse for information about their villages, progress of the work and details of wage payments. Officials can monitor the programme more effectively as the NREGA portal provides features to generate reports and also analyse the data. By making data available to the society, the NREGA portal facilitates social auditing of the NREGA implementation, under the Right to Information Act.

The following statistics (as on 31 March 2007) amply demonstrates the high-scale usage of the solution in 13 districts of the state of Andhra Pradesh:

▪ Total no. of job cards issued	: 52,03,888
▪ Total no. of adult members	: 1,18,53,272
▪ Works in progress	: 1,39,169 (1,10,859 lakhs)
▪ Works in shelf ready for grounding	: 3,91,101 (3,06,596 lakhs)
▪ Total expenditure on wages	: 55825.85 lakhs
▪ Total number of person-days generated	: 6,24,89,651