EGOSQ - Users' Assessment of e-Governance Online-Services: A Quality Measurement Instrumentation

Anand Agrawal[1]*, Pragya Shah[1] and Varun Wadhwa[1]

ABSTRACT

E-governance initiatives by the governments all over the world include providing online-services to citizens over the internet web portals. This study aims at finding users' perceptions of the attributes and which determine e-governance online-service quality. The study proposes a comprehensive model for the quality measurement. A two stage design combining the qualitative and quantitative research methods is used to develop the measurement model. A pool of potential attributes that measure online-service quality of e-governance was formed as a result of the literature survey carried out in eight related areas- Service Quality Measurement, e-Service Quality Measurement, System Quality, Information Quality, Technology Adoption Model (TAM), End user satisfaction, Self Service Technologies and e-governance assessment models. This pool was refined using the qualitative techniques of focus groups and in-depth interviews. The attributes from the pool were used to develop questionnaire for the empirical survey. Data analysis suggested seven dimensions of the proposed instrument in case of gap based approach, and, four dimensions in case of perception based approach of measuring quality. Implications of the study, limitations and future research directions are also discusses in this paper.

Keywords: e-Governance, On-line Service Quality, Measurement Model, Government Web Portals, Users' Assessment

1. Introduction

Citizens in all nations always expect creation and delivery of high quality services from their respective governments. This expectation creates pressure to government to perform. E-governance initiatives are results of such pressures by citizens combined with the capabilities achieved through the use of Information and Communication Technology. E-governance is defined as 'the application of electronic means in the interaction between government and citizens and government and businesses, as well as in internal government operations, to simplify and improve democratic, government and business aspects of Governance' (Backus, 2001). One of the important aspects of e-governance is the use of government web portals as an electronic medium for government to Citizens' (G2C) interactions. This study aims at finding the dimensions and attributes which determine e-governance online-service quality (EGOSQ) (EGOSQ is used in this paper as an abbreviation to e-governance online-service quality. And, also as suggested name for the proposed quality measurement instrumentation) from the perspective of users of such services (Citizens) as one of the major factors that can influence the success of e-governance initiatives depends on citizens'

[1] ICFAI Business School Hyderabad, Dontanpally, Hyderabad, India

* *Corresponding Author:* (Email: prof.anand@gmail.com, Telephone: +91-9912382211)

awareness level, acceptance level and hopes and fears about the e-governance (Agrawal and Fuloria, 2003). A high quality of online-service quality by government will ensure high acceptance level and fewer fears. Most of the present studies in e-governance quality focus on the governments' (service provider) perspectives and delineates the needs to develop, and to conform the quality standards by defining some success factors (Tawil and Sait, 2002), focusing on engineering or system dimensions, or, organizing and streamlining administrative and organizational processes. The workshops for developing quality standards for e-governance though realize that a separate approach for developing standards should be 'beneficiary oriented,' but action plans generally emphasize on IT enabled services management standards, technical standards and mere complaint management standards (E-Governance Standards Workshop, Hyderabad, Andhra Pradesh, Sept 20-21, 2006). When customer orientation and customer involvement are fast becoming success mantras for service businesses around the world, governments cannot ignore their customers i.e. users (citizens) of the government (public) services. In words of Parasuraman, Zeithaml, Berry (1988) *"Perceived service quality is a global judgment, or attitude, relating to the superiority of service."* Researches in service quality have proved that a high quality perceived service should result into satisfaction and positive behavioural intentions. This has a direct implication on e-governance initiatives by the governments. There is a need to understand e-governance users' perceptions, specifically, what constitutes a high quality e-governance online service quality. As governments are viewed as service providers, a high quality service will ensure a high level of user citizens' satisfaction and acceptance of e-governance. This study uses perceptions and expectations of e-governance web portal e-sevaonline.com users to explore the constructs which affect EGOSQ perceptions.

2. Research Objectives

- To understand and explore e-governance online service quality (EGOSQ) attributes from the users' perspective.
- To find the linkage between EGOSQ, satisfaction and behavioural intentions (acceptance).

In order to meet these research objectives, a two stage research is designed. At first stage, the literature survey was carried out in eight related fields - Service Quality Measurement, e-Service Quality Measurement, System Quality, Information Quality, Technology Adoption Model (TAM), End user satisfaction, Self Service Technologies and e-governance assessment models. Researchers have studied these fields to develop instrumentations to measure e-service quality (Agrawal, 2007). A pool of potential attributes that measure online-service quality of e-governance web portals was formed as a result of the literature survey. This pool was refined using the qualitative techniques of focus groups and in-depth interviews. The attributes from the pool were used to develop questionnaire for the empirical survey, a part of the quantitative study undertaken to extract the dimensions of EGOSQ.

3. Literature Review

The Literature review is presented in eight sections. Service Quality Measurement literature provides the basic understanding on the aspects of service quality measurement like 'what to measure' and 'how to measure.' e-Service Quality Measurement literature describes the impact on service quality assessment when technology (electronic technology) is introduced in service delivery. Concepts like System Quality, Information Quality, Technology Adoption Model (TAM), End user satisfaction and Self Service Technologies etc. which were not significant in case of traditional services, become relevant in the context of online-services. TAM is significant to analyze the motivational aspect of use of e-service. End user satisfaction is significant for the behavioural aspects. Self service Technologies (SSTs) can provide hint about the behavioural orientations towards the internet use as a technology and system quality relates the engineering and operational aspects of technology to enable the proper satisfactory working of the technology behind online-services. Combined perspectives from all these concepts provide the initial

understanding of online-services, essential to conceptualize EGOSQ model. In addition, e-governance assessment models can provide attributes related specific to e-governance services.

3.1 Service Quality Measurement

Service quality measurements literature presents two major dimensions to measure. (Gronroos 1982; McDougall and Levesque 1992; Parasuraman et al.1991, Dabholkar, Thorpe & Rentz, 1996): Core Dimensions/Outcome aspects concerning 'What is delivered' and Relational Dimensions/Process aspects concerning 'How it is delivered'. In late 1990s, the studies on the impact of the service environment on Service Quality was dominant, boosted by Bitner (1992) seminal work on physical environment's effect on the service quality. Twenty-two statements in SERVQUAL instrument measure the performance across five dimensions (Parasuraman, Zeithaml, and Berry,1985). SERVQUAL measures the difference between expectations and perceptions of performance level for the service attributes. This conceptualization considers service quality as the degree and direction of discrepancy between consumers' perception and expectations, where expectations are viewed as desired or what consumers feel a service provider should offer. Cohen, Fishbein and Ahtola (1972) described the individual attitude (service quality) as his or her importance weighted evaluation of the performance of the specific dimension of a product or service. Bolton and Drew (1991) suggested that service quality is a function of consumers' residual perception of the service quality from the prior period and his or her level of (dis) satisfaction with the current level of service performance. Later, Cronin and Taylor (1992) suggested that SERVPERF scale, based on performance perceptions alone provides a better measure for service quality as compared to the measures based on the discrepancy between expectation and perception. Though, the core dimensions concern two aspects of service quality measurement–'what is delivered' and 'how it is delivered.' SERVQUAL measures seem to measure just one aspect of it, i.e. 'how it is delivered.' Brady and Cronin (2001) argued that SERVQUAL factors do not suggest measure which aspects of service should be measured, more specifically, if the reliability is perceived as a factor contributing to service quality, then which aspects of service quality should be reliable? This study tried to focus on not only 'how it is to be delivered' but also on 'what is to be delivered.' Therefore, SERVQUAL factors are not considered as starting point of this research. Parasuraman and Grewal (2000, p. 171) suggested that research is needed on whether "the definitions and relative importance of the five service quality dimensions change when customers interact with technology rather than with service personnel."

3.2 e-Service Quality Measurement

Various researchers have identified several dimensions of e-service quality as shown in table 1. But, the consistency in the proposed dimensions is lacking. Most of the e-services quality measurement research is limited to e-retailing only. A few researchers have proposed measurement instrumentation for measuring website quality (Loiacono et al, 2000; Yoo and Donthu, 2001). Substantial researches providing a generalized scale developed using a variety of industries; also, comparative studies to find the best approach (discrepancy/gap, or, perception based) to measure e-service quality are non existent (Agrawal, 2007). There is a predominance of perception based measurement approaches only. However, the comparative study by Agrawal (2007) suggests that discrepancy/gap based approach is superior to the perception based approach in measuring e-service quality. This study uses both the approaches (Discrepancy/Gap method and the Perception based method) to find the EGOSQ measurement instrumentation.

3.3 Technology Adoption Model (TAM)

Davis (1989) model is one of the most widely used to predict Information technology adoption. TAM is also used to understand the customer behaviour while using Information Systems. TAM, is basically a modified form of Theory of Reasoned Action (TRA) that incorporates technology into the model to explain the usage behaviour of Technology. TRA (Fishbein & Ajzen, 1975) suggests that Behavioural Intention is

the primary determinant of an individual's behaviour. TAM identifies the causal linkages between an individual user's attitudes and perceptions toward technology and the actual adoption of technology. The theory emphasizes that perceptions about 'how useful is this for me' and 'how easy it is' to use are the determinants that influence technology adoption. Thus, the two constructs of TAM: 'Perceived Usefulness,' and 'Perceived ease of use' may help in this study to explore the assessment of e-governance online services by users. The first construct, Perceived Usefulness, is defined by Davis et al. (1989) as "the prospective user's subjective probability that using a specific application system will increase his or her job performance." The second construct, Perceived Ease of Use, was conceptually defined by as the "degree to which the prospective user expects the target system to be free of effort." The use of online-services can be viewed as similar to the new technology adoption, therefore, the two constructs: 'Perceived Ease of Use', and 'perceived usefulness' seem important in assessing online-services quality (Yang and Fang, 2004). Several key dimensions of online-services quality like: customization, content, reliability, and response are found to have significant effect on perceived ease of use and perceived usefulness, which in turn influence attitude towards usage and re-usage of websites also (Lin and Wu, 2002).

Table 1: Proposed Dimensions of e-Service Quality by Previous Researchers

Kaynama and Black (2000) ***"E-QUAL"***	**Zeithaml et al (2001)**	**Liljander et al (2001)**	**Loiacono et al. (2000)** ***"WEBQUAL"***
1. Responsiveness, 2. Content and Purpose, 3. Accessibility, 4. Navigation, 5. Design and Presentation, 6. Background, 7. Personalization and customization	1. Reliability, 2. Responsiveness, 3. Access, 4. Flexibility, 5. Ease of navigation, 6. Efficiency, 7. Assurance/trust, 8. Security/privacy, 9. Price knowledge, 10. Site aesthetics 11. Customization /personalization.	1. User Interface, 2. Responsiveness, 3. Reliability, 4. Customization 5. Assurance	1. Information fit to task, 2. Interaction, 3. Trust, 4. Response time, 5. Design, 6. Intuitiveness, 7. Visual appeal, 8. Innovativeness 9. Flow (Emotional appeal), 10. Integrated communication, 11. Business processes, 12. Substitutability
Lin and Wu (2002)	**Zeithaml (2002)**	**van Riel et al (2004)**	**Yang, Jun and Peterson (2004)**
1. Information content, 2. Customization, 3. Response rate	***Core e-SQ*** Efficiency, Reliability, Fulfillment Privacy. ***Recovery-SQ*** Responsiveness, Compensation, Contact	1. Usability, 2. E-Scape Design, 3. Customization, Assurance 4. Responsiveness.	1. Reliability 2. Responsiveness 3. Competence 4. Easer of Use 5. Product Portfolio 6. Security
Yoo and Donthu (2001) SITE-QUAL	***Li, Tan and Xie (2002)***	**Zeithaml, Parasuraman and Malhotra (2005) "e-SQUAL"**	**Agrawal (2007)**
1. Ease of Use 2. Processing Speed 3. Aesthetic Design 4. Interactive Responsiveness	1. Website Design 2. Customer Service 3. Reliability 4. Privacy	1. Tangibility 2. Reliability 3. Responsiveness 4. Integration of Communication 5. Assurance 6. Quality of Information 7. Empathy	1. Information 2. Interaction 3. Integration 4. Access 5. Corporate Image 6. Emotional engagement 7. Active Service Recovery 8. Assurance

3.4 System Quality

Shannon and Weaver (1949) and Mason (1978). Deleon and McLean (1992) suggested three levels of information which yield six categories, namely, System Quality, Information Quality, Use, User Satisfaction and Individual and Organizational Impacts. For the present study, System quality, Information Quality and User satisfaction are found relevant.

System Quality: System Quality research focuses more on the engineering-oriented performance characteristics of the system. Table 2 adopted from the work of Deleon and McLean (1992) provides some empirical measures of system quality developed by the researchers.

Table 2: Empirical Measures of System Quality (Deleon and McLean, 1992)

Authors	Description Of Study	Type	Description of Measure(s)
Bailey and Pearson (1983)	Overall I/S, (8 organizations, 32 managers)	Field	1. Convenience of access 2. Flexibility of System 3. Integration of Systems 4. Response Time
Conklin, Gotterer and Rickman (1982)	Transaction Processing: (one organization)	Lab	Response time
Franz and Rokey (1986)	Specific I/S, 34 organizations, (118 user managers)	Field	Perceived usefulness of I/S (12 items)
Mahmood (1987)	Specific I/S, (61 managers)	Field	Flexibility of system
Srinivisan (1985)	Computer Based modeling System, (29 firms)	Field	1. Response Time 2. System Reliability 3. System accessibility

Information Quality: Information Quality researches focused on the quality of the information system output. Bailey and Pearson (1983) suggested 39 system related items to measure user satisfaction. Ten most important items were: Information accuracy, Output timeliness, Reliability, Completeness, Relevance, Precision and Currency. Many information quality criteria are included within the area of 'User Information Satisfaction' (Iivari 1987; Iivari and Koskela 1987). The constructs used are: "informativeness", consisting of relevance, comprehensiveness, recentness, accuracy and credibility, "accessibility", consisting of convenience, timeliness and interpretability; and "adaptability." deLeon and McLean (1992) found that most of the information quality measures are from the perspective of the user and are fairly subjective often included as part of the measures of the user satisfaction. Table 3 summarizes the attributes found by the researches on information quality.

End User Satisfaction: Baroudi and Orlikowski (1988) proposed 13 items to measure end users' satisfaction. Doll and Torkzadeh (1988) purified these into 12 items with five dimensions: Content, Accuracy, Format, Ease of Use and Timeliness. E-services users are in fact, the end users of the computer programs and network systems, which are part of the online-service design. The goal of the I/S here is to help in conducting transactions, keeping the records and help consumers to seek desired product and service information through websites. Giannakoudi (1999) suggested that besides these five dimensions, security and privacy may constitute a framework to assess I/S Quality in online-services. The literature review suggest that technology adoption model provides the conceptual clarification about the basic motivational reasons the consumers seek while using technology, and, as in online-services technology is inherent (based on technologies of the internet and digital electronic), TAM attributes: Perceived Usefulness, and perceived ease of use can provide valuable insights to the customers' assessment of e-governance online-services quality. Moreover, the attributes under the system quality, information quality and end using computing categories overlap. This overlap is understood in the sense that all these three

entities more or less are directed to solve usually the same purpose. Another, paradigm to look into comes naturally with the fact that internet is a form of self service technology.

Table 3: Empirical Measures of Information Quality (deLeon and McLean, 1992)

Authors	Description Of Study	Type	Description of Measure(s)
Bailey and Pearson (1983)	Overall I/S, (8 organizations, 32 managers)	Field	1. Accuracy 2. Precision 3. Currency 4. Timeliness 5. Reliability 6. Completeness 7. Conciseness 8. Format 9. Relevance
King and Epstein (1983)	Overall I/S (2 firms, 76 managers)	Field	Information 1. Currency 2. Sufficiency 3. Understanding 4. Freedom from Bias 5. Timeliness 6. Reliability 7. Relevance 8. Comparability 9. Quantitativeness

3.5 Self Service Technologies

According to Meuter et al (2000), "Self-service technologies (SSTs) are technological interfaces that enable customers to produce a service independent of direct service employee involvement. Examples of SSTs include automated teller machines (ATMs), automated hotel checkout, banking by telephone, and services over the Internet, such as Federal Express package tracking and online brokerage services." This suggests that services on internet or online-services are a type of SST. Meuter et al (2000) suggested that SST can be effectively utilized by customers to get customization and flexibility of service offerings, recovery from service failures, and, instant spontaneous delight. In a study to understand the customer satisfaction with technology based service encounters, using critical incident technique Meuter et al (2000) found three major groups of factors leading to a satisfactory evaluation of an SST experience and four major groups of factors leading to a dissatisfactory evaluation. The prime cause of satisfaction found was due to the SST's ability to bail customers out of immediate or troubling situations due to SSTs' pervasive nature and relatively easy accessibility. Another cause found was the customers' perception of the relative advantage they get from using an SST in comparison with interpersonal service delivery alternatives. The last cause was the perception that technology does what it intends to do effectively, i.e. "the novelty of the technology and its ability to perform these services may be satisfying" (Meuter et al, 2000). In case of dissatisfaction, technology failure was found the major cause that includes situations in which customers are prevented from using the service. Many of the dissatisfying incidents were found to be caused by process failures also that means due to the breakdown at some point after the SST encounter has occurred but before the service consumption was completed. Poor design was also found as a source of dissatisfaction. Customer-driven failure was another cause for dissatisfaction where customers are willing to take some of the blame when dissatisfying encounters with SSTs occur. The research findings emphasized the role of feeling of enjoyment and control ownership by consumers as important factors, customization and flexibility, pervasiveness of the internet due to availability, and the general advantages or benefits, including the perception of novelty and increased effectiveness of the internet.

4. Research Methodology

To develop the quality instrumentation EGOSQ, a two stage research was designed to. The first stage was the qualitative research consisting of focus groups and in-depth interviews, the second stage comprised of questionnaire survey. The measurement scale used for this study was developed by combining the exploratory and the empirical studies. Initially, a pool of forty eight attributes in probable seven dimensions was formed as a result of the literature survey. This pool was refined using the qualitative techniques of focus groups and in-depth interviews. The focus groups' participants were registered users of e-sevaonline.com and the groups were balanced in terms of gender. Total three focus groups were organized to find out the relevance of the dimensions extracted by the literature review. The resulting pool of dimensions and items was further refined through in-depth interviews of ten registered users of e-sevaonline.com. This pool of items was further elaborated to a panel of experts, academicians and researchers to get their feedback. The result of the qualitative study was a pool of twenty six items spread across proposed seven overlapping dimensions (See Table 4). These 26 items are cast into survey questions described in Table 4.

Table 4: Pool of EGOSQ items

A. Information	**28. Fast navigation without jams**
1. Accurate information*	**29. Impressive looking interface (website)**
2. Reliable information	**30. Well designed and organized interface (website)**
3. Comprehensive information*	31. Simple and easy to navigate website
4. Useful information	32. Quick response to my actions (clicks) in website
5. Timely information	33. Web pages load quickly
6. Easy to retrieve and use information	34. The website does not crash often
7. Easy to comprehend information	**E. Emotional Engagement**
8. Information in concise format	**35. Provides opportunities to contact other users (through blogs/discussions forums)**
9. Information not easy to get otherwise form other sources (exclusive information)	**36. Using esevaonline.com is exciting***
10. Updated information	37. Using esevaonline.com provides fun and enjoyment
B. Interaction	**F. Active Service Recovery**
11. Friendly and courteous interaction by employees	**38. Getting fair compensation in case of loss in the event of service failures/ faults by e-firm***
12. Employees understand my needs	**39. Government accepting responsibility and taking control in the event of service failure/ fault.**
13. Availability of easy to use various online contact options	**40. Shows concern about the problem in case of service failure***
14. Employees behave empathetically	41. Describe me why the service had failed
15. Employees respond in time	42. Always get a chance to raise my concerns in case of service failure
16. Employees take prompt actions to address my needs	43. Excellent complaint handling procedures to satisfy my needs in case of service failure
17. Employees demonstrated their willingness to help me	**G. Assurance**
18. Employees know their jobs well	**41. Getting things done right the first time**
19. Employees have enough knowledge to answer my questions	**42. Financial security during the online transactions.**
20. Employees appear concerned always	**43. Protection of personal information and privacy**
C. Integration	**44. Getting things done within the expected time frame.**
21. Features can be customized according to my needs	45. Takes appropriate precautionary measures to prevent frauds
22. Wide range of services through a single website	46. Honest to deal with
23. Ease of use of all e-service features.	**47. Transparent in all transactions**
24. Personalization of WebPages/services possible	48. Maintenance of accurate records
25. Various payment options	
26. Provides confirmations on my email/phone	
D. Accessibility	
27. Availability of online-services on all days and at all time	

[The Questionnaire contains 26 items which are presented in bold letters; 5 items (marked*) were further dropped during data analysis. Final instrument contains 16 items in perception based and 22 items in gap based questionnaire see table 7 for details on final questionnaire]

Pre-test and Data Collection: The questionnaire survey was administered through a combination of offline and online survey with the respondent's profiles ranging from college students, housewives to industry executives and academicians. The face validity of the measures can be evaluated by group of experts or judges, who look at the scale and measures to decide whether it measures what its name suggests (Judd et al. 1991, p. 54). After the feedback from six academics and four professionals who are expert in online-service, some items were modified. Next, the questionnaire was forwarded through email to more than 100 online e-sevaonline.com registered users to get their critique. After getting the feedback from 16 respondents, the questionnaire was further revised.

Measures

The questionnaire after the pre-test consisted of:

- Twenty Six e-service quality items, each item cast into two set of statements. First statement reflecting the expectation of the customer about the levels of e-governance online-services that should be offered, and second reflecting the perception of the customers of the level of e-governance online-services they are getting, Five point Likert Scale was used ranging from Completely Disagree to Completely Agree for these statements. (Refer table 4 for all items of questionnaires)
- Set of three questions on overall service quality, two questions on use satisfaction and two questions on behavioural satisfaction. Five point Likert Scale was used for these questions (Refer table 5 for these questions)
- Set of eleven demographic and online-service usage related questions (Refer table 5 for these questions)

Table 5: Items to measure overall online-service quality, satisfaction, behavioural intentions

Items used to measure overall service quality	1. Excellent overall online-service 2. Online-service service of very high quality 3. A high standard of online-service
Items used to measure satisfaction	1. The overall experience with onlineservice (very pleasant/extremely terrible) 2. Feeling with online-service as user (absolutely delighted/absolutely terrible)
Items used to measure behavioural intention	1. Intention to continue use the online-service 2. Intention to recommend others

Data collection and analysis

The survey was conducted using online and offline methods. Convenience and snowballing sampling was used as it was difficult to do random sampling without access to database of e-sevaonline.com users. After a month of surveying, sixty five valid responses were obtained. As the study takes into consideration both of the approaches of quality measurement (Perception and discrepancy/gap-perceptions minus expectations), data analysis was done using both the scores separately as separate sets of data. For profile of the respondents refer table 6. After data collection, for each of the proposed dimensions, scale reliability analysis was done for both sets of data, which provided vague results. This called for a fresh look into the dimensional structure. Therefore, an exploratory factor analysis was carried out.

Exploratory Factor Analysis

The principal component analysis in both sets of data could not provide any pattern. Principal axis factoring with oblique rotation (as factors were found correlated with each other) provided better results. The perception score data provided four dimensions, with 16 items in total. The discrepancy score data provided

seven dimensions with 22 items in total. Scale items reduction was done using the criteria of corrected item-total correlation in SPSS. Dimensions with less than coefficient value of 0.5 were discarded. Table 7 provides the results of factor analysis and coefficient of alpha values of the dimensions extracted from factor analysis. There appears consistency in the results of both approaches of measurement as 16 similar items were retained in the questionnaires after the statistical reduction of items. In terms of factor loadings also, similar loading patterns emerged in two measurement approaches. However, the gap measurement approach appears superior to perception based approach in terms of more number of dimensions extracted with more total number of items constituting the measurement scale.

Validity analysis

The relationship between the overall online-service quality and dimensions of EGOSQ (using both measurement approaches) was analysed by regression analysis. Using the gap based scores; three dimensions (Reliability, Assurance and Resourceful) were found significantly impacting overall online-service quality (with 10% level of statistical significance). The regression model was found significant and R^2 value was 0.327. Using the perception based scores; three out of four dimensions (Reliability, Assurance and Resourceful) were found significant. The regression model was found significant and R^2 value was 0.322. Another consistency is found in the dimensions which emerge as significantly impacting the overall quality. However, to conclude that other dimensions are not significant will not be justified based on this study, due to the limitations of this study. The relationship between users' satisfaction and EGOSQ dimensions and between behavioural intentions were not found significant through regression analysis. But, the regression results should be interpreted with caution, as the purpose of this study is to provide a starting platform to develop an instrument; the dependant variables for the regression emerged from the literature survey from one of the related field of this study and not from the exact field due to the absence of available research.

Table 6: Profile of the respondents

	Percentage (n=65)	**Internet Usage**	
	22	Less than 1year	0
Unmarried	78	1-3 Years	0
Male	62	3-6 Years	22
Female	38	6 Years & over	78
Age group		**Average Usage of internet**	
16-24	51	1-5 times a month	0
25-34	46	1-5 times a week	0
35-44	3	1-5 times day	43
Income		More than that	57
Under Rs. One lac	0	**Internet Usage-Hours per week**	
Rs One lac to Two lac	0	5-10 Hours	3
Rs Two lac to Three lac	0	10-15 Hours	40
Rs Three lac to Four lac	12	15-20 Hours	48
Rs Four lac to Five lac	37	20-40 Hours	9
Rs Five lacs & over	51	1-5 Hours	0

5. Findings & Results

The study proposes measurement instruments to measure e-governance online-service quality (EGOSQ). The literature survey and the qualitative studies resulted into seven dimensions of EGOSQ. The quantitative study using factor analysis extracted seven dimensions in case of perception minus expectation (discrepancy/gap) based approach of measurement and four dimensions in case of perception based approach. There is consistency in the instrument evident from the similar pattern of factor loadings in both

of the approaches. Though, the sample size (n=65) is too small for any conclusive results, but, the reliability analysis and the factor analysis results suggest possibly good factor structure of the instrument. The regression analysis also suggests validity of the instrument. In addition, comparisons with few studies already present on e-governance provide support to the findings. Information delivery is regarded as one of the most important role of e-governance initiatives. The research report of IICD Research brief (Backus, 2001) emphasized importance of information, interaction and involving users to get success in e-governance initiatives. The paper also suggests one point of contact for users to provide convenience. Convenience is one of the factors regarded as critical in another report pertaining to New Zealand e-governance initiatives (E-government Unit Research paper, 2004). This Unit Research report brings out other important attributes as ready access to information, wide range of services by single website, ease of contact by users, integrated services, assurance factors, interaction using multiple means, website design, privacy and security concerns. End to end responsibility of service delivery and trust concerns are elaborated in other study also (Al-Omani & Al-Omani, 2006; Tawil & Sait, 2002).

6. Discussion & Implications

This study aims at finding users' perceptions of the dimensions and attributes which determine e-governance online-service quality, and, to propose a comprehensive model for the quality measurement. A two stage design combining the qualitative and quantitative research methods is used to propose the measurement model. A pool of potential attributes that measure online-service quality of e-governance was formed as a result of the literature survey carried out in eight related areas- Service Quality Measurement, e-Service Quality Measurement, System Quality, Information Quality, Technology Adoption Model (TAM), End user satisfaction, Self Service Technologies and e-governance assessment models. This pool was refined using the qualitative techniques of focus groups and in-depth interviews. The attributes from the pool were used to develop questionnaire for the empirical survey. The data analysis suggested dimensional instrument to measure e-governance online-service quality. There are two alternative approaches to use this instrument. First is taking the perception based scores of users only, and the second includes expectation scores also. In the second approach, the discrepancy/gap score is calculated by subtracting the expectation scores from the perception scores. The present study could not do the comparative analysis of the two approaches to find the better one. Though, the researches in the related field of e-service suggest superiority of the discrepancy approach (Agrawal, 2007).

The dimensions which are common to both the approaches are: Reliability, Resourceful and Utility. It implies that users consider these dimensions to assess the quality of e-governance online-service quality EGOSQ. Reliability includes attributes of protection of personal information and privacy, getting things done within the expected time frame, getting things done right the first time, fast navigation in the website without frequent jams and, availability of online-services on all days and at all time. It means governments have to ensure apart from 24X7 availability of online-services, ensuring performance of the services right always. Users don't expect slow navigations and frequent jams while surfing the sites, therefore, the WebPages should be small in size so that they load fast and web servers should avoid congestions. Users also expect the service performance within the expected time frame. Therefore, governments should clearly suggest the users the time required to fulfil the service request online. Resourceful dimension contains attributes - getting updated information and getting useful information. It means governments have to provide useful information to users and have to update the information frequently. Users expect the websites to be a resourceful website having all the information they need. The dimension of utility consists of attributes- availability of easy to use various online contact options, friendly and courteous interaction by employees, availability of wide range of services through a single website and availability of customizable features according to the users needs. Contact options include email, telephone, online chatting etc. Presence of these options will improve the quality perception of online-services. Moreover, users expect friendly and courteous interactions from on-line service providers.

Table 7: Reliability and Factor Analysis Results

	Using Gap Scores (P-E)				**Using Perception Scores**		
S. No	**Items & Factors**	**Loadings**	**(Coefficient of Alpha)**	**S.No**	**Items & Facotrs**	**Loadings**	**(Coefficient of Alpha)**
	Reliability		0.899				0.904
1	Protection of personal information and privacy	0.959		1	Protection of personal information and privacy	0.957	
2	Getting things done within the expected time frame	0.842		2	Getting things done within the expected time frame	0.891	
3	Getting things done right the first time	0.684		3	Getting things done right the first time	0.669	
4	Fast navigation without jams	0.81		4	Fast navigation without jams	0.822	
5	Availability of online-services on all days and at all time	0.723		5	Availability of online-services on all days and at all time	0.734	
	Resourceful		0.708		**Resourceful**		0.676
6	Getting Updated information	0.783		6	Getting Updated information	0.72	
7	Getting Useful information	0.865		7	Getting Useful information	0.877	
	Utility		0.625		**Utility**		0.646
8	Availability of easy to use various online contact options	0.377		8	Availability of easy to use various online contact options	0.552	
9	Friendly and courteous interaction by employees	0.497		9	Friendly and courteous interaction by employees	0.381	
10	Wide range of services through a single website	0.622		10	Wide range of services through a single website	0.639	
11	Features can be customized according to my needs	0.764		11	Features can be customized according to my needs	0.717	
	Assurance		0.732		**Assurance**		0.77
12	Transparent in all transactions	0.776		12	Transparent in all transactions	0.571	
13	Employees take prompt actions to address my needs	0.649		13	Employees take prompt actions to address my needs	0.846	
14	Provides opportunities to contact other users (through blogs/discussions forums)	0.677		14	Provides opportunities to contact other users (through blogs/discussions forums)	0.621	
				15	Financial security during the online transactions	0.572	
				16	Getting Timely information	0.58	
	Accountability		0.642				
15	Government accepting responsibility and taking control in the event of service failure/ fault.	0.454					
16	Financial security during the online transactions	0.683					
17	Shows concern about the problem in case of service failure	0.672					
	Convenience		0.589				
18	Getting Timely information	0.833					
19	Getting Reliable Information	0.517					
20	Easy to retrieve and use information	0.454					
	Appealing website		0.708				
21	Well designed and organized interface (website)	0.627					
22	Impressive looking interface (website)	0.785					

Table 8: Regression Results*

	Using Gap Scores		**Using Perception Scores**
Dimensions	**t-value**	**Dimensions**	**t-value**
Reliability	2.439	Reliability	2.538
Assurance	1.828	Assurance	2.196
Resourcefulness	1.803	Resourcefulness	1.908
R^2 value	0.327	**R^2 value**	0.322
F value (ANOVA Table)	3.954	**F value (ANOVA Table)**	7.130
Sig	0.001	**Sig**	0.000

* Other variables were insignificant and not shown in the results.

In addition, a wide range of services should be offered through the web portal so that customers perceive a high level of utility of such online-services. Another dimension that is up to a large extent common to both measurement approaches is Assurance. Users expect transparency from online service providers in all transactions and want prompt actions to address their needs. In addition, they also expect options to contact other users (through blogs/discussions forums) so that they can share their views. In India, most of the e-governance online-service portals lack this feature, which if is included can help in a more rapid adoption of e-governance i.e. use of online-service by users for most of the transactions. Two other related attributes are financial security during the online transactions and getting timely information. However, these attributes appear in separate dimensions in the gap based approach of measurement, it seems that users are quite concerned about these attributes in their quality perceptions. Other dimensions which exist in case of the gap based approach are convenience, accountability and appealing website. Users expect that government service providers should accept responsibility and take control in the event of service failure/ fault, and, they should show concern about the problems users face in case of service failure. Availability of reliable information to enable users to take quick decisions in an easy to retrieve and use form is also expected by the users. A well designed and organized website with impressive looking WebPages will also add to the quality perception.

7. Limitations & Future directions

The major limitation in this research has been the access to the users of e-governance online-services, evident in the sample size. Because of the small sample size, the results of the study should be viewed with caution. However, high reliability coefficients of dimensions suggest the rigour with which the questionnaire is developed. Factor analysis provides better results with large sample sizes (about 5 times the number of variables used). Other related limitation is perhaps somewhat biased sample of high internet usage group, more experienced users of internet, high income group and relatively younger age of the sample. These characteristics of sample need to be taken into consideration. There is a possibility that most of the users of e-governance online-service have these characteristics. There is a need to verify this assumption by conducting study to profile the users of e-governance online-services users in India. Therefore, without such study, it cannot be established that the sample represented in this study is truly biased. Another limitation is the absence of dependant variables which should be used to test the predictive validity of the proposed measurement instrument. The dependant variables used in this study are derived from the related field of e-service, which represent commercial businesses. Qualitative studies involving the users of such online-services will provide more insights in this field. The time has come to study more about the users of the services, their behaviours while availing online-services, their preferences and expectations and their dispositions to understand them better. This will definitely result into a more rapid acceptance and adoption of government online-services by the users.

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About the Authors

Anand Agrawal, has been working as a faculty member at ICFAI Business School at Hyderabad since last two years. He has done PhD in the field of services marketing from ICFAI University in which he developed a measurement instrument to measure e-service quality. His research area includes Marketing Management, Services Marketing and Research in general. He has more than 10 national research publications and a few international research publications in his credit. He has also written case studies and magazine articles. Currently, he is also acting as assistant consulting editor of ICFAI Journal of Marketing Management.

Pragya Shah, has completed graduation in Commerce from Hansraj College; Delhi University in 2005, and is currently pursuing Masters in Business Administration from ICFAI Business School, Hyderabad Her employment history includes Summer Internship during MBA with Karvy Stock Broking ltd with a prior 1 year work experience in textile Industry.

Varun Wadhwa, completed schooling from Laxman Public School, Delhi, after which he joined College of Vocational Studies, Delhi university for his graduation in B. Com.(hons). Currently he is pursuing MBA from IBS, Hyderabad in the field of finance. He has a training experience of 3 months at ICICI Bank in the Corporate Banking Group (CBG)