E-Governance Service quality Assessment from Citizen's Perspective: A Case study in the State of Madhya Pradesh

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Abstract—*The objective of this study is to evaluate e-Governance projects in Madhya Pradesh from end user's perspective. A novel tool 'EGSQUAL' is developed using customized set of attributes to assess the quality of e-governance. Attributes are adapted from a widely accepted e-service quality assessment tool 'E-S-QUAL' along with another e-governance quality measurement tool 'EGOSQ'. Attributes are customized according to the implementation model for the e-Governance projects in the state of Madhya Pradesh. The proposed model follows perception based approach using five dimensions namely, reliability, efficiency, content, assurance and utility. Along with the service quality assessment, relationship between above dimensions with perceived user satisfaction and return value perception is examined using regression analysis. Finally, the reliability of the proposed model are tested using Cronbach Alpha. Convergent and Discriminant validity of the proposed model have been tested with the help o Composite Reliability (CR), Average Variance Extracted (AVE) and correlations between the constructs The respondents were citizens of both urban and rural regions of state of Madhya Pradesh. Significant relationship is observed between the dimensions of EGSQUAL and user satisfaction as well as return value perception is observed.*

Keywords: E-Governance, E-service Quality Assessment.

1. INTRODUCTION

The e-Governance initiatives around the globe and at all the levels of development, are gaining thrust to make services more transparent and to trim down response time and cost. The necessity for continuous monitoring and evaluation of all the on-going activities in e-Governance at the grass-root level, has been recognized by the governments as well as by researchers. 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'. 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. As significant amount of public fund had been impelled into wide range of projects under e-

Governance plan, from national to state, district and panchayat level. In such situation, it was but natural to assess the e-Governance projects. The need to evaluate the e-Governance projects and services also sensed, as the citizens who were made to access these e-Governance services, expected the concerned authorities to justify the process of conceiving, designing, as well as implementing them accelerate the implementation of e-Governance strategies and challenges and creating the right environment for G2G, G2B, G2E and G2C services within the country by adopting new policy on open standards for e-Governance, which is in force since July 2008.

Despite of lack of proper preparedness in the government workforce and strategies for the dramatic transformations with respect to the dynamically changing Information Communication Technology & human knowledge, citizens still expect the same level of service from governments as experienced with private sector.

In present state, specially, in developing nations the e-Governance projects appear to be are planned and implemented in a way that is analogous to the product concept in some of firms where they try to improve their products without involving customers and without knowing customers' preferences. The results of such approach are drastically negative as customer does not adopt such products/services rapidly.

Regardless of global , workshops and the conferences for developing quality standards for e-governance, need for a separate approach for developing 'beneficiary oriented,' standards, but still, Action Plans generally emphasize IT enabled services management standards, technical standards and mere complaint management standards (E-Governance Standards Workshop, Hyderabad, Andhra Pradesh, September 20-21, 2006).

In this research the perceptions of citizens of Madhya Pradesh accessing e-Governance services being provided by

various government departments have been used to measure the e-Governance Service Quality

1.1 Research Objectives

Though the current research being a part of the inclusive research to assess e-Governance service quality in the state under focus, following objectives have been set up for the present research :

- To explore the dimensions of e-Governance service quality in the context of Madhya Pradesh from citizen's perspective.

- To examine the relationship between e-Governance Service Quality dimensions and uers' satisfaction.

- To examine the relationship between e-Governance Service Quality dimensions and return value perception from citizens perspective.

To achieve the objectives set up or the research, extensive literature in the domain of service quality, e-service quality, e-governance assessment models. and related domains have been surveyed.

2.   REVIEW OF LITERATURE

The domain of e-Governance involve multiple disciplines comprised of service quality, e-service quality e-Governance, ICT. Accordingly, extensive literature from the associated domains have been surveyed for this research.

[3] Agrawal A have studied the e-service quality and related domains literature. Based on his study and using qualitative techniques of focus groups and in-depth interviews, he developed a pool of potential attributes to measure online-service quality (EGOSQ) of e-governance web portals.

Service quality as difference between expected and perceived service[8]. Adding to it , [22] also suggested service quality as the comparison between consumer expectation and perception of service. [18][16], Dabholkar et.al[8] performed studies on 'What is delivered' and some of the aspects concerned with 'How its delivered'. Based on insights from previous studies Parasuraman et.al[18][21] developed and improved SERVQUAL as a multiple-item instrument that could be used to quantify customers global assessment of a service provider's quality of service. Basically SERVQUAL (SQ) proposed five dimensions ; reliability, responsiveness, assurance, empathy and tangibles. The SERVQUAL not only had been used directly in many of the researches as an instrument to measure service quality of various services, but also its has been adapted by other researchers to develop new instruments for assessment of service quality in some differing scenario . [6] argued that service quality is a function of consumers' residual perception of the service quality from the prior period and his or her level of satisfaction (or dissatisfaction) with the current level of service performance. Later, [7] explained that SERVPERF scale, based on

performance perception alone provides a better measure for service quality as compared to the measures based on the discrepancy between expectation and perception.

ICT enabled delivery of services , termed as e-services required additional dimensions considering technological aspects to measure quality of services provided in such forms. With the pre-existence of products based services, the e-service for products based market got rapidly transformed. [19] defined e-SQ as "the extent to which a website facilitates efficient and effective shopping, purchasing and delivery". e-services provide means to interactive services on the internet , using advanced telecommunications, information and multimedia technologies". Loiacono et al.[14] developed WEBQUAL using 12 dimensions (Interaction, Trust, Information fit to task, Response time, Design, Visual appeal, Innovativeness Flow (Emotional appeal), Intuitiveness, Integrated communication, Business processes, Substitutability) to measure e-service quality of online retailing domain. Along with the above studies Different dimensions for e-service quality assessment with respect to different research contexts, have been explored by other researchers, viz. [15],[25] , [13] , [23] .

Reliability to has been observed by many researchers to be the most important dimensions for internet purchasers as compared to credibility, security and ease of use etc.

[11] explored different Assessment models including e-Government Assessment Framework (EAF), e-GEP, Impact Assessment Model IIM-A.

[24] in his study distinguished e-Governance from e-Government , also he developed a framework that describes challenges and measures in the quality management system for e-Governance projects.

The multi-item scale E-S-Qual had been widely adopted in many researches to assess e-service quality of retailers and other similar domains. However the developers of E-S-QUAL [20] acknowledged that the dimensions included in E-S-Qual are initially adequate with respect to product based companies. They suggested to make necessary modifications with respect to pure service based organizations.

Another tool EGOSQ [1] has been used previously for assessment of online service quality of e-governance projects. Although the researchers of this tool suggested minor modifications with respect to the changed context of the specific study.

Resulted from the review of literature on these researches, and after discussion with academicians experts, the researchers adopted dimensions from E-S-Qual, EGOSQ and instruments reviewed , to develop a fresh scale EGSQUAL. Dimensions included the new tool include Reliability(REL), Efficiency(EFF), Content(CNT), Utility(UTL) and Assurance(ASR).

2.1 Rationale

Most of the existing studies on e-governance service quality, focus on the governments' (service provider) perspective. The focus of these studies came out to be either on justifying the need to develop and implement the said project or on conforming the quality standards [1], with focus on engineering or system dimensions, or, organizing and streamlining administrative and organizational processes. There is lack of studies assessing e-Governance service quality from citizen's perspective, specifically none could be explored focusing on citizen perception of the dimensions. Hence the researchers guided by subject experts, adequately decided to assess the service quality of e-Governance projects in the state through this explorative study.

2.2 Limitations
Following are the limitations of the research.

- Population of the study are the citizens belonging to the state o Madhya Pradesh, which restricts the results of analysis applicable to the geographic limitation.
- The study has considered current state of the ICT infrastructures and responses of the samples. With varying Technological development the responses may vary with time.

3. RESEARCH MODEL

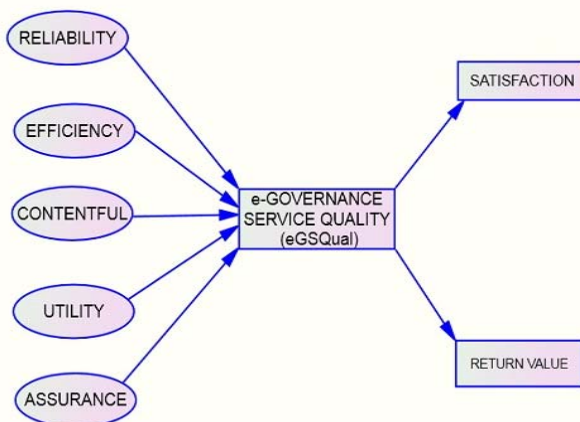Conceptual Model of the research is described in figure1

Figure 1: Conceptual Model of the research

The research is organized as follows :

First- based upon the literature survey a conceptualization is developed through exploration of the domain and having discussion with domain experts, followed by defining the conceptual model of the constructs.

Second- preliminary scale EGSQUAL is developed depending upon the dimensions explored and consultation with the subject experts.

Third- Data collected from the respondents, which are citizens accessing various e-Governance services provided by the state government through online surveys, using Google docs. Fourth - Taking initial representative 30 samples, the iterative process of testing alpha reliability and item-to-total correlation, is performed.

Fifth – Items with insignificant correlation were eliminated, then exploratory actor analysis was performed to finalize the scale. Afterwards the data was collected for the refined final scale.

Sixth- Out of responses , 401 complete responses were selected further reliability and validity tests, exploratory factor analysis then correlations were examined to examine relationship among the dimensions observed.

Seventh- Conclusions were derived depending upon the findings of the tests and statistical analysis.

4. RESEARCH METHODOLOGY

After widespread survey of literature of the domain and related domains, preliminary scale tool EGSQUAL was developed. The scales of 28 items divided into five dimensions adopted from E-S-Qual and EGOSQ and other tools reviewed.

Pre-Test data Collection and scale refinement :

The respondents are citizens of Madhya Pradesh and belong to one of the focus groups. After performing initial factor analysis and testing alpha reliability of pre-test data collected 6 items with low loadings were dropped and remaining 22 items were selected to develop the final questionnaire.

Measures used :

The questionnaire consisting of two parts, has been developed to collect online primary data through Google docs.

Part I contains demographic details (Table S1 in Appendix I) .

Part II contains Twenty two items divided five dimensions of EGSQUAL. Responses are measured on five point likert scale from 1-Strongly disagree to 5-Strongly agree. Along with these items four questions belonging to User's Satisfaction and Return value perception (2 question for each measure) are added with 5 point.

4.1. Demographic details of the samples
Primary data is collected from the citizens belonging to urban as well as rural areas of Madhya Pradesh using online survey. Out of 857 online responses . 401 responses complete in all manners and desired details were selected for the research. (Details available in Table S1 in Appendix I)

Data analysis and statistical tests were performed using SPSS 20.0.

4.2. Summary of Means and Standard Deviations

Table 1 : Summary of Means and S.D.

Scales	Means	S.D.
Reliability (REL)	3.08	3.01
Efficiency (EFF)	2.75	3.2
Content (CNT)	3.12	2.98
Utility(UTL)	2.86	3.36
Assurance (ASR)	2.45	3.35
Satisfaction (SAT)	2.69	1.44
Return Value (RET)	2.76	0.94

4.3. Exploratory Factor Analysis (EFA)

Principal component factor analysis is conducted to validate underlying structure of EGSQUAL. Results of EFA shown in Table 2 indicate existence of significance of EGSQUAL dimensions.

Table 2 : EFA and Reliability Results for EGSQUAL Dimensions

Factor	EFA Loadings* (Citizens)	Co-efficient Alpha
Reliability		0.781
REL1	0.821	
REL2	0.872	
REL3	0.754	
REL4	0.645	
REL5	0.791	
Efficiency		0.740
EFF1	0.714	
EFF2	0.612	
EFF3	0.742	
EFF4	0.548	
EFF5	0.854	
Contents		0.71
CNT1	0.667	
CNT2	0.759	
CNT3	0.549	
CNT4	0.623	
Utility		0.72
UTL1	0.812	
UTL2	0.634	
UTL3	0.652	
UTL4	0.754	
Assurance		0.86
ASR1	0.878	
ASR2	0.733	
ASR3	0.677	
ASR4	0.646	

Note : EFA- Exploratory Factor Analysis, *- Standard loading estimates from EFA using SPSS. Values are significant at p<0.01

Adequacy value of the items using KMO measures are as listed below

Table 3 : Results of KMO normalization

Scales	KMO value
Reliability (REL)	0.701
Efficiency (EFF)	0.721
Content (CNT)	0.543
Utility(UTL)	0.674
Assurance (ASR)	0.535
Satisfaction (SAT)	0.568
Return Value (RET)	0.704

4.4. Correlations between the variables

Strength of relationship among the dimensions oe EGSQUAL is shown in the Correlation matrix constructed from the responses.

The correlation matrix indicates highest correlation 0.764 between Reliability(REL) and efficiency(EFF) , while lowest correlation between EFF and CNT. All correlations among the dimensions are found to be significant.

Table 4 : Correlations between EGSQUAL Dimensions (Citizens)

Scales	REL	EFF	CNT	UTL	ASR
Reliability (REL)	1	.764**	.680**	.546**	.773**
Efficiency (EFF)		1	.253*	.290*	.511**
Content (CNT)			1	.548**	.523**
Utility(UTL)				1	.294*
Assurance (ASR)					1

** - Correlations is significant at 0.01 level (2-tailed) ,
* - Correlation is significant at level 0.05 (2- tailed)

4.5. Regression between the variables

The results of regression analysis from Table 5 , shows variance in user's satisfaction to be 15.32 and return value perception being 10.47 with 0.000 level of significance . The regression results support significant positive results between EGSQUAL dimensions and satisfaction as well as between EGSQUAL dimensions and return value perception.

Table 5 : Regression Results of EGSQUAL Dimensions and Satisfaction and Return value

Independent Variables (Factor Scores)	Dependent Variables	
	(SAT)	(RET)
REL	0.52 (.00)	0.61(.00)
EFF	0.56. (.00)	0.64. (.00)
CNT	0.22(.00)	0.26(.00)
UTL	0.35(.00)	0.43(.00)
ASR	0.49(.00)	0.59(.00)
Adjusted R^2	.56	.54
F value (ANOVA)	15.32	10.47
Sig.	0.000	0.000

Table 6 : Measurement Model of EGSQUAL Dimensions

Fit Measures	CFA-REL	CFA-EFF	CFA-CNT	CFA-UTL	CFA-ASR
χ2/df	2.242	2.156	2.081	2.049	1.812
CFI	.910	.0914	.890	.781	.929
RMSEA	0.021	0.054	.042	0.063	0.065

Note: REL-Reliability, EFF-Efficiency, CNT-Contents, UTL-Utility, ASR-Assurance, CFI-Comparative Fit Index, RMSEA- Root Mean Square Error of Approximation.

The values from Table 6 shows valid measurement model with a good fit of the EGSQUAL dimensions.

5. RELIABILITY AND VALIDITY ANALYSIS

Cronbach's alpha values of the dimensions shown in Table 2 range from 0.71 (CNT) to 0.86(ASR). To test for convergent validity, items in each construct must have reliabilities over 0.5 and composite reliability(CR) should be over 0.7 and should be greater than their respective Average Variance Extracted (AVE). The square root of AVE was found to be greater than inter scale correlations

6. FINDINGS AND RESULTS

The present research suggests a new tool EGSQUAL to assess e-Governance service quality. The qualitative study making use of factor analysis to extract dimensions to measure the service quality of e-Governance. The results of factor analysis came up with good factor structure of the tool. The analysis also suggest validity of instrument. The regression results support the positive relationship among the EGSQUAL dimensions and Statisfaction as well as return value perception. The research was aimed with exploring

7. IMPLICATIONS & FUTURE DIRECTIONS

With the objectives to explore dimensions of e-Governance service quality in context of the state, the research comes out with a new tool EGSQUAL to assess service quality of e-Governance,, along with this the relationships of the constructs of EGSQUAL with user satisfaction and return value perception have been examined. The study itself is a part of an inclusive ongoing research assess the e-Governance

service quality both from citizen's perspective as well as from stakeholders perspective. Further research in this context is still going on, which may need further improvements in the developed tool. Also the research has been performed with limitations of present ICT infrastructure conditions as well as user awareness status. With respect to the dynamically changing technology and skill levels of the citizens as well as the service providers, Further refinement and new consideration may be needed. Also it has been observed during the research that the user expect the e-Governance service portals to be more reliable and efficient. The portal with attractive and useful contents and user friendly interface can raise the satisfaction level of the users. Also during the research it has been observed that there is broader gap between availability of ICT infrastructures to the citizens belonging to urban regions and rural regions of the state. Initially the research did focus on comparison of perceived of e-Governance service quality between urban region citizens and rural region citizens. Such objectives are due for future researches.

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APPENDIX I

Table S1: Demographic details of respondents (N=401)

	Frequency (Citizens)	%
Age Group		
<25	107	27%
25-40	207	52%
41-55	87	22%
>55		
Gender		
Male	255	64%
Female	146	37%
Resident Location		0%
Urban	311	78%
Rural/Tehsil/Town	90	23%
Education Level		0%
Higher Secondary or less	97	24%
Graduate	210	53%
PG or above	94	24%
Occupation		0%
Student	198	50%
Unemployed	7	2%
Service	83	21%
Kiosk Operators		0%
Business or Self Employed	113	28%
Tenure in years of using Internet and Online Services		
<3	0	0%
3-6	124	31%
6 or above	277	69%
Frequency of visiting Assessed e-Gov. Online Services		
<5 times a month	10	3%
3-8 Times a month	135	34%
Very frequently	256	64%
No.of e-Gov. Online Services You have accessed		
1	23	6%
1-3	273	68%
More Than 3	105	26%
Purpose of using assessed e-Gov. Online service		
Tax/Bills Payment	90	23%
Admission/Exam/Fees Payment	204	51%
Job Application	107	27%
Mode of payment made by you for the concerned e-Gov. service		
Offline	172	43%
Online (Netbanking/Debitcard/CreditCard)	229	57%
Online (Mobile)	0	0%