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Title

**AN INTEGRATED APPROACH TO RURAL DIGITAL SERVICES-
CASE STUDY ON COMMON SERVICE CENTRES IN HUNDRED
THOUSAND VILLAGES OF INDIA**

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Abstract:

Efficient, effective and un-hindered, symmetric access to Governmental information is a fundamental goal of India's National E-governance Project (NeGP). The plans for this project recognize that citizens' Information needs are for both generic and specific purposes. Post-deployment research on earlier experiments with rural telecentres has shown that successful deployment of ICT platforms for development needs both dynamic updates to local data and knowledge that can aid decision-making process for personal and economic well-being of rural citizens. While access to relevant information may be key to rural development, mere availability of information is not enough. Information is a necessary but not a sufficient condition for citizen-empowerment. This paper studies the over-arching needs of architecting the front end delivery system of Government to Citizen (G2C) services through an one-stop 'Common Service Centers' (CSC) in Indian villages through a case study in the action research mode. An analysis utilizing AHP (Saaty, 1998) rank orders and prioritises the critical to quality and critical success factors for this integrated approach.

Keywords: Telecentres, Common Service Centers, e-Governance, Informational G2C Services, Service Quality, Analytic Hierarchy Process (AHP)

Introduction:

Citizens' Information needs are for both generic and specific purposes but dynamic updates to local data and knowledge that can aid an appropriate decision-making process for personal and economic well-being. While access to relevant information may be the key to rural development, mere availability of information is not enough. Information is a necessary but not a sufficient condition for empowerment. Traditionally dissemination of Information from Government to citizens in general and rural citizens in particular has followed various means like across the counter, Newspaper, Television, Radio, Public Address (PA) system etc. Such traditional modes suffer from inherent limitations of 'Efficiency' in terms of Time and Cost and 'Effectiveness' in relation to Reach , One-way communication, lack of customised and need-based information,

lack of feedback mechanism and largely available during specific days and specific time slot of a day.

Innovational information has to be linked to appropriate possibilities for using the information meaningfully. Access to rural infrastructure and effective product service exchange systems represent the means that can allow villagers to support, supplement and expand their traditional incomes in a sustainable way using new information. A number of services ranging from micro-credit, literacy, education, health, agriculture, entertainment, etc., have the power to lay a solid foundation for the economic prosperity of Rural India. But a systems approach must integrate social and economic empowerment with Information and Communication Technology (ICT) tools / platforms. ICT enabled Information system significantly enhances both 'Efficiency' and 'Effectiveness'.

ICT enabled Informational Government to Citizen (G2C) services for rural India have witnessed many innovative applications like Voice Call Centre, Web Portal, Info kiosks / telecentres, Touch screens, Mobile SMS and Value Added Services (VAS). Many of these services support two way communications and positioned as assisted services to take care of digital illiteracy amongst the vast majority of rural citizens. In the arena of mobile telecommunications, we witnessed many innovations: innovations from the consumers such as the 'missed call', innovations from the operators such as the infrastructure tower sharing (business) model, one-paisa-per-second tariff plan etc.

Literature Review:

Telecentres

There is an ongoing debate about the continued relevance of public access ICTs; particularly models that receive public funding (see Coward, December 2008).

Literature dealing with venue performance indicates that public access venues generally struggle and often fail to achieve financial sustainability. All conclusions point to the fact that financial success is associated with a variety of factors including good management, good locations, strong local demand, new service development, locally relevant services, external linkages and

networking (e.g., Benjamin, 2001; Etta & Parvyn-Wamahiu, 2003; Latchem & Walker, 2001; Roman & Colle, 2002).

A study by Kumar & Best (2006b) found that access to financial subsidies enabled NGO-run kiosks to stay operational while a significant proportion of private kiosks had closed down. Benjamin (2001) concluded that less than one-third of Universal Service Agency telecentres in South Africa had the potential for sustainability. In a critique of the focus on financial sustainability as a measure of success, Simpson, Daws, & Pini (2004) recommend that public access points be reconceptualised as essential community infrastructures like schools and libraries, and deserving of government funding: “This would mean re-defining the sustainability of a public access only in terms of the outcomes it produces in terms of social and community betterment rather than only in terms of economic gain.”

Knowledge workers, “infomediaries” and/or local champions (formal and informal) have been found to be important contributors to the viability and sustainability of a public access venue, (particularly in the case of libraries) helping to attract users to the site (Rajendra Kumar & Best, 2006b), and providing guidance and guiding users unfamiliar with ICTs (Bailey, 2009; Kiri & Menon, 2006; Rajalekshmi, 2007; Ulrich, 2004). According to Rajalekshmi (2007), trust between citizens and intermediaries at various levels affects the way e-governance services are delivered through telecentres, although the achievement of trust in one public access service area will not necessarily transfer to other service areas.

The occurrence of proxy usage, that is, people using a public access venue on behalf or at the request of another person is worth noting here, especially since it introduces indirect use into the picture, potentially ameliorating the dominance of particular populations at public access venue. Ulrich (2004) found high levels of proxy use in rural China, such as a child getting information from the center for a semi-literate parent.

Menon et al (2006) found that e-government, veterinary and healthcare services constituted less than 10% of the use of rural PC kiosks in India, they also concluded that use of such services is high at locations where they are offered consistently. Bhatnagar and Vyas (2001) also found relatively low usage of Gyandoot kiosks in rural India. However, 95% of the usage that did occur was related to agricultural produce rates, land records and grievance services.

An assessment of UNESCO's community multimedia centres also identified a range of economic and social benefits from creation of new livelihood opportunities to the removal of social barriers (Creech, 2004).

Diffusion of Innovations' (DOI)

Rogers E M in his seminal work on 'Diffusion of Innovations'(DOI),(The Free Press, New York, originally published in 1962, 3rd Edition 1983) found that technological innovation is communicated through particular channels, over time, among the members of a social system.

The **stages** through which a technological innovation passes are: **knowledge** (exposure to its existence, and understanding of its functions); **persuasion** (the forming of a favourable attitude to it); **decision** (commitment to its adoption); **implementation** (putting it to use); and **confirmation** (reinforcement based on positive outcomes from it).

Quality of e-Government Services

Christos Halaris et al, 2007 in their literature review 'Classification and synthesis of Quality Approaches in e-government services' have summarised issues related to Quality of e-Government services:

Approaches of this area focus on the quality of the portal and the overall customer satisfaction. Customer satisfaction is affected both from perceived by citizens quality and from their expectations about the service.

The American Customer Satisfaction Index (American Customer Satisfaction Index, 2006) uses two interrelated methods to measure and analyze customer satisfaction: customer questionnaires and econometric modelling. The American egov-ACSI (American Customer Satisfaction Index, 2006) is the more established model of this category. It evaluates quarterly more than 90 online e-government sites grouped into four categories (ecommerce/transactions, news/information, portal/dept. main sites, recruitments/careers). The second model of this group, the Korean g-CSI (Kim et al., 2005), has been based on the ASCI model and therefore has many resemblances. Quality aspects addressed by these models consist of information, process, and service. Accessibility and accuracy of information easiness and costs of the service as well as expertness and kindness concerning customer service, are some of the quality dimensions included.

The interactive E-Government (Barnes and Vidgen, 2003) examines the results of a survey of the quality of a web site provided by the UK Government. The site is that of the Inland Revenue. The survey was administered directly after the launch of a new system to enable online submission of self-assessed tax returns. The instrument, E-Qual, draws on previous work in web site usability, information quality, and service interaction quality to provide a rounded framework for assessing e-government offerings. The metrics and qualitative comments provided some detailed insights into the perceptions of users who attempted to interact with the online taxation system. The research findings suggest that usability has been a major issue that requires attention and that there is a great need for empathy and personalization in the delivery of services.

The approach used by e-government sites in Thailand (Sukasame, 2004) focus on the development of a conceptual framework and on the elicitation of factors such as reliability, linkage, content, ease of use and self-service that affect the e-Service provided on the web portal of Thailand's government. Content refers to concise, useful, and current information moreover to the presentation and layout of factual information and functions on the web site, linkage refers to the number and quality of links that a web site offers targeting to the integration of relevant information at the site and at other sites. Reliability is related with the technical functioning of the site, particularly the extent to which it is available and functioning properly, while ease of use reflects the usability of the web site during customer navigation and aims to reduce customer frustration. Finally, self-service refers to formats, which enable customers to perform services for themselves quickly and conveniently.

A key common feature is that they are based on a "model". This model consists of a number of latent variables (such as "quality") and the cause and effect relationships between them. Each of these latent variables includes several manifest variables that act as concrete proxies for the latent variable. Consumer satisfaction is the latent variable that is at the centre of the model; it is encased within a system of variables relating to causes and effects.

Gaps in existing Literature:

A review of the extant literature reveals the following gaps:

- a) Models for qualitative assessment of e-Government (G2C) Services for Rural Citizens in general and 'Unreached and unserved' citizens in specific;
- b) Models to measure quality of e-Governance (G2C) services delivered through shared access telecentres / info kiosks / Common Service Centres as an assisted services ;
- c) Hierarchy based model to provide guidance to the Government & Public Administration (service provider) on the issues that needs to be prioritised to enhance the G2C service quality for Rural Citizens.

Model Building and Development of Research Questions:

In the background of theory on Diffusion of Innovation, gaps in existing literature on Telecentres and Quality of e-Government Services the following questions emerge:

1. What factors affect Rural Citizens **initial use** of telecentre to seek information and visit Government Web portal?
2. What factors affect Rural Citizens **re-use** and re-visit of Telecentre to seek information and visit Government Web portal?
3. What factors affect Rural Citizens **Involvement and Interaction** with the telecentre and Informational Government Web Portal?
4. What factors affect Rural Citizens **Trust** on telecentre and informational Government Web Portal?
5. What factors affect Rural Citizens **Satisfaction** on use of Telecentre and Informational Government Web Portal?
6. What factors affect Rural Citizens **Confirmation** (adoption) of Telecentre and Informational Web Portal?

7. How to build a hierarchical model to prioritise the aforesaid e-Government service quality issues that would lead the National strategy for roll out of hundred thousand CSCs? and
8. Provide focus and direction to allocate resources in achieving the NeGP vision of inclusion of 'unreached and unserved' rural citizens

In this paper, the primary pursuit is to identify a new way of evaluating the aforesaid research questions related to Informational e Governance (G2C) services that satisfies the following requirement :

- (I) Is based on user's experience and judgements supported by explanations that ensure a sense of realism and a broad perspective beyond Gap analysis.
- (II) Due to interaction among the various factors and the stakeholders that impacts the e Governance service delivery through rural telecentres / infokiosks , it is essential to identify the important ones and to determine the degree to which they affect each other before a clear evaluation can be attempted.
- (III) Issue of how to structure a complex electronic government service delivery, identify its criteria and other factors whether intangible or concrete, measure the interactions among them in a simple way and synthesize all the information to obtain priorities. The priorities can then be used to develop portfolios of activities to meet developmental goal of 'electronic government', one of the major concerns of the G&PA and Citizens.
- (IV) The model should also offer the evaluators a simple test of the consistency of their judgements and can also be used to test compatibility of projected service provisioning with established service delivery models.
- (V) A new way to evaluate the myriad factors that affect the government service delivery through electronic media along the continuum of reform of G&PA
- (VI) The outcome should support to rank various alternatives, allocate resources and exercise control in the service delivery system by evaluating the sensitivity of the outcome to changes in judgment

ICT enabled Informational services as the Driver for Rural Empowerment:

A significant part of Indian population living in rural and remote areas has low access to information. There are often governmental poverty alleviation and development schemes and bulletins for which the information rarely reaches the citizens on time. Similarly, information pertaining to citizen-charters, legislation for the rural people suffers inordinate delays before reaching the target audience. Several past initiatives to use Information and Communication Technology for Development (ICT4D) by the Government and Public Administration (G&PA) in India to provide information to the citizens did not achieve the desired results due to limited access, timeliness of the information, relevance of the information to citizens' need, preciseness and completeness of the content etc. Further such information remained largely scattered and not available from a single source. . Hence, citizens' need to receive meaningful information from Government and use such information to conclude transactions with the Government remained significantly unfulfilled in spite of ICT enabled initiatives. Providing transparent and actionable citizen-centric information services to every village has thus become a key constituent of most plans for meeting the development goals of both State as well as the federal governments. Actual service delivery to the rural citizen in India currently happens at four different locations where most of the government services are delivered – Gram Panchayat, Block HQ, District HQ, and State HQ.

The Government of India (GOI), through National e-Governance Plan (NeGP) has made its intent clear. All such services for which the rural citizen needs to travel outside the village should be provided to him at the village level itself. To ensure this, the service delivery platform needs to be enabled for Single point of contact for various services; Transparency in transactions; Easy and simplified processes; Faster turnaround time; Increased awareness of citizens towards developments affecting them; Cost savings for citizens; Saving time and effort for citizens; and Increased access to markets, employment, etc.

In India over the last decade, State Governments, as well as Private Entrepreneurs, have launched ICT-enabled kiosk projects across various locations. These projects mainly catered to e-Government services as well as private sector services. Notable projects like ITC's e-Choupal, IIT Kanpur's dealindia, Drishtee, n-Logue, Tarahat, kisanblog or krishikatha - in the private sector, and e-Seva, Bhoomi, SETU, FRIENDS in the government sector, have met with

considerable success despite various constraints in the form of internet penetration, lack of user awareness, administrative challenges, and limited financial support and so on. But in many cases sustainability issues were challenging and many famous projects languished after the initial euphoria and publicity.

However, the ability of the current kiosks to scale up and provide effective service delivery has been hampered by various challenges as Lack of Financial Support ; Absence of Process Reengineering; Limited End-to-end e-Government Services ; Limited Sharing of Best Practices; Lack of Awareness amongst Users; Limited Capacity Building and Training; Inability to Leverage Economies of Scale ;Limited bouquet of Content & Services; Lack of Partnerships with Government departments and agencies ; Lack of adaptability to e-enable the services amongst Government & Public Administration (G&PA).

Introduction to 100K Common Service Centres (CSCs) project as per NeGP and other plans:

Common Services Centres are envisioned as the front-end delivery points for Government, private and social sector services to rural citizens of India. The objective is to develop a platform that can enable Government, private and social sector organizations to integrate their social and commercial goals for the benefit of rural populations in the remotest corners of the country through a combination of IT as well as non-IT services. The Common Services Centers (CSC) are proposed to be the delivery points for Government, private and social sector services to rural citizens of India. The CSC Scheme was approved by Government of India in September 2006 for setting up of 100,000+ (one lakh) internet enabled centres (infokiosks / telecentres) in rural areas in a public private partnership (PPP) model with an equitable distribution - one CSC for every six census villages. The CSC Scheme is not just about rolling out IT infrastructure but to build a network of 100,000+ rural businesses across India

The CSC Scheme is being implemented in a Public Private Partnership (PPP) framework to create an effective and appropriate implementation mechanism by optimally leveraging public funds, integrating public sector scale with private sector efficiencies, reducing life cycle costs and looping best practices

The Village Level Entrepreneur (VLE)

The VLE is the key to the success of the CSC operations. While content and services are important, it is the VLE's entrepreneurial ability that would ensure CSC sustainability. A good VLE is expected to have some financial strength, entrepreneurial ability, strong social commitment as well as respect within the community. The quality of service at the CSCs would depend a great deal on the quality of VLEs. Selection and proper training of the VLE therefore would play a vital role in making the CSC Scheme a success.

Government Financial Support

The real challenge in implementation of a project of this nature is not so much in setting up of the physical infrastructure but in running and sustaining these centers once the infrastructure has been set up. Therefore, the cornerstone of the funding arrangements of the CSC Scheme is to focus on a calibrated revenue support, rather than providing Government financial support for the initial capital expenditure

CSC and Agriculture:

Agriculture related service is one of the key services that are being offered through the CSCs. There has been an earnest attempt to aggregate all possible farm related information and services to the local level using the CSCs. It has been attempted to work with Agricultural Universities where advanced farm knowledge is generated. There is a growing need for reliable and specialized advice on issues beyond farm technology adoption like markets inputs and environment for a country like India where majority of the population are dependent on the Agriculture.

The Government intends to augment the Information and Communication Technology (ICT) resources and capabilities of the Agricultural Technology Information Center (ATIC) at the University level and the Krishi Vigyan Kendras (KVKs), so that sustainable farm knowledge and advisory services can be disseminated using the internet as an additional medium to the farmers through the CSCs. Attempt has also been made to establish 'Online Farm Information and Advisory Cell' (OFAC) with computer and internet facilities in the Krishi Vigyan Kendras.

Research Findings and Analysis:

Strategy evaluation for such e – Governance infrastructure project (Like CSC) in India is problematic in view of diversity , sheer size / scale of the project and socio-political complexity. Since there can be several possible strategies, it requires multi-criterion decision-making analysis to choose the best ones. Government agencies are not always best equipped in terms of choosing appropriate strategies to fit the particular context. Hence, in this paper, the researcher attempted multi-attribute decision-making based analysis for the evaluation of strategies for making the CSC enabled Informational e-Governance a success. The aim of this paper is to prioritise the factors that would need focussed attention and resource allocation of the Government to make this massive initiative of building the rural digital eco-system of the country a success. Because of the interaction among the multitude of factors affecting a complex decision, it is essential to identify the important ones and to determine the degree to which they affect each other before a clear decision can be made.

In this paper, based on literature review, field study of CSCs in the state of Jharkhand, numerous workshops with the stakeholders and Focussed Group Discussion with State Anchors of NLSA and select VLEs, the following hierarchy of factors and sub-factors emerged in search of answers to the research questions and hypothesis .Subsequently, the researcher asked the experts to assign weights to the factors and sub-factors of hierarchy model. The hierarchy as per the figure depicted below has been analysed using Analytical Hierarchy Process (AHP). AHP is an approach of ‘ breaking down a complex , unstructured situation into its component parts ; arranging these parts , or variables , into hierarchic order ; assigning numerical values to subjective judgements on the relative importance of each variable ; and synthesizing the judgements to determine which variables have the highest priority and should be acted upon to influence the outcome of the situation’ (Thomas L Saaty, Decision Making for Leaders The Analytic Hierarchy Process for Decisions in Complex World , Second Edition , 1998). In the literature review, it is understood that a numerical tool for the evaluation of the criterion in arriving at the proprieties is needed. The analysis provides an analytical tool to the stakeholders who are responsible for the determination of strategy for success of CSCs as an assisted front-end delivery channel for the rural citizens in door-step delivery of Informational e-Government services.

INFORMATIONAL e-GOVERNANCE

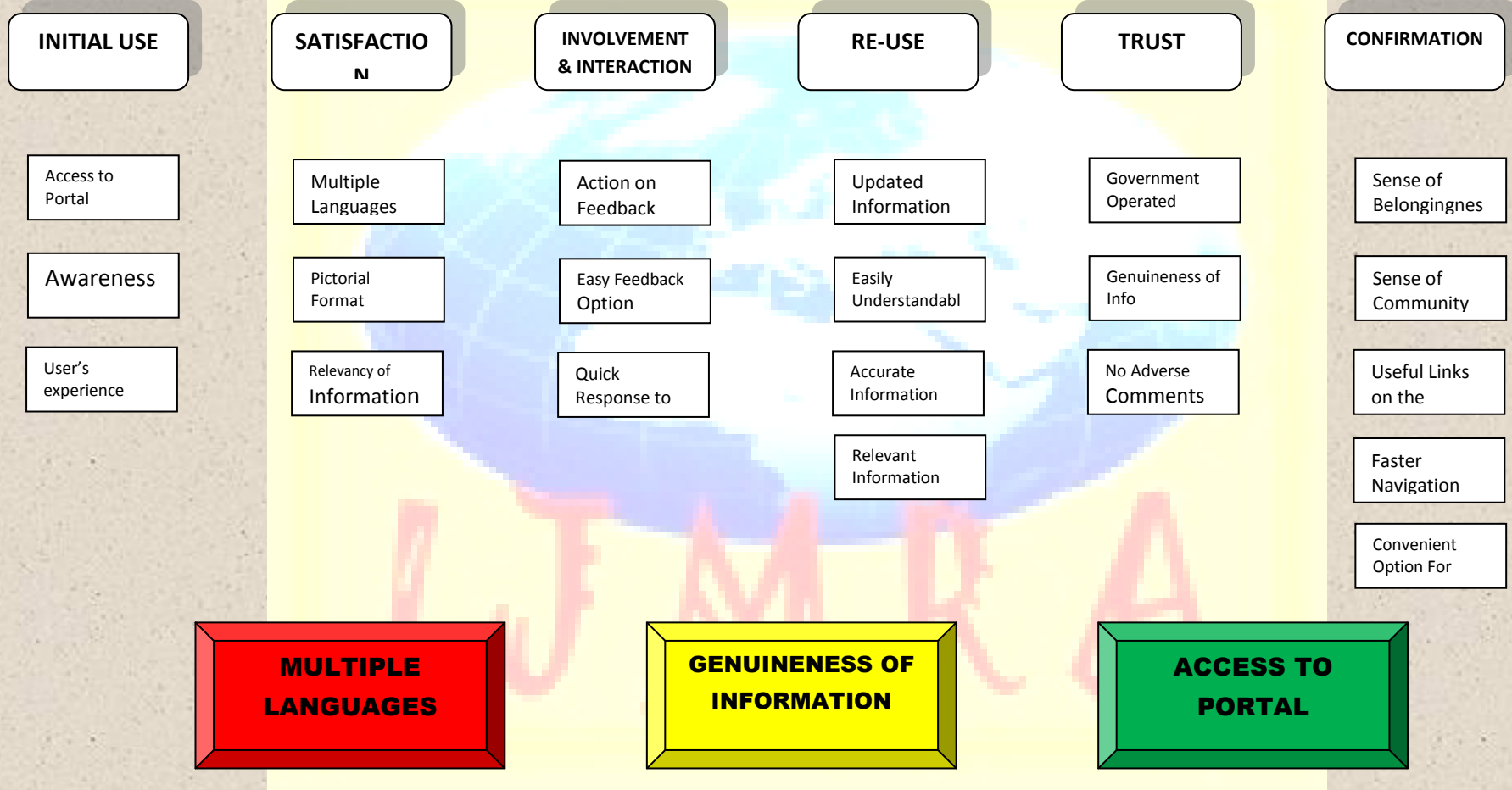


Table 1: Overall Priority Table for all sub factors under Each Main Factors

Name of category	Local priority	Global priority	Overall rank
Initial use	0.14		
Access to portal	0.54	0.08	3
Awareness	0.30	0.04	
User's experience	0.16	0.02	
Satisfaction	0.34		
Multiple language	0.58	0.20	1
Relevancy of information	0.11	0.04	
Pictorial format	0.31	0.11	
Involvement & interaction	0.06		
Easy feedback option	0.14	0.01	
Quick response to feedback	0.14	0.01	
Action on feedback	0.71	0.04	
Re-use	0.20		
Accurate information	0.23	0.05	4
Updated information	0.42	0.08	3
Relevant information	0.12	0.02	
Easily understandable information	0.23	0.05	5
Trust	0.20		
Government operated	0.45	0.09	2
Genuineness of information	0.45	0.09	2
No adverse comments	0.09	0.02	
Confirmation	0.06		
Sense of belongingness	0.40	0.02	
Sense of community	0.32	0.02	
Useful links on the website	0.14	0.01	
Faster navigation to related links	0.07	0.00	
Convenient option for feedback	0.07	0.00	

A citizen–centric approach of e-Governance Information quality is defined to achieve the real citizens’ participation and ensuring inclusion of the citizen in the Governance system. A quality G2C service centric model should also ensure speedy and effective redressal of e-Complaints and provide e-Forum for direct access to citizens’ feedback.

Table 1 summarises the findings of AHP analysis with the relative priority and rankings of Informational e-Governance development through CSCs. The top five rankings involving seven quality factors have been further grouped in the two Quality aspects of Information quality and Communication quality that would need attention of the service-provider to improve the G2C Informational Service quality delivered through CSCs.

Information Quality

Genuineness of information: Usually Government Portals are expected to provide genuine information, because there is proper Content Management System (CMS) and has to meet requirements at several rounds of approvals.

Updated Information: Updating of information on Government Portal is major concern, most of the portals provide static information and updates are less frequent.

Accurate information: Normally portals provide accurate information when updated, but after lapse of time, in the absence of regular update, portal information may not be accurate and thereby many a times can be misleading as well.

Easily understandable information: Refers to available Information on the portal that is easily understandable by the rural citizens who use the portal frequently.

Completeness of information: Currently most of the portal provides only static information without reengineering, integration and back-end data digitisation. Consequently, information provided is not complete

Customised information: In the absence of reengineering, integration and back-end data digitisation it is not currently possible to provide customised information.

Communication Quality

Multiple languages: Generally portals are in English although there are some portals that offer options of Hindi (national language) and one local language also. Some state Government portals

only local language option. Further, problems like fonts, formatting etc. is quite common in most of the portals

Government operated: Normally information on Government Portal are perceived as more reliable since contents pass through several round of approval hierarchy, However, there are other constraints like:

- Most Government portals are hosted on state-owned National Informatics Centre (NIC) servers and consequently in case of problem arising after official working hours or weekend, remediation happens only in next working day
- Less frequent update
- Lack of customisation due to absence of back-end data digitisation.

Access to portal (Tangible): Access to information on G2C services to all citizens at their door step is the stated objective under NeGP. From a perspective of rural citizens, such access to information can happen in various ways e.g. 'proxy accesses, assisted access, access mediated via voice call through fixed line or mobile telephony. CSCs are designed and positioned to offer access to Information Services in all such modes.

Towards effective redressal of service quality issues mentioned above, the Government under NeGP has initiated creation of an integrated information infrastructure that will expand, integrate and enhance the utility and reach of the services provided by the Government by utilizing the network of the Common Service Centers. This project aims to enhance the services provided to the citizens through Common Service Centers. It is envisaged that State Portal (SP) along with State Service Delivery Gateway (SSDG) will be developed and implemented so that citizens are provided with outlets where they can access the services under a single interface mechanism in the form of the Portal. State Service Delivery Gateway (SSDG) would ensure development of role based workflow driven by web based Content Management System (CMS) for contribution of any content to the State Portal including metadata as specified in State Portal Framework.

Conclusions and further work:

e-Governance is no longer just an option but a necessity for India aiming for better governance. The framework used in this paper provides a direction towards systematic evaluation of e-Governance service quality issues. The case study of CSC mediated e-Governance roll out for rural digitisation to cover six hundred thousand villages provide an illustrative reference of the scale, magnitude and complexity of the problem. This study would be beneficial for evaluating any other national e-Governance strategy and options and comparing its priority with other Government strategies. The qualitative assessment of these factors is highly subjective and may differ from an expert to another.

The further work therefore should logically concentrate on the design of Transactional e-Governance service quality evaluation model from the multidimensional quality aspects of NeGP as G2C service and the guidelines that can emerge through such quality assessment models for citizen-centric transformation of governance processes in India.

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