E-service quality model for Indian government portals: citizens’ perspective

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Abstract

Purpose – E-government implementation evolves through different stages of maturity, enforcing changes in strategies at each level. The transitions of service maturity phases pose continuous challenges to service providers in assessing the e-service quality of web-based services used in government. This study is conducted to propose a multi item scale for assessing the e-service quality of government portals involving transactions.

Design/methodology/approach – Factors influencing the e-service quality of government portals were identified from an extensive review of research performed by academic scholars and practitioners. A questionnaire was designed based on a review and interviews with users of e-government applications and was used to conduct a survey of fully operational portals. Responses were obtained and quantitative analyses were performed on the data to develop a scale. This scale can help in evaluating citizen perceived quality of e-services.

Findings – Seven constructs – i.e. citizen centricity, transaction transparency, technical adequacy, usability, complete information, privacy and security and usefulness of information – were identified from the analyses, which can be used to assess the demand side service quality of government portals.

Practical implications – Despite a well-structured, national-level plan on e-government and adequate funding in India, most of the projects under the scheme are far below the expectation level of citizens. Technology-enabled applications have promised easy access to government services with economic gain in certain cases, but they have not ensured citizens’ satisfaction. Improved service quality based on citizens’ need and expectation can reduce the gap between design and reality and act as positive trigger for adoption of e-government. This study can help government portal developers get an insight into users’ needs to improve the design and implementation of online services. The issues are significant and cannot be overlooked in practice.

Originality/value – The paper is original and a research study. It provides an understanding of citizens’ perceived quality of e-services and adoption behavior within the framework of the web-based environment of government services.

Keywords E-service quality, Service maturity phases, Government portal, Scale, Multi-item, E-government, India

Paper type Research paper

1. Introduction

Indian experience of technology in public administration began in the 1960s and continued throughout the pre internet era till the early 1990s. Initialization of this effort
was for basic purpose of developing in-house government applications in the areas of defense, economic monitoring, planning and managing data intensive functions relating to elections, census and tax administration. A second phase of computerization started with the advent of the “internet era” in the late 1990s initiating pioneering efforts in e-government (Gupta, 2010). Globalization and privatization in the period of 1990-2000 had phenomenal impact on India with major policy changes and structural changes in government departments. National Informatics Centre (NIC), a premier Information Communication Technology (ICT) organization of Government of India, played a significant role in providing e-government solutions of global standard by streamlining departmental responsibilities and integrating service platforms in government sectors. The Department of Information Technology proposed a National e-Government Plan (NeGP) (Government of India, 2006) with a holistic approach of e-governance in federal, state and local level. Under this scheme the government of India approved 27 mission mode projects (MMPs) supported by a massive infrastructural reform and robust network backbone. The policy making body also laid emphasis on a single window approach to reach out to citizens efficiently and effectively. Today India has more than 20,000 web sites facilitating citizens to carry out their regular activities with government.

Heeks (2003) in his study of e-government systems observes that almost 35 percent of e-government projects are total failures in developing countries and 50 percent are partial failures. In India, despite rising investments, extensive planning and growing implementation of e-government projects, public agencies have not been able to ensure adoption of online service by the citizens. Carter and Bélanger (2005) posit that though there is evidence for substantial development and diffusion of e-government globally, yet it is not very clear why citizens of both developed and developing countries are not very keen to choose online services over traditional means. Some studies conclude that acceptance, diffusion and success of e-Gov initiatives are contingent upon citizens’ willingness to use the services (Schaupp and Carter, 2005; Carter and Bélanger, 2005; Evans and Yen, 2006; Shareef et al., 2009, 2011). Thus it is necessary to have significant research and develop models of service quality so that the advantages of e-service can be explained to citizens. An existing literature review on e-service of government portals (Halaris et al., 2007; Jun et al., 2009; Papadomichelaki and Mentzas, 2009; Wangpipatwong et al., 2009; Agrawal, 2009; Alanezi et al., 2010; Sukasame, 2004; Li and Suomi, 2008; Loukis et al., 2011) reflects that most studies are conceptual and based on theories of management. Empirical studies based on actual experiences of citizens with government online services are crucial for proposing models of management implications. Another important perspective to service quality research is to ensure return on investments (Wang et al., 2005). Money paid to government by citizens in the form of taxes is invested in building and maintenance of e-government systems. So, government should be answerable to citizens about service quality offered by new systems. Service quality dimensions might vary with political environment, technical advancement and socio-economic conditions of a country, but the primary objective for such studies is to provide citizens with a transparent and effective service.

Government portals in India are designed completely by IT professionals and implemented solely by the IT department. The portals thus lack clear focus on service objectives, resource commitment and citizen oriented design perspective. These portals often face challenges with multilingualism, presentation of features, plurality of services, interoperability and communication. These inefficiencies in portal
management usually restrain citizens from availing the online services. Additionally, as a contrast to the traditional means of interaction with the government, e-services are distant and impersonal, which create a sense of mistrust, non-reliability and dissatisfaction among citizens. Overall concern has led researchers and practitioners to work towards a generic and fundamental mission of “citizen centricity”.

So, in our study we have tried to focus on the demand side perception of service quality. Objective of our study is to understand the services offered by the government portals in India and to analyze how well they fit to the need of citizens. An empirical study based on citizen experience with two popular web portals of India is conducted to evaluate e-service quality (e-SQ). Seven contributory factors: citizen convenience, usability of information, transaction transparency, complete information, usefulness of information, technical adequacy and security and privacy are identified.

2. Background

2.1 Usage of portals in government

E-government has been a subject of academic research for the last one-and-half decades. In the initial phases of implementation, e-government was a confluence of information technology (IT) developments and the application used by government entities (Relyea, 2002). Tapscott and Agnew (1999) argue that digital government is not only a shift of existing public services on-line: it is about government harnessing IT to redefine its “social technologies” in order to remain relevant in a more participative, more interactive and more informational era. E-government refers to the networked structure for interconnectivity, electronic service delivery, electronic workflow, efficiency, effectiveness, transparency and accountability (Sheridan and Riley, 2006; Yildiz, 2007) offered by governmental agencies, at any given moment and place (Gupta et al., 2004).

Complexities associated with government work procedures have always been barriers to easy access of government services for citizens and other stakeholders. However, government portals envelope the size and intricacies of government department dependencies; representing government-on-line in many ways. They allow for all kinds of self-services, from searching for information to services involving complex transactions like e-filings of income tax. The same portal can also serve as a convenient platform for getting new business permits, for uploading or downloading tenders, bidding for government auctions, or promoting business to government (B2G) transactions. Precisely, government portals offer an opportunity to reorient services around the needs of citizens while consolidating back office responsibilities (Gupta et al., 2004).

A vast range of services those are offered through various web sites and portals to the citizens and other stakeholders of India have been categorized as:

- National entry points: gateways or portals.
- Citizen-centric or business-centric portals.
- Ministry-level web sites.
- Parliamentary web sites.
- Judicial branch web sites.
- Portals for provincial, local and municipal governments.
- Personal web sites for elected officials.
Each of these categories has its own significance as it catering to specific needs of users. Since these portals provide information and services from across different government departments transcending organizational boundaries of heterogeneous infrastructures, quality of services becomes a major concern for the government administrators. Besides the management problem of sources, incorporation of new technologies, attenuating digital divide and changing mind set of citizens also make quality a continuous challenge for practitioners. Today, it is important to embody the changing scenario of service delivery in the online working models to achieve success on purpose. Various government and non-government agencies, stakeholders and citizens need to work in synergy to transform government into a citizen centric enterprise society.

2.2 Service quality in e-government

Srivastava (2011) describes e-government as the use of ICTs for improving the access to government services and delivery of value added target processes for the benefit of stakeholders. Service quality in e-government or e-service quality as it is referred to by some researchers is defined as users’ overall assessment of quality in the virtual context and serves as one of the key factors in determining success or failure of e-government (Yang, 2001; Santos, 2003; Welch and Pandey, 2005). It has an impact both on government and citizens (Srivastava, 2011).

E-government is a paradigm shift from traditional government and its evolution happens in stages: initiation starts with web presence, matures to interaction through email or other electronic media followed by development of business logic infused with front end applications finally ending with integration of governmental activities beyond web interface (Hiller and Bélanger, 2001; Layne and Lee, 2001; United Nations and the American Society for Public Administration, 2002). Time and again academic scholars and practitioners have suggested different conceptual models (Schelin, 2003; Siau and Long, 2005; Andersen and Henriksen, 2006; Al-Khatib, 2009), which elaborate on multi-stage e-government evolution. Successive gradation of these stages involves varied levels of technological sophistication, incorporates administrative integration, has unique levels of service maturity and induces citizen orientation (Holden et al., 2003; Moon, 2002; Gil-Garcia and Martinez-Moyano, 2007; Shareef et al., 2011). Maturity phase of e-government evolution thus influence e-service quality of government portals making it a dynamic percept.

It is observed that service quality of e-government may also vary with administrative levels of a country. Empirical studies (Edmiston, 2003; Moon, 2002; Stowers, 2000; West, 2005) identify the dynamic progression of services from national level to state and from state to local level governments. These studies conclude that federal government is generally more advanced than the state government at quality features and accessibility. Irrespective of implementation phase or administrative level, the ultimate purpose of online government is to serve the citizens in a transparent and effective way.

Extant literature review apprises of two prominent needs:

1. identifying dimensions which help assessment of e-service quality; and
2. knowing the need of citizens and other stakeholders using e-service.

Quality of e-government services can be evaluated by user satisfaction and intention of future use. Bertot et al. (2008) analyze the associated benefits and cost for a citizen centric service model. They observe that for user perceived service quality of
e-government there is a need to understand user expectation, to identify issues, which prevent citizens and other stakeholders from using e-government services and the factors which enhance user experiences with e-government services. “User centric” service quality is about anticipating actual service and resource needs of citizens who can be residents, businessmen, government employees, and other stakeholders. Services to citizens and business have the potential to reshape the public sector and remake the relationships between citizens, businesses, and the government by allowing open communication, participation, and public dialogs in formulating national regulations (West, 2000; Tan and Subramaniam, 2005; Ke and Wei, 2004). Citizen centric government is being leveraged by practitioners as well, to accommodate changes brought by the transition of e-government 1.0 to e-government 2.0. UN survey report proposes clear guidelines defining needs of respective countries to include post implementation assessment. This practice can encourage citizen participation in decision making and build efficient and effective e-government systems. While first two phases do not have much scope for citizen participation, the transaction phase and integration phase can provide a platform for citizen to interact with government officials and express their views on prevailing systems.

Sung et al. (2009) perform a gap analysis of users’ own perception of service quality and government administrators’ perception of user perceived service quality which exhibits considerable lacunae between both the percepts. In another study Jones et al. (2007) argue that government organizations must include social and management aspects in e-Government evaluation model to improve understanding of e-Government impact. They emphasize on prioritizing e-Government evaluation by government organizations with correct and professional approach as it is critical to get the citizens’ feedback for the success of e-government. Lack of interaction with users and improper understanding of users’ percepts might often lead to discontent among citizens resulting in poor functioning of e-government. So, there is a serious need of customer involvement ex ante and ex post e-government implementation.

In a research for features of e-government service which have positive impact on citizens, Verdegem and Hauttekeete (2007) find that the online presence of government organizations itself serve as a moral support for citizens. They also identify reliability, security, usability, content readability, ease of use, content quality, cost effectiveness, privacy or personal information protection, transparency, courtesy, responsiveness, accessibility and flexibility as other contributory factors to user satisfaction. Parasuraman et al. (2005) had proposed scales, E-S-QUAL and E-RecS-QUAL, to measure service quality of e-commerce systems, which are extensively used by researchers to evaluate e-SQ in different applications. Jun et al. (2009) considering the idiosyncrasies of the service delivered by e-government web sites draw an analogy between e-commerce applications and e-government applications. They propose two scales namely, E-G-S-QUAL and E-G-RecS-QUAL based on E-S-QUAL and E-RecS-QUAL. E-G-S-QUAL is a 22-item scale of four dimensions: efficiency, fulfillment, system availability, and privacy, and E-G-RecS-QUAL is a ten-item scale of three dimensions: responsiveness, compensation, and contact. Papadomichelaki and Mentzas (2009) conceptualize an e-government service quality model, e-GovQual, where they propose six factors:

1. ease of use;
2. trust;
(3) functionality of the interaction environment;
(4) reliability;
(5) content and appearance of information; and
(6) citizen support (interactivity).

Wangpipatwong et al. (2009) in a study of e-government portals of Thailand, find that improved system quality, service quality and information quality can ensure continued use of e-government applications by citizens. Sung et al. (2009) propose a scale based on dimensions like: website design, reliability, responsiveness, personalization, information quality and system quality of a government portal. Alanezi et al. (2010) propose another scale having website design, reliability, responsiveness, security/privacy, personalization, information and ease to use as the seven factors contributing to service quality of government portals. This study is purely conceptual and based on existing literature. Irrespective of the nature of studies and the context adapted, all of the above researches provide directions towards the conception of factors influencing service quality of e-government portals.

However citizens' behavioral intention to adopt a new technology-driven system is very complex (Shareef et al., 2011). Behavioral attitude to adopt innovations depend on relative advantage of new practices, which are compatible with existing values, beliefs, and experiences (Rogers, 2003). Ideas or practices, which are relatively easy to comprehend and are observable or tangible are adopted rapidly by e-government users. Kanat and Ozkan (2009) while studying users’ perception of e-services notice that, trust on internet, skill of using advanced technology, accessibility to technology and faith in e-government influence citizens’ adoption of government online services. DeLone and McLean (1992) proposed a model explaining causal flow of IS measures which actuate use of information system in an organization. They explained “information quality”, “system quality” as the two determining factors influencing “use/intention of use” and “user satisfaction” of a system ultimately yielding “net benefits” at individual level and organizational level. In 2003, the model was refined by them to accommodate changes brought by rapid growth online environment. The success factors “system quality” in the online environment proposed to measure the desired characteristics of an e-commerce system like usability, reliability, adaptability, and availability etc while “information quality” embodied features of web content in the context of e-commerce. A new factor “service quality” was introduced to ensure relationship and care for the users. Several empirical studies by scholars (Seddon and Kiew, 1996; Grover et al., 1996; Seddon, 1997; Garrity and Sanders, 1998; Molla and Licker, 2001) are based on D&M model validating association of IS success factors in the context of different online environment. Since government institutions use several information systems like web sites, portals and online databases for G2G, G2C and G2B communication, D&M IS success model can be advertently used to explain the dynamics of these online services and their impact on users. Wang and Liao (2008) validate D&M IS success model in assessing systems success of G2C e-Government environment in Taiwan. They proffer six dimensions:

(1) information quality;
(2) system quality;
(3) service quality;
E-service is a citizen experience and perception of a new system used by public organizations (Yang and Jun, 2002). Perception of users for adopting new information systems has been explained by Davis (1989) through “technology acceptance model”. The model establishes relation of end users’ perceived usefulness (PU) and perceived ease of use (PEOU) of a technology enabled system with users’ behavioral intention to accept it. Technology acceptance Model (TAM) has been frequently used by many researchers as a success model to predict users’ adoption intention of e-government services (Wang, 2002; Al-adawi et al., 2005; Sahu and Gupta, 2007; Kanat and Ozkan, 2009; Belanche et al., 2010). They concur with the opinion that PEOU of a system is one of the determining factors for citizen acceptability.

The above studies have appreciable management implications and worth considering to develop fast, inexpensive, trustworthy and reliable quality service model for e-government.

2.3 Guidelines of government portals/web sites in India

Realizing the benefits of e-government for development of a country, Government of India has set some policies for its implementation. The policies include major infrastructural growth of ICT so that people even in the remotest corner of the country can enjoy benefit of connectivity and 27 mission mode projects, which can enable citizen to use government data online. Guidelines, in compliance with World Wide Web Consortium (W3C) standards to govern design aspect of government website/portals have been prepared by NIC, Department of Information Technology (DIT) and adopted by Department of Administrative Reforms and Public Grievances (DARPG). Nevertheless citizens’ experiences with various government websites are not the same because of divergence in technology standards, navigation policy, usability, functionality and interactivity restrictions.

Since NePG has the vision for universal accessibility, special stress has been given on citizen orientation (chap 5, Sec 5.1). It has been recommended in the guidelines from DIT that the decision on content should be user oriented and not agency oriented.

It has been mentioned in the guideline that language used for content presentation should be lucid and simple if the web site is meant for general public. Proper hyperlinks like “About Us”, “News” and other web pages which are associated with the portals need to be clearly defined. Information should be updated and linked to the home page. Consistent content terminology, positioning and framework need to be adopted to give confidence to users and make them comfortable while availing the service. International Conventions need to be followed in presenting information as web presence transcends geographical boundaries. All web-enabled applications should be available 24 × 7 so that people with busy schedule, non-resident Indians and foreign residents can avail the convenience benefits of online services beyond regular office hours.

As India has 22 official languages, to reach out to common people implementation of multilingual version of the web sites is necessary. Privacy and security is a factor, which often acts as a barrier for citizens to take up to online governance and has been
addressed in this report with elaborate explanation. It is proposed that if a citizen has
to give his details then the site will be held responsible for any improper use of the data.
Both security and privacy of data are to be taken care of by the government authorities.

In another report for a Smart Government, Chakravarti and Venugopal (2008)
depicted Citizen Centricity as a result of three main contributing factors: improved
quality of service, anytime accessibility, anywhere availability of service, transparent,
efficient and secured delivery.

DIT report also deals expansively with technical and technological aspects which
are not in the scope of this research so we have omitted that portion in our study.

3. Theoretical framework

E-government adoption behavior is at a premature stage globally and most of the
research studies concerning behavioral attitude of citizens to adopt e-government, lack
clarity and also have poor treatment of generalization (Heeks and Bailur, 2007). The
researchers recommend rigorous research methods to conduct such studies. Since
e-government portals in India are designed and implemented solely by the IT
department, these portals lack clear focus on citizens’ perspective and their
requirements to accept the technology driven environment. While doing literature
review we also found that there is a dearth of empirical studies in India, which can
provide a comprehensive framework for service delivery assessment of government
web portals. Therefore, in our study we have tried to identify the constructs affecting
e-service quality from the existing conceptual studies in conjunction with different
scales posited by researchers.

The roles of the initial two phases of e-government evolution, such as information
phase and interaction phase are primarily to convey information and communicate
with customers using ICT but the transaction stage of e-Government has an impact on
implementing systems in their broader organizational context (Irani et al., 2006). Since
the initial phases of e-government maturity models are static and involve less
interaction with citizens, we have considered the web elements of transaction phase to
understand the user experience with portals in depth.

Our study is exploratory in nature and is not based on any previously proposed
model; rather we have tried to propose a scale ourselves which can evaluate e-service
quality of government portals. Seven exogenous variables (quality dimensions): Citizen
Centricity, Usability, Technical Adequacy, Privacy and Security, Usefulness of
Information, Transaction Transparency and Complete Information based on extant
literature have been defined which can fairly assess e-service quality of a transaction
based portal. Table I gives a gist of existing literature for the contributing factors.

As mentioned before, we have not used any predefined scale in particular in our
study; rather we have tried to devise a scale to appositely assess user perceived
e-service quality of Indian government portals. To establish the scale we propose a
conceptual model as shown in Figure 1.

To use e-government services, firstly the citizens need to adopt internet as a service
delivery channel. But actual use of internet as an information and communication
mode, depends on two criteria: the ease with which it can be used (perceived ease of
use, PEOU) and its factual usefulness to the citizens and other stakeholders (Perceived
Use, PU), thus justifying the theory of TAM. Secondly, a government web portal is an
information system (IS), consisting of digital information and collection of information

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Table I: Contributing Factors

<table>
<thead>
<tr>
<th>Construct</th>
<th>Literature Reference</th>
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<tbody>
<tr>
<td>Citizen Centricity</td>
<td>Heeks and Bailur (2007)</td>
</tr>
<tr>
<td>Usability</td>
<td></td>
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<tr>
<td>Technical Adequacy</td>
<td></td>
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<tr>
<td>Privacy and Security</td>
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<td>Usefulness of Information</td>
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<tr>
<td>Transaction Transparency</td>
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<td>Complete Information</td>
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E-service quality model
delivery systems like browsers, portals, search engines, forms networking systems etc. Citizen find the utility (PU) of such IS in quality of information (information quality) imparted by them. As the internet medium lack advantages of physical cues in traditional systems, the effortlessness or comfort (PEOU) of using the new system can inspire citizens to adopt e-government system (system quality). So, our proposed model is guided by both TAM and D&M IS Success Model.

Quality dimensions identified (Table I) in the model have been derived from several existing research works and guided by the policies framed by Government of India. The policies have been taken into account because e-service quality of government portals is often specific to political, socio-economic and infrastructural conditions prevailing in a country.

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Implication</th>
<th>Authors</th>
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<tbody>
<tr>
<td>Citizen centricity</td>
<td>Citizen centricity parameter tries to encompass the facilities provided by an e-government portal so that a citizen can comfortably use the services</td>
<td>Zhang and Prybutok (2005); Bouaziz and Fakhfakh (2007); Sarkar and Cybulski (2004); Gupta and Jana (2003); Sahu and Gupta (2007); Karunasena et al. (2011)</td>
</tr>
<tr>
<td>Usability</td>
<td>The content needs to be reliable and usable to build trust and confidence in citizens</td>
<td>Yang et al. (2005); Kim et al. (2006); Kumar et al. (2007)</td>
</tr>
<tr>
<td>Technical adequacy</td>
<td>Fast access, upload and download of information are important, specially for transaction sites</td>
<td>Yang et al. (2005); Aladwani and Palvia (2002); Liu and Arnett (2000)</td>
</tr>
<tr>
<td>Privacy and security</td>
<td>The site should take complete responsibility of secured transaction ensuring privacy of data supplied by citizens</td>
<td>Zeithaml et al. (2000); Yoo and Donthu (2001); Welch and Pandey (2005); Yang et al. (2005); Shareef et al. (2011); Karunasena et al. (2011)</td>
</tr>
<tr>
<td>Usefulness of information</td>
<td>This dimension helps to build citizen relationship and be in regular contact with users</td>
<td>Wolfinbarger and Gilly (2003); Pan et al. (2006); Reddick (2010); Wu (2011)</td>
</tr>
<tr>
<td>Transaction transparency</td>
<td>Transaction transparency may include cost effectiveness, communication for a cancelled or incomplete transaction and providing receipt or acknowledgement immediate to a transaction</td>
<td>Welch and Himnant (2003); Rocheleau and Wu (2005); Irani et al. (2006)</td>
</tr>
<tr>
<td>Comprehensive information</td>
<td>This factor ensures sufficient information for the existing users and comprehensive information for new users.</td>
<td>Kim and Stoel (2004); Zeithaml et al. (2000); Salahuddin and Rusli (2005)</td>
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</table>

Interaction

Communication with users is very important as it gives confidence to a citizen to use the service

Cox and Dale (2001); Liu and Arnett (2000); Yang et al. (2005)
3.1 Operationalization of variables

Citizen centricity. User experience plays a decisive role in the diffusion of e-government, making citizen oriented functions an essential criterion for online government. Citizen centric services must protect the interest of citizens and provide easy access to online benefits. However, it is quite often observed that online transaction services are not available round the clock. As e-government has a global perspective, availability of 24 × 7 is important (Zhang and Prybutok, 2005). This is more applicable for citizens who are located in different time zones. Shareef et al. (2011) argue that virtual transactions lack physical cues, so this service requires extra facilities for individuals with different ethnic backgrounds. If a user can interact with website in his/her native language, then the cultural connection can help in the adoption of the site (Parasuraman et al., 2005; Kim et al., 2006). Multilingual option is especially required for a country that has multicultural and multilingual groups (Bouaziz and Fakhfakh, 2007). For citizens with less exposure to technology, presence of online demos and trials along with voice aid can promote attitude towards adoption of e-services (Sarkar and Cybulski, 2004). Another very important aspect of online application is performing complete task without any manual intervention. Sometimes due to lack of complete integration between government departments partial job needs to be carried out with the help of government officials. Since a parallel system of traditional government service exists, citizens prefer to use the conventional method. Studies indicate that adoption of e-government service can be delayed till the expected benefits are clearly established (Gupta and Jana, 2003; Sahu and Gupta, 2007, Karunasena et al., 2011). Citizens continue using the service only if they enjoy the benefits of e-government services. Thus citizen centric approach needs to encompass the basic facilities provided by an e-government portal so that a citizen feels comfortable and confident while using online applications. So, this research proposes:

H1. Citizen centricity (CCEN) is positively related to e-service quality.
Usability. In technology acceptance model (TAM) initially proposed by Davis (1989), it was explained that behavioral intention of use of information systems depends on the perceived ease of use (PEOU) and perceived usefulness (PU) of information. This model was later modified by other researchers (Venkatesh and Davis, 2000; Venkatesh et al., 2003) to define variables, which determine PU and PEOU. Citizens' ability to use portals depends primarily on the usability of the web based applications and TAM can successfully explain usability of e-government systems and its affect on intention of future use. Usability of e-government systems is determined by content parameters like updated information, well organized hyperlinks and detailed description of the service being offered etc. which can create a perception of reliability among users. The information provided is expected to be complete in all respect with elaborated explanation, well defined working links to build trust and confidence in citizens (Yang et al., 2005; Kim et al., 2006; Kumar et al., 2007). Sang et al. (2010) review the acceptance of e-government services and find that relative advantage over traditional method of service delivery by public organization in a government has a positive impact on citizens. Sometimes when the portal uses multilingual interface, there might remain some disparity in information, which can make the portal less usable and can have a negative influence on adoption behavior of citizens. Thus we propose:

H2. Usability (UI) is positively related to e-service quality.

Technical adequacy. The convenience of using web portal as an information centre cannot be achieved without fast accessibility (Yang et al., 2005). Citizens while using online applications look for two aspects: availability and responsiveness. They expect quick log on, fast upload and download of forms, speedy search and prompt response from the service providers. Often due to inadequate technical infrastructure, there might be disruption in between web sessions leading to discontinuous web services. These failures act as constraints for citizens to avail online benefits. Users always appreciate uninterrupted and time efficient operations (Aladwani and Palvia, 2002; Liu and Arnett, 2000). Hence we propose technical adequacy as a contributing factor for evaluating e-service quality:

H3. Technical adequacy (TAD) is positively related to e-service quality.

Privacy and security. Web portals engaged in transactions sometimes need to collect sensible and personal data to identify citizens and serve them in a secured way. Since privacy and security of the data collected are a major concern, citizens need to be explained why the data are needed and how will the record be protected from third party invasion. Several research studies administered on e-service quality and adoption of e-governance reveal that uncertainty, security and privacy have prominent influence on citizens' attitudinal aspect of adopting e-government services (Zeithaml et al., 2000; Yoo and Donthu, 2001; Welch and Pandey, 2005; Yang et al., 2005, Shareef et al., 2011). As online government is virtual and different from traditional government in the mode of operation, so, policy makers associated with e-government transaction stages should be careful about developing application-based and institution-based trust in citizens (Kim et al., 2005). The transaction site should take complete responsibility of all transactions by integrating functions of interdependent departments instead of redirecting citizen to corresponding authorized web interfaces. Karunasena et al., 2011 observe that public trust in e-government is
reflected in citizens’ perceptions about the e-government services delivered. Ensuring privacy and security help to build trust in public agency and brings e-satisfaction resulting in enhanced usage of online services. Therefore we propose:

**H4.** Privacy and security (SP) is positively related to e-service quality.

**Usefulness of information.** Users are keen to use online information if it proves to be useful to them. Relevance of content, organized information and customized presentation are some of the criteria for useful information. Additionally users value usefulness and feel connected if there is a two-way communication between the user and administrators. Valuable tips, suggestions in message boards, chat facility and regular follow up can help to establish a rapport with the citizens. Some of the scholarly articles suggest that effectual citizen services and a good relationship with citizens can help to enhance trustworthiness retaining existing users and attracting new users (Wolfinbarger and Gilly, 2003; Pan et al., 2006; Wu, 2011). Reddick (2010) emphasizes on citizen relationship management as one of the advanced e-government solutions to create citizen centric systems. Complying with the above discussion we propose usefulness of information as a factor contributing to e-service quality:

**H5.** Usefulness of information (UFI) is positively related to e-service quality.

**Transaction transparency.** Web portals advocating online transactions help citizens to pay bills, book tickets, pay taxes, renew visas or get a license. A two-way interaction between users and specified government departments is established to complete the transaction electronically (Irani et al., 2006). This mode of transaction is critical as high level of security has to be monitored for the complete procedure of payment till the receipt is acknowledged by the user. People who are not very conversant with web environment often have reservations against these online exchanges. As the online service lack the privilege of face-to-face interaction unlike traditional payment system, extra care should be taken to maintain transparency in these affairs. A transparent government is expected to disclose any performance information of public organizations on time. According to Welch and Hinnant (2003), the use of the online services is dependent on transparency and interactivity which might help to build public trust in government. Some common methods to enforce transparency in electronic transaction may include acknowledgement mail or printable receipt for a successful transaction, prompt communication for a cancelled transaction and intimation of refunds for incomplete transactions. Rocheleau and Wu (2005) posit web transaction as a benefit of cost reduction and quick performance. Drawing a conclusion that clear and transparent dealings enhance the service quality of a portal we propose:

**H6.** Transaction transparency (TTR) is positively related to e-service quality.

**Comprehensive information.** Quality of content in a government web portal has a positive influence on e-service quality. Salahuddin and Rusli (2005), in their study mentioned that comprehensive and accurate information helps to support economic decisions and policy making at all levels of government. Besides, sufficient and appropriate information make citizens confident about a service. If the information is incomplete or irrelevant, then user might get confused and seek help from other sources, which make online effort a failure. It is necessary that web content should ensure sufficient and comprehensive information both for the existing users and new
users. Complete information can also be used to evaluate the effectiveness of policies and decisions. So, we propose:

\[ H7. \] Comprehensive information (CI) is positively related to e-service quality.

Interaction. To assist citizens further, advanced search options and well-framed frequently asked questions (FAQs) can be provided. As use of technology in government is a new experience for citizens, portals should provide effective interaction support. Contact details of the officials and support staffs should be provided at the site, so that any query can be answered with minimum response time (Kim and Stoel, 2004; Zeithaml et al., 2000). Some other studies also emphasize that communication with users is very important as it imbibles trust and ensue willingness in a citizen to use the service (Cox and Dale, 2001; Liu and Arnett, 2000; Yang et al., 2005). Communication can also be encouraged by using opinion poll system, message board and social media platform. Depending on the previous arguments, this research proposes:

\[ H8. \] Interaction (INT) is positively related to e-service quality.

4. Methodology

An empirical study using exploratory factor analysis has been done following the guidelines of scale development procedures proposed by Churchill (1979). The research is divided into three steps:

1. Conceptualization;
2. Design; and

The first step focused on content validity that involved conceptualization of constructs and enlisting all possible items representing respective constructs. A questionnaire of 32 items was designed based on our literature review and interviews with citizens on their experience with government portals.

The second step is about design, which included refining the items defined in the first step, forming an initial scale and pilot-testing the initial scale. The questionnaire was then administered by a focus group of experts consisting of practitioners, researchers and government officials to a final form having 23 items. Construct validity and reliability analysis was done in this step.

A survey was conducted based on the questionnaire for two frequently used transaction portals: Indian Railways Catering and Tourism Corporation (www.irctc.co.in) and Income Tax India web portal (https://incometaxindiaefiling.gov.in). As a last step factor analysis was performed on the responses obtained for independent verification and validation.

4.1 Data collection and sample profile

We distributed 2,000 questionnaires using email, social media and personal contacts over a period of 90 days. Likert five-point scale from 1 (strongly agree) to 5 (strongly disagree) was used to collect responses. A total of 486 responses were received, out of which 441 (22 percent response rate) were complete and could be considered for analysis. Sample size was found to quite satisfactory for our analysis as per the
recommended item-to-response ratio value of 1:10 (Schwab, 1980). A sample profile analysis of the two different portals is given below:

(1) We used a judgmental sampling for the IRCTC portal as only computer literates and people who are conversant with online transactions use this portal. It was observed that 73 percent of the total numbers of respondents were between the ages 20 and 55 while 27 percent were below 20 years. A total 63 percent were male respondents while 37 percent were female for the IRCTC portal. It was observed that respondents using the service had a minimum education level. Of the total respondents 66 percent were post graduate or professionally qualified while 44 percent were graduate or below.

(2) E-filing of income tax is a facility provided to individuals but a mandatory process for firms in India. For corporate house or firm e-filing is generally done by income tax practitioners on a paid basis or by in-house professionals. Since there are different rules for different sections for filing income tax, we used a stratified sampling method for Income tax portal. We wanted to include the experience of corporate tax payers, so distributed questionnaire to firms as well. Profile analysis for the income tax portal was thus different from the IRCTC where the service is used at individual level. From the responses received, it was found that 10.2 percent respondents were between age 18 and 25; 32.1 percent were between 26 and 35 years; 34.6 percent were between 36 and 60 years, rest 23.1 percent was from firms. Male tax payers attributed up to 51.2 percent, female tax payers were found to be 25.7 percent and firms formed the rest of the part. Education profile analysis of individual tax payers showed that 47.4 percent of the tax payers were post graduates while 29.5 percent were graduates and below graduation level. Since technical difficulties and learning effort pose obstacle in using web portal, people below college level rarely use the portal.

5. Statistical analysis and results
We used SPSS 16.0 to conduct the entire analysis. We performed exploratory factor analysis to understand how the items were loading on factors. In this exercise we found seven factors which distinctly loaded 23 items in total. To make our analysis robust we checked with the sampling criterion. Researchers generally use Kaiser-Meyer-Olkin (KMO) value to decide adequacy of sampling in factor analysis. Minimum permissible value given by Kaiser (1974) is >0.5. We obtained a value of 0.784, which was appreciably good indicating that factor analysis was appropriate for the data.

Heeks and Bailur (2007) mentioned that validity and reliability are two important criteria to be verified for a proposed scale. Validity of a scale can be established by verifying content validity, convergent validity and discriminant validity. Content Validity is a minimum psychometric requirement for construct validation of a new measure (Hinkin, 1995). While forming the questionnaire, all 23 items included in it were administered by experts, so validity of the content was already verified. Convergent validity verifies the internal consistency of items in a construct and discriminant validity ascertains that all constructs are different and no two construct measure the same criteria. Convergent validity can be proved by factor loading (DeCoster, 1998). We performed factor analysis with Principal Axis Factoring method and using varimax rotation (orthogonal) and Kaiser Normalization. We chose Principal Axis Factoring method over Principal Component Analysis as our sole purpose was
not data reduction but to study the correlated pattern of items derived from extant literature. Table II gives the factor loading exhibited by our data.

Factor analysis result revealed that two items representing CI and three items of INT were loading together on a single factor. After close investigation of the items we found that all of them represented a common characteristic of completeness of information in a portal. The correlation matrix also showed a close association confirming that all five items represent a single factor, which we named as complete information (CI). Proposition H7 may be redefined as complete information (CI) is positively related to e-service quality, to accommodate the change. All seven factors extracted had eigenvalue > 1 (Field, 2005) and explained 70.85 percent of total variance. Field, 2005 suggests a minimum value of 0.4 for acceptable factor loading. Our results reflected a value > 0.6 (shown in Table II), for each loading thus verifying convergent validity for the proposed scale.

Discriminant validity was checked by analyzing the correlation matrix obtained for all 23 items (Trochim and Donnelly, 2006). It was observed that the correlation coefficients among the items of the same factor were high (> 0.4) at p < 0.001, whereas the coefficient with items of other factors were less (< 0.2 to nearing zero) and were not within the level of significance. Since each variable of a factor had a strong correlation with all the other variables of the same factor but low correlation with all other variables across the matrix, discriminant validity of the scale was verified. Tables III-IX show a series of seven correlation matrices.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<tbody>
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<td>CCEN_I3</td>
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<td>CCEN_I4</td>
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</tr>
<tr>
<td>CCEN_I5</td>
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<tr>
<td>CI_I1a</td>
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<tr>
<td>CI_I2a</td>
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<td></td>
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<td>INT_I1a</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>INT_I2a</td>
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<tr>
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<td></td>
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<td></td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
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<td></td>
<td>0.651</td>
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<td></td>
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<td>0.786</td>
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<td></td>
<td>0.823</td>
<td></td>
</tr>
<tr>
<td>SP_I1</td>
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<td></td>
<td></td>
<td></td>
<td>0.790</td>
</tr>
<tr>
<td>SP_I2</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>0.800</td>
</tr>
</tbody>
</table>

Table II: Notes: Extraction method: Principal Axis Factoring; Rotation method: Varimax with Kaiser Normalization; *Items which formed a new factor: complete information
It was not possible to accommodate the whole matrix in this layout, so in Tables III-IX, we divided the matrix into parts which displayed item wise matrices for all seven factors.

Reliability of the scale was determined by measuring Cronbach’s alpha ($\alpha$) and was found to be 0.816. Studies (Field, 2005) suggest that $0.7 \leq \alpha \leq 0.8$ is considered to be

<table>
<thead>
<tr>
<th>CCEN_I1</th>
<th>CCEN_I2</th>
<th>CCEN_I3</th>
<th>CCEN_I4</th>
<th>CCEN_I5</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCEN_I1</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCEN_I2</td>
<td>0.644 *</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCEN_I3</td>
<td>0.544 *</td>
<td>0.606 *</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>CCEN_I4</td>
<td>0.618 *</td>
<td>0.582 *</td>
<td>0.474 *</td>
<td>1.000</td>
</tr>
<tr>
<td>CCEN_I5</td>
<td>0.540 *</td>
<td>0.549 *</td>
<td>0.615 *</td>
<td>0.519 *</td>
</tr>
</tbody>
</table>

Note: *Correlation is significant at $p < 0.01$ (two-tailed)

<table>
<thead>
<tr>
<th>TTR_I1</th>
<th>TTR_I2</th>
<th>TTR_I3</th>
</tr>
</thead>
<tbody>
<tr>
<td>TTR_I1</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>TTR_I2</td>
<td>0.481 *</td>
<td>1.000</td>
</tr>
<tr>
<td>TTR_I3</td>
<td>0.628 *</td>
<td>0.506 *</td>
</tr>
</tbody>
</table>

Note: *Correlation is significant at $p < 0.01$ (two-tailed)

<table>
<thead>
<tr>
<th>TAD_I1</th>
<th>TAD_I2</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAD_I1</td>
<td>1.000</td>
</tr>
<tr>
<td>TAD_I2</td>
<td>0.719 *</td>
</tr>
</tbody>
</table>

Note: *Correlation is significant at $p < 0.01$ (two-tailed)

<table>
<thead>
<tr>
<th>UI_I1</th>
<th>UI_I2</th>
<th>UI_I3</th>
</tr>
</thead>
<tbody>
<tr>
<td>UI_I1</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>UI_I2</td>
<td>0.577 *</td>
<td>1.000</td>
</tr>
<tr>
<td>UI_I3</td>
<td>0.550 *</td>
<td>0.577 *</td>
</tr>
</tbody>
</table>

Note: *Correlation is significant at $p < 0.01$ (two-tailed)

<table>
<thead>
<tr>
<th>CI_I1</th>
<th>CI_I2</th>
<th>CI_I3</th>
<th>CI_I4</th>
<th>CI_I5</th>
</tr>
</thead>
<tbody>
<tr>
<td>CI_I1</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CI_I2</td>
<td>0.672 *</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CI_I3</td>
<td>0.406 *</td>
<td>0.414 *</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>CI_I4</td>
<td>0.447 *</td>
<td>0.409 *</td>
<td>0.556 *</td>
<td>1.000</td>
</tr>
<tr>
<td>CI_I5</td>
<td>0.365 *</td>
<td>0.420 *</td>
<td>0.543 *</td>
<td>0.579 *</td>
</tr>
</tbody>
</table>

Note: *Correlation is significant at $p < 0.01$ (two-tailed)
acceptable and value > 0.8 is considered to be appreciably good, which confirmed that the scale is reliable and can be used for our purpose.

We next performed regression analysis to find the relationship of the exogenous variables with endogenous variable (e-service quality) and establish the hypotheses we had proposed. The data were checked for distinctive outliers and linearity to avoid any erroneous result in regression. A plot of standardized residuals versus the predicted values showed random scatter conforming linearity. We used multiple regression method to obtain the result of $F$-test, $R$-square and beta coefficients. $F$-value was statistically significant ($p < 0.05$) and found to be 21.2, indicating that the scale could predict the outcome variable (e-service quality) with significant precision. Model fit summary reflected that 25.5 percent variance of e-service quality could be predicted by the model, which was quite satisfactory.

The beta coefficients of the predictor variables with corresponding significant $t$-values helped us to prove the hypotheses. Table X gives a summary of the beta values, $t$-values and proven hypotheses. It is evident from the result that only six factors contribute significantly to the assessment of e-service quality.

### Table VIII.
Correlation among the items for each factor extracted – Factor 6: Privacy and security

<table>
<thead>
<tr>
<th></th>
<th>SP_I1</th>
<th>SP_I2</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP_I1</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>SP_I2</td>
<td>0.684 *</td>
<td>1.000</td>
</tr>
</tbody>
</table>

**Note:** *Correlation is significant at $p < 0.01$ (two-tailed)

### Table IX.
Correlation among the items for each factor extracted – Factor 7: Usefulness of information

<table>
<thead>
<tr>
<th></th>
<th>UFI_I1</th>
<th>UFI_I2</th>
<th>UFI_I3</th>
</tr>
</thead>
<tbody>
<tr>
<td>UFI_I1</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UFI_I2</td>
<td>0.553 *</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>UFI_I3</td>
<td>0.499 *</td>
<td>0.620 *</td>
<td>1.000</td>
</tr>
</tbody>
</table>

**Note:** *Correlation is significant at $p < 0.01$ (two-tailed)

### Table X.
Beta values and hypothesis test result

<table>
<thead>
<tr>
<th>Model</th>
<th>Beta</th>
<th>$t$</th>
<th>Sig.</th>
<th>Hypothesis</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citizen centricity</td>
<td>0.159</td>
<td>3.566</td>
<td>0.000</td>
<td>$H1$</td>
<td>Accepted</td>
</tr>
<tr>
<td>Usability</td>
<td>0.110</td>
<td>2.345</td>
<td>0.019</td>
<td>$H2$</td>
<td>Accepted</td>
</tr>
<tr>
<td>Technical adequacy</td>
<td>0.097</td>
<td>2.126</td>
<td>0.034</td>
<td>$H3$</td>
<td>Accepted</td>
</tr>
<tr>
<td>Security/privacy</td>
<td>0.278</td>
<td>5.919</td>
<td>0.000</td>
<td>$H4$</td>
<td>Accepted</td>
</tr>
<tr>
<td>Usefulness of information</td>
<td>-0.043</td>
<td>-0.928</td>
<td>0.354</td>
<td>$H5$</td>
<td>Rejected</td>
</tr>
<tr>
<td>Transaction transparency</td>
<td>0.090</td>
<td>2.053</td>
<td>0.041</td>
<td>$H6$</td>
<td>Accepted</td>
</tr>
<tr>
<td>Complete information</td>
<td>0.186</td>
<td>3.892</td>
<td>0.000</td>
<td>$H7$</td>
<td>Accepted</td>
</tr>
</tbody>
</table>

**Notes:** $t$-value is significant at 5 percent level of significance; $n = 441$
6. Discussion
The study elicits seven service quality dimensions perceived by users of a government portal: citizen centricity, usability, technical adequacy, security/privacy, usefulness of information, transaction transparency and complete information. The finding is consistent with our proposed quality dimensions except the interaction factor (INT). We proposed INT as a distinct construct but the result determined that it was associated with comprehensive information and was merged with it. The factors address three essential aspects of e-service quality:

1. security/privacy and transparency of transaction;
2. completeness of information about the service; and
3. citizen centric features and usability of portal.

6.1 Transaction security and transparency
We find support for proposition $H4$ and $H6$ which postulate that security/privacy (SP) and transaction transparency (TTR) have positive influence on e-service quality. Transaction phase is a stage in e-government where two-way interactions take place between the citizens and service providers (Irani et al., 2006). While transacting, citizens often need to provide their personal details, and other information which require secured handling. The virtual existence of online government agencies is often enigmatic to the users, making them skeptical about providing the required details online. Since internet is prone to unscrupulous activities like hacking, phishing, spamming and identity theft, government authorities need to take the total responsibility of protection. An important factor for online transaction is transparency of the process (Rocheleau and Wu, 2005). A sense of trust and security develops when the citizens are informed of every detail in a procedure. In case of any incomplete transaction due to technical error, system failure or otherwise; the service providers need to inform users about the unfinished task immediately. Sometimes if there be a situation for refund, users should be informed through email or via other communication mode, to avoid any fraudulent activity. It is observed that citizens are willing to use e-transaction services if the method is transparent, smooth and cost effective otherwise if they are unsure of security and privacy mechanisms or do not receive proper communication about a transaction; they prefer to use alternative traditional system. So, SP and TTR are major deciding factors for end users to avail the convenience benefit of online applications.

6.2 Completeness of information
The second aspect of e-service is quality of information. A significant support for $H7$ is found in the result. $H7$ hypothesizes that completeness of information (CI) in a portal has a positive effect on e-service quality resulting in citizen satisfaction. High coefficient value of CI in analysis conforms to the proposition. Citizens and other stakeholders prefer to have detailed and updated information about services provided by the portal, respective department associated with the services and interaction option available in case of clarification before they start enjoying the portal utility. Sometimes citizens also like to express their opinion, so providing different platforms like message boards; opinion poll etc. imbibe a feeling of participation promoting the quality of e-service.
6.3 Usability and citizen centricity

The third aspect of service quality is conjectured by two hypotheses: $H1$ and $H2$ which postulate that citizen centricity and usability of government web portals have positive influence on e-service quality. Attenuating digital divide help to increase citizens’ awareness of e-government services; resulting in adoption of e-services. Citizens at this stage prefer to use electronic media to collect information, download forms, obtain licenses, check status of pending documents and for many such purposes. Regular updates of information with structured hyperlinks, well defined instruction for use, complete description of service utility, easy navigation in or outside the portals and customized information presentation increase usability of the portal helping citizens to develop an aptitude for online services. To make e-government applications convenient for users, service providers should also incorporate citizen centric facilities. During the study, it has been found that though portal services are available round the clock for providing government service 24 hours a day and seven days a week, banks or other financial organizations which help to get the transactions complete, allow transactions only during office hours. Hence, citizens attempting transaction after or before regular hours cannot transact. This limitation refrain people from utilizing online public applications. Besides, citizens who are new to the web interface do not understand the complicacy of online transaction affairs and need the facility of voice aid or guided tour to carry out such activities successfully. Most of the portals do not provide such features making the process inconvenient. Language problem is another barrier for adoption of e-government. For citizens with less education, it is difficult to get connected to an online environment without their primary language. India being a country of 22 official languages, diverse culture and pronounced knowledge divide, problems of e-government diffusion is rather grave. Due to lack of proper integration of internal activities of government departments, manual intervention is required to complete a task. Shareef et al. (2011) while studying for a new e-government adoption model, observes that most countries are still struggling to attain service level at transaction and integration phases. Complexity and incomplete service availability compel end users to follow the brick and mortar government procedures curbing the growth of e-government practice. Wang (2003) found that there is a close relationship between citizen satisfaction and e-service quality. The UI and CCEN factors in our study delineate the characteristics which can make the government service convenient for citizens. The beta values of both the factors reflect a strong association with e-service quality supporting Wang’s observation. $H1$ and $H2$ thereby show significant support.

Regression analysis shows a positive relationship of technical adequacy (TAD) with e-service quality thus supporting $H3$. This is in accord with previous studies done by several researchers. Gupta and Jana (2003) suggested that communication networks, administrative culture, and a greater appreciation of information systems can influence the diffusion of an innovation. Relative advantage is found to be an important factor in the adoption of the internet and the world wide web (Tan and Teo, 2000; Sang et al., 2010). In the context of e-government, relative advantages may include speedy log ins, fast download, quick upload of documents and swift reliable transactions quality of public services, flexibility offered to the individuals, efficiency gains, greater satisfaction, community empowerment, the ease of use and convenience (Gupta et al., 2004). Technical adequacy is judged based on flexibility and speed of a service system.
by end users and can act as trigger for acceptability of online services. Technical adequacy is a contributory factor for usability of the portal.

The factor usefulness of information (UFI) displays a deviation from expected result and does not show significant influence on e-service quality; hence $H5$ could not be proved and is rejected. This factor characterizes citizen relationship management through citizen engagement. In India the portals are poor in citizen relationship management and refrain from communication with registered users. Irrespective of these shortcomings, people still use transaction portals because of convenience benefit and are apparently quite satisfied. Thus usefulness of information is not a strong determining factor for assessing e-service quality in the current status of Indian e-government.

7. Conclusions

The objective of this study is to understand the present situation of e-government portals in India and investigate the factors, which can enhance e-service quality of the portals ensuring end user adoption. Indian government has aggressive plans for implementing e-government solutions in the country. Large investments have already been made on ICT infrastructure and a continuous effort is being made at the strategic level to reform service delivery model. Outcome of these reforms and restructuring has not been very encouraging as there is gap between design and reality. Understanding citizens’ needs and expectations can help to reduce this gap and act as positive trigger for adoption of e-government (Dada, 2006; Bertot et al., 2008). Complying with global research works we conducted a rigorous study and developed a reliable scale of seven factors, which can successfully determine e-service quality of government transactional portal in India.

Researchers (Jaeger and Matteson, 2009; Bertot et al., 2008) in their study of citizen centered e-government services conclude that the process of implementing citizen-centered e-Government is iterative and needs continuous effort for improvement. This validated scale can be used by e-government practitioners for administering regular assessment system in both central and federal levels.

Besides management implications the study also has important research implication. Most of the studies in India are conceptual and do not suggest any concrete measurement procedure to assess e-service quality. Our study is empirical and establishes a parsimonious model, which can contribute significantly in further theoretical advances on e-service quality of transaction portals used by government organizations.

There are some limitations of the study. First, our data were collected from users of selected e-government transaction portals of India so a generalized use of the scale might require further scrutiny. Second, web design and technological aspects have been excluded in this study but with traditional e-government giving way to transformational government there is a scope of future research incorporating technology choice and design factors.

References


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**Further reading**


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