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Assessment of E-government Service Quality under User Satisfaction Orientation: The Establishment of E-Govqual Model

Shang Shanshan
College of International Business, Shanghai International Studies University, Shanghai 200083, China

Abstract: The purpose of E-Government is to provide information and service for citizens by taking use of Information Communication Technology and the assessment of E-Government service quality has become the key research topic. The study analyses the importance of the user satisfaction and establishes the E-GovQual assessment model under customer satisfaction orientation after a review of the theories on service quality. The study proposes that the model includes four dimensions: usability, information quality, security and responsiveness and the study further build the attributes of each dimension.

Keywords: E-government, E-GovQual, service quality assessment, user satisfaction

INTRODUCTION

Now the internet user is larger and larger, many people are enjoying the high level and satisfied service from the private sectors, which leads to a high level service expectation from the public administration and sectors. The public administration all around the world is taking great effort to enhance their service quality (Batini *et al*., 2009). All the government agencies agree that the function of the government should be improved so that to provide better and more convenient public service to the citizens and the enterprises. The implementation of E-government can assist to offer better public service. Rowley says the E-government is a reform of the government agencies. The national and the local government all join the team of the E-government successively, but according to the research result the successful rate is quite low (Whitmore, 2012). According to Heeks (2004), in the development countries, 35% of the E-government projects are totally failed, 50% of them are partially failed and only 15% of them are successful (Gorla, 2009). Kim and Kim (2009) propose that the key factor that decides the success of the online enterprises is service quality (Gorla, 2009). Lee and Lin (2002) research discovers that the reason of the failure of most online companies is the low service quality (Akakandelwa, 2011). Chutimaskul *et al*. (2008) finds that a lot of e-government projects don't actually care about the service quality and the customers' requirements (Akakandelwa, 2011).

Scholars and the governments are all trying to establish an evaluation standard, so more and more researches participate in the discussion of what factors make the e-government project successful and what method can do better measurement and assessment. E-government is that government provides information and service to citizens, enterprises and other government agencies, by taking use of information and communication technology. The essence of e-government is to offer better service to citizens, enterprises and other social groups by changing the information management method (Saghafi *et al*., 2011). Therefore, the study is aim to establish an assessment model on e-government service quality under the customer satisfaction orientation after deep analysis on the previous research study related to this topic.

LITERATURE REVIEW

Service quality and e-service quality: Service quality is a key performance indicator on the traditional service evaluation. High service quality has great impact on the customers' adoption decision. The most popular and most accepted service quality assessment model is proposed by Parasuraman *et al*. (1985), the SERVQUAL model, including 10 dimensions with 97 indicators and then in 1988, Parasuraman and his group further simplify it to 5 dimensions with 22 indicators, they are tangibles (physical facilities, functional appeal and appearance of employees), reliability (the ability to execute the promised service in an accurate and trustworthy way), responsiveness (willingness to assist the end users and provide punctual service), assurance (personnel cognizance which persuades user confidence and trust) and empathy (providing caring and paying individual attention to customers) (Tambouris and Tarabanis, 2004).

With the development of information technology, scholars and experts began to focus on the on-line service quality. For e-commerce and e-government also belong to information system area, the early researches mainly pay attention to the website quality in the e-commerce area. In the information system literatures,

Table 1: The main literatures on e-service quality dimensions

Authors	Dimensions of online service quality
Barnes and Vidgen (2001)	1. Usability; 2. Information quality; 3. Service interaction
Liljander *et al*. (2001)	1. User interface; 2. Responsiveness; 3. Reliability; 4. Customization; 5. Assurance
Linand Wu (2002)	1. Information content; 2.personiztion; 3. Responsiveness;
Zeithaml *et al*. (2002)	Core E-SQ: efficiency, reliability, fulfillment, privacy Recovery-SQ: responsiveness, compensation, contact
Van Riel *et al*. (2004)	1. Usability; 2. Design; 3. Customization, assurance; 5.responsiveness
Yang *et al*. (2004)	1. Reliability; 2. Responsiveness; 3. Complement; 4. Ease of use; 5. Product portfolio; 6. security
Li and Lin (2005)	1. Web design; 2. Responsiveness; 3. Reliability; 4. Trust
Zeithaml *et al*. (2005)	1. Tangibles; 2. Reliability; 3. Responsiveness; 4. Integration of communication; 5. Assurance; 6. Information quality; 7. empathy
Agrawal (2007)	1. Information quality; 2. Interaction; 3. Integration; 4. Accessibility; 5. Corporate image; 6. Emotional engagement; 7. Active service recovery; 8. Assurance

Tambouris and Tarabanis, 2004; Mishra and Mishra, 2011; Ayanso and Chatterjee, 2011

the best known information system evaluation model is put forward by DeLone and McLean (1992, 2003), that is the IS Success Model. DeLone and McLean (1992) analyses the similarities and differences among all the evaluation dimensions in 180 empirical research literatures and integrates all the evaluation dimensions into one measurement model, that is the IS Success Model (Mishra and Mishra, 2011) Since then, the IS Success Model is widely accepted and indexed by a lot of researchers and is identified as the most important contribution in the information system evaluation field. Kettinger and Lee (1994), Pitt *et al*. (1995) and Jiang *et al*. (2002) apply the service quality measurement in marketing into the information technology service evaluation. DeLone and McLean (2003) renews IS Success Model, taking the service quality as an evaluation dimention (Mishra and Mishra, 2011). Bauer, Hammerschmidt, Falk (2005) proposes an assessment method on e-commerce website quality. Miranda *et al*. (2006) also proposes an evaluation method and uses it to measure the website and makes a comparative analysis (Ayanso and Chatterjee, 2011).

The main literatures on e-service quality dimensions are listed in the Table 1.

E-government service quality: For the governments are non-profit agencies, in the pursuit of excellent service quality, the governments have always largely fallen behind the private sectors. However, in the 1990s, as the penetration of the conception of Total Quality Management (TQM) in the public sectors, many governments strive to meet the citizens' requirements and satisfaction and high quality of e-government can help the country to gain more competence advantage in the world. Jansen *et al*. (2010) concludes that the service quality is much more important than the service quantity. Many experts analyze the dimensions of e-government service quality based on the dimensions of e-commerce service quality. However, the research history of e-government is relative short, the research study specially on e-government service quality is little (Byun and Finnie, 2011). Anand *et al*. (2009) proposes the evaluation model of e-government service quality, the EGOSQ model, including ease of use, interaction function, information content, trust, reliability and assistance of citizens (Kumar and Mukerji, 2007). Alanezi *et al*. (2010) uses web design, reliability, responsiveness, security/privacy, personalization, information and ease of use to evaluate the e-government service quality (Papadomichelaki and Mentzas, 2012). Kaisara and Pather (2011) considers that the dimensions of the e-government service quality evaluation include information quality, security, communication, web aesthetics, web design and accessibility (Kaisara and Pather, 2011). Papadomichelaki and Mentzas (2012) puts forward that the dimensions of the e-government service quality evaluation are ease of use, trust, interaction, reliability, content and information presentation, user help (Alanezi *et al*., 2010). Hongli and Lanrong (2012) proposes the dimensions are informatization, government affairs coordination, website quality and user satisfaction under the view of supply chain.

THE IMPORTANCE OF USER SATISFACTION

Oliver (1993) defines satisfaction as a person's perception after his or her prior experience. Oliver (1999) indicates that satisfaction is the content feeling after getting the expected service. In the field of information system, satisfaction is defined as user's response to the system. Gatian (1994) emphasizes that the user satisfaction is the most important requirement. Since Cardozo (1965) began to study the user expectation and satisfaction, user, customer, citizen satisfaction becomes an important research trend in the field of information technology, information system and marketing (Ifinedo, 2011). Wind *et al*. (2002) observes that the internet makes the customers not the enterprises be the center of the market and the commercial strategy. Besides, Wind and Rangaswamy (2001) stresses that in order to involve customers into all the aspects of the marketing activities, customer oriented strategy is much more important than providing a website with aesthetic exhibition and strong function. Engaging the customers into all the process from product design to pricing, distribution is essential to establish sturdy and stable customer relationship to

advance the enterprise competence. Accenture highly appraises the Canadian government for its in-time response to the user requirements, based on which the Canadian government continues to improve the e-government (Ray, 2011). In order to effectively deliver the public service the governments should take the user-centered e-government strategy. The user-centered e-government website should be user friendly website, which is a synthesized website integrating all the information and other website hyperlinks and the website style should be consistent with the government image, asking citizens for suggestions from time to time, having simplified website address. Liu *et al*. (2008) pinpoints that the online service satisfaction depend on whether the service meets the customers' demands from the online experience (Miyata, 2011). Liu *et al*. (2008) also points out that before supporting the e-government, the governments should first let the citizens understand that the governments have the ability and the resources to implement and maintain the e-government subject, that is the candid straightforward communication between the governments and the citizens can upgrade the user satisfaction. Johns (2006) research reveals that the diversification of the users is an important predictor to the final user satisfaction from the social viewpoint, so the governments should provide service that every citizen can understand and use (Koh and Prybutok, 2008). West (2004) concludes that in order to improve the e-government service quality, the governments should make citizens understand that the government websites not only just issue information but also provide professional services that can satisfy citizens' needs (Koh and Prybutok, 2008). Irani *et al*. (2007) emphasizes that the way that the e-government provides services should reveal whether the e-government strategy can do contribution to the improvement. Hence, it is quite important to measure the direct benefits to citizens, governments and the whole nation brought by e-government (Koh and Prybutok, 2008). Al Shafi and Weerakkody (2007) points out that the citizen satisfaction is a complicated and comprehensive measurement that should involves the measurement to all the aspects of citizens' needs (Sharifia and Manian, 2010), such as services, expectation and the G2C (Government-to-Citizen, G2C) relationship.

THE ESTABLISHMENT OF E-GOVQUAL MODEL

Many researches show that service quality is an important predictor to the user satisfaction. Kumar and Mukerji (2007) stresses that the service quality affects the user satisfaction directly (Kim and Grant, 2010).

According to deep analysis on a large amount of literatures, the study establishes the E-GovQual model to assess the e-government service quality under user orientation, including four dimensions:

- **Usability:** Integration, navigation, accessibility, aesthetics, Multilanguage and personalization
- **Information quality:** Information accuracy and information timeliness
- Security
- **Public responsiveness:** Publication and government responsiveness

Usability: Holden *et al*. (2003) hold that despite rapid development, the e-government haven't given full play to its potential to conquer the current obstacles to usability. Chen and Macredie (2005) concludes that the usability of the website is critical important to help users' to get their expected effective information. Flavián *et al*. (2006) explores that the better the usability of the website, the higher the user satisfaction and loyalty (Mishra and Mishra, 2011; Byun and Finnie, 2011). Casaló *et al*. (2008) confirms that the website usability can assist to enhance the user satisfaction and has a great impact on the user loyalty. Oztekin *et al*. (2009) gets that website service quality has strong relationship with the website usability by empirical studies. Floropoulos *et al*. (2010) regards that service quality, usablility and user satisfaction are the important successful factors to e-government projects (Papadomichelaki and Mentzas, 2012). Brown and Brudney (2004) points out that usability is very important for the aim of using e-government by public agencies is to provide convenient services to citizens (Alanezi *et al*., 2010).

Stowers (2002) deems that there should be six dimensions to evaluate usability, that is, online service, users' help, navigation, legislation, information delivery and accessibility. After deep analysis on 30 famous e-government websites in Korea, Byun (2006) gives the conclusion that the usability should includes web design, content design, image design, ease to learn, navigation, interaction (Concha and Astudillo, 2012).

Reichheld *et al*. (2000) notes that the root causes of the failure of Boo.com are over complexity, low responsiveness, difficult to access and poor navigation (Sharifia and Manian, 2010). The study considers that the usability should involve integration, navigation, accessibility, aesthetics, Multilanguage and personalization.

- **Integration:** E-government has transformed from simple website only publishing information to integrated website with strong business function. An integrated website can help users to reach their expectation on the usability and users needn't to know which services are provided by different department and go to visit different departments at different locations, they can just visit the website to get all the services they need, therefore, the integrated website can significantly reduce the time and cost by users to acquire the needed services.

Grant and Chau (2005) refers to e-government as high qualified, seamless, integrated public service delivery that is to promote the interaction between citizens and governments, to help citizens, enterprises and other groups to realize the economic and social development goal at local, municipal, national and international level (Miyata, 2011). User oriented e-government website should be a website that is user friendly, integrated with other hyperlinks and all kinds of information (Rana and Williams, 2011).

- **Navigation:** Schultz *et al*. (2001) appeals that e-government should take a user service approach to realize the usability, notes that the government website presented to citizens should just like an array of service navigation, which users can easily manipulate. Internal navigation can be strengthened by setting up website map and internal search engine, by which users can easily skip the information that is not what users are interested and get what they wanted effortlessly. Clyde (2000) obtains that the auxiliary navigation tools such as menu, directory, control button, theme tree and view map are quite useful for the navigation of website.
- **Accessibility:** Papadomichelaki and Mentza (2009) states that website address should be concise and simple so as to be easily remembered by users. Website address that is simple and brief, easy to be remembered and convenient for users to search is important to the web usability (Tambouris and Tarabanis, 2004). Bertot and Jaeger (2006) declares that the government website should attach importance to assurance to normal visits from any citizen. The government website should also guarantee that no error will happen when a large number of users visit the website simultaneously. The website system should independent on the browser so that even different users take use of different browsers, users can access the website with no barrier, which of course will improve the usability (Lee, 2010).
- **Aesthetics:** Hoffman and Krauss (2004) points out that visual effect of website has a great impact on users' perception, besides, according to Schenkman and Johnsson (2000) research, visual effect of website has even more influence on users especially when people interact with website (Akakandelwa, 2011; Mishra and Mishra, 2011). Web aesthetics is important to any website, certainly e-government website is included. E-government web designer should notice that the balance between the trustworthy image and visual appeal. Too much colors and animations are not suitable, for users' attention will be distracted, which is more important than e-commerce websites for e-government websites (Byun and Finnie, 2011). For example, e-commerce website can use plentiful bright colors, but for the sake of the governments, e-government website should delimit the use of various colors.
- **Multi-language:** E-government website should provide multi-language service considering global development. Collier and Bienstock (2006), Kim *et al*. (2006), Parasuraman *et al*. (2005) and Wolfinbarger and Gilly (2003) all stress that multi-language is a most important factor for users to access the e-commerce website (Gorla, 2009). Nantel *et al*. (2005) verifies that website providing user's native language has significant relationship with website adoption by empirical study in which online shopping critical factors are analyzed (Batini *et al*., 2009). By investigating 93 companies in China, India, Japan and USA, Singh and Pereira (2005) demonstrates that if the website provide user's native language, user will have cultural resonance and have a positive intention to use the website (Ifinedo, 2011). Michon and Chebat (2004) illustrates that if a website only provide one language which is not the user's native language, user may not go on to use the website (Ifinedo, 2011).
- **Personalization:** Personalization is that the system can recognize the use automatically according to the use's recent visit records and put the information that may be the user interested in the homepage in user's native or familiar language (Papadomichelaki and Mentzas, 2012). Personalized website, product service and self service can not only establish contact with users but also enhance users' experience (Whitmore, 2012). Personalization can give users the feeling of autonomy, which will potentially increase the user satisfaction. Personalized information is the tailored information by analyzing user's preference, such as communicating with user by user's familiar language, providing multi-language not the native language of the website provider, offering special channels for the disabled to visit the website, all of which can improve the convenience of the government website. Personalization is important for improving the usability of the website and the service quality.

Information quality: No matter private sectors or public sectors all care about information quality, it has been confirmed that information quality has significant relationship with web usage rate. Thomas and Streib (2003) and Misnikov (2005) research reveal that the most important reason for citizens to visit website is to acquire information (Alanezi *et al*., 2010). Information is the premise of decision, so information quality is of vital importance for appropriate decision. In order to explain the importance of information quality, DeLone and McLean (2003) stresses information quality is more important than any other dimensions in all the dimensions that are used to evaluate the service quality

(Mishra and Mishra, 2011). Peppard and Rylander (2006) points out that organizations should take use of information quality as the tool to enhance user satisfaction (Islam and Scupola, 2011).

- **Information precision:** The information provided by governments should be accurate, deliberate, related and easy to understand for users. Information accuracy means that whether information in the website has errors, whether the information is what the users need, whether the information is detailed enough. According to the survey by Council for Excellence in Government (2003), a lot of people would not like to use the government website for it is hard to get the useful and expected information. Belanger and Hiller (2006) states that in the primary stage, the biggest challenge for governments is to provide the correct information (Kaisara and Pather, 2011).
- **Information timeliness:** Timeliness which means the information provided is the latest information is important for information quality. Santos (2003) research demonstrates that periodical updates do not happen in most of the government websites, the information provided in website are always out of date, so the government should provide the newest information (Ifinedo, 2011; Sharifia and Manian, 2010). Government website should refresh the information in time, otherwise, the information that users get will not be what the user's need, which certainly will not meet users' requirements, as a result, service quality will be reduced and user satisfaction will be decreased.
- **Security:** Bélanger and Carter (2005) and Schaupp and Bélanger (2005) purports that safe website can protect users from kinds of risks when they are doing online transactions (Orgeron and Goodman, 2011). Security of website can help users to build trust to the website. According to the empirical researches by Angst and Agarwal (2009), Shareef *et al.* (2008) and Yoo and Donthu (2001), privacy is a most important factor for user to employ websites to do transactions. It has great influence on the transformation of government to use internet to provide e-service. E-service can improve the service quality and reduce the cost (Concha and Astudillo, 2012). But Rotchanakitumnuai and Speece (2003) notify that different from traditional service, e-service users undertake greater risks, such as security risk, distrust etc (Dwivedi and Weerakkody, 2011). E-government website, integrated with many online transaction services, need users to provide personal information, therefore, it demands higher security and otherwise, it may leads to personal information disclosure or even worse to damage their benefits. Governments should pay special attention on protecting users' personal information and establish citizens' trust to the government. Security is an important factor for users to adopt online service.

Public responsiveness:

- **Openness:** Jorgensen and Bozeman (2007) refers to openness as the transparency of public service, which represents the extent to which governments discloses its decision processes and procedures and performance information timely. Governments need to make public the information that need to be revealed, answer citizens' questions and doubts and open the content that citizens ask for. Karunasena and Deng (2010) points out that governments should publish the policy information, the organizational structure, the government contact information, the budget and cost to show government's accountability, the tenders to show the transparency and make citizens able to complain online (Kaisara and Pather, 2011).
- **Government responsiveness:** By the empirical study in developing countries, Shareef *et al.* (2009) pinpoints that service responsiveness is an important factor affecting users' adoption. Responsiveness is a crucial consideration for citizens to select e-service (Wong and Hideki, 2011). Responsiveness means that governments positively meet citizens' requirements and reply to citizens' suggestions immediately. When people confront some question, no matter will want to get reply as soon as possible, however, email addresses in some government websites are invalid addresses and the some governments don't answer citizens' questions, even automatic replies are not common.

CONCLUSION

For the rapid development of internet and information technology, almost all the governments in the world are transforming from traditional service to e-service. E-government system becomes a indispensable auxiliary tool to governments. Governments are trying to provide 7 days 24 h service to citizens. And almost each country takes use of e-government website to offer services to citizens and enterprises. The aim of e-government is to provide satisfied service to citizens, in order to assess the e-government service quality to help the governments to better meet citizens' requirements; the study establishes the E-GovQual to evaluate e-government service quality under user satisfaction orientation.

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