Research Journal of Applied Sciences, Engineering and Technology 11(3): 315-324, 2015
DOI: 10.19026/rjaset.11.1722
ISSN: 2040-7459; e-ISSN: 2040-7467

Submitted: February 13, 2015 Accepted: March 1, 2015 Published: September 25, 2015

Research Article

Quality Dimensions Trend Analysis in the Context of Evaluating E-government Services

Taisira Hazeem AlBalushi and Saqib Ali
Department of Information Systems, Sultan Qaboos University, Oman

Abstract: Governments are increasingly realizing the importance of utilizing Information and Communication Technologies (ICT) as a tool to better address user's/citizen's needs. As citizen's expectations grow, governments need to deliver services of high quality level to motivate more users to utilize these available e-services. In spite of this, governments still fall short in their service quality level offered to citizens/users. Thus understanding and measuring service quality factors become crucial as the number of services offered is increasing while not realizing what citizens/users really look for when they utilize these services. The study presents an extensive literature review on approaches used to evaluate e-government services throughout a phase of time. The study also suggested those quality/factors indicators government's need to invest in of high priority in order to meet current and future citizen's expectations of service quality.

Keywords: Dimensions, e-government, e-services, quality factor, quality frameworks, quality metrics, quality models

INTRODUCTION

The governments of several countries have realized that information technologies present immense possibilities. They have started to implement and invest in such technologies in order to serve their citizens efficiently and achieve more national prosperity and satisfaction. The issues and concerns that the world's top governments have identified include education, health care, transport, natural resource and information management and the economy. They need to be provided through electronic services (Kingdom, 2014; House, 2015; Affairs, 2015; Africa, 2015; Finance, 2015).

Offering government services via electronic channels would open up new avenues for citizens/users seeking to access government services at a reasonable cost, regardless of their geographical locations. However, providing effective e-services is not an easy task and it requires proper planning to achieve its strategic value. As the number of e-services offered increases drastically, the quality of most of the services is still low, especially that of e-government services (Sharma *et al*., 2013). E-service quality is becoming a necessity for better performance of the online applications (Barrutia and Gilsanz, 2009).

A number of researchers have studied the quality of e-services by proposing models, guidelines and mechanisms for quality evaluation. These models and guidelines can serve as a roadmap for the most basic and important quality level that citizens are willing to accept. E-government services have unique attributes as they involve the provision of services to a scattered audience whose members have different backgrounds, varying forms of experience, different levels of computer literacy, etc. Therefore, the aim of the study is threefold: to investigate the quality of e-services, primarily that of e-government services; to collect different quality factor studies involving standards, frameworks and models; to outline the quality trends in the studies over time. This will help determine key quality factors in the implementation of e-government services.

E-GOVERNMENT AND E-SERVICES EVALUATION

Defining e-government and e-services: E-services have not only transferred many traditional services into the electronic domain but have also given birth to many new kinds of services that are facilitated by the use of electronic devices. Defining "e-services" is not easy because of the vastness of the domain and its variation with factors such as location, ethnicity, culture, tradition, age, religion, user experience and background and type of business.

One of the earliest definitions of e-services is, "Internet-based application that fulfill service needs by seamlessly bringing together distributed, specialized resources to enable complex transactions" (Tiwana and Ramesh, 2001). A simpler definition states that e-services are kind of services delivered using the electronic networks (Rust and Kannan, 2002). Some of the other definitions proposed can be found in Rowley

Corresponding Author: Saqib Ali, Department of Information Systems, Sultan Qaboos University, Oman

(2006) and Gummerus (2011). One of the latest definitions describes them as a "consumer process of online selection, inspection, negotiation and marketing communication through technological interfaces that enable consumers to produce a service independent of direct service employee involvement" (Hellman, 2014).

E-government is a type of e-service concerned with the provision of government services to citizens through electronic networks and devices. Citizens can now enjoy better services from the government sector, accessing various forms of information and services. These include online applications, tax calculations, online payments and electronic voting. The World Bank identifies some major benefits of e-government in areas such as cost reduction, promoting economic development, enhancing transparency and accountability, improving service delivery, improving public administration and facilitating e-society (Bank).

Similarly to its antecedent, the e-service, e-government has not yet been defined precisely as governments and citizens vary considerably from country to country. The United Nations defines e-government as, "the use of ICT and its application by the government for the provision of information and public services to the people," in its Global E-Government Readiness Report (2004). It also points out the road towards obtaining the overall sustainable development of world governments.

E-government service quality evaluation: The United Nations', European Union's and many countries' efforts towards the achievement of E-government proves that they are seriously considering the advantages, opportunities and possibilities of these new technologies and services (Affairs, 2014; Barbara *et al*., 2012). The UN, EU, World Bank and many other individual entities have already designed frameworks and benchmarks. Thus, it has become important to understand and measure the status of the implementation of the technologies and their respective standards, benchmarks, frameworks or models (Affairs, 2014; Barbara *et al*., 2012; Khalil *et al*., 2009). This evaluation can be done using two different perspectives (Osman *et al*., 2011):

Value measurement models: Peters *et al*. (2004), Kim and Kim (2003), Savoldelli *et al*. (2013) and Foley (2006): These are done from the perspective of the value of the implementation of electronic technology in the provision of government services:

Success or maturity models: Layne and Lee (2001), Andersen and Henriksen (2006), Wimmer and Tambouris (2002), Reddick (2004) and Wang and Liao (2008): These are done from the perspective of the degree of advancement of the government technology employed to serve citizens. It is broadly described as four stages-publishing, interactivity, completing transactions and delivery of services. As e-government is still in its infancy stage, most top level e-government providers are still in the second or third stage of maturity.

eService quality models: Magoutas and Mentzas (2010), Osman *et al*. (2011), Carlson and O'Cass (2011), Ding *et al*. (2011), Lin and Hsieh (2011), Parasuraman *et al*. (2005), Barnes and Vidgen (2000), Wolfinbarger and Gilly (2003), Webb and Webb (2004), Papadomichelaki and Mentzas (2012), Eleanor *et al*. (2007), Yoo and Donthu (2001) and Abhichandani *et al*. (2005): These are done from the perspective of the quality of the e-services that the government provides, i.e., the quality of the e-government. They involve the identification of the citizens' various expectations, demands and needs and their comparison with the services offered. The evaluation is generally done using qualitative and quantitative surveys. To evaluate e-government, it is important to identify its purpose, the perspective from which the measurement is to be done and its implementation and significance. One of the exclusive benefits of quality models/frameworks is that they not only involve extensive literature reviews and model proposals but also consider citizens' demands and perceptions. Based on these factors, a government can improve its e-services. These models or frameworks generally employ qualitative, quantitative and/or mixed surveys. By comparison, the maturity model is concerned with the level of technological advancement of E-government services and the value measurement model generally measures the value of the e-government services based on various factors. The quality model tries to evaluate the overall quality of e-government based on the authors' understandings and the citizens' responses. The understanding obtained from the use of quality models helps the government to upgrade its e-services and indirectly adds to the value of the e-services, making them more mature.

This shows that concentrating on the quality model can help with the achievement of overall understanding and with the improvement of e-government from the perspectives of value measurement and maturity. Based on the above understanding, the study of quality models/frameworks constitutes the best option. The following section discusses the major quality frameworks, models and standards that have been developed and implemented.

METHODS OF SERVICE QUALITY EVALUATION

Understanding the quality of services is a difficult task as it is dependent on numerous factors such as culture, tradition, religion, economy and region as well as the characteristics of the providers and customers associated with a particular service. Thus, it is challenging to develop a universal understanding of the needs, demands, perception and satisfaction of the people. In addition, the diversity of the quality models, frameworks and standards that various governments,

organizations, authors and researchers have developed is a manifest to the vastness of e-government services. Though the ultimate models and frameworks employed differ for various reasons, the development of almost all models follows an analogous process as discussed below (Lin and Hsieh, 2011; Parasuraman *et al*., 2005; Osman *et al*., 2014; Papadomichelaki and Mentzas, 2012; Ding *et al*., 2011; Eleanor *et al*., 2007; Ladhari 2010; Magoutas and Mentzas, 2010; Webb and Webb, 2004; Osman *et al*., 2011):

- **Conceptualize dimensions/item generation:** The items are generated based on the literature review conducted.
- **Develop preliminary scale/make questionnaire:** Based on the understanding of the authors, a preliminary scale is framed and, accordingly, a questionnaire is developed.
- **Revise the scale/statistical analysis:** A survey is conducted and, based on the statistical results, the items are revised.
- **Develop the scale/reduced dimension:** Based on the revision of the items, a refined scale is developed.
- **Validate the model:** A second survey is conducted to validate the scale and further refine it if possible.
- **Apply the model:** The final model is thus created and applied in real life situations.

Quality frameworks: Magoutas and Mentzas (2010), Carlson and O'Cass (2011), Ding *et al*. (2011) and Osman *et al*. (2011)

Frameworks generally try to give a holistic evaluation and a mechanism for evaluating quality using a structured system. These techniques are generally more elaborate and dynamic than quality model techniques.

Quality models: Lin and Hsieh (2011), Parasuraman *et al*. (2005), Barnes and Vidgen (2000), Wolfinbarger and Gilly (2003), Webb and Webb (2004), Papadomichelaki and Mentzas (2012), Eleanor *et al*. (2007), Yoo and Donthu (2001) and Abhichandani *et al*. (2005)

Models generally try to give a template with which the quality of a given e-service or e-government can be evaluated. They form a concise technique for evaluation, the survey and literature review. Its contributions to the knowledge are smaller than those associated with quality frameworks.

Quality standards: Quirchmayr *et al*. (2007) and Folmer *et al*. (2011) Standards are basic structures that form guidelines and benchmarks for e-services and e-government. Almost every international organization (e.g., the United Nations, European Union, ISO and World Bank) has proposed its own set of standards. In addition, many individual governments have come up with their own standards.

RESEARCH APPROACH

The objective of this study is to highlight the key quality trends in the domain of e-government services; hence it is important to conduct an exhaustive literature review.

To conduct an effective study, guidelines for conducting literature reviews on e-services have been taken from the most relevant well-known papers in the field (Webster and Watson, 2002; Levy and Ellis, 2006; Islam and Scupola, 2011). Figure 1 illustrates the theoretical concept map for the literature review.

SERVQUAL is known as a quality model and was formulated in the 1980s. It became the reference model for all major quality models and researchers use it as a template even today.

When the Internet became public in the 1990s, it didn't take much time for service providers to identify its benefits and make the effort to provide their respective services electronically. This gave rise to research on, development of and innovations of E-services. Models and frameworks for the evaluation of quality started to be proposed and implemented during the 2000s. The process continues to date. Some of the models are WebQual (Barnes and Vidgen, 2000), Sitequal (Yoo and Donthu, 2001), eTailQ (Wolfinbarger and Gilly, 2003), E-S-Qual (Parasuraman *et al*., 2005), eGovSat (Abhichandani *et al*., 2005), WebQual (Eleanor *et al*., 2007), eGSQ (Quirchmayr *et al*., 2007), SSTQual (Lin and Hsieh, 2011) and e-GovQual (Papadomichelaki and Mentzas, 2012). These models are further categorized based on dimensions as depicted in Table 1.

The concepts, parameters and trends among these and many other models and frameworks are discussed in the later sections of this study. As suggested in (Webster and Watson, 2002), to conduct a good literature review, it is important to identify apt keywords and papers from reputable journals. Thus, based on ideas from Levy and Ellis (2006) and (Islam

Table 1: Dimension categorization according to the literature

Category	Dimensions
Content parameters	Ease of use, design, visual appeal, emotional appeal, convenience, understandability, learnability
Performance parameters	Efficiency, accuracy, response time, fault Tolerance, recovery, stability
Security parameters	Security, privacy, trust
Personalization parameters	Enjoyment, assurance, changeability, Innovation, compliance, customization
Citizen involvement parameters	Citizen support, citizen participation, citizen feedback

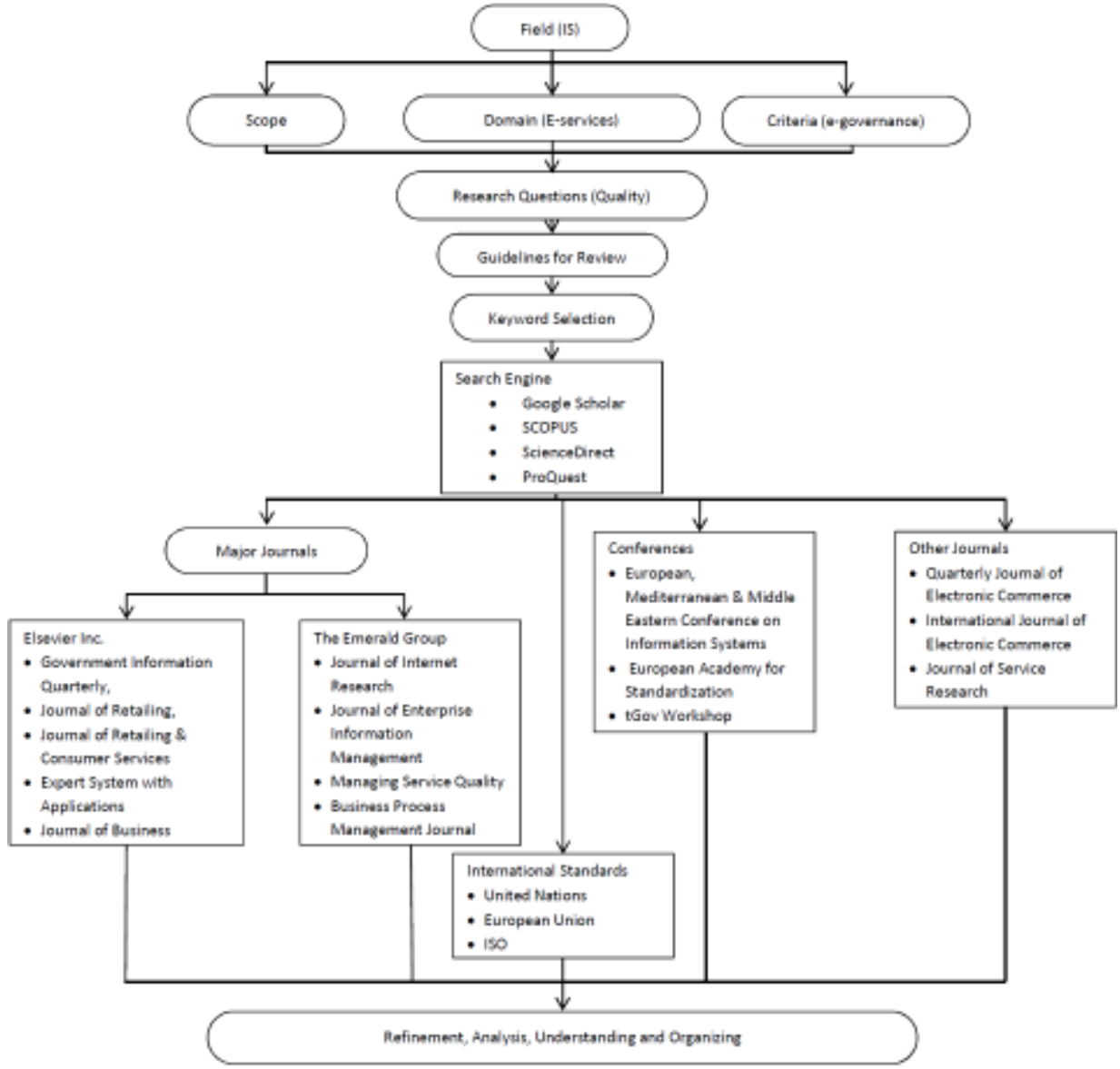

Fig. 1: Theoretical concept map for the literature review

and Scupola (2011), it is possible to identify keywords such as e-service quality, e-government quality, satisfaction, evaluation, quality models and quality frameworks. These keywords have been used in journal indexes and search engines such as Google Scholar, SCOPUS, Science Direct and ProQuest. Using these keywords makes it possible to find numerous research papers from journals such as the Government Information Quarterly, Journal of Retailing, Journal of Retailing and Consumer Services, Expert Systems with Applications and Journal of Business Research from Elsevier Inc., Journal of Internet Research, Journal of Enterprise Information Management, Managing Service Quality and Business Process Management Journal from the Emerald Group, Quarterly Journal of Electronic Commerce, International Journal of Electronic Commerce and Journal of Service Research. Papers from various conferences, including the European, Mediterranean and Middle Eastern Conference on Information Systems, the European Academy for Standardization and tGov Workshop are also relevant. Numerous papers have been obtained from the aforementioned journals and conferences. These have subsequently been shortlisted based on their importance and their relevance to the research being conducted in this study. The papers from the refined list have then been further analyzed and studied to categorize and tabulate them based on the year of publication, the number of dimensions implemented, the types of dimensions, the type and size of the survey used for refinement and validation and the limitations of the proposed model/framework. Table 2 is based on the above criteria.

Table 2: A comparison of quality models and their limitations

Year	Model	Description	Scale	Dimensions		Sample	Limitations
2000	WebQual (Kim *et al*., 2013)	based on website quality of UK business schools	• 4 dimensions	1. Ease of use 2. Experience 3. Information 4. Communication and Integration		• 32 undergrad • 14 grad students • 4 sites	• Not a comprehensive study
2001	SITEQUAL (Kim and Kim, 2003)	concentrates on e-shopping	• 4 dimension • 9 items • 5 point scale	1. Ease of Use 2. Design 3. Processing speed 4. Security		• 69 students • 207 sites Validation • 47 individuals • 187 sites	• Convenience sample • Cross-sectional • Regional
2003	eTailQ (Kingdom, 2014)	Concerned with the e-retailer success	• 4 factors • 14 item • 7 point scale	1. Website design 2. Fulfillment/Reliability 3. Privacy/Security 4. Customer Service		• 9 online focus groups (64 consumers) • 2 offline focus groups • 1013 online survey	• Validation survey is not conducted • Further verification required
2004	SiteQual (Ladhari, 2010)	Based on retail music industry. B2C relationship	• Desired – 7 factors • Minimum – 4 factors • 9 point scale	1. Reliability 2. Assured empathy 3. Tangibility 4. Navigability 5. Relevant representation 6. Accuracy 7. Security	1. Reliability 2. Assured empathy 3. Perceived usability 4. Trustworthiness	• 1,950 survey mails sent • 178 complete responses obtained	• Concentrates only on B2C and not on other e-services • Validation survey not performed
2005	ES-Qual (Khalil *et al*., 2009)	Quality model for online shopping	• ESQUAL 22 item 4 dimension • E-ResS-Qual 11 item 3 dimension • 5 point scale	1. Efficiency 2. Fulfillment 3. System availability 4. Privacy	1. Responsiveness 2. Compensation 3. Contact	• 549 complete responses from experienced users • 858 responses for model validation	• Cross-sectional results • Regional survey • E-ResS-Qual requires further verification
2006	eGovSat (Layne and Lee, 2001)	Citizen satisfaction with online government services	• 3 performance dimensions with 11 items • 1 emotional dimension with 4 items • 5 point scale	1. Utility 2. Efficiency 3. Customization		• 155 from Los Angeles • 246 from Minneapolis	• Interpretation is based from just the 2 cities • Not validated, implementing on other locations • Cross-sectional survey
2007	WebQual (Lin and Hsieh, 2011)	Online shopping website quality	• 12 dimensions • 36 items • 7 point scale	1. Informational fit-to-task 2. Tailored information 3. Trust 4. Response time 5. Ease of understanding 6. Intuitive operations 7. Visual appeal 8. Innovativeness 9. Emotional appeal 10. Consistent image 11. Online completeness 12. Relative advantage		Refinement stage • 510 and 336 Validation • 311 and 377	• Only one kind of students used • Many participants are not regular users, thus knowledge on existing customers is limited • Convenience sampling of websites
2007	e-GSQ (Levy and Ellis, 2006)	Evaluating e-government quality by embedding ISO/IEC standard	• 2 side • Demand (citizen's side) 5 items • Supply (government side) 15 tems	1. Understandability 2. Learnability 3. Operability 4. Compliance 5. Privacy	1. Suitability 2. Accuracy 3. Interoperability 4. Security 5. Maturity 6. Fault Tolerance 7. Recoverability 8. Time Behavior 9. Analyzability	• N/A	• No Survey conducted • Solely conceptual idea • Only case studies used for verification

				10. Changeability 11. Stability 12. Testability 13. Install-ability 14. Compliance			
2011	SSTQual (House *et al*., 2015)	Self-service Technology	• 7 dimensions • 20 items	1. Functionality 2. Enjoyment 3. Security/privacy 4. Assurance 5. Design 6. Convenience 7. Customization	Refinement • 862 users Validation • 376 users Generalization • 2 industries • 600 users	• Survey is not completely random • SST is still young and proper understanding cannot be predicted • Regional and cross-sectional survey
2012	eGovQual (Leonova, 2009)	Evaluating government website from a citizen's perspective	• 4 dimension • 21 items • 5 point scale	1. Reliability 2. Efficiency 3. Citizen support 4. Trust	Refinement • 630 users Validation • 264 users	• No distinguishing between experienced/non-experienced and regular/rare users • Just one website is sampled • Extremely regional
2014	e-GSPTA	Assess quality and trust dimension of e-services from citizen's perspective	• 7 dimensions • 38 items • 5 point scale	1. System quality 2. Information quality 3. Service quality 4. Usefulness 5. Citizens' Trust 6. Citizens' Satisfaction 7. Perceived e-government service quality	Refinement • Indian e-tax service • 260 user responses	• Regional data • Small sample size • Validation of the model was not conducted • Further evaluation on other organizations required

RESULTS AND DISCUSSION

Based on the extensive literature review conducted by studying papers from various journals and the data analyzed in Table 2, a summary of key quality dimensions has been created and classified to highlight the vital parameters and findings of the models. Certain reviewers and researchers have used the technique that involves categorizing the dimensions into relevant groups (Carlson and O'Cass, 2011; Papadomichelaki and Mentzas, 2012). A similar strategy has been implemented to categorize the dimensions here and it has given rise to a large database that facilitates better understanding and evaluation. Based on the understanding derived from this review, dimensions can be classified in to five major categories. These categories include content, performance, security, personalization and citizen involvement. Table 1

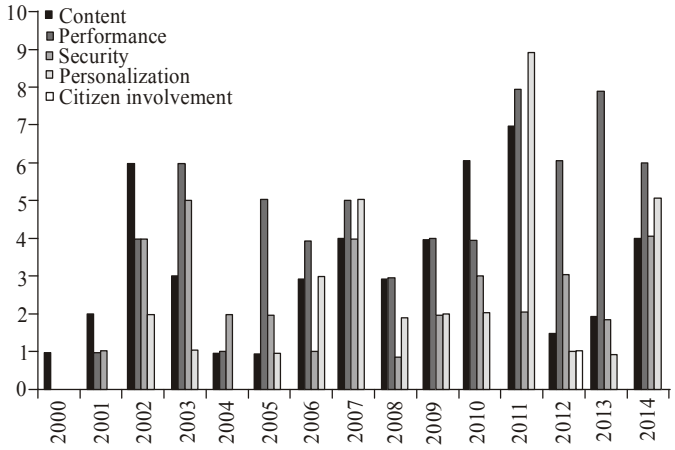

Fig. 2: Quality dimension trends from 2000-2014

depicts the dimensions categorized based on the literature review conducted and our understanding in this field.

To facilitate considerable analysis, explanation and understanding, the literature review was organized to obtain a large database of the dimensions proposed and implemented in papers from 2000 to 2014. The dimensions used in these papers have been grouped in the categories set in Table 1. The collected information is used to obtain a clear picture: An associated bar graph has been plotted, as illustrated in Fig. 2. This graph facilitates a better understanding of the trends and the path taken by this field of research.

Based on the analysis of the literature in this domain, it is evident that content parameters such as ease of use, design, appeal and convenience were accorded greater importance by the earlier researchers (Barnes and Vidgen, 2000; Yoo and Donthu, 2001). As time progressed, based on the circumstances and the requirements of the time, other categories came into existence. This can be explained by the fact that, during the initial stages, Internet technology was not as sophisticated and popular as it would ultimately become (Zickuhr and Madden, 2012; Campbell-Kelly and Garcia-Swartz, 2013; Miranda and Lima, 2012).

During the early stages of the development of any online services, the major concern in the building of websites involved the content perspective. It is also well-known that where any kind of e-service, including e-commerce, e-library, e-music and e-government, is concerned, the first thing that a user notices is the website's visual appeal and the ease with which he or she can use its various functions and applications. Thus, these dimensions hold top priority during the early stages (Sutcliffe, 2001; Cyr *et al*., 2010; Bonnardel *et al*., 2011).

Once the design and content category are fulfilled, notable performance in offering well-designed and easy to use websites and services becomes vital. It is well understood that a good but ineffective or inefficient website/service is practically worthless. This leads to performance parameters, which include dimensions such as efficiency, accuracy, response time and fault tolerance. Since the ingraining of this category into the field of e-services, it has gained great importance, becoming one of the top categories that influence e-service.

As technology and popularity advanced with time, so did security issues. There was a rise in cybercrimes such as hacking and theft. This gave rise to the security parameters category, which includes the dimensions of security, privacy, trust and assurance. As the trends show, security came into existence with the performance parameters. Since then, it has been ranked just beneath the performance parameters.

As the Internet and various other online services started to gain importance, users became more selective and sought better experiences of the services. This gave rise to personalization parameters such as entertainment, enjoyment, innovation and customization. These have gained immense importance among current researchers. They came into prominence in 2006, when the Internet was already popular among the general public. Since then, they have been on the rise.

As the current and state-of-the-art trends show, the performance and personalization parameters are the categories that have received the most emphasis. The security parameters and, finally, the content parameters follow them. This trend is expected to continue and to also see the emergence of a new set of parameters: citizen involvement. Citizen involvement parameters have gained popularity in recent times (Leonova, 2009; Osimo, 2008). Dimensions such as citizen feedback on services, citizen participation in decision-making and service provision and citizen support fall within this category.

This category is expected to gain importance not only in private sector e-services but also in the e-government context in coming years. This is because governments have already developed services such as e-voting, e-feedback and e-participation (Kim *et al*., 2013; Do Canto Cavalheiro and Joia, 2014). Future e-voting could eliminate the physical requirement of voting in voting booths and minimize the financial and managerial requirements associated with elections. E-feedback can help governments to understand citizens' needs and demands better and to evaluate their performance in real time. As for e-participation, it can help governments involve citizens in important tasks, including decision-making, policy making and the signing of various agreements.

LIMITATIONS AND FUTURE RESEARCH

This survey provides an extensive literature review concerning the approaches to evaluate e-government and e-service quality. However, it has a few limitations. Though it covers a wide range and number of papers, it may not cover all possible papers and models in the field. In addition, the review takes into consideration the dimensions used in the papers, but it generally ignores the hierarchy of or the diversity of importance among the dimensions, if any. It also ignores factors such as geographical location, cultural changes, sample size and the statistical methods used in the verification and evaluation of the models. Moreover, the review takes minimal note of the items (questionnaire) under the dimensions used, which might have been especially important for the evaluation had they been considered.

This study mainly discusses the models used over the indicated timeline. However, it does not present any practical survey or questionnaire for evaluation and

modeling or propose a new model. This issue will be addressed in the future, when a new model will be proposed based on a broad survey undertaken using a questionnaire and the rigorous analysis of the data obtained. The model is to be proposed and evaluated as a case study of the e-government scenario in Oman.

CONCLUSION

Recent accelerated investments by various governments have resulted in the provision of various government services through electronic channels to a larger and more diverse group of citizens. The efforts have been prominent; hence studies in the area are growing in number as well. Governments are becoming more concerned about motivating citizens to use these services to increase the effectiveness and efficiency of their operations. E-service users seek quality attributes that they expect to be integrated in the ways that these e-services are offered. While a number of guidelines and frameworks can be followed, service users still want features that are better tailored to their expectations and experiences.

This study provides a roadmap for the assessment of different e-government services in order to integrate more quality features into them. It outlines the trends in studies conducted over time with an emphasis on the quality dimensions that will lead to the greater usability of e-government services. This survey will serve as a basis for the consideration of key quality factors in the implementation of e-government services with the aim of improving user satisfaction and the likelihood of users to employ the services more often.

ACKNOWLEDGMENT

The Research leading to these results has received Research Project Grant Funding from the Sultan Qaboos University of the Sultanate of Oman, Research Grant Agreement No [SR/EPS/INFS/14/01].

REFERENCES

Abhichandani, T., T.A. Horan and R. Rayalu, 2005. EGOVSAT: Toward a robust measure of e-government service satisfaction in transportation. Proceeding of International Conference on e-Government, pp: 1-12.

Affairs, D.O.E.A.S., 2014. United Nations E-government Survey 2014: E-government for the Future We Want. Retrieved from: unpan3.un.org/egovkb/en-us/Reports/UN-E-Government-Survey-2014.

Affairs, M.O.G., 2015. Government of the Netherlands. Retreieved form: http://www.government.nl/issues. (Accessed on: January 01, 2015)

Africa, G.O.S., 2015. Key Issues [Online]. Government of South Africa. Retreieved form: http://www.gov.za/issues/key-issues. (Accessed on: January 01, 2015)

Andersen, K.V. and H.Z. Henriksen, 2006. E-government maturity models: Extension of the layne and lee model. Gov. Inform. Q., 23: 236-248.

Barbara, L., D.T. Niels Van Der Linden, O. Sander, J. Laurent, K. Hugo, S. Jo, R.L. Gabriella Cattaneo, S. Rebecca and G.C. Jeremy Millard, 2012. eGovernment benchmark framework 2012-2015. In: Commission, D.G.I.S.O.T.E. (Ed.), RAND Europe and the Danish Technological Institute.

Barnes, S. and R. Vidgen, 2000. WebQual: An exploration of website quality. Proceeeding of European Conference on Information Systems. Vienna, Austria.

Barrutia, J.M. and A. Gilsanz, 2009. e-Service quality: Overview and research agenda. Int. J. Qual. Serv. Sci., 1: 29-50.

Bonnardel, N., A. Piolat and L. Le Bigot, 2011. The impact of colour on Website appeal and users' cognitive processes. Displays, 32: 69-80.

Campbell-Kelly, M. and D.D. Garcia-Swartz, 2013. The history of the internet: The missing narratives. J. Inform. Technol., 28: 18-33.

Carlson, J. and A. O'Cass, 2011. Developing a framework for understanding e-service quality, its antecedents, consequences and mediators. Manage. Serv. Qual., 21: 264-286.

Cyr, D., M. Head and H. Larios, 2010. Colour appeal in website design within and across cultures: A multi-method evaluation. Int. J. Hum. Comput. Stud., 68: 1-21.

Ding, D.X., P.J.H. Hu and O.R.L. Sheng, 2011. e-SELFQUAL: A scale for measuring online self-service quality. J. Bus. Res., 64: 508-515.

Do Canto Cavalheiro, G.M. and L.A. Joia, 2014. Towards a heuristic frame for transferring e-government technology. Gov. Inform. Q., 31: 195-207.

Eleanor, T.L., R.T.W. and D.L. Goodhue, 2007. WebQual: An instrument for consumer evaluation of web sites. Int. J. Electron. Comm., 11: 51-87.

Finance, D.O., 2015. Topics [Online]. Australian Government. Retreieved form: http://www.australia.gov.au/topics. (Accessed on: January 01, 2015)

Foley, K., 2006. Using the value measuring methodology to evaluate government initiatives. Proceeding of 2006 Crystal Ball User Conference.

Folmer, E., M.V. Bekkum, P.O. Luttighuis and J.V. Hillegersberg, 2011. The measurement of quality of semantic standards: The application of a quality model on the SETU standard for egovernment. Proceeding of 6th EURAS Annual Standardization Conference-Standards and Development. Kaunas, Lithuania, June 8-10.

Gummerus, J., 2011. Customer value in e-service: Conceptual foundation and empirical evidence. Ph.D. Thesis, Hanken School of Economics.

Hellman, P., 2014. The effect of communicating E-service benefits on consumer E-service adoption. Ph.D. Thesis, Hanken School of Economics.

House, T.W., 2015. Issues [Online]. The United States Government. Retreieved form: http://www.whitehouse.gov/issues. (Accessed on: January 01, 2015)

Islam, M.S. and A. Scupola, 2011. E-service research trends in the domain of e-Government: A contemporary study. Int. J. e-Serv. Mobile Appl., 3(1): 18.

Khalil, M., P. Dongier and C.Z.W. Qiang, 2009. "Overview". In: Information and Communications for Development 2009: Extending Reach and Increasing Impact. World Bank, Washington, DC, pp: 3-17.

Kim, C.S., C.D. Jung, S.Y. Ha and C.H. Park, 2013. A study on the ubiquitous e-voting system for the implementation of e-government. Int. J. Secur. Appl., 7(4): 167.

Kim, S. and D. Kim, 2003. South Korean public officials' perceptions of values, failure and consequences of failure in e-government leadership. Public Perform. Manage. Rev., 26(4): 360-375.

Kingdom, G.O.U., 2014. Welcome to GOV.UK [Online]. Retreieved form: https://www.gov.uk. (Accessed on: December 01, 2014)

Ladhari, R., 2010. Developing e-service quality scales: A literature review. J. Retail. Consum. Serv., 17: 464-477.

Layne, K. and J. Lee, 2001. Developing fully functional E-government: A four stage model. Gov. Inform. Q., 18: 122-136.

Leonova, M., 2009. New index for measuring feedback and e-participation effectiveness of e-government in Russia. Proceeding of 9th European Conference on e-Government. Academic Publishing Ltd., London, pp:445-450.

Levy, Y. and T.J. Ellis, 2006. A systems approach to conduct an effective literature review in support of information systems research. Inform. Sci. Int. J. Emerg. Transdiscipline, 9: 181-212.

Lin, J.S.C. and P.L. Hsieh, 2011. Assessing the self-service technology encounters: Development and validation of SSTQUAL scale. J. Retailing, 87: 194-206.

Magoutas, B. and G. Mentzas, 2010. SALT: A semantic adaptive framework for monitoring citizen satisfaction from e-government services. Expert Syst. Appl., 37: 4292-4300.

Miranda, L. and C.A. Lima, 2012. Trends and cycles of the internet evolution and worldwide impacts. Technol. Forecast. Soc., 79: 744-765.

Osimo, D., 2008. Benchmarking eGovernment in the Web 2.0 era: what to measure and how. Eur. J. ePractice, 4: 37.

Osman, I.H., A.L. Anouze, Z. Irani, H. Lee, A. Balcı, T.D. Medeni and V. Weerakkody, 2011. A new COBRAS framework to evaluate e-government services: A citizen-centric perspective. Proceeding of tGov Workshop'11 (1GOV11). Brunel University, West London.

Osman, I.H., A.L. Anouze, Z. Irani, B. Al-Ayoubi, H. Lee, A. Balcı, T.D. Medeni and V. Weerakkody, 2014. COBRA framework to evaluate e-government services: A citizen-centric perspective. Gov. Inform. Q., 31: 243-256.

Papadomichelaki, X. and G. Mentzas, 2012. e-GovQual: A multiple-item scale for assessing e-government service quality. Gov. Inform. Q., 29: 98-109.

Parasuraman, A., V.A. Zeithaml and A. Malhotra, 2005. ES-QUAL a multiple-item scale for assessing electronic service quality. J. Serv. Res., 7: 213-233.

Peters, R.M., M. Janssen and T.M. Van Engers, 2004. Measuring e-government impact: Existing practices and shortcomings. Proceeding of the 6th International Conference on Electronic Commerce (ICEC '04), pp: 480-489.

Quirchmayr, G., S. Funikul and W. Chutimaskul, 2007. A quality model of e-government services based on the ISO/IEC 9126 standard. Proceeding of International Legal Informatics Symposium. University of Salzburg, Austria.

Reddick, C.G., 2004. A two-stage model of e-government growth: Theories and empirical evidence for US cities. Gov. Inform. Q., 21: 51-64.

Rowley, J., 2006. An analysis of the e-service literature: Towards a research agenda. Internet Res., 16: 339-359.

Rust, R.T. and P.K. Kannan, 2002. E-Service: New directions in theory and practice. M.E. Sharpe In.c, Armonk, NY.

Savoldelli, A., G. Misuraca and C. Codagnone, 2013. Measuring the public value of e--government: The eGEP2. 0 model. Elect. J. e-Government, 11(1): 373-388.

Sharma, S.K., H. Al-Shihi and S.M. Govindaluri, 2013. Exploring quality of e-government services in Oman. Educ. Bus. Soc. Contemp. Middle Eastern Issues, 6: 87-100.

Sutcliffe, A., 2001. Heuristic evaluation of website attractiveness and usability. In: Johnson, C. (Ed.), DSV-IS 2001. LNCS 2220, Springer-Verlag, Berlin, Heidelberg, pp: 183-198.

Tiwana, A. and B. Ramesh, 2001. E-services: Problems, opportunities and digital platforms. Proceeding of the 34th Annual Hawaii International Conference on System Sciences, pp: 1-8.

Wang, Y.S. and Y.W. Liao, 2008. Assessing eGovernment systems success: A validation of the DeLone and McLean model of information systems success. Gov. Inform. Q., 25: 717-733.

Webb, H.W. and L.A. Webb, 2004. SiteQual: An integrated measure of web site quality. J. Enterprise Inform. Manage., 17: 430-440.

Webster, J. and R.T. Watson, 2002. Analyzing the past to prepare for the future: Writing a literature review. Manage. Inform. Syst. Quart., 26: 3.

Wimmer, M.A. and E. Tambouris, 2002. Online one-stop government. In: Traunmuller, R. (Ed.): Information Systems. Springer Science+Business Media, New York.

Wolfinbarger, M. and M.C. Gilly, 2003. eTailQ: Dimensionalizing, measuring and predicting etail quality. J. Retailing, 79: 183-198.

Yoo, B. and N. Donthu, 2001. Developing a scale to measure the perceived quality of an internet shopping site (SITEQUAL). Q. J. Electron. Commerc., 2: 31-45.

Zickuhr, K. and M. Madden, 2012. Older Adults and Internet Use. Pew Internet and American Life Project.