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An Empirical Investigation of Electronic Government Service Quality: From the Demand Side Stakeholder Perspective

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Abstract:

The emergence of the eGovernment (eGov) virtual medium to provide government services to citizens has opened opportunities for public administration to reform and restructure the public service to improve service quality. However, while the restructuring and reforming aspects of eGov service have been explored by researchers, hardly any papers have attempted to investigate eGov service quality requirements of citizens as customers. Based on a literature review, a proposed theory, and an extensive empirical study of two Ontario, Canada cities, we can infer that the service quality of eGov can be conceptualized from four essential formative dimensions of service quality: ease of interaction, fulfillment, trustworthiness, and customer service. In our model, trustworthiness is mediated by security and privacy perceptions. This research provides valuable input towards designing and developing higher quality service for eGov, inspiring further reformation of public administration. Through our proposed approach,

public administration reformation can receive insights from the findings of this paper on the aspects of service quality which citizens need. However, since this research was conducted in only the Canadian eGov context, in order to generalize our findings on service quality perceptions, similar research should be undertaken in other developed and developing countries

Keywords: Electronic Government, Service Quality, Public Administration, Citizens, Survey

Introduction

The emergence of the virtual communication medium as an alternative support for government services has opened an opportunity for public administration to upgrade services to meet citizen requirements in the 21st century. Kim (2010) from an extensive analysis of data from the 2003, 2004, and 2006 *Asia Barometer Survey* collected from citizens in Japan and South Korea, provided significant implications of public administration perceptions which can reflect relevant global trends, “The era of governance, which is concerned with government performance, transparency, citizen participation, and strengthening democratic governance values, affects citizens’ expectations of effective, confident and flexible government leadership in Japan and South Korea”. Kim’s study study concluded that, in Japan and South Korea, citizens are very skeptical about the present performance of public administration in providing good quality service and are expecting higher quality service from the reformation of public administration to impart trust in government and political leaders. Mohr, Deller, and Halstead (2010) also conducted an extensive empirical study that used data from approximately 1,000 small, mostly rural municipalities in Illinois, New Hampshire, and Wisconsin, finding that “governments feel pressure to find more efficient ways to produce necessary services”.

Citizens are paying taxes to governments and they expect to benefit from cost effective and efficient service with the highest quality, competitive with private organizations. The procedure of implementing eGovernment (eGov) provides an excellent opportunity for political commitment to develop good governance and transform public administration, revolutionizing the traditional concepts of a brick and mortar government service system. A reformation of public administration which resulted from the application of information and communication

technology (ICT) in the core design of public administration can achieve the most impact by fulfilling the requirements of major stakeholders. This paper provides a related design that conceptualizes the service quality requirements of citizens, as the primary government stakeholders, to develop an efficient and effective public administration system that is initiated by the adoption and application of ICT to implement eGov. Several researchers have conducted empirical studies to conceptualize service quality of E-commerce as mentioned in Appendix A (Table 1); however hardly any researchers have attempted to explore citizen perceptions of service quality for eGov (Connolly et al., 2010). The fundamental reason for this research gap appears to be due to the non-commercial nature of government service portals. It is widely perceived that public administration reformation through eGov is enthusiastically engaged in satisfying citizens and not customers (Mares et al., 2010; Shareef et al., 2012). But the concept of “reinventing government” has dramatically changed. Now the radicalization of turbulent doctrines of public administration reformation through eGov has resulted in a consensus that the consumer nature of citizens in eGov must ensure top quality service (Moe, 1994; Mosser, 2009; Pierre, 2009). Understanding the need for overarching requirements in formulation of service quality to fill significant gaps in the literature has motivated this paper in conceptualizing service quality perception of citizens for eGov. The objective of the paper is to show how to facilitate public administration review and reformation so as to provide higher quality government services for citizens through eGov.

Theoretical Basis: Conceptualizing Service Quality Dimensions for eGov

Since eGov resembles E-commerce models where customers seek online services from providers, many researchers have drawn inferences from E-commerce to derive the basic attributes of public service design. Although conceptualizing service quality of eGov is the

contemporary demand of public service reformation, the identification of epistemological and ontological paradigms of eGov service quality is still in an emerging and exploratory stage. Researchers are searching for various dimensions of service quality, maintaining consistency with the fundamental characteristics of public administration that should incorporate market mechanisms. Since the locus of public service quality is citizen satisfaction with the concept of treating citizens as customers, the service quality design of eGov can be conceptualized through a marketing view. Based on this approach, we can borrow service quality models from E-commerce as the foundation of a service quality model of public administration.

To develop a consensus model with strong theoretical and empirical justification, we have synthesized the most significant E-commerce service quality models, in order to encapsulate a comprehensive view of service quality attributes. Among all the extant models reviewed to define and measure service quality dimensions of B2C E-commerce, eight fundamental models are considered here; this consideration is based on the previously mentioned criteria to evaluate, explain, and conceptualize service quality dimensions. The constructs and measurement scale items used in these models, based on their generic meaning, are reworded, categorized, and summarized in Appendix A (Table 1). Based on this table, we identified the following constructs considered most important by researchers in service quality of E-commerce. These are:

1. Website design/content
2. Fulfillment
3. Shipping and handling options
4. Security and privacy
5. Customer care
6. Trustworthiness
7. Enjoyment

There are some fundamental differences between public service and private service designs. The coverage and scope of eGov is much broader than E-commerce. E-commerce can focus on profit making by targeting a segmented customer group, and emphasize limited service with no political commitment. On the other hand, government is for all citizens equally. Public administration, to serve government interests, must have a political commitment for democracy, ensure citizen participation in decision making, conceptualize overall citizen perceptions and expectations, and stand for good governance, with no consideration for profit.

Another important aspect to be considered while designing eGov service websites is that a majority of the population may not be capable of handling advanced ICT-related interfaces, and their economic and professional functions may not necessarily depend on ICT. Citizens can use traditional government services without having knowledge of modern ICT. However, from technological, behavioral, economic, and social perspectives, unprivileged societies in any country will tend to seek easy technological interfaces to interact with public service through eGov. Several scholarly articles (Yao and Murphy, 2007; Collier and Bienstock, 2006), including the identification of a technology adoption model by Davis (1989) have postulated that 'easy to use' is a major criteria that all citizens will apply when choosing to adopt the technology of eGov as an alternative service channel of public service. Shareef et al. (2011) found that perceived ability to use and perceived functional benefits are two important eGov adoption criteria for Canadian citizens. The diffusion of innovation theory (Rogers, 1995) also supports these findings.

Considering the distinct differences of eGov and public administration from E-commerce, we modified the seven constructs based on Appendix A, Table 1) in the design of our exploratory study, by deleting the ‘shipping and handling option’ construct and restructuring the ‘website design and content’ construct by incorporating attributes of perceived ability to use. As we find from Appendix A (Table 1), some researchers suggested enjoyment as a supplementary service quality, but some researchers e.g. (Parasuraman, Zeithaml, and Malhotra, 2005) do not agree. More importantly, since seeking public service has no alternatives, citizens interact with eGov domains in a mandatory fashion and thus ‘enjoyment’ is not a necessary construct of public service quality. Based on the constructs depicted in Table 1 and an extensive literature review on eGov (Connolly et al., 2010; Shareef et al., 2011), we have developed the constructs, concepts, and measurement items of an exploratory model of eGov service quality (see Appendix A, Table 2): Ease of Interaction, Fulfillment, Security and Privacy, Customer Care, Trustworthiness, and the dependent measure of Service Quality. A questionnaire based on the measurement items from Table 2 was pretested by four scholarly researchers of the Sprott School of Business at Carleton University who have expertise in reviewing public administration service design, and four PhD students from the social science and natural science departments of Carleton University who have extensive knowledge in using Canadian eGov web services. This was used to verify the validity, consistency, and reliability of the questionnaire to conceive service quality.

In our model, we defined all the measurement items as reflective indicators of the five independent constructs (i.e., the constructs exist independently of the measurement items). The constructs are the attributes that form service quality perceptions of consumers/citizens. The

argument for modeling the five service quality dimensions as constructs of service quality is supported by several authors (Coltman et al., 2008).

Common method variance (CMV) is an important concern for any self reported empirical study. Nevertheless, since the respondents in our empirical study were citizens who did not have any personal affiliation with the eGov website used in the survey, citizens could be assumed to not have self-interested bias. Following this procedure can help to reduce common method bias (Burton-Jones, 2009).

Research Methodology

Based on the survey questionnaire (Table 2), we conducted an empirical study in June, 2010 among Canadian citizens in two cities in the province of Ontario. Respondents were previous users of a Canadian federal government website (www.canada.gc.ca). We selected our survey venue for capturing citizen perceptions of eGov service quality because Canada is a leading country in reforming public administration and developing a successful eGov system (Accenture, 2005).

A structured questionnaire was used to measure the five constructs of service quality along with service quality itself, with a 5-point Likert scale ranging from 1 (strongly disagree/never) to 5 (strongly agree/always). We targeted 2000 citizens for our questionnaire distribution. We distributed 1500 questionnaires in Toronto and 500 in Ottawa, consistent with the population size of these two cities. In each city 50% of the questionnaires were distributed through mail with return postage and the rest were distributed physically, to help reduce CMV. Addresses of the citizens of Ottawa and Toronto living in houses, condominiums, and apartments were selected

from the respective Telephone White Pages. Each city was divided into five regions: east, west, north, south, and center. 50 percent of the questionnaires were distributed to houses and condominiums and 50 percent to apartments. The survey was conducted over a two-month period.

We received 289 completed questionnaires but 3 were almost blank and were discarded. Therefore, the eligible number of respondents was 286, a response rate of 14.3%. Although in a statistical sense this response rate is very small, it is quite satisfactory if we take into consideration that empirical studies involving citizens in a developed country are not likely to achieve a high response rate because citizens are very reluctant to respond to a lengthy questionnaire (such as our exploratory study). In addition, adoption of eGov is only about 35% in Canada (Canadian Statistics Report, 2010), and respondents were only eligible to answer if they were within that 35%. The effective response rate from eligible citizens is therefore about 41% ($14.3\%/0.35$). This is a reasonable response rate.

Findings

We conducted exploratory factor analyses (EFA) on the 37 measurement items of the five independent constructs. We removed those items which loaded at less than .40 (Stevens, 1996, pp. 389-390) or cross loaded a significant amount on more than one factor. We found that 5 constructs with 24 measurement items could be retained. To support the refinement of measurement items to retain, we also reviewed the correlation matrix and analyzed convergence through confirmatory factor analysis (CFA). We observed confirmation of the EFA results in CFA. However, since one item of the Fulfillment construct (FL15) and one item of the Service Quality (SQ3) were loaded in CFA with a loading factor of less than 0.50, we removed those

items. We verified the model fit indices with the recommended values for CFA and found that 5 constructs with the 23 measurement items could be retained. The CFA results indicated that the scale items were reflective indicators of their corresponding constructs, which indicates construct validity (Chau, 1997). In CFA, the average variances extracted (AVE) for each factor and its measures all exceeded 0.50; thus, convergent validity was shown (Fornell and Larcker, 1981). Discrimination is also indicated in this analysis as the largest shared variance between these factors is lower than the least AVE value for each factor and its measures (Espinoza, 1999). The retained items from EFA and CFA are shown in Appendix A, Table 3. The reliability scores for the constructs were measured by Cronbach's alpha. The reliability scores for all the five constructs of service quality as well as the service quality concept itself ranged from 0.725 to 0.953, which suggest an acceptable internal consistency among the items in each construct (Nunnally and Bernstein, 1994).

Model Testing: Causal Relationship by Path Analysis

We used LISREL for Structural Equation Modeling (SEM) path analysis. After the initial path analysis for the five constructs of service quality, we found that the primary model fit indices did not fit well with the data. Based on modification indices to improve model fitness, we added a causal relation from Security and Privacy to Trustworthiness, and error covariance between Fulfillment and Customer Care, Ease of Interaction and Customer Care, and Fulfillment and Ease of Interaction. This improved the model fit. We checked the 't' values for all the constructs. We found Ease of Interaction, Fulfillment, Customer Care, and Trustworthiness were significant constructs of service quality at the 0.05 level. Security and Privacy did not have a direct relationship with Service Quality but this construct has an indirect relation with Service Quality,

mediated through Trustworthiness at the 0.05 level. Therefore, we removed the non-significant causal relation of the Security and Privacy construct with Service Quality and non-significant covariance relations according to recommendations and ran the model again. This time, the four constructs directly and the Security and Privacy construct indirectly through Trustworthiness significantly defined Service Quality, and model fitness indices were good. The final revised model is shown in Figure 1. The χ^2 statistic of 9.26 (df = 7, p value 0.23435), indicates that the model is a good fit. Root mean square error of approximation (RMSEA) (.034) is also good. Other fit measures such as CFI (0.99), GFI (0.98), and NFI (0.99) indicate acceptable model fitness (Chau, 1997; Kline, 2005, pp. 133-144).

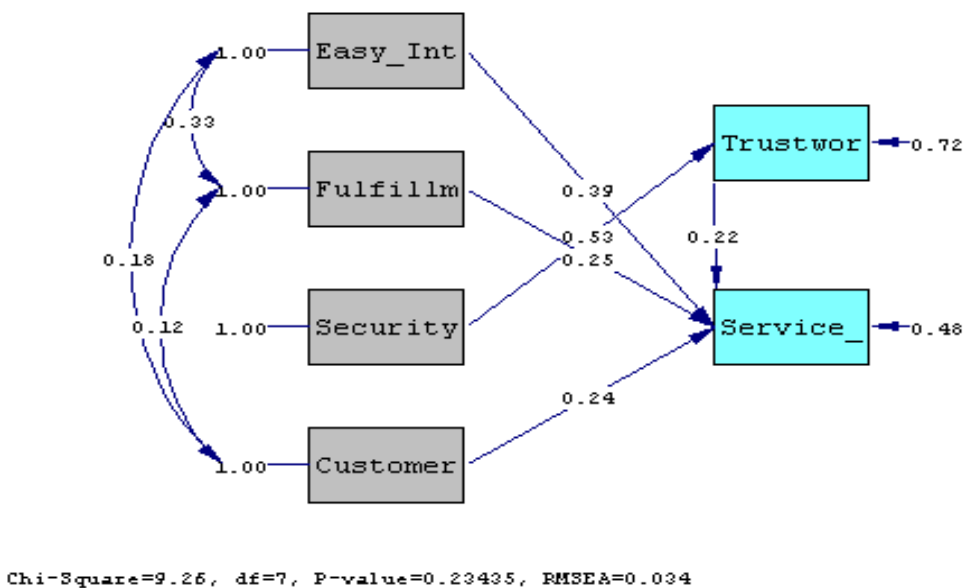


Figure 1 Public Service Design of eGov

Discussion

At this stage, we have to resolve two important issues in order to validate these research findings. The first issue is statistical. For the five dimensions selected for Service Quality we cannot

simply delete any dimension without modifying the epistemological and ontological paradigms of the service quality concept, although this study is exploratory in nature. Although the Security and Privacy construct still has a formative effect on Service Quality, mediated through Trustworthiness, the exclusion of a direct formative relation of this construct from the concept of Service Quality necessitates the modification of the initially defined concept of Service Quality. Now the service quality concept should be theorized in the light of the meaning of the remaining four dimensions: Ease of Interaction, Fulfillment, Customer Care, and Trustworthiness, but with considerations of the indirect effect of Security and Privacy mediated through the Trustworthiness dimension. The second issue is theoretical, involving modifications of the concept of service quality of eGov so it is grounded in the theoretical aspects of ICT, public administration, and behavior.

Ease of interaction is the main formative dimension of service quality of eGov public administration. From both an empirical study and theoretical perspective, Bauer, Falk, and Hammerschmidt (2006) also asserted that ease of interaction is a major component of service quality when using a virtual medium which is supported by unified theory of acceptance and use of technology (UTAUT) (Venkatesh et al., 2003). In the light of social cognitive theory (Bandura, 1986), we believe that higher quality perception of citizens of reformed public administration services offered through eGov and driven by ICT skill is significantly dependent on how users perceive it as being easy to perform intended tasks. Drawing inferences from the diffusion of innovation (DOI) (Rogers, 1995) and the technology adoption model (Davis, 1989), we find logical underpinnings that perceptions of ease of interaction with eGov service can be a potential dimension for service quality (Chen and Li, 2010).

A review of E-commerce, eGov, and marketing literature positively asserts that citizens perceive service quality as good if the service provider can fulfill their different needs for services (Dorner, 2009; Kim 2010; Lin, 2007). Both SERVQUAL (Parasuraman, Zeithaml, and Berry, 1988) and SERVPERF (Cronin and Taylor, 1992) and contemporary literature reviews of total quality management (Kuei and Lu, 2013; Yaya, Marimon, and Fa, 2012) showed that fulfillment of user requirements through services can enhance perceptions of higher service quality. While seeking services, if citizens find that an eGov service system can meet their requirements in a satisfactory manner, citizens will perceive that service quality is good (Handley and Howell-Moroney, 2010). Grounded in both the well-regarded theories of planned behavior (TPB) and reasoned action (TRA), we can conclude that the fulfillment dimension of service quality can be an antecedent of positive eGov service quality evaluation. Several theories of consumer behavior for online technology like the model of PC utilization (MPCU) (Thomson et al., 1991), and the Motivational Model (MM) (Vallerand, 1997) support this finding.

Trustworthiness is one of the major dimensions of service quality among users (Setó-Pamies, 2012). Kim (2010) found from an empirical study that trust can affect perceptions of service quality. Overall service performance of eGov is closely linked with the trustworthiness of the system (Donovan and Bowler 2004). Researchers working on government service performance and social capital found that, both from theoretical and empirical perspectives, trustworthiness is a potential component of service quality, particularly in a virtual medium such as eGov. Using behavioral theories like TPB, we can argue that trustworthiness is a strong motivator to seek service from a provider and thus can improve intention to adopt that service (Ajzen, 1991). For

the proper institutionalization of virtual norms of service, eGov as an institution can attract citizens to its service through perceptions of trustworthiness. This overarching consumer behavioral attitude for online technology is appropriately grounded in the root of several theories like the extension of the unified theory of acceptance and use of technology (UTAUT2) (Venkatesh et al., 2012) and the Motivational Model (MM) (Vallerand, 1997).

Customer service is also a component of eGov service quality. Citizens usually seek customer service while interacting with eGov when they encounter problems. Performance of customer service necessarily plays a crucial role in developing better perceptions about service quality. Prompt, responsive, and caring customer service can be positively related with perceptions of higher quality service (Bauer, Falk, and Hammerschmidt, 2006; Lin, 2012; Sousa and Voss, 2012)). If citizens find that public administration customer service is not available or it fails to meet their expectations of need or promptness, behavioral theories suggest that citizens will be distracted from their perceptions of service quality (Grant 2008; Hondeghem, and Wise, 2010).

Although the literature review of E-commerce suggested that the security and privacy concept can act as a formative construct of service quality in a virtual medium, we found that security and privacy perceptions did not directly relate to perceptions of higher service quality; rather this concept affects perceptions of trust in government service which in turn is a formative construct of eGov service quality. Citizens perceive that private organizations frequently share their information with other private organizations who can use this information for commercial purposes (Bauer, Falk, and Hammerschmidt, 2006). However, public administration cannot and should not share their citizens' information with other organizations for commercial purposes. Under these circumstances, Canadian eGov systems have explicitly demonstrated security

policies, and citizens appear to have interpreted this security perception as a contributor to trustworthiness rather than as a component of service quality. Shareef et al. (2011) conducted an empirical study of Canadian eGov adoption and observed that security and privacy concepts have a direct causal relationship with the formation of eGov trust. Therefore, considering specific characteristics of public service which have political, social, and good governance aspects beyond the characteristics of E-commerce, eGov security and privacy does not appear to be a dimension of service quality, but it contributes towards developing trust in eGov.

Based on our theoretical considerations and literature review, we can infer that the service quality of public administration offered through eGov can be conceptualized based on four essential dimensions: Ease of Interaction, Fulfillment, Trustworthiness, and Customer Care. However, Trustworthiness is mediated by Security and Privacy perceptions. Finally, eGov service quality can be conceptualized as the extent to which eGov service offered by public administration is easy and simple to use for accomplishing intended tasks, to serve citizen needs on time as required, and is reliable, authenticated, and secure, protecting citizen information , and available when required with a timely response.

Conclusions and Research Implications

Although educated and technologically skilled citizens are embracing eGov public service, a government needs to maintain a pragmatic vision that government service is for all (Shareef et al., 2009); it must be available, accessible, and manageable for all citizens equally. If the service offered by eGov is not easy and understandable for all citizens to accomplish their intended tasks and required obligations, citizens will be more frustrated with public service and will evaluate

public service quality as below standard. It is therefore important to pay close attention when reengineering public service offerings into eGov services, including website design, information organization, security features, and application software. This is particularly important in order to cater to the broad range of cognitive abilities of the citizens who will be using the eGov site.

For traditional government services, citizens can discuss expectations, requirements, and complaints with front office representatives. But in the case of eGov services, citizens seek government services by interacting online, making it difficult to meet citizen expectations that are more easily met in a face to face environment. These needs must be diagnosed, analyzed, and conceptualized carefully in order to design systems that will enhance citizen perceptions of public service quality. Citizens expect that eGov operations can be conducted anytime and anywhere. Citizens also want eGov services to be fast. If eGov public services can meet basic expectations of citizens by offering efficient and effective services, citizens will find eGov services to have relative advantages over brick and mortar government services as well as certain private services. Consequently, citizens will perceive higher quality of eGov services.

Behavioral and IS theories and extensive empirical studies have indicated that, since eGov is a virtual medium where the reputation and reliability of face to face interaction is absent, trust plays a significant role in developing positive citizen attitudes towards eGov service quality. In this connection, public administrators should be aware of two important issues. First, in physical office environments, where there are misunderstandings, miscommunications, erroneous services, transaction failures, and policy disputes, administrators can resolve problems by cordial discussions and by fostering understanding, which is not possible in an impersonal eGov

environment. Secondly, during transactions when citizens are providing sensitive personal identification information it might be stolen, hacked, misused, or overcharged. As a result, trustworthiness about eGov is an important dimension of service quality. Public administrators should review privacy and security policies carefully and display required privacy protection information on eGov websites. Much effort needs to be directed to create trust in eGov public service, since bureaucracy and public organizational culture can be a barrier. Administrators should clearly encourage citizens to contact them if they suffer from difficulties arising from any technological or organizational discrepancy. If citizens feel that eGov public service is reliable, they will perceive higher service quality and consequently adopt it.

Citizens do not interact with customer service representatives very frequently, since this only happens when they encounter a problem (Parasuraman, Zeithaml, and Malhotra, 2005). This is a major challenge of public administrators, because this infrequent interaction might cause employees to be behaviorally slow to respond quickly and with empathy to meet service requirements (Perry, Hondeghem, and Wise, 2010). Public policy makers must therefore select customer service representatives with empathy and patience as well as skill in understanding the potentially complex needs of citizens who may be from different demographic, cultural, and social backgrounds. Continuous upgrading and proper training of front office employees are key to managing these problems.

From a theoretical point of view, we find that this study has contributed to existing knowledge of consumer perceptions of service quality. Several behavioral theories like the theory of planned behavior (TPB) (Ajzen, 1991), technology adoption model (TAM) (Davis, 1989), diffusion

innovation theory (DOI) (Rogers, 1995), unified theory of acceptance and use of technology (UTAUT) (Venkatesh et al., 2003), model of PC utilization (MPCU) (Thomson et al., 1991), social cognitive theory (SCT) (Bandura, 1986), and the Motivational Model (MM) (Vallerand, 1997) were applied in modeling consumer preferences for online technology, justifying the service quality dimensions Ease of Interaction and Fulfillment. Trustworthiness and Customer Care are two important concepts of online service quality which were not explored in the aforementioned models of online technology. Shedding light on behavioral learning theory, we propose through the stimulus-consumer response model (Ertmer and Newby, 1993) that, for perceptions of higher service quality, trustworthiness of eGov as a virtual medium can act as a stimulus to create responses of consumers. At the same time, practitioners of eGov should realize that, irrespective to virtual characteristics of eGov, consumers still prefer quality customer service as a potential dimension of service quality. Basically customer service is a phenomenon which is an essential concept for that reflects consumer behavioral perceptions of higher service quality. In addition, most researchers, while studying perceptions of service quality in online behavior, have ignored post-purchase behavior which is a prerequisite needed to understand the total decision making process as identified by Ives and Learmonth (1984) in their customer resource life cycle (CRLF). Therefore, this study has potential value for both researchers and practitioners to improve insights in the reformation of public administration and the design of service dimensions of eGov.

Limitations and Future Research Directions

This research provides valuable knowledge for the design and development of higher quality eGov service that can also serve as an inspiration for reforming public administration. However,

the findings have limitations. Canada is a pioneer initiator of public administration reformation, so its eGov activities have some merit in providing meaningful insight into citizen perceptions of service quality in other developed as well as developing countries. However, without replication of this study in other countries where the cultural context is significantly different from Canada, its findings should be generalized with great caution. The study reflects Canadian public service quality which might be extended to developing countries through further studies in order to generalize these findings. In developed countries a majority of citizens do not use eGov services; any empirical eGov study will have certain non-response bias limitations. Though it is cumbersome, to avoid or at least reduce common method variance, further empirical research could be conducted through interviews.

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Appendix A

Table 1: Quality Constructs and Scale Items from the Reviewed Literature (Items are reworded and categorized)

Dimensions	Authors								
	1	2	3	4	5	6	7	8	9
Website design/content	x	x	x	x		x		x	
Site up-to-date		x			x			x	
Price knowledge			x	x				x	
Product information	x			x	x	x		x	x
Shopping features				x	x	x		x	x
Physical response time	x	x	x	x				x	
Easy navigation	x	x						x	x
Ease of use	x		x	x	x	x	x	x	
Download time	x		x	x	x				
Site availability /access		x	x	x				x	
Ease of ordering		x	x	x	x				
Site effectiveness /functionality		x	x	x	x				x
Ordering methods		x		x		x			
Flexibility—process features						x			x
Customization /personalization	x	x					x		x
Site aesthetics		x		x	x	x		x	
Fulfillment	x		x					x	
Product representation	x		x				x		x
Product selection	x	x							x
Product quality						x	x		
Reliability: product	x					x			x
Reliability: service		x	x		x	x	x		x
Payment methods				x		x	x		
Shipping/handling options				x					
Delivery time/ Order tracking	x	x	x	x			x	x	x
Return policy		x	x			x		x	
Security/privacy	x							x	x
Privacy	x	x	x	x			x	x	x
Assurance: person-to-technology	x		x			x	x		
Security: transactional	x		x	x		x	x		x
Customer care	x								
Empathy: willing and ready to respond to customer needs	x		x	x		x	x		
Assurance: person-to-person		x	x	x		x	x		
Customer support: problem solving	x	x	x	x		x	x		
Empathy: inquiries answered promptly	x	x	x	x		x	x		
Trustworthy						x	x		x
Truthful information	x		x	x		x	x		
Reputation				x					
Enjoyment		x							
Playfulness	x				x				
Attractiveness		x			x	x		x	

[1] Wolfinger and Gilly (2003), [2] Bauer *et al.* (2006), [3] Parasuraman *et al.* (2005), [4] Collier and Bienstock (2006), [5] Fassnacht *et al.* (2006), [6] Cai and Jun (2003), [7] Devaraj *et al.* (2002), [8] Zhang and von Dran (2002), [9] Schaupp and Bélanger (2005)

Table 2: Theoretical Model Design

Name of Variable	Definition	Measurement Items	Source (with modifications)
Ease of Interaction	The extent to which the overall interactions of citizens with the website — in terms of website design, technology, software, organization of information, information searching, information gathering, and forms downloading — is easy and manageable so that citizens perceives their competence in and comfortable ability for using the website	<ol style="list-style-type: none"> 1. Learning to interact with the website is easy for me. 2. This site is simple to use. 3. The website is flexible to interact with. 4. It is easy to navigate the website. 5. Interactions with the website are clear and understandable. 6. I can easily do my tasks while using the website. 7. It enables me to complete a transaction quickly. 8. It is easy to download required documents from the website. 9. This site is well organized. 	Carter and Bélanger, 2005; Evans and Yen, 2006; Parasurama, Zeithaml, and Malhotra, 2005; Santos, 2003; Schaupp and Bélanger, 2005; Shareef et al., 2011 ; Wolfinger and Gilly, 2003; Yao and Murphy, 2007.
Fulfillment	The extent to which eGov fulfills the expectations and requirements of citizens regarding public service availability and delivery	<ol style="list-style-type: none"> 10. All the required services are available in the eGov website. 11. Information is up to date. 12. All the required forms are available in the eGov website. 13. The eGov website delivers services when promised. 14. Through the eGov website, I can complete my task within a suitable time frame. 15. The website quickly provides services. 16. The website sends out the required documents when ordered. 17. The website is appropriate for my needs. 18. The website fits well with the way that I like to gather information. 19. The website gives a wider choice of interactions with different functions compared to interactions with the physical government office. 20. The website helps to accomplish tasks quickly. 	Bauer, Falk, and Hammerschmidt, 2006; Chen and Thurmaier, 2005; Collier and Bienstock, 2006; Parasurama, Zeithaml, and Malhotra, 2005; Ritz 2009; Shareef et al., 2011; Yoo and Donthu, 2001
Security and Privacy	The extent to which citizens perceive the eGov website is safe to disclose personal and financial information during interaction and transaction with websites, and the website does not disclose or share information with others or misuse for any purpose.	<ol style="list-style-type: none"> 21. The website is safe to interact with for financial purposes. 22. The website has adequate security features. 23. The website protects information about my credit card. 24. The security policy at the website is clearly stated. 25. I would hesitate to provide information to the website. 26. The website protects my disclosed information. 27. The website does not share my personal information with other sites. 	Chen and Thurmaier, 2005; Collier and Bienstock, 2006; Devaraj, Fan, and Kohli, 2002; Janda, Trocchia, and Gwinner, 2002; Shareef et al., 2011; Yao and Murphy, 2007.

Name of Variable	Definition	Measurement Items	Source (with modifications)
Customer Care	The extent to which customer care personnel of eGov effectively, efficiently, promptly, and sympathetically takes care and solves affairs and disputes of citizens.	28. The website remembers/ recognizes me as a valuable customer. 29. The customer care of the website addresses my specific needs. 30. The website takes prompt action when I encounter problems performing my tasks. 31. Online customer care is available at all times. 32. The customer care of the website responds very quickly.	Janda, Trocchia, and Gwinner, 2002; Parasurama, Zeithaml, and Malhotra, 2005; Shareef et al., 2011; Wangpipatwong, Chutimaskul, and Papasratorn, 2005; Wolfenbarger and Gilly, 2003
Trustworthiness	The extent to which the eGov website is able to provide attitudinal confidence for reliability, credibility, safety, and integrity among citizens	33. The website is, overall, reliable in providing service. 34. What I do through this website is guaranteed. 35. I have confidence in the performance of the website 36. The government will take full responsibility for any type of insecurity during interactions/ transactions at the website. 37. Legal and technological policies of the site adequately protect me from problems on the Internet.	Balasubramanian, Konana, and Menon, 2003; Collier and Bienstock, 2006; Fassnacht and Koese, 2006; Kim, 2010; Shareef et al., 2011
Service Quality	The extent to which the eGov website can provide citizens' perceived needs regarding public service in terms of behavioral, technological organizational, social, economic, and political perspectives so that user expectations regarding public service can be satisfied	1. The site offers highly efficient service. 2. The site offers highly effective service. 3. I am happy with the overall service of the site. 4. I am satisfied with my experience in its overall service.	Collier and Bienstock, 2006; Devaraj, Fan, and Kohli, 2002; Fassnacht and Koese, 2006; Janda, Trocchia, and Gwinner, 2002; Parasurama, Zeithaml, and Malhotra, 2005; Wolfenbarger and Gilly, 2003

Table 3 Retained Constructs and Measurement Items and Service Quality Concepts after EFA and CFA

Construct	Measurement Items
Ease of Interaction	EI 1, EI 2, EI 4, EI 6
Fulfillment	FL 10, FL 13, FL 14, FL 16, FL 17, FL 18
Security and Privacy	SP 21, SP 23, SP 24, SP 26, SP 27
Customer Care	CC 29, CC 30, CC 31, CC 32
Trustworthiness	TR 33, TR 35, TR 36, TR 37
Service Quality	SQ 1, SQ 2, SQ 4