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SQ mGov: A Comprehensive Service Quality Paradigm for Mobile Government (mGov)

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Abstract
Service quality of Mobile Government (mGov) is an important concept, however to date there has been relatively little work conducted in this emerging area. Based on an empirical study conducted among 1404 users of mGov in Mumbai, India, this study conceptualizes and identifies four service quality dimensions – connectivity, interactivity, understandability, and authenticity – as the formative constructs of mGov service quality, and 16 measuring items to evaluate those dimensions as the reflective indicators.

Keywords: mGov, eGov, Citizen, Service quality, Consumer behavior

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Introduction

The proliferation in recent years of information and communication technology (ICT) in the public sector has created much scope to reengineer public service systems which ultimately aims to develop a new public administration through Electronic Government or eGov. This eGov system, with the increase in electronic services, potentially affects traditional public administration service concepts (Bryer, 2007).

Researchers and leaders of the democratic movement now exhibit the strong belief and politicians have internal realization that the population has become increasingly frustrated with functions and performances of traditional public administration service design, their service delivery systems, and their overall service quality (Kim, 2008; Kim, 2009; Rana et al., 2013; Seligson, 2002; Shareef et al., 2012). As stated by Kim (2010), "Public administration in Asia is continuously challenged by government reforms in response to demands for decentralization, economic development, and globalization and to citizens' demands for strong democratic and transparent governance". In many countries, either for all services or for certain services, public service systems enjoy a monopoly and suffer no competitive pressure to achieve efficiency and effectiveness or to provide high-quality service to compete with the advanced private business sector with dynamic distinctive competencies. However, citizens are exhaustively reluctant to seek government services, and they have a severely negative impression of public administration, which, since the last decade of the last century, has severely affected politicians' popularity in democratic elections (Bel and Fageda, 2008). Consequently, underperformance of public services potentially undermines the government's performance which leads to a negative perception of the fundamental credibility of the capitalist government system. Both developed and developing countries realized this trend and felt imminent revolution in the public administration through the application of information and communication technology (ICT) in the hope to enhance the performance of government services (Damodaran, Nicholls, and Henney, 2005).

To fulfill this imperative urge of the 21st century democratic movement, the public administration review process is forced to upgrade its service quality paradigm through the synergy of ICT with public service reformation in eGov, which has received enormous attention from political scientists, public administrators, sociologists, and, above all, citizens. Designing the highest-quality service with citizens' participation is the ratified paradigm of public administration that defines the ultimate role of public administrators in providing competitive services that citizens and diverse communities of interest demand from public systems. However, the majority of populations are not capable of handling modern ICT-based systems like computers and the Internet which are essential components of eGov. This inability to use computers and the Internet to seek government services does not necessarily impart positive perceptions of functional benefits among the populations of most countries, particularly in developing ones (van Beuningen et al., 2009). Bandura's (1986) self efficacy theory also supports this argument. Several researchers (Heeks, 2002; Van Dijk et al., 2008) asserted that due to the unavailability of resources for citizens in rural areas, which sometimes comprise the majority of populations, eGov rather creates a severe digital divide which inhibits the proliferation of good governance, which is the ultimate aim of public service. Considering these potential challenges, researchers are now skeptical about the expected benefits of eGov (Blackman, 2006; Dwivedi and Irani, 2009; Global Dialogue, 2007; Trimi & Sheng, 2008).

These challenges led the scope of Mobile Government (mGov) to flourish, particularly in developing countries.

eGov has been extended and supplemented through mGov in several European, Asian and African countries, not only to offset the obvious shortcomings of eGov but also to facilitate the enhancement of generic and expected service quality targeted through the reformation of public administration (Blackman, 2006; Trimi & Sheng, 2008). mGov is an extended subset of eGov where interactions with government services can be conducted through mobile devices (Kumar & Sinha, 2007). mGov also offers some explicit services which have potential where real-time information is important, such as terrorism alerts, traffic and road conditions information, severe weather forecasts, police investigations, disaster management and land inspection (Archer, 2007). As a completely alternative way of providing public services through online wireless media, mGov has already been accepted in several countries for providing several government services which can be used by citizens from anywhere and at any time with impressive efficiency and effectiveness (Misuraca, 2009; Naqvi & Al-Shihi, 2009). The substantial growth of mobile use by all classes of people throughout the world has created enormous opportunity for governments to provide government services through mGov with convenient functionality including features such as user proximity, accessibility, instantaneous messaging and real-time information exchange (Vincent and Harris, 2008).

As has already been mentioned, mGov user base is comprised of all classes of people, unlike eGov, as it requires little technological knowledge. Nevertheless, as a new medium of offering public services with higher quality and efficiency, addressing, revealing and formulating citizens' perceptions and further expectations of public services in mGov is a complex, dynamic and dialectic issue. Researchers and policymakers regard mGov as a dynamic system that offers higher-quality, efficient, and effective public services which can meet the real challenges of the public service system (Trimi & Sheng, 2008). Market researchers and academics realize that perception of excellent service quality in mGov is imperative for both privileged and unprivileged customers to be satisfied with and loyal to the public service system, and it is a mandatory component for public administration to enhance competitiveness and profitability. Beginning from the 90th era, along with public administration researchers and politicians, the National Performance Review (NPR, 1993) of USA proclaimed that cutting red tape and putting citizens first should be the contemporary doctrine for public administration in any country and their comprehensive effort in this aspect led to the realization that better service is the main driving force for public sector reformation through mGov. It is now widely accepted that providing better-quality service is at the core of public administration's success and competitiveness (Parent et al., 2005; Perry et al., 2010). This current research has engaged in identifying and theorizing the epistemological and ontological paradigms of the service quality concept for public administration. More specifically, in this research, we are enthusiastic about revealing consumers' perceptions regarding the service quality dimensions of public administration reengineered and restructured through mGov.

Online Service Quality

Several researchers (Fassnacht and Koese, 2006; Parasuraman et al., 2005) have argued that due to distinct service patterns, service quality of the virtual medium is presumably different from

traditional service quality in several dimensions, as illustrated in SERVQUAL (Parasuraman et al., 1988) or SERVPERF (Cronin and Taylor, 1992). Boyer, Hallowell, and Roth (2002) defined electronic services, primarily focusing on E-commerce, as "all interactive services that are delivered on the internet using advanced telecommunications, information, and multimedia technologies". Fassnacht and Koese (2006) defined online services as "Services delivered via information and communication technology where the customer interacts solely with an appropriate user interface (e.g., automated teller machine or website) in order to retrieve desired benefits." These definitions are primarily derived from electronic commerce (eCommerce). In this aspect, it is worth noting that from extensive empirical studies for service quality of the virtual medium, Janda, Trocchia and Gwinner (2002) recommended that, while designing service quality, an important consideration is specifying the type of service functions one is evaluating; in other words, service quality for the virtual medium should be industry specific. Nevertheless, as a new wave of delivering services to consumers, particularly for public service domains, the effort of deriving service quality dimensions is significantly exploratory. For this reason, in this research of conceptualizing the service quality of public administration offered through mobile devices, formally termed as mGov, we commence our theoretical development strategy by focusing on concepts of eCommerce service quality.

Electronic Commerce (eCommerce) Service Quality

Although eCommerce as a private entity is engaged in delivering services to certain segments, in contrast with eGov which deals with overall public service for all citizens, due to the unavailability of any comprehensive service quality models of eGov (or mGov) we started our digging to reveal service quality dimensions considering fundamental characteristics of the virtual medium through eCommerce. We reviewed leading service research, marketing, and information system journals for the last decade and identified around 49 papers which explicitly deal with the service quality aspects of eCommerce. We again scrutinized those studies and listed a total of 13 models which are fundamental in nature and can be used for conceptualizing service quality dimensions of the virtual medium. We organized those 13 eCommerce service quality models in Appendix (Table 1). These models of service quality have identified constructs and measuring items of service quality. Nevertheless, we hardly found any consistency among those service quality models in constructs and measuring items focusing on business-to-consumer (B2C) eCommerce. Measuring the items and constructs of service quality of these models is quite different and inconsistent in terms of number of scale items, number of constructs, and definition of the items and constructs. Therefore, we tried to identify the generic meanings of those constructs and respective measuring items of the service quality models presented in Appendix (Table 1) and revealed the following broad categories of service quality dimensions. These are:

- Communication: illustrates the proper and convenient communications with the customers.
- System availability: the correct technical functioning of the site.
- Website design: encompasses all elements of the consumer's interaction with the website, including navigation, information search, order processing, appropriate personalization, and product selection.

- Fulfillment/reliability: includes specific and accurate display and description of a service so that there should not be any ambiguity regarding service quality and delivery time of the same service ordered.
- Customer service: a recovery issue that defines responsive, caring, and prompt response to customer inquiries.
- Privacy/security: privacy of shared information, security of personal identification information and financial transactions like credit card payments.

Electronic Government (eGov) Service Quality

We did not find any holistic approach to define service quality of eGov. Most of the researchers (Naqvi and Al-Shihi, 2009) attempting to reveal eGov service systems are primarily engaged in revealing its different adoption factors which reflect not only the service perspectives of eGov but also product, facility, and technology related issues irrelevant to service systems like resource availability, awareness, cost and software. Researchers (Carter and Bélanger, 2005; Irani et al., 2009; Parent et al., 2005; Warkentin et al., 2002; Williams et al., 2009) are also very enthusiastic about revealing trust in government and, thus, the effect of trustworthiness on public administration which is a component of service quality. Some researchers who are interested in eGov's E-service (Chun, Young, and Hal, 2005; Evans and Yen, 2006; Shareef et al., 2011; Warkentin et al., 2002) fundamentally defined the different distinct service aspects of eGov. However, while we regard this as the primary step in identifying service quality dimensions, these authors addressed different aspects of the eGov service, delineated the relation of these aspects with adoption behavior of eGov, and primarily identified that citizens pragmatically perceive public service quality as inferior and do not adopt eGov if:

- They cannot find the website or get connected.
- The system is complex and not easily understandable.
- The software is not user friendly and the information placement, organization, and content are not up to date.
- The required information and forms are not available.
- The overall process and transaction is not efficient.
- They fail to complete transactions and receive the required service.
- The outcome of the service is not reliable.
- They are not assured about the privacy and security of the disclosed information and transaction.

mGov Conceptualization

mGov is a new trend in reforming, restructuring, and reengineering public services that can enhance and upgrade existing eGov services with more competitive and versatile applications. In many countries, this service is primarily available through handheld devices, particularly mobile phones. We conceptualize mGov, which is an extension of the existing eGov, as a reformed public service system which can be connected to and available through any mobile devices from anywhere and at anytime to facilitate countrywide users of government services with more efficiency, mobility, and scope of availability, and less complexity (Archer; 2007; Misuraca, 2009; Naqvi & Al-Shihi, 2009; Trimi & Sheng, 2008). Researchers identified some distinct

behavior of mGov and its users. First, unlike eGov, mGov users can be either literate or illiterate, privileged or unprivileged, and urban or rural people (Blackman, 2006; Global Dialogue, 2007). Since mobility and real-time information are two overarching characteristics of mGov, website availability and connectivity are presumably potential requirements from mGov (Misuraca, 2009; Naqvi & Al-Shihi, 2009; Trimi & Sheng, 2008). Most of the services of mGov offered through mobile phones are conducted by SMS (short messaging service) and the complete process of seeking any service or transaction (like purchasing lottery or public transport tickets, getting exam results from the Education Board, paying utility bills, or tax) has several sequential steps. Although the steps are self-explanatory, understanding the steps has real importance since the service users are also illiterate village people and mobile phone operating time is costly. Return SMS from the public service domain typically confirms the reliability of the process and outcome; however, without physical contact (which is available in traditional brick and mortar government services) and even without the visual appearance of a government website (which is available in eGov), process and outcome authenticity are dominating distinctive characteristics of mGov which consumers essentially require (Misuraca, 2009). Security is an imperative concern for any virtual medium like eCommerce or eGov; however, since mGov uses open networks and wireless connections between government portals and mobile users, security is a vulnerable and obligatory issue for mGov service design (Archer; 2007).

Research Design

In this section, we figured out the theoretical and methodological perspectives of the design of the service quality framework for consumers of mGov as the research objective. While investigating the theoretical paradigms of the quality dimensions and measuring items of service quality of mGov, this research explores the service quality models of eCommerce and eGov as depicted in the previous sections and contrasts those factors and issues with the distinctive service requirements of mGov. We have also examined theories related to technology adoption, public administration and organization, psychology, and marketing to conceptualize as well as justify the service quality dimensions of mGov.

Model Development

Synthesis of the service quality models of eCommerce from the previous sections delineated that connection between the users and the service providers in a virtual environment, through a wired or wireless medium, is certainly regarded by the consumers as an important aspect of service quality. eGov service researchers also asserted the same requirements. mGov users might seek government services through mobile phones (mostly) from remote places at any time (24/7). While required, if they cannot reach government services to fulfill their intended tasks through their mobile phones, they cannot regard mGov service as effective. Connection from anywhere and at any time is very important from a technological perspective. Referring Bentham's principles of legislation (1931) and the theory of mere exposure (Zajonc, 1968), consumers preference is highly dependent on cognitive attitude which is influenced by connectivity. Since consumers use this service in their busy lives even during travel, and since using mobile phones or any handheld devices is costly, from an economic perspective, certainly they require connection with reasonable speed. Transaction cost analysis (Shelanski and Klein, 1995) supports this view. Shedding light on theory of reasoned action (TRA) (Ajzen & Fishbein, 1980),

we perceive that assurance of a certain connection through mobile phones with government service domains definitely exaggerates appreciating beliefs of positive attitude towards perception of higher service quality. Therefore, we argue that connectivity could be an important formative construct of the service quality concept of mGov. Based on the prior studies on service quality of eCommerce and eGov and integrating this view with mGov characteristics, we have defined the service quality dimension "Connectivity" as the formative construct of the service quality concept and also identified the reflective indicators of this construct (connectivity) as the measuring items shown in Appendix (Table 2). The scale items of the construct connectivity, attempted to measure availability and accessibility of mobile phone connection, are grounded on the technology adoption behavior theories like, theory of planned behavior (TPB) (Ajzen, 1991), technology adoption model (TAM) (Davis, 1989), and diffusion of innovation theory (DOI) (Rogers, 1995) and extracted from literature review mentioned in Appendix (Table 2). This is also supported by model of PC utilization (MPCU) (Thomson et al., 1991).

In any virtual medium, either eCommerce or eGov, self-service technology predominantly controls the overall interactions between the users and the service providers. Consequently, we have evidence from Table 1 and also from adoption factors of eGov that in the absence of physical contact, consumers' ability to interact with this virtual medium with technological efficacy and manageable effort contributes potentially to perceiving higher service quality. This is also a phenomenon of mGov. In this system, consumers seek government services through their mobile phones where they have to follow some technological steps to accomplish their intended jobs. From a technological perspective, consumers will perceive the mGov service as convenient with high quality if they are able to complete their task with minimum efforts. The technology adoption model (TAM) (Davis, 1989), with the construct ease of use, and the diffusion of innovation theory (DOI) (Rogers, 1995), with the construct complexity, justify the inclusion of "Interactivity" as an important quality dimension (formative construct) of service quality. Bandura's (1986) self-efficacy theory asserts that, if users believe behaviorally and psychologically that they are capable of handling the process of mGov service, they recognize mGov service systems as high quality, which also reflects the assertive belief of positive evaluation of service quality, the central concept of TRA. We therefore argued that "Interactivity" is a potential formative construct of service quality of mGov, and thus listed it in Appendix (Table 2) with the concept of this construct and the reflective measuring items of this construct. Since the measuring items of interactivity construct share the common theme of users' ability to adopt mGov, and they are interchangeable and have high inter-correlations, they should be considered as reflective indicators (Coltman et al., 2008). The measuring items of interactivity, extracted from literature review referenced in Appendix (Table 2), have strong support from social cognitive theory (SCT) (Bandura, 1986) and motivational model (MM) (Vallerand, 1997) to reflect the construct.

Since, in a virtual medium, consumers typically conduct their tasks without any human assistance, understanding of the process and interpretation of the outcome are very important to the consumers. We observed strong evidence in favor of this argument from the previous two sections regarding service quality of eCommerce and eGov. Conducting any task in the public service domain through mobile phones or any other handheld device essentially requires you to follow some sequential steps to meet the goal. Several researchers (Bhatti et al., 2000; Cao et al.,

2005) of the virtual medium asserted that information clarity and outcome interpretability are potential attributes for consumers to perceive higher service quality in the system. For instance, to buy a train ticket through SMS you must follow several steps which are sensitively interconnected. Missing one step or putting in the wrong information can lead to an inappropriate outcome which may not be the intended interest of the consumer. Policymakers and researchers streamlined mGov to alleviate the long list of shortcomings of eGov. Among the pronounced challenges that eGov faces are its unsuitability to poor, illiterate, and rural people due to unavailability of resources and technological inability (Ho, 2002; Ebrahim and Irani, 2005; Hollifield and Donnermeyer, 2003). mGov is the supplement of eGov which is explicitly expected to overcome such barriers. Therefore, for all kinds of users of mGov, process and outcome understandability is regarded as one of the potential segments of service and can be treated as the formative construct of service quality of mGov. From the literature review of eCommerce service quality and eGov, as illustrated in the two previous sections, while contrasting with mGov characteristics also described in the last section, we define the concept of the construct "Understandability" as the formative construct of the service quality concept and the measuring items as the reflective indicators of the same construct shown in Appendix (Table 2). The measuring items have strong theoretical support to conceptualize the structural meaning of understandability as several studies shown in Appendix (Rable 2) indicated the formation of this construct. As a virtual medium, from a technological perspective, this argument is justified. From an organizational perspective, reengineering and reformation of public services to make this system suitable for interacting through mobile phones is a challenging issue and consumers will have a positive attitude and thus intention to perceive higher service quality if they have the belief to understand the process and interpret the outcome. Both TRA and expectancy disconfirmation theory support this doctrine.

The literature review of the eCommerce and eGov service quality clearly indicates that reliability or authenticity of the process, transaction, and outcome is always a serious concern of consumers when considering using these service domains. For a public service, from an organizational perspective, reliability is sometimes a more vulnerable concern, since citizens have little faith in public service efficiency, empathy, transparency, accountability, and their employees' motivation to serve consumers properly (Kim, 2008; Kim, 2009; Seligson, 2002). When public services are offered through mobile phones or handheld devices, from a technological perspective, authenticity of information, process, transaction, and outcome are more sensible, as in mGov users even do not interact with the government website when they do it through SMS. Nevertheless, through mGov, consumers seek important services like buying travel tickets, paying utility bills, taxes, duties, and contacting physicians for health. Therefore, reliability of the complete interaction in mGov has potential merit and is perceived by consumers as an important dimension of service quality. Almost all the eCommerce service quality models and eGov service issues identified reliability as an important component of the service system of the medium. Traditional service quality models like SERVQUAL and SERVPERF also recognized the system's authenticity as an integral dimension of service quality. Shedding light on the TRA, we understand that authenticity of the complete process, including transaction and outcome in seeking public services through mGov, is a source of positive belief that affects attitudes and the intention of perceiving service quality as good. Therefore, we have argued that "Authenticity" is one of the service quality dimensions of mGov and a formative construct of the service quality concept, and we have defined this construct with its reflective measuring indicators in Appendix

(Table 2). Basically authenticity is one kind of facilitating condition of mGov, and thus, the measuring items of authenticity have strong theoretical support from unified theory of acceptance and use of technology (UTAUT) (Venkatesh et al., 2003).

The safety of disclosed personal identification and financial information is always a serious concern for consumers seeking service from eCommerce or eGov (Ruscio, 1996). We observe strong support in favor of this argument from Table 1 and from the section dealing with eGov's service quality. In the previous section, we also identified that, since in mGov we use an open network, security is more vulnerable for mGov service. While conducting an intended task, consumers disclose sensitive information and consequently require safety and privacy of their financial and personal identification information. Transaction cost analysis asserts this rationale through uncertainty of the system which is applicable for the wireless virtual medium. When consumers believe that their disclosed information is protected and not shared with others, they certainly have a positive attitude and intention in evaluating the service quality of mGov. Based on this argument and drawing inference from the previous section of eCommerce and eGov service quality models, we argued that "Security" is a service quality dimension of mGov and is a formative construct of the mGov service quality concept. From the literature review of eCommerce, eGov, and trust as described in the previous sections, we have defined the formative construct "Security" of the service quality concept and the reflective measuring items as listed in Appendix (Table 2). Several studies, based on technology acceptance theories, used the measuring items to reflect security concept as mentioned in Appendix (Table 2).

Finally, based on the aforementioned five formative constructs of service quality as stated in Appendix (Table 2), we have defined the concept of service quality of mGov, here termed as SQ mGov, and included the measuring items of service quality from eCommerce service quality measuring items to identify predictive and nomological validity of the service quality concept. Since those five quality dimensions are formative constructs of mGov service quality, the concept of service quality, i.e., SQ mGov, must represent the comprehensive and holistic view of the paradigms of those five constructs (Borsboom et al., 2004; Coltman et al., 2008). SQ mGov is a service quality concept which is formed with the integrated paradigms of those five constructs or service quality dimensions without any assumptions of the patterns of inter-correlation between these dimensions. Since service quality is an abstract concept comprised of certain service attributes, conceptual modification in service quality cannot affect the five quality dimensions/constructs; rather, the constructs affect the concept of service quality. This argument is theoretically supported by eCommerce researchers (Bauer et al., 2006; Collier and Bienstock, 2006; Parasuraman et al., 2005; Wolfinbarger and Gilly, 2003). Therefore, we have formed our SQ mGov model in such a way that the five service quality dimensions are the formative constructs of the service quality concept. This model formation validity is supported by Borsboom et al. (2003; 2004); Diamantopoulos and Siguaw (2006). We have defined the five service quality dimensions as the independent latent constructs which could be measured by consumers' responses to the measuring items that are evoked by these constructs. The measuring items under each construct share a common paradigm and variations in any measuring items are caused by variations in the respective constructs. Therefore, modeling the measuring items of those five quality dimensions as the reflective indicators of the respective service quality dimension has theoretical (cause and effect) validity (Borsboom et al., 2003; 2004; Coltman et al., 2008). From detail theoretical exploration of service quality models like SERVQUAL and

SERVPERF and technology adoption behavior related theories like (UTAUT) (Venkatesh et al., 2003), TPB (Ajzen, 1991), TAM (Davis, 1989), DOI (Rogers, 1995), prospective gratification (LaRose et al., 2001), reception approaches (Cunningham and Finn, 1996), and social cognitive theory (Bandura, 1986) and in-depth literature review of service quality of eCommerce and eGov listed in Appendix, we developed the comprehensive as well as parsimonious service quality model for mGov, termed here as SQ mGov.

Empirical Validation

This study is designed to conceptualize citizens' perceptions of the quality of public services available through any handheld devices like mobile phones – services which we termed as mGov. The questionnaire, as stated in Table 2, was pretested by two scholarly researchers of the DeGroote School of Business at McMaster University, Canada who have expertise in reviewing public services offered through mGov, and two PhD students from the same school who have extensive knowledge in seeking government services through handheld devices. Following their suggestion, we reworded the questionnaire. The structured questionnaire was used to measure the 5 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). Based on the survey questionnaire, as mentioned in Table 2, we conducted an empirical study in January, 2011 among consumers in Mumbai, India. There are 25 measuring items for five latent constructs of service quality. To reveal predictive and nomological validity, we also introduced four measuring items to capture the concept of service quality. We also added three demographic questions regarding profession, income, and computer skill. We have chosen citizens of Mumbai, India as our empirical study respondents to ensure extensive response from real experience and perception. The proliferation of eGov has been observed most extensively in North America and Europe (as well as some countries of Asia like Singapore, South Korea, and Japan) (Accenture, 2005). However, depending on the growth of mobile phone usage and several barriers in the growth of eGov, mGov has been extended mostly in Asia and Africa (and in some countries of Europe) (Misuraca, 2009; Naqvi & Al-Shihi, 2009). Due to super advancement in ICT-related infrastructure and human resources, India was one of the first countries in the world to claim a substantial achievement in the implementation of mGov (Kapugama, 2009). Mobile phone usage in India is extremely high and approximately 50%–60% of government services in India can be delivered via the mobile channel (Global Dialogue, 2007). mGov growth rate is very fast in Mumbai, India (Global Dialogue, 2007). Therefore, Mumbai, India is a justified venue to capture consumers' perceptions of mGov's service quality. To capture consumers' specific perception regarding a public service of mGov that is performed through mobile phones, we mentioned two of the most popular public services in the questionnaire that can be conducted through mobile phones.

In the questionnaire, consumers were asked to respond based on their recent experiences (within the past three months) of interacting/accomplishing any of the following two tasks through their mobile phones. These tasks are:

1. Online challan (receipt for tax or government fees deposit) status inquiry: Indian citizens can conduct challan status inquiries through mobile phones to verify whether banks have correctly uploaded the details of their tax or government fees deposit and also get a

receipt for the same deposit. The Income Tax Department (ITD) of India offers this SMS-based services to citizens and it is widely used among Indian citizens (Kapugama, 2009).

2. Property registration: For land registration and property ownership verification, citizens can now seek public services through mobile devices. When this service was offered through paper documents in brick and mortar government offices, it was a major source of corruption. Recently, this mGov service has become very popular among citizens in remote areas of India (Kumar & Sinha, 2007).

In a cover letter attached with this structured questionnaire, citizens were also requested not to respond if they did not have direct practical experience of seeking the above-mentioned two tasks within the past three months.

The field survey was conducted in Mumbai city and adjacent suburban/rural areas with 3,000 general citizens. The questionnaire was primarily printed in English and then translated into Hindi language, so that the less educated people in both the suburban and rural areas could understand the exact meaning of the questions. To distribute the questionnaire among the citizens, 20 university students were engaged as research assistants. We collected the addresses of Mumbai city residents from the White Pages telephone directory. To choose the respondents randomly and to ensure variability among the samples, we divided the city into five regions: east, west, north, south, and central. We also collected the addresses of residents living in the suburban/rural areas in the east, west, north, and south regions outside the city. In all regions, we distributed the questionnaires among residents of slums, houses, and apartments. The slum locations were selected from the White Pages, but the addresses of the residents in different slums were selected randomly.

With the help of our volunteer students, we physically went to 2,000 addresses. We distributed a questionnaire to 1,000 of these addresses physically by hand delivering them and asking them to send them back to us after completion through the prepaid return postage. The other 1,000 were distributed among residents by meeting with them face to face and requesting that they fill them out at that moment. We also distributed 1,000 questionnaires by mail with return postage. To encourage participation, five gift items of value five hundred rupees each were offered through coupon draws for each category of samples. We used different-colored envelopes for these three types of questionnaire distribution to identify the responses from each source. From the first category where we contacted them physically but they sent us the filled out questionnaires later on, we received 609 completed survey instruments.

From the face-to-face survey collection, we received 587 filled out survey questionnaires. From the mail survey, we received 214 responses. Therefore, in total we received 1,410 filled out questionnaires. Of these, six were mostly blank or improperly completed and were discarded. This left a total of 1404 valid responses for the final analysis, indicating a 47 percent valid effective response rate. The small number of missing values in the remaining cases appeared to be randomly distributed, and was replaced by the mean values of the variables involved.

Common method variance (CMV) is a methodological issue for this type of self-administered questionnaire (Malhotra et al., 2006). However, following these three methods of data collection, we made a significant attempt to reduce this statistical problem (Burton-Jones, 2009). We can

claim that the sample selection and response method is free of bias as the respondents answered willingly without any affiliation or interest for the outcome. Since our respondents are general consumers who have real experience in seeking government services from mGov through mobile phones, thus have no personal interest in providing misleading information in this survey, CMV is significantly minimized in this empirical study (Murphy et al., 2004).

Analysis and Findings

We have first conducted exploratory factor analysis (EFA) in SPSS to retain the effective reflective indicators to measure the respective constructs of service quality and also to verify the formation of the constructs with construct validity. Then we conducted confirmatory factor analysis (CFA) in LISREL among the retained scale items of the constructs to further identify construct and discriminant validity. We identified the coefficient alpha to verify the reliability of the measuring items to measure the construct. Finally, we conducted structural equation modeling through a path analysis to identify the causal relations of the formative constructs with service quality of mGov.

We first conducted exploratory factor analysis (EFA) on the preliminary 25 scale items measuring the five independent constructs which are formative constructs for the concept service quality of mGov. We used principal component analysis as the extraction method and varimax rotation as the rotation method. We removed those items which loaded less than .40 (Stevens, 1996, pp. 389-390) or cross loaded more than one factor. However, simultaneously we also examined the correlation matrix of the indicators of each construct separately. We identified the same five service quality dimensions as the factors from our EFA which we developed from our theoretical arguments. However, among the 7 measuring items of the connectivity construct, we retained 5 items based on our aforementioned specifications (C5 and C6 in Table 2 were removed due to a loading factor of less than 0.40). Through EFA, we also retained 4 measuring items for the interactivity construct (I1 was removed from Table 2 due to cross loading both in interactivity and understandability constructs), 3 measuring items for the understandability construct (U2 was removed from Table 2 due to a loading factor of less than 0.40), 4 measuring items for the authenticity construct (A5 was removed from Table 2 due to cross loading both in authenticity and security constructs), and all 4 measuring items for the security construct. Finally, we found that 5 constructs with 20 measuring items could be retained for the service quality concept of mGov.

For further verification of this refinement in measuring items and support construct and discriminant validity, we also conducted confirmatory factor analysis (CFA). For the 5 quality dimensions and formative construct of mGov's service quality, we assessed confirmation of EFA results in CFA. For all 5 quality dimensions and service quality variables, we verified the model fit indices with the recommended values for CFA and found that those 5 constructs with 20 measuring items could be retained. However, since we introduced 4 measuring items to measure service quality, we also conducted CFA for those 4 items and removed 1 item (SQ3) for service quality since it was loaded in CFA with a loading factor of less than 0.50 (Kline, 2005). The CFA results statistically justify the theoretical argument that the scale items are reflective indicators of their corresponding constructs and thus indicate construct validity (Chau, 1997). In CFA, the average variances extracted (AVE) for each factor and its measures all exceeded 0.50;

thus, convergent validity is proved (Fornell and Larcker, 1981). Discrimination among the 5 constructs is also achieved as the largest shared variance between these factors that is lower than the least AVE value for each factor and its measures (Espinoza, 1999). We also verified the reliability of the constructs by coefficient alpha and found that the reliability scores for all 5 constructs of service quality and the service quality concept of mGov ranged from 0.766 to 0.965, which provided acceptable reliability of the constructs (Nunnally and Bernstein, 1994).

Model Testing: Causal Relationship by Path Analysis

We used LISREL for path analysis as the statistical procedure of structural equation modeling (SEM) to verify the causal relationships of the formative indicators of mGov's concept service quality. Since we have measured all the constructs and service quality through the Likert Scale 1-5, the data are not perfectly continuous; thus, path analysis is appropriate for the identification of cause-effect relations (Kline, 2005, pp. 219).

After conducting path analysis for the 5 constructs of service quality, we found that the primary model fit indices did not fit well with the data. We checked 't' values for all the formative constructs. We found connectivity, interactivity, understandability, and authenticity to be significant formative constructs of service quality at the 0.05 significant level. The contribution of security in forming the service quality concept of mGov is much less (less than 0.10) and, based on the "t" value, it is non-significant at 0.05 (even at 0.10). The security concept does not have any relation with service quality in imparting perceptions of mGov's service quality. Therefore, we removed the non-significant causal relation of the security construct with service quality and non-significant covariance relations according to recommendations. Based on modification indices to improve the model fitness, we have added error covariance between connectivity and authenticity, interactivity and understandability, and understandability and authenticity. We ran the model again. Then we got saturated with a perfectly fitted model, as shown in Figure 1. The loading factors of the 4 service quality dimensions are presented in Table 3. The $\chi2$ statistic of 0 (df = 3, p value 1.000000) indicates that the null hypothesis of the model is perfectly fitted for the data. RMSEA (.0001) is also good (Churchill, 1979; Chau, 1997; Kline, 2005, pp. 133-144).

Table 3: SQ mGov Equation

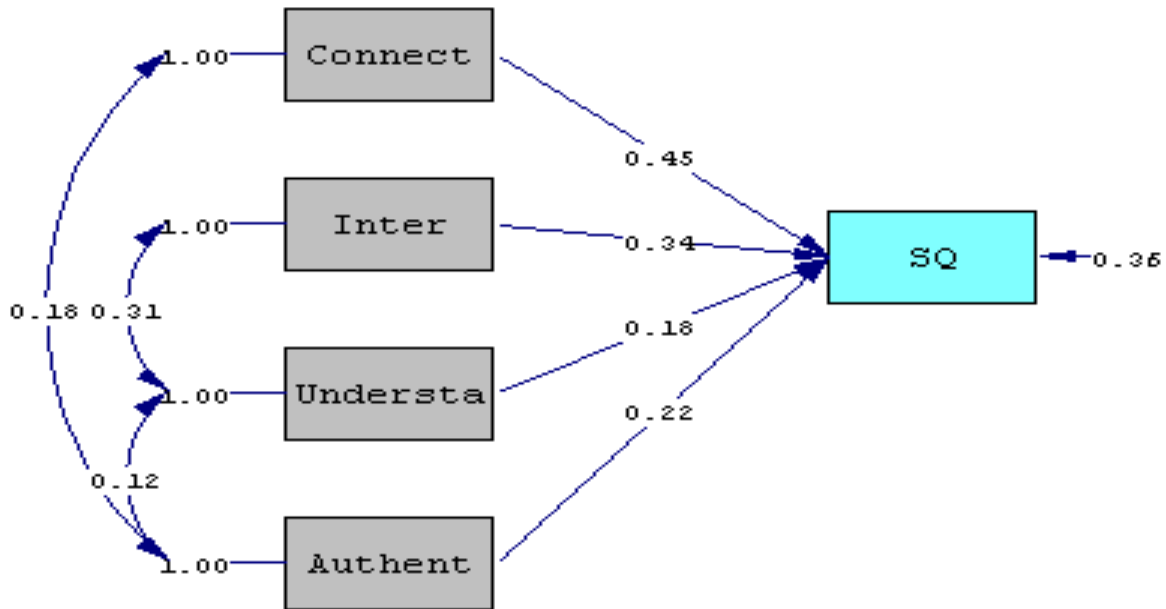| SQ = 0.45*Connect + 0.34*Inter + 0.18*Understa + 0.22*Authent,				Errorvar.= 0.36 , R² = 0.64
(0.027)	(0.027)	(0.026)	(0.025)	(0.021)
16.70	12.63	6.85	8.72	17.09

Figure 1 Loading Factor of SQ mGov

Concluding Discussion

We deduced from Figure 1 that the formative constructs connectivity, interactivity, understandability, and authenticity are the service quality dimensions of mGov and can perfectly define the service quality concept (SQ mGov). The four service quality dimensions connectivity, interactivity, understandability, and authenticity combined explained 64 percent of variances on service quality of mGov (SQ mGov). Among the four formative constructs of service quality of mGov, connectivity contributed the maximum in perceiving service quality of mGov. A unit of positive change in connectivity causes .45 of a unit of positive change in service quality of mGov, when interactivity, understandability, and authenticity remain constant. The second highest contributor is interactivity. A unit of positive change in interactivity causes .0.34 of a unit of positive change in perception of mGov service quality when the other three constructs are constant. Similarly, authenticity is the third most influential and understandability is the least influential significant contributor in creating service quality perception of mGov among consumers in India. We hypothesized that, as well as these four formative constructs, security is also an integral part and a formative construct of mGov service quality perception. However, from the statistical analysis, we revealed that only the four constructs connectivity, interactivity, understandability, and authenticity comprehensively define mGov service quality and thus are the service quality dimensions. This conclusion leads to the beginning of a new theory for public administration reengineered and offered through mGov.

Theory Development

Since we attempted to define service quality with the five service quality dimensions as the formative constructs, any change in the combination of the formative constructs must be linked

with the modification in the explanation of the concept of mGov service quality and justified in the light of the theory.

We have verified the correlations among the five constructs and found high correlation (0.81) between the security and authenticity construct. We also conducted forward regression analysis with these five constructs of service quality and identified that authenticity explained enough variance of security on mGov's service quality, i.e., security and authenticity have a certain degree of overlapping in terms of service quality concepts. As a result, in defining the service quality of mGov, the authenticity construct has shared a significant amount of perception of security for mGov service quality and thus, while authenticity is a significant formative construct of service quality, security becomes non-significant. Several eCommerce researchers have observed that security is not a service quality dimension, which is completely a part of technological orientation; rather, authenticity/reliability of service, which includes process, transaction, and outcome, creates safety, guarantees, and trustworthiness in the virtual medium (Bauer et al., 2006; Cai et al., 2003; Collier and Bienstock, 2006; Fassnacht and Koese, 2006). eGov researchers have postulated that government policies are essential components of developing a reliable virtual service which ultimately contributes in eGov service adoption (Anttiroiko, 2005; Shareef et al., 2011). From demographic analysis among our survey respondents, we found that more than half of the respondents were lower middle class and not very skilled in ICT. For this segment of the population, who are not very concerned about, conscious of, or familiar with modern ICT, computers, and the Internet, security, safety, and privacy of the virtual medium do not form a holistic part of service quality. Rather, psychologically, they feel that if the government takes full responsibility for any plausible discrepancy which might occur during interaction with mGov through mobile phones, they are assured about the safety and security of the service and will regard the mGov service as being of high quality. Since the measuring items of the authenticity construct have already conceived their psychological, behavioral, organizational, and even technological concerns about the reliability of the service offered through the virtual medium in mGov, security is no longer an integral component of the service quality concept of mGov. If we shed light on expectancy disconfirmation theory, we reveal that the root of safety of mGov service rests on the expectation of process reliability, transaction reliability, and outcome reliability. If these expectations are confirmed, consumers spontaneously perceive the safety of the service of mGov. Can the security concept create belief for a positive attitude of service quality based on TRA? In Mumbai, India, we conducted interviews with 50 users of mGov. We asked them one question: Is it possible for you to recognize immediately whether your disclosed information when seeking public services through mobile phones is shared with others or intervened by hackers (which is the prime concept of security)? They asserted that they cannot recognize that security threat immediately. They rely on government performance. Therefore, while performance of security perception is not realizable, security cannot create belief for a positive attitude in evaluating the service quality of mGov.

So, finally, we conclude that the service quality of mGov, which has technological, organizational, psychological, behavioral, and economic perspectives that must be evaluated, is defined by the four service quality dimensions connectivity, interactivity, understandability, and authenticity as the formative constructs of mGov service quality, and sixteen measuring items to

measure those four service quality dimensions as the reflective indicators. The final SQ mGov model is shown in Appendix (Figure 2).
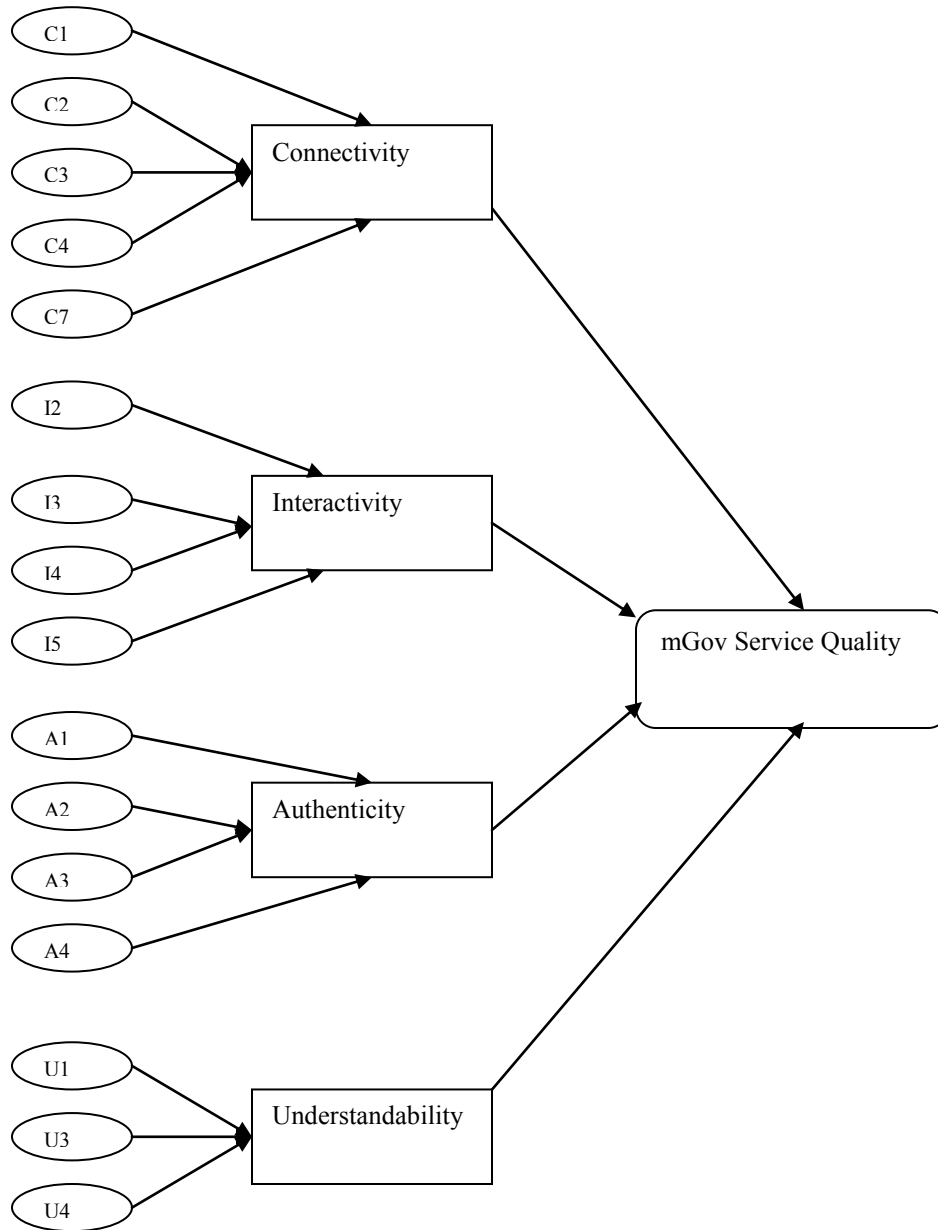

Figure 2: SQ mGov Model

Theoretical and Managerial Implications

This conceptualization of the service quality concept of mGov and identification of its four service quality dimensions has potential theoretical and managerial significance. mGov is a contemporary, phenomenal trend in reforming and offering public services through mobile devices; revealing epistemological and ontological paradigms of service quality is therefore

imperative for researchers and policy makers to extend this revolutionary virtual medium further. This medium is anticipated to meet most of the challenges of eGov and achieve sustainable benefits for it in terms of pursuing both of the following speculations: 'government service is for all equally' and 'the consumer is first for public service'. Different governments can use this SQ mGov model to evaluate the performance of their implemented mGov systems.

If we look at the eCommerce service quality models presented in Table 1 and eGov adoption factors of different researchers (Shareef et al., 2011), we can postulate that most of the researchers did not recognize connectivity as a significant service quality dimension. However, for mGov, the accessibility and availability of a public service from anywhere and at any time is valuable for the users, who assess it as the most important service quality component of mGov. As we already discussed, seeking government services through handheld devices has two important characteristics. Users have mobility and real-time information is of utmost importance for them. Consequently, having connectivity wherever they are has significant implications for their belief in creating a positive attitude and thus increases their desire to evaluate mGov's service quality. Therefore, TRA has theoretical support for construct connectivity as a quality dimension of mGov. Several researchers of eCommerce (as we see in Table 1) and eGov (Carter and Bélanger, 2005; Chen and Thurmaier, 2005) service aspects have acknowledged the importance of easy interaction as a contributor of positive evaluation of service quality in a virtual medium. Both TAM and DOI have recognized the importance of the concept of interactivity as stated in Table 2 for the positive evaluation of service quality. Bandura's (1986) self efficacy theory also asserts that consumers will perceive service as good if they have the ability to use it. However, unlike TAM or DOI, we accentuate not only the technological aspect but also the psychological and organizational aspects of interactivity which is noteworthy for mGov, since the majority of mGov users are not professionally, psychologically, or economically attached to ICT-related behavior or compatible with the virtual medium. Evidence from the mGov literature review (Misuraca, 2009; Naqvi & Al-Shihi, 2009; Trimi & Sheng, 2008) and also from our demographic analysis, as previously mentioned, show that most mGov users are lower middle class to middle class. For the same reason, understandability is a significant factor of mGov's service quality dimension. The consumers will have a strong belief in having a positive attitude and the intention to perceive the service quality of mGov when they can understand the complete process, transaction, and outcome. Since seeking public services through mobile phones primarily follows some instructions in SMS, presumably understanding of the instruction, process, and outcome has severe implications for the consumers to perceive higher service quality. TRA has theoretical support in favor of this argument. Consumers, while using mGov through mobile phones to accomplish their intended task, have the belief that they can understand the process and outcome. Both traditional service quality models like SERVQUAL and SERVPERF and eCommerce service quality models as depicted in Table 1 have asserted that the reliability and guarantee of the complete service has potential for the users. eGov adoption models (Carter and Bélanger, 2005; Chen and Thurmaier; 2005) referred the inclusion of process, transaction, and outcome reliability is significant for service. Authenticity concept is therefore a powerful component of the service quality dimension. To have a positive attitude towards mGov service quality, consumers must believe that the accomplishment and outcome of any task involving the government through a mobile phone is authentic.

The identified SQ mGov model has significant implications for the policy makers of any country, because mGov has not only expanded in many countries in Asia, Africa, and Europe, but also met the challenges of eGov (Blackman, 2006; Trimi & Sheng, 2008). At some stage, eGov was seriously accused of creating a digital divide and some researchers were really skeptical towards the intended vision of implementing eGov (Foley and Alfonso, 2002; Kenway, 2004). The worldwide proliferation of mobile phones and their simple application have ensured the seamless interaction of consumers with the public service domain through mobile phones or any other handheld devices. This has presented an opportunity for the policy makers, who are very enthusiastic to develop effective, efficient, and high-quality public services, to promote mGov. Therefore, conceptualizing the service quality of mGov and identifying mGov service quality dimensions based on real consumers' perceptions provides a significant knowledge contribution to this contemporary extendable public service medium.

Consumers are comprised of both urban and rural populations. They are both literate and illiterate people. Some of them are very unskilled in ICT-related interactions. Professionally they might be unaffiliated with, and thus not interested, in the virtual medium. Considering all these aspects of mGov, policy makers must assert some basic issues. First, in most of the countries, mobile phone operators are private companies. So, with mGov using private services, consumers are seeking public services and therefore an effective partnership between private and public organizations is crucial for mGov. Policy makers should ensure the central essence of mGov, i.e., consumers must be able to get a connection with the government service domain from anywhere and at any time with sufficient speed. Service design is also crucial for mGov. mGov service designers and policy makers should realize that this service should be usable for all citizens irrespective of their status, knowledge, and professions. Consumers should be able to receive the service and accomplish their intended task with minimum time and effort. In this respect, analyzing consumers' behavior is important. The overall service system should be such that consumers can perceive mGov's service system as being both technologically and psychologically effortless and manageable. As several mGov services are provided through SMS and the majority of users are not skilled in ICT, SMS in their mother tongue helps them greatly in understanding the instructions, processes, and outcomes. Using mGov, consumers purchase public transportation tickets, collect examination and admission results from Education Boards, pay utility bills etc. following certain steps on their mobile phones. These steps and the information structure need to be very simple and easy to understand. Authenticity is the sole responsibility of public administration. Through the proliferation of mGov, a country can achieve efficiency, cost effectiveness, transparency, and accountability in its public services. This is a demand of the 21st century. Through this service channel, public administration can save government expenditure and create an effective public-private partnership. Therefore, to achieve acceptance of this service, public administration must realize that without ensuring the highest authenticity of the processes and outcomes of mGov services, consumers will always feel a lack of service quality which will essentially deter them from using mGov. It must be well published and established that the government is the final caretaker for any legal discrepancy, if it occurs. Consumers will be treated fairly and will not suffer. During any disputes, consumers' issues must be resolved with efficient customer service that resembles that of top-quality private organizations. If the mGov service's reliability is ensured in this way, other security problems are not concerned part of consumers to evaluate public service quality.

Policy makers should realize that consumers use private organization services (generally the mobile phones of private operators) to seek public services. The intrinsic combination should be homogenous, so that consumers' perception of public service is promoted. All four of the quality dimensions of service quality are significant and potentially contribute to perceptions of higher service quality. It is noteworthy that these service quality dimensions are formative constructs of mGov service quality. Therefore, this is a holistic and integral concept of service quality. If any one of these service quality dimensions is inappropriately entertained and less emphasized, the overall perception of the public service offered through mGov will be severely affected.

Limitations and Future Research Directions

mGov service design is still in a premature stage and thus, this research is exploratory in nature. Therefore, as an exploratory research, we developed our empirical study instrument from the comprehensive view of multidiscipline. Statistical analyses like EFA and CFA were also indicative for the inclusion of measuring items as the reflective indicators of the service quality dimensions. Though Mumbai, India, is a good place to study the quality of public services conducted through mobile phones, termed here as mGov, the generalization of this study and proper validity of the theory can only be achieved if this study can be replicated in some other countries, both developed and developing. We have designed our study for two specific tasks where consumers generally seek government services through SMS in mobile phones. However, mGov can also be conducted through methods such as government website navigation and voice messages, and although, in developing countries, most of the popular mGov services are conducted through SMS (Naqvi & Al-Shihi, 2009; Trimi & Sheng, 2008), it is still not the only way, so cannot be generalized. Moreover, although we have attempted to capture a high response rate, still our response rate is less than 50 percent. However, since we requested the citizens to respond only if they have mGov usage experience, this response rate is quite satisfactory (Deehan et al., 1997; Gendall and Healey, 2010).

From the aforementioned explanations of this study's limitations, we obviously address some issues which could be resolved by future research. For proper validation, this empirical study instrument could be used in some other countries and also for other mGov tasks. In this way, we can generalize the SQ mGov model. Future research should be conducted on those mGov tasks that can be achieved through web browsing and voice messages from any type of handheld wireless instrument. Researchers can also verify this SQ mGov model for other public service domains. Future researchers could also experiment with the suitability of this model for eGov.

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Appendix

Table 1. Service Quality Dimensions of eCommerce

Sl. No	Study	Measurement Domain	Dependent Variable	Independent Variable related to Quality Dimensions
1	Balasubramanian *et al.* (2003)	Service quality	Satisfaction	Price, Trust disposition, perceived environmental security, perceived operational competence, and perceived trustworthiness
2	Bauer *et al.* (2006)	Service Quality	Quality	Functionality/design; enjoyment; process; reliability; and responsiveness.
3	Collier *et al.* (2006)	Service quality	Satisfaction	Process quality: privacy, design, information accuracy, ease of use, and functionality. Outcome quality: timeliness, order accuracy, and order condition. Recovery quality: interactive fairness, procedural fairness, and outcome fairness.
4	Devaraj *et al.* (2002)	Service quality	Channel satisfaction	Usefulness, asset specifity, uncertainty, price savings, time, ease of use, and assurance.
5	Fassnacht *et al.* (2006)	Service quality	Quality	Environmental quality: graphic quality, clarity of lay out. Delivery quality: attractiveness of selection, information quality, ease of use, technical quality. Outcome quality: reliability, functional benefit, and emotional benefit.
6	Gummerus *et al.* (2004)	Service quality	Loyalty, Satisfaction, Trust	User interface, responsiveness, need fulfillment, security
7	Lee *et al.* (2000)	Website quality	Purchase behavior	Perceived usefulness, perceived use, perceived transactional risk, and perceived product/service risk
8	Parasuraman *et al.* (2005)	Service quality	Quality	E-S-QUAL: Efficiency, system availability, fulfillment, privacy. E-RecS-QUAL: responsiveness, compensation, contact.
9	Schaupp *et al.* (2005)	Service quality	Satisfaction	Privacy, merchandising, convenience, trust, delivery, usability, product customization, product quality, and security
10	Srinivasan *et al.* (2002)	Service quality	Customer loyalty	Customization; contact interactivity; care; community; cultivation; choice; character
11	Szymanski *et al.* (2000)	Service quality	Satisfaction	Convenience; merchandising; site design; financial security
12	Wolfinbarger *et al.* (2003)	Service quality	Quality	Web site design, fulfillment /reliability, privacy /security, and customer service.
13	Zeithamal *et al.* (2002)	Service quality	Quality	Efficiency; reliability; fulfillment; privacy; customer service (responsiveness; compensation; contact)

Table 2. Service Quality dimensions of mGov

Quality Dimension (Formative)	Definition	Measuring Items of Quality Dimension (Reflective)	Source
Connectivity	The extent to which the service is available and accessible from anywhere at anytime with reasonable speed through mobile device	C1 The service is available at anytime through my mobile device/phone C2 The service is available from anywhere through my mobile device/phone C3 The service is accessible at anytime through my mobile device/phone C4 The service is accessible from anywhere through my mobile device/phone C5 The service is quickly available through my mobile device/phone C6 The service is quickly accessible through my mobile device/phone C7 I can complete my task with reasonable time through my mobile device/phone	Bauer et al. (2006); Cai et al. (2003); Cao et al (2005); Chiu et al. (2005); Collier and Bienstock (2006); Gummerus et al. (2004); Kim et al. (2006); Parasuraman et al. (2005)

Interactivity	The extent to which the service is easy to use both technologically, psychologically, and structurally	I1 The service is easy to search through my mobile device/phone I2 The service is easy to navigate through my mobile device/phone I3 I can easily perform my task through my mobile device/phone I4 I feel very easy conducting the service through my mobile device/phone I5 Service seeking steps are easy to perform through my mobile device/phone	Chiu et al. (2005); Collier and Bienstock (2006); Kim et al. (2006); Parasuraman et al. (2005); Srinivasan et al. (2002)
Understandability	The extent to which the processing of complete service starting from instruction and information organization to outcome is understandable	U1 Instruction provided to process the service is understandable through my mobile device/phone U2 Information organization to process the service is understandable through my mobile device/phone U3 The service provides all relevant information necessary to understand to fulfill my needs through my mobile device/phone U4 Outcome of the service is understandable through my mobile device/phone	Bauer et al. (2006); Schaupp et al. (2005); Srinivasan et al. (2002);
Authenticity	The extent to which the process, transaction, and outcome of the service is reliable with government's legal responsibility	A1 The process of the service through my mobile device/phone is overall reliable A2 Any transaction during conducting the service through my mobile device/phone is overall reliable A3 The outcome of the service through my mobile device/phone is guaranteed A4 The government takes responsibility for any technical discrepancy during processing of the service through my mobile device/phone A5 Policies of the service conducted through my mobile device/phone adequately protect me from problems on the wireless media	Bauer et al. (2006); Cai et al. (2003); Collier and Bienstock (2006); Parasuraman et al. (2005); Zeithamal et al. (2002)
Security	The extent to which disclosing personal identity and financial information is secured	S1 Disclosing personal identity and financial information during the process of the service through my mobile device/phone is safe S2 Disclosing personal identity and financial information during any transaction through my mobile device/phone is safe S3 Outcome of the service conducted through my mobile device/phone containing personal identity and financial information is safe S4 The service through my mobile device/phone has adequate security features	Cai et al. (2003); Cao et al (2005); Gummerus et al. (2004); Kim et al. (2006); Parasuraman et al. (2005); Schaupp et al. (2005)
Service Quality	The extent to which users' perceptions/ experiences using government service offered through mobile device/phone can fulfill users expectations regarding availability and accessibility with timelines, simplicity to use, perceive, and understand, and reliability and safety of the process, transaction, and outcome in completing the intended tasks	SQ1 I completed the task efficiently through my mobile device/phone SQ2 I completed the task effectively through my mobile device/phone SQ3 I am happy with the overall service offered through mobile device/phone SQ4 I am satisfied with my experience in overall service conducted through mobile device/phone.	Collier and Bienstock (2006); Devaraj et al. (2002); Fassnacht and Koese (2006); Janda et al. (2002); Parasurama, et al. (2005); Wolfinbarger and Gilly (2003)