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Reformation of Public Service to Meet Citizens' Needs as Customers: Evaluating SMS as an Alternative Service Delivery Channel

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Abstract

Citizens of different countries are now experiencing a newly invented service delivery channel to receive service from government portals. This study addresses whether a service delivery channel, based on mobile phones and provided through a short messaging service can be included in public administration to meet citizen requirements. The study further examines what factors are important to develop citizen perceptions of high value and effectiveness of this new service delivery channel. It also attempts to identify if culture has any effect on developing a positive attitude toward this service delivery channel. This study, through an empirical investigation among citizens in three countries – the USA, India, and Bangladesh, has identified that citizens are quite satisfied with this new service delivery channel use by the public service domain. The success of this delivery channel depends on the issue of segmentation. If public service providers can effectively segment the market based on time, location, and requirements, and can deliver the preferred message to concerned users with relevant and information that is easy to access and process, citizens will regard this service delivery channel as effective and satisfactory, and as competent as its private counterparts.

Keywords: SMS (short messaging service) and service delivery channel, New public management (NPM), Public administration reformation, Citizen perception of public service, Effective service delivery channel

1. Introduction

The dramatic penetration of mobile phones all over the world, even in very remote areas, has created enormous opportunities for marketers and public administrators to be in touch with consumers with continuous interactivity so that citizens can find a satisfactory relationship to government. If we look at the concept of reference group influence on consumer behavior (Bearden and Michael, 1982), we clearly notice that less connectivity of the virtual medium of Electronic-government and Electronic-commerce, in terms of reach to customer with direct interaction and credibility, can reduce the influence on consumers in several ways. Many researchers have asserted that in delivering service to citizens, the public service system is ineffective and inefficient ((Kettl, 2000; Pierre, 2009). The public service system cannot provide dynamic and interactive service to citizens (Mosser, 2009). This could be potentially overcome through mobile phone connectivity irrespective of time and location constrains. So our obvious concern is whether a mobile phone-based service delivery channel can be included in public administration to meet citizen requirements of robust and interactive service and, if included, what factors are important to develop citizen perceptions of the high value and effectiveness of this new service delivery channel.

Since public administrations in many countries consider citizens as consumers (Bilhim & Neves, 2005) like private organizations, for their service, while identifying the issues important to develop citizen perceptions of the high value and effectiveness of this new service delivery channel, it is imperative to gather knowledge from consumers service output demand for any traditional marketing channel. Out of four service output demands, shedding light on the distribution channel preference theory of Bucklin (1966), spatial convenience (decentralized service) and assortment (communicating with different pieces of information) and variety are significantly facilitated by continuous connectivity through mobile phone short messaging service (SMS). These factors are viable preference factors (consumer requirements from a distribution channel while buying a product or service) of consumers in selecting products and services.

Public administration reformation, to capture efficiency of private organization, deems service receivers as consumers; so analyzing consumer behavior is an essential component to be reviewed to organize and accumulate citizens' perception for this citizen centric reformation through the inclusion of SMS based service delivery channel. Citizen interaction with government websites to seek government services, as a buying behavior, is very time effective. This is relevant to and defined by the theory of mere exposure (Zajonc, 1968) where frequency of information exposure may dictate citizen final interaction behavior. On the other hand, for many public services, such as paying taxes and forecasting weather, market researchers are interested in identifying consumer preferences. This is characterized by extended problem solving (Howard and Jagdish, 1969; Zurawicki and Nestor, 2005), because this type of decision making is substantially cognitive, and consumers, through a continuous cognition process, gradually compare alternatives in developing their final behavior for the acceptance of the product or service (Bloch and Marsha, 1983). Policy makers have recently found potential opportunities from wireless marketing where connectivity is dominated by SMS that is conducted through any hand-held device (such as mobile phones) (Danaher and Rossiter, 2011 ; Mari, 2013). This SMS-based connectivity can control citizen attention, exposure, perceptions, and behavioral attitudes, and it can significantly facilitate citizen behaviors, both cognitive and affective (Drossos et al., 2007; Faber et al., 2004). Shedding light on the social exchange theory (Roloff, 1981), we find significant support for the idea that citizen technological, organizational,

and social beliefs in seeking government service can be mainly governed by their regular interactive behavior with mobile phones (Shareef et al., 2013). Since human behavior is embedded in individual cognitive and affective attitudes, consumers, while seeking service from the public service domain, definitely search for both emotional benefits and economic support from the public administration that is now being restructured. So connectivity, interactivity, and ongoing communication with all citizens through mobile phone SMS can be a radical application in the reformation of public service to meet customer needs satisfactorily, which is the prime mission of public administration reformation.

Many researchers (Jibril et al., 2014; Mari, 2013; Njemanze, 2012; Shareef et al., 2015; Srisawatsakul and Papasratorn, 2013; Varnali et al., 2012) explored consumer online behaviors and investigated consumer preference criteria to accept this mobile phone, SMS-based online media as a communication channel for effective marketing. However, the potential contribution of this channel in the reformation of public administration to provide citizen-focused service in order to make government service as competent as a private organization has not been investigated comprehensively. There is a potential research gap in this connection for public administration. In this connection, the behavioral characteristics of citizens as consumers are an important area to be investigated to formalize an effective service delivery channel through mobile phone SMS. Therefore, this research is an exploratory attempt to bridge this research gap and direct public administrators to identify citizen behaviors and acceptance criteria as online consumers.

Two fundamental research questions in this context and a supplementary research question are explored and encapsulated in this current study. At first, this study investigates whether an SMS-based service delivery channel from the public service domain through mobile phones can be regarded by citizens as an effective channel giving a perception of high value. Then this research further identifies and postulates the critical factors which develop citizen perceptions of the high value and effectiveness of this new service delivery channel. The supplementary research question, which will be described and addressed, will identify if culture has any impact on the citizen perception process.

In the next section, this study analyzes theoretical paradigms of public administration reformation for better interactivity with consumers through SMS-operated mobile phones as an alternative channel. Our theory of consumer behavior for this newly initiated service delivery marketing channel is based on this analysis. Then, based on an empirical study among citizens, further sections give our research design, analysis, and result and discussion to further reconcile the theoretical basis. Behavioral justification for this theory of consumer perceptions regarding an SMS-based service delivery marketing channel of public administration operated by mobile phone is provided in the theoretical and practical implications section. Finally, conclusions and future research directions are provided for future research.

2. Existing Inefficient Service Delivery Channel of Public Sector: New Paradigm for Citizens as Consumers

Researchers (Box, 1999; Jaeger and Bertot, 2010; Light, 2006; Osborne and Gaebler, 1993; Pandey, 2010) and leaders of the democratic movement now have a strongly expressed belief and politicians have an internal conviction that the population has become increasingly frustrated with the functions and performances of traditional public administration systems; their service delivery systems; their transparency, accountability, and bureaucracy; and, finally, with their

overall service quality (Kim, 2008). Many researchers (Box, 1999; Light, 2006; Mosser, 2009) have claimed that corporate management in public administration could ensure better efficiency, cost effectiveness, and customer-focused service for citizens. In the 1990s, President Clinton rejected the privatization doctrine initiated by President Regan for government organizations to uphold and continue traditional democratic values; instead he put his enthusiasm toward reengineering and restructuring public organizations by introducing new public management (NPM). NPM discussions contemplated change paradigmatically in the perceived concept of a public service delivery system offered to citizens to maintain a systematic alignment with the private service system (Pandey et al., 2007).

Starting from the governments of President Regan in the USA and Prime Minister Thatcher in the UK, numerous weaknesses of public service delivery systems have been explored and exposed. And consequently, they advocated for the privatization of government organizations as the doctrine of conservative politics (Kettl, 2000). Public administration reformation gained momentum when President Bill Clinton initiated his program called "Reinventing Government," which aimed to provide a cost-effective and efficient public service system through reconciling the overall public administrative function. As Alford (2002), explained, "….the citizenry has the dominant say not only about public value but also about the private value that the clients are to consume. As a result, the nature of organization-public relationships in the public sector is very different from those in the private sector." We can further understand the demand of the public who are now being treated as customers in NPM by quoting Mosser (2009), who proposed a reformation of public administration focusing market orientation by saying: "…Satisfying customers' demands – as much as possible, the customers must be offered services that correspond to their specific situations. A service that fits all demands is no longer adequate nor necessary, because the new flexibility within the public sector allows the services' harmonization with the demands...".

However, paradigmatically this conceptual change is open to controversy in the light of public values. Several researchers (Alford, 2002; Mares et al., 2010; Rouban, 2008) argued that public values, democratic accountability, and equal rights for all citizens are intrinsic and inherent characteristics of public administration that cannot be reflected by the new portrait of citizens as customers or by the directly imported values of the market mechanism prioritized in the corporate culture.

3. Research Design: Service Delivery Channel through SMS

The concept is exploratory and should be investigated from the perspective of urgency of public administration reformation, particularly focusing on the context of a new service delivery channel. However, under radical discourses of public administration reformation, marketing concepts are used for the launching of a new marketing channel in the core service delivery system of public administration. Therefore, the systematic overview of this new service delivery channel and epistemological and ontological paradigm is examined and developed from the comprehensive integration of the core concepts of public administration reformation and initiation of NPM, and the selection of distribution channel for service delivery and consumer preferences.

3.1. Development of Conceptual Model

Market researchers and academics have long realized that perceptions of excellent service quality are imperative for customers to be satisfied and loyal in the private business sector (Orzech et al., 2016; Vošner et al., 2016), and now public administrators have asserted that it is a mandatory component for public service domains to enhance competitiveness and profitability. It is now well accepted that providing better quality service is the core of any business model to be successful and maintain competitiveness (Shareef et al., 2014). Citizens as consumers must perceive a higher value in receiving any service from government portals through a mobile phone-based SMS delivery channel in comparison to the traditional public service delivery channel. Here, perception of value reflects citizen interpretations of government service to be effective and efficient, and able to meet satisfaction as per expectation. In the context of this innovative service delivery channel, the key driving issue is not the perception of citizens as the consumers (as it is called in the NPM); citizens must perceive this service delivery channel as competitive as an efficient private service delivery channel where citizens are treated as consumers. Under this assumption, our dependent variable is citizens' "perceived value (PV)" of mobile phone-based SMS, which can be an effective service delivery channel for the public service domain.

From the above discussion, we can infer that various citizen demands of any service domain, whether government or private, create severe challenges for public administrators to keep citizens satisfied by treating them as customers who expect the same level of service from public as from private domains. Therefore, the public administration reformation is experimenting with many marketing theories to help predict consumer behavior for accessing the public service. The radically innovative idea of two-way connectivity with customers, providing full-time customer service, awakening citizens to the full-time ability to contact the government, and keeping customers in touch with government has now created a new service delivery marketing channel for the public service (Ho et al., 2010, Mari, 2013). Continuous connectivity, particularly for the public service domain, can be a major way to developing consumer interest, familiarity, affiliation with, attachment to, and motivation to connect with government service. This unique pattern of service can be implemented through the service delivery channel of SMS through mobile phones. Based on these arguments, we propose for mobile phone-based SMS from public service portals as an effective channel of reformed public service that,

H$_1$: Connectivity can enhance citizen perception of value.

The significant opportunity which can be offered through SMS of mobile phone is personalization. Personalization of messages – i.e., preparing the message to be specific to customer need based on historical precedence of receipt and interactivity with the government service system, lifestyle, taste, location, profession, purchasing behavior, income, and preference – is a major source of benefit which can be uniquely captured by SMS-based connectivity with citizens through mobile phones (Cockrill et al., 2011; Danaher & Rossiter, 2011; Hindman, 2008). As a marketing distribution channel, many researchers have advocated for SMS due to its capacity to provide personalized service to customers (Chang, 2013; Phau and Teah, 2009; Varnali et al., 2012). One-to-one, direct-target marketing where personalization is the major focus is the essential content for this channel to be viable. The above arguments can justify the following proposition to be investigated for mobile phone-based SMS from public service portals as an effective channel of reformed public service,

H$_2$: Personalization can enhance citizen perception of value.

Capturing and utilizing the opportunities of mobile phone-based SMS allows potentially enormous benefits like sending time and location-based messages and creating a scope of interactivity and customization through one-to-one target marketing in the appropriate context, the recent trend of SMS-based communication, interactivity, and connectivity has initiated a new service delivery channel for public administration which has potential merit to be explored and sustained in future (Carroll et al., 2007; Peters et al., 2007; Xu, 2007). Through the application of mobile phone-based SMS, the public service domain can now maintain a continuous flow of customer service to potential customers to meet their requirements similar to that from the private counterparts. Customers can get continuous messages from government web portals regarding any important government service, warning messages, significant information, substantial reminders, urgent recalls, etc. Among these services, important issues include but are not limited to weather forecasts for people who are driving, date of immunization needles for kids who need immunization urgently, the deadline for paying taxes for those who have not yet submitted taxes, school opening day to parents of school-going kids, any traffic jam on a specific road for persons who are entering that road, and many more government services and information to make citizens aware of their citizen responsibility and accountability (Hindman, 2008). This unique service delivery pattern through mobile phone based SMS from the public service domains, where a message is delivered to the customers who need it at a particular time, specific location, and with well-organized and customer-specific language and content based on specific customer requirements is defined here as a new service delivery marketing channel of public administration (Cai, 2010; Njemanze, 2012). Based on the arguments just presented, we have the following propositions for mobile phone-based SMS from public service portals as an effective channel of reformed public service.

H$_3$: Time and location-specific interactivity can enhance citizen perceptions of value.
H$_{3a}$: Time and location-specific interactivity can enhance citizen perceptions of personalization.

Many researchers (Okazaki and Barwise, 2011; Peters et al., 2007; Rau et al., 2011 ; Scharl et al., 2005) have acknowledged that the content of the SMS message and its relevance to the customer requirements potentially help this channel to create a positive response among consumers and govern their behavior. Characteristics of SMS-based message sending, such as the ability to interact directly with a customer with relevant content, and time and location-based contextual information are the main driving powers of SMS to create positive attitudes among consumers. As the authors Scharl et al.(2005) noted, "Text messages should contain an attractive idea, convey this idea concisely, employ language understood by the target group, and utilize the available 160 characters effectively." For different kinds of government services, the authors Ho et al. (2010), experimented with the viability of personalization and relevancy of content for the effectiveness of this service delivery channel; through an empirical study the authors confirmed this result. In the same context, researchers unequivocally found an SMS-based service delivery channel to be effective due to its capacity to deliver time- and location-based information. For example, if someone travelling in Manhattan, New York, got the message that the expiry date of their driving license was close, that person could renew it promptly. The office is 300 west 34th street. At 7 AM before starting for office, someone may get a weather

alert message from government that severe snowfall with black ice is expected within 1 hour. So, drive slowly.

The findings of many studies (Danaher and Rossiter, 2011;Faber et al., 2004; Scharl et al., 2005; Susanto and Goodwin, 2013; Watson et al., 2002; Xu et al., 2009) have revealed that the positive attitude of consumers toward SMS-based commercials is heavily dependent on the ability of mobile phone to provide relevant messages, which are a unique capacity of mobile phone SMS. Based on this discussion, we propose to explore mobile phone-based SMS from public service portals as an effective channel of reformed public service as follows:

H_4: Relevant content can enhance citizen perceptions of value.
H_{4a}: Relevant content can enhance citizen perceptions of personalization.

Some researchers (Dwivedi et al., 2012; Peters et al., 2007; Trappey and Woodside, 2005) have identified that consumers find great motivation to be connected with government service systems; due to the ubiquitous process of SMS, they also have significant process motivation. Other authors (Peters et al., 2007) explained further how the process of SMS advertisement facilitates consumer organization of daily life by providing an example: "I think with this service, I would definitely be a more organized person. It would help me organize where I should go, where to get the better offer, or whatever." The study used the media uses and gratification theory proposed by Kartz and Folkes (1962) to conceptualize that consumers selectively expose themselves to this service delivery channel due to their motivation for establishing daily life routines through the reminders, alerts, and warning processes of SMS. Several other researchers acknowledged the benefit of SMS to motivate consumers because of its unique process (Phau and Teah, 2009; Scharl et al., 2005; Trappey and Woodside, 2005; van Zoonen et al., 2016). Several researchers of consumer behavior and ICT (Cheng et al., 2009; Drossos et al., 2007; Ho et al., 2010) recognized that a continuous flow of messages from web portals to consumers can be a potential asset for service providers to satisfy and motivate consumers for the process of service delivery. Thus, we propose for mobile phone-based SMS from public service portals as an effective channel of reformed public service that:

H_5: Process motivation can enhance citizen perceptions of value.

Marketers using mere exposure and media selection and gratification theories asserted that entertainment and enjoyment potentially contribute to developing consumer attention, exposure, and positive attitudes toward any channel of service delivery (Henderson et al., 2003; Kuo and Chuang, 2016; Mazar and Zhong, 2010). Since the message of SMS is prepared specifically to focus on customer requirements, its language and content is generally attractive and fascinating; this provides, particularly for young consumers, enjoyment unlike any other government service-providing system (Drossos et al., 2007; Ho et al., 2010; Xu, 2007). Providing service to citizens with attractive contents through mobile phone SMS can provide hedonic benefits, i.e., enjoyment to citizens (Danaher and Rossiter, 2011). Many researchers working on 3G or 4G mobile phones, Bluetooth, and many other application of wireless message sending, such as MMS and SMS, have asserted that consumers have substantially different attitudes toward receiving messages through SMS for any service because it provides and supports their enjoyment requirements (Okazaki and Barwise, 2011; Phau and Teah, 2009). In addition, according to the mere exposure theory, due to the capacity to send the same messages frequently, this service delivery channel

can be effective in controlling consumer behaviors and positive attitudes by mere exposure (Mazar and Zhong, 2010). The aforementioned arguments suggest the following relations to be tested for mobile phone-based SMS from public service portals as an effective channel of reformed public service:

H_6: Entertainment can enhance citizen perceptions of value.
H_{6a}: Entertainment can enhance citizen motivation for process.

Timely and important information from SMS are important motivations for consumers to pursue positive attitudes toward this service delivery channel. Usefulness, timelines, accuracy, accessibility, and availability of information through an SMS-based mobile phone has possibilities to offer this service delivery channel as a means for consumers to get service from the public domain (Xu, 2007). Some studies (Cheng et al., 2009; Scharl et al., 2005; Van der Waldt et al., 2009) have provided evidence that due to the information on an SMS-based service delivery channel, it is creating positive attitudes among consumers as an effective interactive channel for consumers. Based on these arguments, we propose for mobile phone-based SMS from public service portals as an effective channel of reformed public service,

H_7: Timely and important information can enhance citizen perceptions of value.

Based on the above discussions of consumer behavior, the capacity of mobile technology, and the urge of public administration to reform, we suggest the established theory of the effectiveness of mobile phone-based SMS as the new service delivery channel for citizens to be treated as consumers while keeping the traditional democratic values of public service. We propose that the following factors are essential in convincing citizens of the value in public administration: continuous connectivity, personalization, time and location-specific interactivity, and relevant content of messages. Also essential are motivation to use the process, entertainment, and the value of message information provided through SMS of mobile phone as an alternative channel of service delivery from public service domain. The theoretical framework is shown in Figure 1.

Public administrators have now realized that this public service system that treats citizens as consumers is effective and successful, and this should motivate them to use this system (Cheng et al., 2009). To analyze the feasibility of public administration reformation, this current study has analyzed the market value of SMS operated through mobile phones as the new service delivery system. The conceptual discourse has developed the established theory that the ubiquitous characteristics of SMS through a mobile phone can create an effective service delivery channel for public administration, and that citizens perceive the significant value of this channel. Therefore, to understand and measure consumer perceptions of this new service delivery system for public service as effective, which is our first fundamental research question, PV is considered as the theoretical concept (dependent variable) in this context. For our second fundamental research question, to measure critical factors for the perception of higher value of the SMS-based mobile phone as the effective service delivery channel, this construct will be the dependent variable.
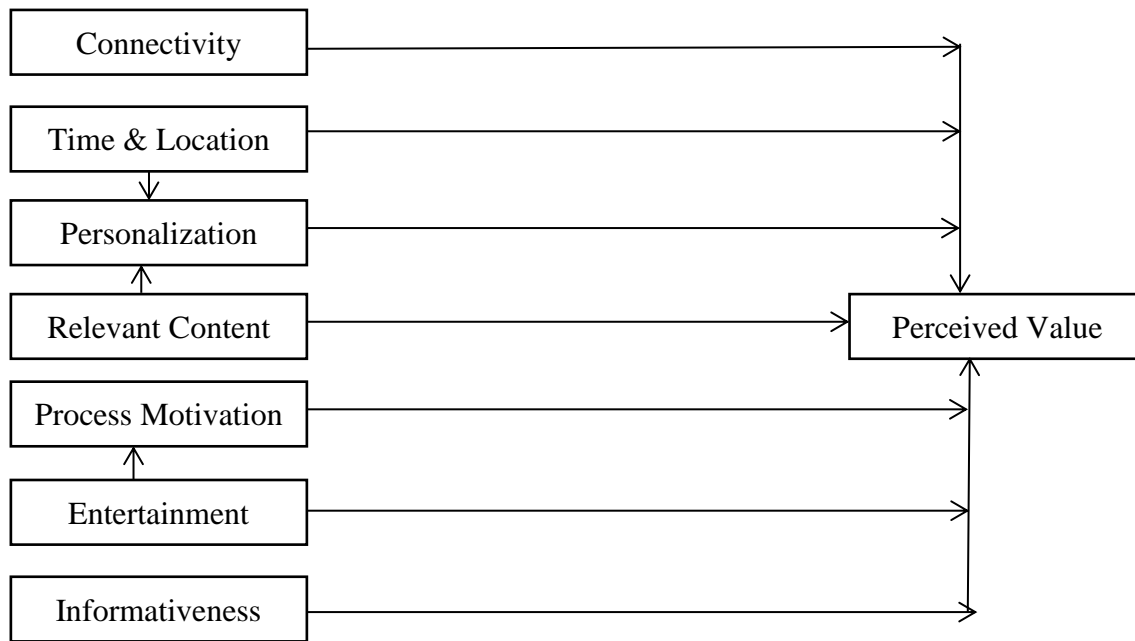
Figure 1 Conceptual Framework for PV of SMS-based Service Delivery Channel

3.2. Effect of Culture

Researchers have made convincing arguments that consumer behavior to use mobile phones and SMS is highly influenced by cultural attributes, and cultural differences have potential implication in the development of an established theory in this connection (Balabanis et al., 2007; Jamieson, 2012; Lillie, 2012; Tomaskova, 2010).Based on the impact of cultural differences among consumers, Nelson and Clark Jr. (1994) argued that, "From a theoretical perspective, a cross-cultural approach to information systems research has the potential to enhance our knowledge by widening our field of vision and questioning existing theories." Many cross-cultural researchers have asserted this view and argued that any attempt to generalize consumer behavior for a private or public service governed by a virtual medium will be jeopardized if cross-cultural differences are not considered to moderate this established theory. Some multicultural researchers (Balabanis et al., 2007; Brailovskaia and Bierhoff, 2016; Lillie, 2012; McDonald and Dahlberg, 2010; Muk, 2007;Tomaskova, 2010; Xu et al., 2009) have argued, based on empirical studies in countries with different cultural traits like the USA, UK, South Korea, China, Australia, New Zealand, and some other European and Asian countries, that the effect of direct marketing through SMS is different for each country based on citizens attitudes toward mobile-commerce. Using these arguments, this study is designed to develop a framework for the effectiveness of the SMS-based service delivery system for public service comparing consumer behavior in three countries having distinct cultural traits: the USA, India, and Bangladesh. By doing this, we will address our third supplementary research question by identifying if culture has any impact on the factors which are important to develop citizen perceptions of higher value and effectiveness of this new service delivery channel. The differences in cultural traits are based on Hofstede (1980) and depicted in Table 1. This study has

chosen uncertainty avoidance, individualism, and power distance from the cultural dimension of Hofstede, as these can be effective in explaining citizen behavioral differences to accept public service system (Shareef et al., 2014).

Table 1 Cultural Dimension from Hofstede (1980)

Country	Cultural Dimension		
	Uncertainty avoidance (UA)	Individualism	Power distance(PD)
Bangladesh	60	20	80
India	40	48	77
USA	46	91	40

4. Empirical Study

This study explored consumer perceptions of the effectiveness of the SMS-based service delivery channel of public service system for these three using a questionnaire. The measuring scales of the independent and dependent constructs were initially derived from a literature review (shown in Appendix A) and revised to reflect the service systems offered through SMS of mobile phones in the different countries. We then introduced an expert group to refine the measuring items for conceptual clarity and similar understanding of the consumers, extracted from different literature, as illustrated in Appendix A. The expert group was composed of three university professors, one each from a USA university, a Bangladeshi university, and an Indian university. All of these professors have expertise in guiding marketing behavior for public administration reformation through the connectivity of mobile phone. We also launched a pilot study among ten general consumers of public service through SMS in Bangladesh and India, since these two countries have extensive experience in getting government messages through mobile phone SMS. We included the recommendations of the expert group and the outcome of the pilot study in our final measuring items of the eight constructs, including the dependent variable, in Appendix A. Seven items were used to measure citizen perceptions of the value and effectiveness of this new service delivery channel, which is termed here as "PV." There were a total of 37 measuring items for the independent constructs to identify the reasons this alternative channel was perceived as having high value.

These three countries were chosen for this current study as the consumers of these countries have experience in receiving messages through the SMS of mobile phones, and these three countries have enough cultural variations to justify evaluating cross-cultural differences in consumer behavior. However, since the reformation of public administration of different countries has recently initiated the use of SMS of mobile phones as an alternative service delivery system, it puts certain limitations on launching a questionnaire for the tasks offered by a public service system. Considering differences in the service systems offered in these three countries, we did not mention any specific task of public service system for the three countries; rather we kept the questionnaire more general to cover messages exchanged between consumers of public service systems through the SMS of mobile phone. In this study, we used PV as the dependent variable to understand consumer perceptions of value for the new service delivery system as an effective channel of reformed public administration. Scale items of the independent

and dependent constructs were measured by a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Consumers were asked to respond to the questionnaire based on recent experiences of receiving messages from public service system through the SMS of mobile phone.

The generic questionnaires attached in Appendix A were slightly modified based on the type of public service offered in the respective countries. The field survey was conducted in New York, USA; Mumbai, India; and Dhaka, Bangladesh. To maintain random data collection and a representative sample, we divided each city into five regions: east, west, north, south, and central. The mailing addresses of these areas of these cities were collected from the Telephone White Pages. We targeted different demographics, such as slum areas, houses, condominiums, and apartments in these five regions. 50 percent of the questionnaires were sent through mail to these addresses with return postage and the other half were delivered to citizens physically going to their residences. The questionnaires were distributed with the help of five trained volunteers.

We requested general citizens to respond only if they have had experience using public service through SMS on mobile phones. For the required statistical results, although we hardly find any consensus for sample size of structural equation modeling (SEM) (Sivo et al, 2006), the generally recommended value is at least 10 samples to estimate the causal relation of each free parameter (Hoe, 2008). By using different sample sizes, Iacobucci (2010) tried to estimate the plausible effect of sample size on different model fit parameters and suggested that a sample size over 50 is sufficient for SEM depending on the number of latent variables. Since we have selected seven independent variables to define PV of public service through cause-effect relations, a sample size of around 70 is adequate for measurement. From our past experience of empirical studies following a similar method of communication, we expected around a 20 percent response rate. So our target sample size for each of the cities would be 350. However, since many citizens might not have prior experience in using a government service through SMS of mobile phones or might not perceive this service delivery channel as being effective, for an appropriate and sufficient sample size, we finally chose to distribute our questionnaire to double the number of citizens, i.e., 700 citizens in each city.

The rationale for the selected services chosen in the three countries is explained in the following paragraphs.

4.1. USA

In the USA, the empirical study was conducted in New York among general citizens. We targeted a very popular state government service system for any kind of emergency offered through mobile phone SMS known as New York Alert or NY-ALERT. It is a statewide general notification system for all citizens that allows different state authorities to provide news related to weather, traffic, and missing-child alerts; public health alerts, such as flu vaccine clinics; consumer protection-board news; sex offender relocation alerts; and state and local government press releases. NY-ALERT has 6.3 million subscribers. Out of those subscribers, around 3.6 million people receive different alerts on their mobile phones through SMS every day.

Out of the total of the 700 citizens who received the questionnaire through mail or personally who received our questionnaire, 95 and 123 citizens responded respectively. This is an overall response rate of 31.14 percent.

4.2. India

For India, we selected three important and popular services which are now being conducted through SMS of mobile phone. These are:

1. Online challan (receipt for payment of government fees) status inquiry: The Income Tax Department (ITD) of India launched SMS-based services to provide challan status information to citizens to verify whether banks have correctly uploaded the details of any government fees deposited to ITD.
2. Property registration: For land registration, citizens can now seek government services through mobile devices. This SMS-based service is very common and popular among citizens in remote areas of India.
3. Agri-watch: This public service is disseminated among citizens who need agricultural information, such as the latest information on crops, fertilizers, farming, seeds, and medicines.

The response rate was slightly higher than in the USA, out of 700 citizens who received the questionnaire through mail or physically, 91 and 143 citizens responded, respectively. So, the overall response rate is 33.43 percent.

4.3. Bangladesh

Currently in Bangladesh, the government regularly provides important messages to citizens through the SMS of mobile phones; examples of messages provided are the last date to pay income tax, the driving license renewal date, appointment for the automobile tax payment and fitness test, results of public examinations, dates and information about vaccination, and other government instructions and suggestions. For any of these kinds of services provided by the public service domain through SMS of mobile phone, we distributed the questionnaire, following a similar procedure to the USA and India, among 700 citizens.

Out of 700 citizens who received the questionnaire through mail or physically, 84 and 165 citizens responded, respectively. So, the overall response rate is 35.57 percent.

5. Data Analysis

To get a general impression about the sample and how representative it was, we first conducted demographic analyses for the samples collected from the three countries. The average age for USA respondents was 43 years, for India 46, and for Bangladesh 37. In our collected samples, the male to female ratios for the USA, India, and Bangladesh are 1:82, 1:41, and 1:59, respectively. The result is clearly explainable and potentially representative. Since the tasks mentioned for Bangladesh are more associated with a new generation of mobile phone users, the average age is lower and the male-female ratio is higher than in India. Nevertheless, in terms of response from female citizens, it is much lower than in the USA; this can be clearly explained from Hofstede's (1980) masculinity index. For India, the individuals who were concerned about the tasks mentioned for our study were mostly business owners, family heads, and farmers. Consequently, older males were more prone to answer our questions.

We conducted exploratory factor analysis (EFA) on the preliminary 37 scale items. We removed those items which loaded less than .40 (Stevens, 1996, pp. 389-390) or cross-loaded more than one factor. Through EFA analysis, we found statistical justification to retain the same

seven factors for the USA, India, and Bangladesh; however, from the seven constructs, we removed one item from the construct "Personalization" (PR2), one item from the construct "Time and Location Specific Interactivity" (TL1), one item from "Relevant Content," one item from "Process Motivation," one item from "Entertainment," and one item from "Informativeness" for all three countries. Other than these, from the USA sample we removed four more measuring items: CN4 (Connectivity construct), PR3 (Personalization), TL6 (Time and Location Specific Interactivity), and RC2 (Relevant Content). We retained a total of 27 measuring items with seven constructs. Similarly, for the Indian sample, we removed, through the iteration of EFA, CN2, CN4, CN6, and EN1. We kept a total of 27 measuring items with 7 constructs for the Indian sample. For the Bangladeshi sample, we removed PM5, PR3, TL2, TL5, and RC2. After this, 26 scale items were retained for measuring seven independent constructs.

Separately, we examined the measuring items of dependent variable "PV" through EFA. Under one principal construct, due to a loading factor of less than 0.40, we removed PV1, PV3, and PV5 for all the three countries. So, we retained a total of four items for this construct.

For the independent and dependent variables, we examined confirmation of EFA through confirmatory factor analysis (CFA) individually for all the constructs. At this point, we set the cut off value to remove any item as 0.50 (Kline, 2005). However, we did not find any justification to remove any further scale items from any constructs for any of the countries' samples. The CFA models for all the constructs retained the scale items for each construct if the average variances extracted (AVE) for each factor and its measuring items have a loading factor of at least 0.50; thus, convergent validity was proved (Fornell and Larcker, 1981). Discriminant validity among the seven constructs is also claimed as the largest shared variance between these factors that is lower than the least AVE value for each factor and its measures (Espinoza, 1999).

For the three samples, we examined the reliability of the seven independent constructs and one dependent construct after finalizing the scale items through EFA, CFA, and Cronbach's alpha. For all the constructs, the coefficient alpha scored from 0.710 to 0.955 for the three samples (shown in Table 2), which confirmed that the constructs and their measuring items were reliable to measure the intended concept (Nunnally and Bernstein, 1994).

Table 2: Reliability of Different Constructs

Construct	Cronbach's alpha		
	USA	India	Bangladesh
Connectivity	0.882	0.890	0.911
Personalization	0.732	0.726	0.703
Time & Location	0.955	0.946	0.939
Relevant Content	0.871	0.888	0.901
Process Motivation	0.798	0.788	0.792
Entertainment	0.941	0.955	0.955
Informativeness	0.701	0.734	0.744
Perceived Value	0.802	0.804	0.809

To answer our first research question, which we attempted to encapsulate through the theoretical construct PV measured by four scale items, we measured the average of the four scale items for each respondent. We defined the concept of PV in the way that it is formed by the comprehensive attributes of the measuring items in an integrative way (this is also supported by Wilcox et al., 2008) without any assumptions as to the patterns of inter-correlation between these items. This is termed a formative or causal index. Under this assumption of the meaning of PV, we have taken the average of the measuring items to get the integrative concept. What we intended to measure through this concept is *the extent to which citizens perceive that the received service from the public service domain through the mode of message of mobile phone SMS is so valuable that the mobile phone SMS can be an effective service delivery channel for public service domain.* This construct, measured by a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) where a score of 3 measures "neither agree nor disagree," and indicates any value higher than 3 as the perception of agreeableness about the effectiveness of this service delivery channel. Among the total of 218 respondents in the USA, 176 citizens (80.74 percent) scored more than 3. So, we concluded that 80.74 percent of the citizens of the USA perceive that mobile phone SMS can be an effective service delivery channel for public service domain. For India, we found that out of a total of 234 respondents, 191 scored higher than 3, which represents 81.62 percent citizens. In Bangladesh, this result is 84.74 percent. Out of 249 respondents, 211 scored higher than 3 on the PV construct. This result reflects the answer of our first research question.

For our second research question, we conducted path analysis through LISREL to verify the cause-effect relationships of the seven independent constructs with the dependent variable based on the respondents who perceived high value for the SMS-based mobile phone service delivery channel as an effective channel of public service to deliver service to citizens.

5.1. Path Model: USA

For structural equation modeling (SEM) following the path model, we took the average of the scale items of each of the variables individually for the 218 cases who perceived high value from the SMS-based mobile phone service delivery channel as an effective channel of public service to delivery service to citizens. The maximum likelihood procedure of LISREL was used for analysis. For path analysis, we used the correlation matrix as input data for all the variables.

After several iterations, we observed that the values for Chi-Square, degree of freedom (df), probability (p), and root mean square error of approximation (RMSEA) are 86.141, 12, 0.00219, and 0.193, respectively, which reflect poor representation of the model fitness. For a better model to depict the cause and effect relation, as per recommendation of the statistical analysis, we added error covariance terms between constructs. The significance of the relationships of the seven constructs with a dependent variable was tested primarily at the 0.05 level by 't' values. Based on the "t" value, we identified that Connectivity, Personalization, Time and Location-specific interactivity, Process Motivation, and Informativeness are significant for a perception of high value at the 0.05 level. The direct causal relationships of Relevant Content and Entertainment with perception of high value and the indirect relation of Time and Location with a perception of high value mediated through Personalization are not significant, even at the 0.10 level; however, Relevant Content affects the perception of high value through the Personalization construct and Entertainment has an effect on perception of high value through

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the Process Motivation construct. This means that the relevancy of content of SMS can enhance the personalization realization of citizens and entertainment of this service delivery channel can boost the perception of process motivation, which ultimately affects the perception of higher value of the SMS-based alternative service delivery channel. So we modified these relations and ran the model again. The final public service delivery channel model through the SMS of mobile phone depicting the critical factors is shown in Figure 1A. The verified model fitness indices are reasonably acceptable, as listed in Table 3 with the recommended values (Chau, 1997; Kline, 2005, pp. 133-144). The RMSEA value (.044) is quite fine in terms of the upper limit of the typical recommendation. (The recommended value is less than 0.06.) The squared multiple correlation coefficient (R^2) explaining the amount of variance that the independent constructs accounts for in the dependent variable (PV), is 0.464. It means 46.4% of variance on perception of value for mobile phone-based SMS from public service portals as an effective channel for service delivery is explained by the independent variables that are tested here as the critical pursuing factors for citizens. The relation between those critical factors and the perception of value for mobile phone-based SMS as an effective public service delivery channel is numerically shown in Appendix B.
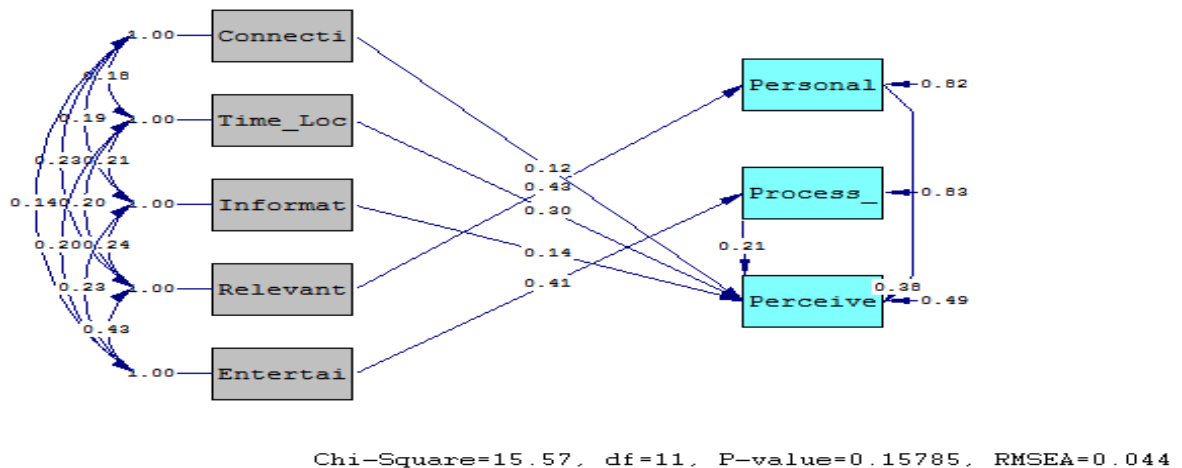

Chi-Square=15.57, df=11, P-value=0.15785, RMSEA=0.044

Figure 1A Critical Factors for Effective Public Service Delivery Channel for USA

5.2. Path Model: India

Following the same procedure, the final public service delivery channel model through SMS of mobile phone depicting the critical factors for the India sample is shown in Figure 1B. Based on "t" value, we identified that Connectivity, Time and Location-specific interactivity, Process Motivation, Relevant Content, and Informativeness are significant on perception of high value at the 0.05 level. The direct causal relationships of Personalization and Entertainment with perception of high value and indirect relations of Time and Location, and Relevant Content with a perception of high value mediated through Personalization are not significant, even at the 0.10 level; however, Relevant Content affects perception of high value through the Informativeness construct, which is recommended by the cause-effect analysis. Entertainment has no effect on perception of high value through the Process Motivation construct. This means that personalization and entertainment are not critical factors for the perception of high value of a

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public service if the service is delivered through an SMS-based alternative service delivery channel.

The squared multiple correlation coefficient (R^2) explaining the amount of variance the independent constructs account for in the dependent variable (PV), is 0.499. This means that 49.9% of the variance on perception of value for mobile phone-based SMS from public service portals as an effective channel for service delivery is explained by the independent variables, which are tested here as the critical pursuing factors for citizens. The relation between those critical factors and the perception of value for mobile phone-based SMS as an effective public service delivery channel is numerically shown in Appendix B.
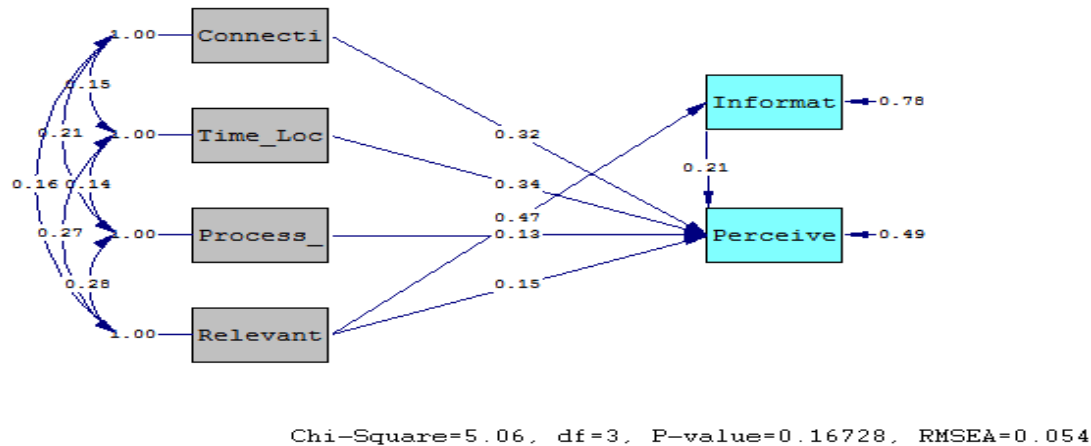

Chi-Square=5.06, df=3, P-value=0.16728, RMSEA=0.054

Figure 1B Critical Factors for Effective Public Service Delivery Channel for India

5.3. Path Model: Bangladesh

Following the same procedure, the final public service delivery channel model through SMS of mobile phone depicting the critical factors for the Bangladesh sample is shown in Figure 1C. Based on the "t" value, we identified that Connectivity, Time and Location-specific interactivity, Process Motivation, and Informativeness are significant factors for a perception of high value at the 0.05 level. The direct causal relationships of Personalization, Relevant Content, and Entertainment with a perception of high value, and the indirect relations of Time and Location, and Relevant Content with a perception of high value mediated through Personalization are not significant, even at the 0.10 level. However, Relevant Content affects perception of high value through the Informativeness construct, which is recommended by the cause-effect analysis. Entertainment has no effect on perception of high value through the Process Motivation construct. This means that personalization and entertainment are not critical factors for the perception of high value of public service if service is delivered through an SMS-based alternative service delivery channel.

The RMSEA value (.075) has crossed the upper limit of the typical recommendation (Recommended value is less than 0.06); however, any value of RMSEA less than 0.10 is quite acceptable (Kline, 2005, pp. 139). The squared multiple correlation coefficient (R^2), explaining the amount of variance the independent constructs accounts for in the dependent variable (PV), is 0.477. It means 47.7% of variance on perception of value for mobile phone-based SMS from

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public service portals as an effective channel for service delivery is explained by the independent variables that are tested here as the critical pursuing factors for citizens. The relation between those critical factors and the perception of value for mobile phone-based SMS as an effective public service delivery channel is numerically shown in Appendix B. The $\chi2$ statistic of 9.59 (df = 4, p-value 0.04785), which indicates that the null hypothesis of the model is not a good fit for the data. However, Chi-square is not a very good fit index in practice when the sample size is large. It is sometimes difficult to get a non-significant chi-square when sample size is larger than 200 or so (Tanaka, 1993; Maruyama, 1998).
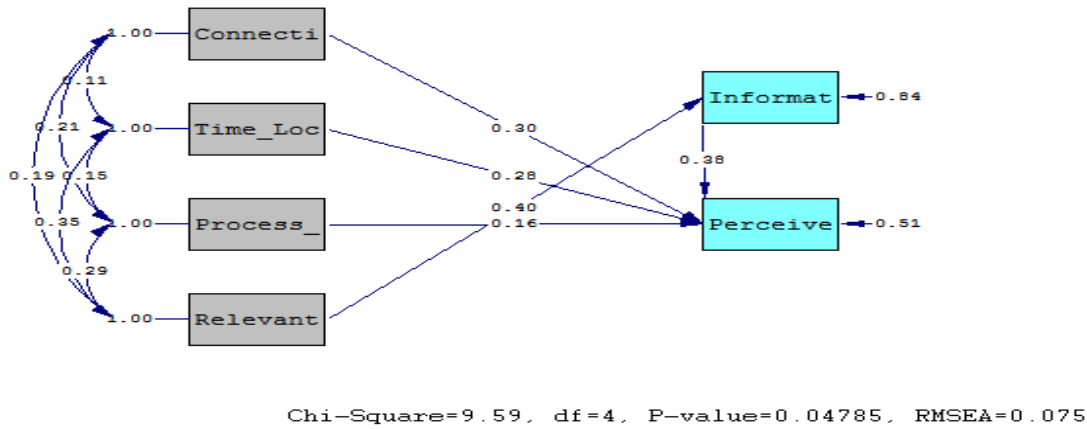

Chi-Square=9.59, df=4, P-value=0.04785, RMSEA=0.075

Figure 1C Critical Factors for Effective Public Service Delivery Channel for Bangladesh

Table 3: Model Fitness Values

Fit Measures	Recommended Values	Adoption Model		
		India	USA	Bangladesh
Chi-square (χ2)	p≥0.05	5.06 (0.16728)	15.57 (0.15785)	9.59 (0.05379)
Degrees of Freedom		3	11	4
χ2/Degree of freedom (DF)	≤3.0	1.68667	1.41545	2.3975
Comparative Fit Index (CFI)	≥.90	0.994	0.99	0.983
Goodness of Fit Index (GFI)	≥.90	0.993	0.982	0.987
RMSEA	<0.06	0.054	0.044	0.075
Normed Fit Index (NFI)	≥0.90	0.986	0.969	0.972
Adjusted Goodness of Fit Index (AGFI)	≥0.90	0.95	0.94	0.933

6. Results and Discussion

For our first research question, we found very close results for all three countries. More than 80 percent of the citizens of these three countries perceived a high value for SMS-based service delivery channel from the public service domain through mobile phones and recommend it as

being effective. This acknowledges that the majority of the citizens in these three countries asserted that they have a positive attitude toward public services if the governments offer a new channel to deliver the required public services. This new channel structure is constructed by SMS on the mobile phone. Our second research question is disclosed by revealing the critical factors which contribute to the perception of the effectiveness of an SMS-based public service delivery channel (shown in Table 4). However, the reasons for the effectiveness of the new public service delivery channel structure, shown by some critical factors, are slightly different for different countries. And interestingly, the magnitudes of importance of those critical factors are significantly different for the three countries according to the perception of the citizens of those three countries (shown in Table 4 and Table 5). This offers a range of potential analysis reflecting cultural differences. This range has exposed and addressed our third and supplementary research question.

We also observed several similarities among the three samples. For all the three countries, Connectivity, Process Motivation, Time and Location, and Informativeness are significant factors for citizens to perceive that there is a high value in an SMS-based service delivery channel through mobile phones, and that this is an effective service delivery channel. However, the citizens of India, the USA, and Bangladesh revealed different attitudes toward some factors which are presumably contributing to the perception of high value for effectiveness as service delivery channel; these factors have the potential to discuss in relation to cultural traits. These differences among the three countries were sought both in factors (independent variable) and their magnitude, i.e., importance. These observed results are depicted in Tables 4 and 5.

Table 4 Summary of Results

Proposed and New Hypothesis	Country Status		
	India	USA	Bangladesh
H_1: Connectivity can enhance citizens' perception of value	Accepted	Accepted	Accepted
H_2: Personalization can enhance citizens' perception of value	Rejected	Accepted	Rejected
H_3: Time & Location specific interactivity can enhance citizen perceptions of value	Accepted	Accepted	Accepted
H_{3a}: Time & Location specific interactivity can enhance citizen perceptions of personalization	Rejected	Rejected	Rejected
H_4: Relevant Content can enhance citizen perceptions of value	Accepted	Rejected	Rejected
H_{4a}: Relevant content can enhance citizen perceptions of personalization	Rejected	Accepted	Rejected
H_5: Process Motivation can enhance citizen perceptions of value	Accepted	Accepted	Accepted
H_6: Entertainment can enhance citizen perceptions of value	Rejected	Rejected	Rejected
H_{6a}: Entertainment can enhance citizen process motivation	Rejected	Accepted	Rejected

H[7]: Informativeness can enhance citizen perceptions of value	Accepted	Accepted	Accepted
New Hypothesis: Relevant content can enhance citizen perceptions of informativeness	Accepted	Not Accepted	Accepted

In Table 5, the critical factors which contribute to the perception process of mobile phone SMS service as an effective public service delivery channel are listed for India, the USA, and Bangladesh expressing their numerical importance. Values of the nonstandardised factor loadings estimate the change in the dependent variable for unit change on the respective independent variable, if the effects of other factors are constant. Suppose, for the USA, personalization has a loading factor equal to 0.38. A unit positive change on personalization causes a 0.38 unit positive change on perception of mobile phone SMS service as an effective public service delivery channel for USA when the effects of all other critical factors (independent variables) remain constant.

Table 5: Relative Importance of Independent Variables for the Perception of Effectiveness of Mobile Phone SMS as a Service Delivery Channel

Construct	India			USA			Bangladesh		
	Loading	Sequence of Contribution	Comment	Loading	Sequence of Contribution	Comment	Loading	Sequence of Contribution	Comment
Connectivity	0.32	**2**	Significant	0.12	**5**	Significant	0.30	**2**	Significant
Personalization	-	**-**	Not Significant	0.38	**1**	Significant	-	**-**	Not Significant
Time & Location	0.34	**1**	Significant	0.30	**2**	Significant	0.28	**3**	Non-Significant
Relevant Content	0.15	**4**	Significant	-	**-**	Not Significant	-	**-**	Not Significant
Process Motivation	0.13	**5**	Significant	0.21	**3**	Significant	0.16	**4**	Significant
Entertainment	-	**-**	Not Significant	-	**-**	Not Significant	-	**-**	Not Significant
Informativeness	0.21	**3**	Significant	0.18	**4**	Significant	0.38	**1**	Significant

We can draw several potential conclusions from the analyses briefly noted in Tables4 and 5 to develop our theory. Based on the findings from the three countries, we can infer that in respect to service delivery, public service users are satisfied with this newly invented service delivery channel operated through mobile phone SMS. They perceived a high value for this delivery

channel and acknowledged that this is an effective channel. They also postulated that the prime driving forces of this effectiveness lie on certain generalized opportunities and characteristics. Fundamentally, continuous connectivity, time and location specific interactivity, structured and focused information, and information access, exposure, attention, and interpretation scope (i.e., process motivation of the SMS-based service delivery channel) helped them to revalue public service delivery as satisfactory and effective. Therefore, these unique characteristics of the mobile phone-based SMS service delivery channel, which can be facilitated by this mobile channel structure, received high positive attitudes from citizens toward public service in satisfactorily accessing and receiving public service.

In addition to those generalized factors, citizens of the USA perceived that personalization of the content of the message (service) is ensured through this channel and this contributes positively to the merit of this channel structure. Relevant content and entertainment are not directly contributing in perceiving this channel structure as effective, as they have a high correlation with personalization and process motivation respectively; these are two essential elements of potential merit for the perception of personalization and process motivation of the SMS delivered through the public service domain for attractiveness, attention, exposure, interaction, and acceptance. Personalization, and time and location specific interactivity are the two most important benefits of this newly invented channel which provide satisfaction to citizens.

However, Indian citizens who evaluated the services, primarily farmers and small traders, did not perceive personalization of SMS to be an essential element for considering this delivery channel to be effective; rather they advocated for relevant content of the message, which is quite consistent with the services considered in this empirical study. For Indian citizens, the scope of time and location-specific interactivity and connectivity offered through this service delivery channel structure are the two key reasons for the perception of a high value of public service delivery.

For Bangladeshi citizens, neither personalization nor relevant content has potential for considering this service delivery channel effective. Bangladeshi citizens found the generalized four value-added elements – namely, informativeness, connectivity, time and location specific interactivity, and process motivation – to be quite sufficient to consider this SMS-based service delivery channel to be satisfactory. The level of importance of those value-added elements is different in the perceptions of the citizens of the three countries. To further understand the cultural traits and service pattern considered for the three countries in this study, these differences will be further analyzed in the next section.

7. Theoretical and Managerial Implications

The potential contribution of this exploratory research by reforming public administration through the inclusion of a mobile phone SMS service delivery channel in the traditional design of government service can be explained and articulated through the following three intertwined issues. In this part of theoretical analysis and interpretation of the findings, we can examine those three intertwined issues. First, we shed light on the sources of similarities and differences identified from the perception of the citizens of the three countries. Then, we proposed the base of a theory of strategic development of an effective service delivery channel of public service. Referring to the cultural differences among the citizens of the three countries, we also developed

both generalized and customized concepts for a delivery channel structure facilitated by mobile phone SMS.

For the three countries studied, citizens asserted that the key driving forces for this service delivery channel structure to meet citizen expectations of public service and create positive perceptions are the ability to deliver time-location sensitive message (Time and Location), the scope to develop very specific and focused information (Informativeness with Relevant Content), the advantage of easy processing of delivered service (Process Motivation), and the opportunity to be connected from anywhere at any time (Connectivity). However, for USA citizens, personalized information is especially important. They value it highly, unlike Indian and Bangladeshi citizens. This phenomenon is explained through the cultural dimension from Hofstede (1980), depicted in Table 1. Since they receive many alert messages, if the content is relevant to their expectations it can enhance their perception of personalization, which is a dominant behavior of an individualistic society. This identification is also acknowledged by many cross-cultural researchers (Espinoza 1999; Sun et al., 2014; Wua et al., 2012). For a pragmatic society like the USA where affective and impulsive buying is important (Gardner and Rook, 1988; Kacen and Lee, 2002), entertainment provided through this service delivery channel can increase the attractiveness of the process and, thus, entertainment increases the value of this mobile channel; however this is mediated by process motivation (Okazaki and Barwise, 2011). However, for Indian and Bangladeshi socio-economic culture, unlike in the USA, public administration services are scarce and it is a matter of fortune to receive public service in a timely fashion because the power distance is high. For these societies, entertainment is not an issue in receiving government service; whereas USA citizens take public service for granted. This finding receives support from previous cross-cultural researchers (Benjamin et al., 2011; Ha et al., 2010; Shareef et al., 2014; Tao, 2011). For Indian users of the government portals described in this study, if the message delivered to them contains relevant information, it will be effective, because their service requirement is very specific and focused. Consequently, the relevant content of the message can add direct value to the perception of the channel structure through which this service is delivered. It also affects the perception of informativeness of the message as perceived by the Bangladeshi citizens. Since the services mentioned in this study for Bangladesh are primarily general, relevant content does not directly affect the perception of the value of the processes of this SMS-based service delivery channel.

For the three countries, the perception of high value for mobile phone-based SMS from public service portals as an effective service delivery channel is practically and statistically high (45-50 percent). We can infer from this that if the public service delivery channel can maintain a seamless interaction with citizens through easy, attractive, specific, and time-location sensitive messages, citizen will find this service delivery to be very effective and will be satisfied with this channel structure. So from Bucklin's (1966) marketing theory, we can postulate that this innovative service delivery channel with input from the public service domain can effectively reduce gaps between service output demand and service output supplied. Consequently, this SMS-based service delivery channel can potentially alleviate citizens' formerly dissatisfied attitude towards interaction with and receipt of public service, the core objective of NPM.

Through the introduction and inclusion of this service delivery channel in providing public service, citizens perceive that receiving public service in certain areas is now effective. This revelation provides certain insights for the policy makers of NPM and clear recommendations for the design of public services. As Mosser (2009) suggested: "The NPM reformation suggests that public administration should be flexible, innovative, problem solving, and entrepreneurial and

make better use of market-like competition." However, it can be a dilemma to bring public service that is as cost effective and accountable, and receives as much consumer participation as do services from private entities. Therefore, the critical factors have potential implications for NPM in the planning and organizing phases of managing public services. This identification also gives insight to the NPM authors that citizens need to be satisfied by public service through the inclusion of this newly invented channel. Certain essential elements need to be embedded in this channel structure that do not hamper the democratic values of public service by treating citizens as consumers.

Since information that is time and location specific is highly valued by the citizens, so use of technology is very important for the public service domain to determine user locations and time sensitive expectations and requirements. The pattern of service requirements of public service users in respect to location and time should be extensively explored and identified. This is one of the key efficiencies in delivering the SMS to users at the appropriate locations and optimum time. Several researchers (Heim et al., 2009; Smutkuptet al., 2010; Van der Waldtet al., 2009) have acknowledged that citizens might be exhausted and annoyed if irrelevant, anonymous information is passed to them through mobile phone SMS. The content of the SMS is one of the major concerns in making this service delivery channel both satisfactory and effective (Anbu and Mavuso, 2012; Gardan et al., 2011; Susanto and Goodwin, 2011). Any inability to understand citizen needs, sending SMS without careful consideration of citizen requirements, and unorganized and unstructured messages can create negative attitudes in citizens and result in blocking information received instead of developing positive attitudes (McDonald and Dahlberg, 2010; Nantel and Sekhavat, 2008). All messages should be very relevant and based on user service demand. Therefore, understanding specific citizen requirements and addressing those requirements at the expected time and location with targeted content can facilitate citizen perceptions of the high value of public service. In this regard, appropriate consumer segmentation based on service requirements tailored to time, location, and content is the hardest but most important part of NPM. The success of this delivery channel lies in segmentation of citizens without hampering democratic values: all citizens should be treated equally. If public service providers can effectively segment the market based on time, location, and requirements and deliver the preferred message to concerned users with relevant information that is easy to access and process, citizens regard this service delivery channel as effective, satisfactory, and as competent as the private counterparts.

8. Conclusion and Future Research Direction

The emerging trend today is to apply SMS to establish a successful channel of service delivery by the public service domains to consumers by developing new paradigm of the NPM system. Revealing consumer behavior towards this new channel is an important issue to explore in defining and developing public administration strategies. This has a great potential to contribute to recent trends of public administration reformation by capitalizing on the enormous benefits of ICT, particularly the mobile phone. Therefore, the objective of this current paper is to assist public administration reformation by understanding how consumer behavior through the use of modern ICT can help achieve the desired goal. Precisely, it has focused on revealing consumer perceptions about the newly implemented service delivery channel of public service through mobile phone SMS to maintain continuous interactivity with government's primary stakeholder – citizens.

This current research has explicitly identified and postulated that the inclusion of mobile phone based SMS media as a service delivery channel in the government service delivery system can contribute significantly to improving citizen perceptions of public service quality. Similar to private organizations who use this channel for effective marketing, public service system can be reformed in order to meet citizen requirements for continuous interactivity with higher quality service through this mobile channel. However, the success and effectiveness of this mobile channel depends on certain citizen-centric parameters, which should be accomplished in the design of this channel for service delivery. In this context, it should be noted that, although citizens as consumers have several generalized requirements, the design of a service delivery channel is, to some extent, culture bound. These findings have potential merit to advance public administration reformation to initiate citizen-centric service design through a mobile channel and establish a strategy to create a competitive advantage for public service.

This current study has identified that citizens are quite satisfied with this new service delivery channel from the public service domain. It has shown that seamless connectivity; time and location sensitive interactivity; informativeness of structured information; easy and attractive information processing; and target-oriented, relevant information can successfully fulfill user expectations and requirements for service from any competent service delivery channel. This competency is provided by a mobile phone SMS-based service delivery channel. However, citizens of the three countries – USA, India, and Bangladesh – studied in this context, showed different attitudes toward the factors which are assumed to be the main forces for the perception of this public service delivery channel as effective and satisfactory. Because of the differences in cultural traits among the citizens and the different services considered in the three countries, the effects of the identified characteristics and properties (independent variables) of an SMS-based service delivery channel in terms of importance and magnitude varied significantly. Nevertheless, the central essence of perceiving this service delivery channel as effective, and reasons for user acceptance of this service is very conclusive. It affirmed that structured information based on time, location, and content requirements that are sensitive to public values and democratic doctrines are important elements of success. Well organized message content and timely, location-oriented delivery based on specific user requirements are also essential to the success of this SMS-based service delivery channel.

This mobile and dynamic channel of service delivery can meet at least two important service output demands recognized by Bucklin (1966): spatial convenience and waiting time. Studies of citizen attitudes toward public services (Butler et al., 2011; Mares et al., 2010) have shown that citizens do not find public services competent, in comparison to private services, due to some inabilities in public administration and the obscure nature of public service. Among many issues, the prominent negative areas are: unavailability of service due to a centralized venue, often inaccessible service in terms of cost and time to receive services, extremely subjective and unfocused service, and a lack of transparency (Kim, 2010; Pierre, 2009). Seamless interactivity, availability from anywhere, accessible around the clock, easy to process with organized and structured information, focused and specifically targeted information, and expected news with no waiting time can meet citizen needs for service from the public service domain. So citizens feel that this service delivery channel is satisfactory and as effective as the private counterparts.

The theoretical framework we have identified provides basic information, but might not be exhaustive. Future researchers could explore other relevant issues such as two-way communication through SMS, transaction facility, and the gender and age effect of using mobile phone SMS transactions. As a supplementary research question, this study also addressed the

effect of cultural traits on the driving forces of perception, exposure, and attention, studying citizens from three countries: the USA, India, and Bangladesh. However, while comparing their attitudes toward an SMS-based service delivery channel, due to the limitation of service availability we could not consider the same services for all three countries. The differences in service patterns might necessarily hamper any explanations of the differences in attitude among the three nations that is only based on differences in cultural traits. In the future, when the services offered through mobile phone SMS are similar in those three countries; researchers can study the same type of service to identify the effects of culture.

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Appendix

Appendix A: Effectiveness of Mobile Phone-Based SMS: A New Service Delivery Channel for Public Service

Quality Dimension (Formative)	Definition	Measuring Items of Quality Dimension (Reflective)	Source
Connectivity	The extent to which citizens perceive physically and psychologically that they are in close contact with the public service system due to one-way or two-way frequent communication from public service domain through mobile phone SMS	CN1 The service is available 24/7 from anywhere through my mobile device/phone. CN2 I feel that I am a part of public service system when I get frequent SMS through my mobile phone from public service domain. CN3 Getting SMS through my mobile phone from public service domain gives me a sense of belongingness. CN4 Mentally I am assured that I am always in close contact with the public service system due to frequent exchanges of messages from the public service domain through mobile phone. CN5 I can always interact withthe public service system through the SMS of mobile phone. CN6 Physically I am always in close contact with the public service system due to frequent exchanges of message from public service domain through mobile phone.	Bauer et al.,2006; Collier and Bienstock, 2006; Kim et al., 2006; Shareef et al., 2014
Personalization	The extent to which citizens perceive that the delivered message from public service domain through mobile phone	PR1 I feel that SMS of mobile phone conveys personalized information to meet my personal specific needs.	Dickinger and

	SMS to the intended consumers is strategically prepared specific to customers' need from historical precedence of receipt considering lifestyle, taste, location, profession, purchasing behavior, income, and preference	PR2	I feel that SMS of mobile phone is personalized for my usage.	Haghirian, 2004; Peters et al., 2007;
		PR3	Public service domain send those messages to me through SMS of mobile phone which are specifically important to me.	Phau and Teah, 2009;
		PR4	Public service domain send those messages to me through SMS of mobile phone which are specifically prepared to meet my personal needs considering my overall life.	Srinivasan *et al.*, 2002; Xu, 2007
		PR5	I feel that any message sent to me by public service system through SMS of mobile phone is prepared only for me.	
Time & Location	The extent to which the strategic location and sending time of the delivered message from public service domain through mobile phone SMS to the intended consumers can draw exposure and attention and facilitate and meet customers' time and location specific requirements.	TL1	I always get any message from public service system through SMS of mobile phone when it is required.	Bauer et al., 2006; Collier *et al.*, 2006;
		TL2	Time of sending any message regarding government service from public service system through SMS of mobile phone is perfectly appropriate.	Drossos et al., 2007; Leppäniemi and
		TL3	I receive any message regarding government service from public service system through SMS of mobile phone when I need to seek that government service	Karjaluoto, 2005; Schaupp and
		TL4	I always get any message from public service system through SMS of mobile phone where it is required.	Bélanger, 2005;
		TL5	My physical location while receiving any message regarding government service from public service system through SMS of mobile phone is perfectly appropriate	Srinivasan et al., 2002
		TL6	I receive any message regarding government service from public service system through SMS of mobile phone when I am close to any government office where I need to seek that government service.	
Relevant Content	The extent to which the subject and language of the message delivered from public service domain through mobile phone SMS to the intended consumers is appropriate and needful to draw exposure and attention and facilitate and meet customers' requirements.	RC1	The subject of message through SMS of mobile phone is appropriate and necessary to fulfill needs.	Devaraj *et al.*, 2002; Fassnacht
		RC2	The subject of message through SMS of mobile phone is prepared appropriately to facilitate needs.	and Koese, 2006; Xu, 2007
		RC3	The subject of message through SMS of mobile phone can draw consumers exposure and attention.	
		RC4	The language of message through SMS of mobile phone can draw consumers exposure and attention.	
		RC5	The language of message through SMS of mobile phone is needful.	
Process Motivation	The extent to which citizens perceive that the received message from public service domain through mobile phone SMS is easy, appropriate, attractive, and interesting for exposure and attention to public service willingly.	PM1	Information organization to process the service is understandable through SMS of mobile phone.	Bauer *et al.*, 2006;
		PM2	I find receiving government service through SMS of mobile phone to be very convenient.	Collier *et al.*, 2006; Peters
		PM3	The process of service delivery from public service system through SMS of mobile phone is interesting.	et al., 2007; Schaupp*et
		PM4	The process of service delivery from public service system through SMS of mobile phone can draw my attention.	al.*, 2005; Szymanski
		PM5	Mobile phone-based SMS can easily get exposure from citizens.	and Hise, 2000
		PM6	The process of getting mobile phone SMS from the public service domain is relaxing and convenient.	
Entertainment	The extent to which citizens perceive that the received service from public service domain through the mode of message of mobile phone SMS is attractive, enjoyable, and pleasant in terms of	EN1	I feel that receiving message of public service through SMS of mobile phone is enjoyable.	Bauer *et al.*, 2006;
		EN2	I feel that receiving message of public service through SMS of mobile phone is pleasant	Fassnacht and Koese,

		EN3 To me it is amusing to receive SMS from public service domain.	2006;
	content and mode of receipt and access.	EN4 The way I receive SMS regarding government service through SMS of mobile phone is entertaining.	Leppäniemi and Karjaluoto,
		EN5 The content of received SMS regarding government service through SMS of mobile phone is entertaining.	2005; Peters et al., 2007; Phau and Teah, 2009; Xu, 2007
Informativeness	The extent to which citizens perceive that the delivered message from public service domain through mobile phone SMS to the intended consumers contains appropriate, necessary, and non-redundant information in terms of message content and delivery time.	IN1 I feel that mobile phone SMS is a good source of government information. IN2 SMS of mobile phone provides the information I need. IN3 Message sent from public service system through SMS of mobile phone is very useful. IN4 I feel citizens are benefitted due to the information of the message sent from public service system through SMS of mobile phone.	Cheng et al., 2009; Dickinger and Haghirian, 2004; Phau and Teah, 2009; Xu, 2007
Perceived Value	The extent to which citizens perceive that the received service from public service domain through the mode of message of mobile phone SMS is so valuable that the mobile phone SMS can be an effective service delivery channel for public service domain.	PV1 I expect to get message through SMS of mobile phone from public service domain. PV2 Messages of public service system received through SMS of mobile phone helps me to accomplish my intended task. PV3 I am happy with the overall service offered through mobile phone SMS. PV4 I am satisfied with my experience in overall service conducted through mobile phone SMS. PV5 Getting SMS through my mobile phone from public service domain gives me a sense of accomplishment and satisfaction. PV6 Getting SMS through my mobile phone from public service domain gives me a sense of control over public service system. PV7 I would be willing to get mobile phone SMS from public service domain as my required service from public service system.	Balasubramanian et al., 2003; Batra and Ray, 1986; Devaraj *et al.*, 2002; Drossos et al., 2007; Fassnacht and Koese, 2006; Peters et al., 2007; Xu, 2007

Appendix B: Relation between those Critical Factors and Perception of Value for Mobile Phone based SMS

USA

Perceive = 0.385*Personal + 0.209*Process_ + 0.119*Connecti + 0.304*Time_Loc + 0.143*Informat, Errorvar.= 0.495 , R^2 = 0.464
Standerr (0.0488)   (0.0486)   (0.0498)   (0.0500)   (0.0502)   (0.0480)

India

Perceive = 0.207*Informat + 0.322*Connecti + 0.338*Time_Loc + 0.133*Process_ + 0.152*Relevant, Errorvar.= 0.488 , R^2 = 0.499
Standerr (0.0522)   (0.0476)   (0.0482)   (0.0488)   (0.0553)   (0.0455)

Bangladesh

Perceive = 0.383*Informat + 0.304*Connecti + 0.284*Time_Loc + 0.158*Process_, Errorvar.= 0.505 , R^2 = 0.477

Standerr (0.0461)   (0.0466)   (0.0464)   (0.0470)   (0.0456)