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Civic engagement with traditional government and mobile government: comparing rural to urban citizens in Saudi Arabia

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Civic engagement with traditional government and mobile government:

Comparing rural to urban citizens in Saudi Arabia

by

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DEDICATION

I would like to dedicate this dissertation to my country, and I hope this work can develop Electronic and Mobile Government in Saudi Arabia and further enhance the relationship between government and citizens through more efficient and effective civic engagement.

I believe this study can improve government-citizen interaction around the world through its application. In terms of academia, this dissertation was accomplished with the aim of contributing to the literature of Human Computer Interaction (HCI), especially the new type of interaction which is Mobile-HCI.

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ABSTRACT

Mobile devices have added new channels for the communication between governments and citizens. The new nature of engagement between government and citizens through mobile devices needs to be studied intensively in order to make it more effective. Thus, this research examines the relationship between mobile government (M-government) and civic engagement deeply. In particular, it compares civic engagement with traditional government (T-government) to civic engagement with M-government in order to determine if M-government increases civic engagement. Furthermore, it compares civic engagement of urban citizens to civic engagement of rural citizens in the case of T-government and in the case of M-government. This dissertation used structured questionnaires and semi-structured interviews as the major methodologies. Our results revealed highly significant evidence for the increase in civic engagement with M-government compared to T-government. Moreover, the results indicated that M-government allows similar levels of civic engagement between urban and rural citizens. However, the results did not detect significant difference between civic engagement of urban and rural citizens with T-government. However, the major finding of this dissertation is that Saudi citizens believe that Human-to-Computer interaction is more effective than Human-to-Human interaction for their communication with government.

KEYWORDS

A word cloud representing the keywords of this research as in where size reflects importance.

CHAPTER 1 INTRODUCTION

1.1 Background and Motivation

M-government is a new research area that has developed in the last decade. There are many aspects of this subject that still need to be explored. One of the essential aspects is civic engagement. With the continued growth in the usage and capabilities of mobile devices and mobile Internet, civic engagement could increase. However, no study has been conducted to determine whether there has been a significant increase in the level of engagement. Furthermore, since rural citizens live far from government agencies, their civic engagement could be less than the civic engagement of those who live close to government agencies. Therefore, it is important to examine the civic engagement of rural citizens and to compare it to that of urban citizens. Moreover, since mobile devices have become available to all citizens, the opportunities for civic engagement have become almost equal for rural and urban citizens. Thus, there is a need for a study that explores whether M-government has provided similar a level of engagement to rural and urban citizens.

1.2 Research Contribution

Mobile devices provided a new way of interaction between citizens and government. Researchers in the HCI field need to study this interaction in details in order to ensure successful communication between government and citizens. Improving this interaction means developing the community and creating more opportunities of civic engagement. Thus, the results of this research would provide helpful recommendations for enhancing the community.

This research deals with an important aspect of our life. Mobile devices created new paths for civic engagement which should enhance our communities. Those new paths have been changing the ways that people use to interact with their communities and governments. Therefore,

it is important to ensure that people use those paths properly, and they apply their benefits on their societies. Furthermore, those paths could allow equal opportunities for civic engagement for different groups of citizens such as rural and urban. Thus, it is important to study if those opportunities significantly allow similar level of engagement between rural and urban citizens.

1.3 Research Plan

This dissertation is divided into three journal papers. The first paper is a literature review on M-government and civic engagement. This paper begins with distinguishing E-government from M-government. After that, it describes the current state of M-government research and identifies future research opportunities. The second paper talks about the research scope and presents the three hypotheses of this dissertation. Next, it shows the results of assessing civic engagement with T-government and civic engagement with M-government. Furthermore, it shows the results of assessing civic engagement of rural citizens and civic engagement of urban citizens in case of T-government and in case of M-government. The assessment is based on analyzing structured questionnaires. Finally, the third paper confirms the findings of questionnaires and provides more detailed explanations through conducting semi-structured interviews with a number of rural and urban citizens.

CHAPTER 2 CURRENT STATE OF M-GOVERNMENT RESEARCH: IDENTIFYING FUTURE RESEARCH OPPORTUNITIES

A paper accepted in 2015 in the International Journal on Electronic Governance

Abdulmohsen S. Albesher and Richard T. Stone

Abstract

Research on m-government has started in the last decade. The use of m-government has been rapidly increasing due to the high penetration of mobile devices in the general population. This research will first compare m-government to e-government which will help in understanding the similarities and the differences between the two types of government. Then this research will examine the current state of research in the area of m-government. In this research, we collected 79 papers specifically related to m-government, dividing them into themes based on the research premise. The results showed that there is a gap in understanding the relationship between the use of m-government and civic engagement. A future study is highly recommended to determine whether the use of m-government positively affects civic engagement.

2.1 Introduction

Online services such as online commerce, online learning, and online government have allowed new channels of communication. They have enhanced communication by allowing 24/7 services any place where an internet connection is available. Because of this, governments have

been seeking to benefit from the advantages of online government, such as reducing the number of calls and in-person interactions.

M-government is a new trend of online government which increases the use of online services by using the mobile internet. M-government is different from e-government, although they share similar aspects. Thus, research on m-government may provide different results than similar research into e-government. In this paper, we will discuss e-government first and then we will compare it to m-government before investigating the current research in m-government. There are several reasons behind explaining e-government in details and comparing it m-government. The first reason is to show how m-government emerged. The second reason is to demonstrate how m-government could cover some e-government's limitations. The third reason is to develop an alternative view of the relationship between e-government and m-government which allows a better understanding of m-government.

This paper is divided into three parts. The first part discusses the definitions of traditional government, e-government, and m-government. The second part describes the differences and similarities between the e-government and m-government. The third part provides a study that investigated the current state of research in the area of m-government. This part contains the methodology that was used in this study, the results of the study, and a discussion based on the results.

2.1.1 Traditional government vs. E-government

The meaning of government is "the system by which a state or community is governed" (Oxford English Dictionary, 2010). In other words, "a government is the dynamic assortment of goals, structures, services, and functions by which a community is ruled" (Hassan et al., 2009, p.4). The word government could refer to the government of any group of people or community.

However, it generally denotes the government of a nation, state, province, city or village (Bealey, 1999). A government is responsible for supporting the delivery of its services by operating different means and communication channels that meet citizens' needs (Hassan et al., 2009). Therefore, most governments seek to improve their quality of delivery by capitalizing on the benefits of new technologies.

Traditional means of delivering services present many problems. For instance, citizens experience busy phone lines, long queues, and continuous redirections to other departments (Shareef et al., 2010). In addition, some citizens live in remote areas, so it is hard for them to seek in-person assistance every time they need to deal with a government issue. Thus, e-government was introduced to overcome many problems with traditional government. E-government uses the internet to communicate with citizens; it not only overcomes the difficulties of the traditional government but it also offers various advantages. For instance, with e-government, documents are more organized and information is easily retrieved. Moreover, the workloads of state officials are reduced (Kirillov et al., 2011).

E-government is also called online government, digital government, or internet government (Hai and Jeong, 2007). E-government has been defined as "the use of Information and Communication Technologies in public administrations combined with organizational change and new skills in order to improve public services and democratic processes" (Grönlund, 2010, p.20). It was first introduced in the late 1990s, when a number of governments began to publish information online. In the mid-2000s, governments began to provide some of their public services online (Snellen and Thaens, 2008). Since that time, governments have been working to facilitate the provision of more online services to the public with the aim of encouraging further civic engagement.

A good example of e-government is the Estonian system which was launched in 2002. By 2011, more than 150 government organisations, ministries, and departments were providing e-services (Kirillov et al., 2011). The developing countries also have great examples of e-government. In fact, the Republic of Korea was ranked first in the United Nations (UN) Report on E-government (United Nations, 2014). Table 1 shows the UN ranking of the top five countries with e-government in 2012 and 2014.

Table 1   The top five countries with e-government in 2012 and 2014

Country	2014 Rank	2012 Rank
Republic of Korea	1	1
Australia	2	12
Singapore	3	10
France	4	6
Netherlands	5	2

E-government is not only concerned with interactions with citizens; it also includes interactions with its employees, the private sector, and other governments. There are different types of interactions related to e-government. The interactions with governments or citizens have been classified into the following categories (Yu, 2013):

- Government-to-Government (G2G)

- Government-to-Business (G2B)

- Government-to-Citizens (G2C)

- Government-to-Employees (G2E)

- Citizens-to-Citizens (C2C).

The interactions in G2B, G2C, and G2E are reciprocal, so it can be said that there are other classifications, like B2G, C2G, and E2G. The interaction in C2C includes services that are designed by residents with the purpose of helping each other (Rannu et al., 2010). It also includes forums that are designed by governments to help citizens share thoughts and recommendations.

Although e-government has exhibited a positive impact in the way citizens become engaged with the government, there are some limitations to e-government. A major limitation is that e-government contributes to the digital divide (Nam and Sayogo, 2011). Digital divide is "an economic and social inequality according to categories of persons in a given population in their access to, use of, or knowledge of Information and Communication Technologies (ICT)" (Chinn and Fairlie, 2004). In fact, Sipior et al. (2011) defined the divide as, "The divide between those with access and skills to use the Internet and new ICT and those without" (p.310). E-government is a new ICT that does not provide equal opportunities for all citizens to get involved (Thomas and Streib, 2003). Another limitation of e-government is the confined engagement between citizens and governments. The government can interact with citizens only when they are online. In other words, communication between the government and citizens is not always available. This limitation could be overcome by the use of m-government, which offers interactions all the time. As a result, more citizen engagement and participation would occur.

2.1.2 M-government

There are several definitions for m-government. For instance, it has been defined as "the strategy and its implementation for providing information and services to government employees, citizens, businesses, and other organizations through mobile devices" (Oghuma et al., 2012, p.4). In addition, it has been defined by The International Communication Union (ITU) as

"the adoption of mobile technologies to support and enhance government performance and foster a more connected society" (Yfantis et al., 2013, p.158).

It is important to note that the term 'mobile devices' does not refer only to mobile phones. It can refer to personal digital assistants (PDAs), tablets, handheld devices, smart phones, cellular phones, terminals, or any other devices that can be carried (Alrazooqi and De Silva, 2010b). Indeed, the most common device that is carried by most people is the mobile phone. The ITU showed that the global rate of mobile-cellular penetration stands at 96% (Yfantis et al., 2013). This penetration has increased the importance of m-government, as it allows for better communication with citizens.

Smartphones, tablets, and other devices have increased mobile penetration. For this reason, the penetration of mobile devices exceeds the penetration of PCs (Alrazooqi and De Silva, 2010a). In 1998, universal mobile device penetration was approximately 5%. It crossed the 50% mark in 2008, and it is expected that there will be almost the same number of mobile subscriptions as the number of global citizens by 2018 (Rannu et al., 2010). Currently, approximately three-quarters of the world's people have access to mobile devices, as was estimated by a World Bank (2010) study and the Global IT Research Company (Oghuma et al., 2012). Besides, the spending on mobile devices has grown more than anything else has. In fact, a study by the World Resources Institute of 2012 showed that "as the developing world's income rise, household spending on mobile phones grows faster than spending on energy, water, or indeed anything else" (Oghuma et al., 2012).

Mobile phones have been improving since they were invented, when they were used to send and receive calls and messages only. However, now they allow users to take pictures, check email, search the internet, and use built-in GPSs and many other features. Those features

make mobile phones more capable than PCs, because some phone features are not available on PCs. For instance, most mobile phones allow sharing of the device's location, which can be used to deliver better services to users. For example, in case of a disaster, the government can send notifications to the right people by using their locations. Therefore, information delivery in m-government is time-efficient, and remote citizens can be reached easily.

Mobile phones have been developed from three sides: the hardware side, the software side, and the network side. The hardware, which includes the data storage and the battery, has been improved significantly. The software, which includes the operating systems and the mobile applications, has also been improved. Similarly, mobile phone networks have experienced frequent upgrades in recent years. Mobile phones started with wireless application protocol (WAP), which allowed very limited access to the internet. Then, they were capable of having global system for mobile communications (GSM), which allowed no more than 9.6 kbps. After that, general packet radio service (GPRS) that could carry 30–80 kbps was used. Next, universal mobile telecommunications system (UMTS) that allowed up to 2 Mbps was used (Hassan et al., 2009). Eventually, mobile phones began to use long-term evolution (LTE), or as it is commonly known, 4G. Today, 4G can allow up to 100 Mbps (Rumney, 2013). Thus, mobile phones have become highly efficient and have great capabilities that allow them to complete various functions effectively.

Consequently, governments have been striving to realize the benefits of mobile devices. According to the 2014 UN E-government survey, the number of countries that offer mobile services has doubled in the period from 2012 to 2014 (Henning et al., 2014). Governments have understood the benefits of m-government that cannot be achieved through e-government. One of the major benefits of m-government is the narrowing of the digital divide that occurs because

of using e-government (Sheng and Trimi, 2008; Peining et al., 2012). Mobile devices narrow the digital divide because they are available to the majority of citizens, they are always on, and mobile internet is easy to set up, unlike fixed internet (Mengistu et al., 2009). Although the problem of digital divide is decreased by using m-government, this problem is still counted as a limitation of the m-governments (Ghyasi and Kushchu, 2004).

2.2 E-government vs. M-government

The types or classifications of the interactions in m-government are similar to e-government, as both have reciprocal interactions with citizens, employees, and businesses. As with e-government, the interactions in m-government occur in two ways. The first way is one-way communication, through which an individual or organization sends out information. The second way is two-way communication, which occurs when a citizen, employee, or organization sends out information and receives a response to the information (Shareef et al., 2010). However, the difference is in the efficiency of the information delivery. M-government allows for immediate delivery, as mobile devices are always carried and always switched on, unlike PCs.

Another similarity is seen in the types of risks that are faced by both e-government and m-government. For instance, both face the risk of privacy and security. However, those risks could be higher in m-government since mobile devices can be easily lost or stolen (El-Kiki and Lawrence, 2007). Another similar risk is in the shortage of ICT skills of some government employees and some citizens (Ghyasi and Kushchu, 2004). Furthermore, another risk is in the cost of the used devices, whether they are PCs or mobile devices. Also, the cost of the internet is another risk for both e-government and m-government. However, Mengistu et al. (2009) claim that the risk of cost is lower in m-government.

In general, m-government combines e-government and mobility together (Zefferer, 2011). Therefore, m-government is more comprehensive than e-government. Mobility has three levels: device mobility, service mobility, and user mobility. Device mobility means "the continued access to services with a device while moving", while service mobility is defined as "the capability to provide a certain service irrespective of device and user" (p.6). User mobility "refers to location and device independent service access apart from the mobility without physical constraints" (p. 6). The feature of mobility in m-government allows for active interactions anytime and anywhere.

A mobile device is usually used by one person, while a PC often is shared by more than one user (Zefferer, 2011). Therefore, mobile devices help to target specific people and send more personalized information easily (Rannu et al., 2010). Mobile devices use mobile internet, while PCs use fixed internet. Several studies have predicted the increased use of mobile internet. For example, a study by industry analyst juniper Research predicted a huge increase in the number of people who used mobile internet from the period 2008 to 2013. In fact, the increase was over 577 million people (Brown, 2011). Also, the results of the study "Future of the Internet III", which surveyed nearly 600 internet experts about the role of technology in the year 2020, indicated the increasing role of mobile internet in the future (Rannu et al., 2010). Mobile internet is expected to be more usable than fixed internet, which supports the use of m-government.

Since the emergence of m-government, the nature of the relationship between e-government and m-government has been thoroughly debated. Several studies showed that m-government is tightly linked to e-government (OECD/ITU, 2011; United Nations, 2014; World Bank, 2012) while Rossel et al. (2006) claim that m-government should not be too specific to e-

government because it is different. Traditionally, m-government has been viewed as subordinate to e-government. The traditional view sees m-government as supplement, subset, or extension to e-government. AlShihi (2007) and Henning et al. (2014) believe that m-government is a supplement to e-government. Meanwhile, Kumar and Sinha (2007) and Shareef et al. (2010) view m-government as a subset of e-government as it appears in Figure 1.
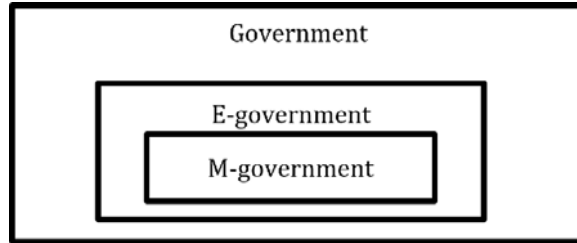
Figure 1 Traditional view of the relationship between e-government and m-government (with respect to services)

The visualization of the relationship between e-government and m-government in Figure 1 is accurate if it is based on services. However, if the visualization is based on time and place, utility, and accessibility, e-government should be a subset of m-government as it appears in Figure 2. There are several researchers who support this visualization in different ways. For instance, Zefferer (2011) believe that m-government is a combination of two concepts: e-government and mobility. Moreover, Rannu et al. (2010) believe that m-government as an extension of e-government, as it pushes e-government beyond the barriers of location and time.
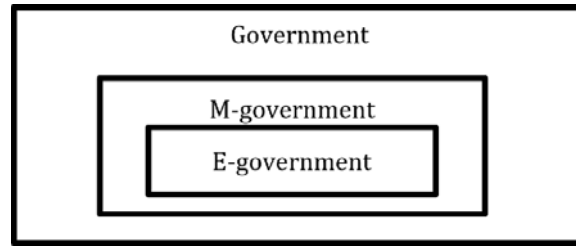
Figure 2   An alternative view of the relationship between e-government and m-government (with respect to time & place, utility, & accessibility

2.3 Methodology

The major aim of this study is to synthesize the current literature in the area of m-government. There are several common methods which help authors conduct a comprehensive literature review. For instance, Andersson and Grönlund (2009) used the 'snowball method' to maximize extracting relevant articles. Norris and Lloyd (2006) found the related articles of their topic by searching through the bibliographies of the first obtained articles. However, Napoleon and Bhuiyan (2010) believe using one approach is not enough, so they developed a new systematic approach to collect related articles. They basically provided an approach that is specific to online databases. The method that is adopted here is a combination of several methods in order to collect all of the papers that belong to m-government only. Therefore, papers that talk about e-government or other m-services such as m-banking were excluded.

There was no time frame for selecting the papers but the collection process started in 2012 till 2015. Several approaches were used to reach a high number of collected papers. First of all, keywords were used in several databases such as Google Scholar, ACM digital library, IEEE, ProQuest, and ScienceDirect. Examples of the keywords are 'm-government', 'mobile government', 'mobile e-government', etc. Also, the feature of 'alert' in Google Scholar was used with those keywords to notify the authors of any new article. Then, more papers were collected

based on the related references in the collected papers and related conferences and journals. Next, by looking at the citations of the authors who had been seen in the collected papers, more papers were added.

Before reading the papers, a table that contained the references, research aims, methodologies, results, future work was made. Every collected paper was included in this table. Using tables to summarize and organize the collected papers is a commonly used approach (DeLone and McLean, 1992). After that, based on the major aim for each paper, similar papers were grouped together. Then, five categories were made which sufficiently covered all the collected papers. Similar approach was used in Webster and Watson (2002). In the area of m-government, this approach was found in Napoleon and Bhuiyan (2010) and Palka et al. (2013).

The five categories were developed after finding the similarity between the collected papers. The 'assessment', and the 'adoption and acceptance' categories were first established. Then, the other categories were established when finding a new similarity between some papers. For example, the papers in the 'user requirement' category may fit in the assessment but since all of them discuss the user requirements, a new category was established for them. Most of the collected papers can fit more than one category based on their contents. However, the classification was based on the primary purpose of each paper. The primary purpose of each paper was defined through the abstract, the research questions, and the conclusion.

2.4 Results

An extensive look into the research on m-government yielded 79 papers that were specifically relevant. These were organized by theme in order to promote clear understanding. As shown in Table 2, 24 papers assessed m-government's state and applications, 22 papers described adoption and acceptance, 17 papers discussed implementation, 10 papers explained

challenges and barriers, and six papers were concerned with user requirements. Napoleon and Bhuiyan (2010) conducted an extensive study that provided a detailed review of the papers on m-government which were available in 2010. However, this study looked at the papers from a different angle and presented more papers that cover recent studies.

Table 2   Classification of m-government papers based on themes

Themes	Papers	Total
Assessment	Müller et al.(2014), Rodrigo and Yaneileth (2014), Bashehab and Buddhapriya (2013), Joseph and Lee (2015), Yu (2013), Alsenaidy and Ahmad (2012), Peining et al. (2012), Al-Khalifa (2011), Brown (2011), De Kervenoael et al. (2012), Eroglu and Sağır (2010), Napoleon and Bhuiyan (2010), Shareef et al. (2010), Naqvi and AlShihi (2009), Fasanghari and Samimi (2009b), Abu-Samaha and Samad (2008), AlShihi (2007), Rossel et al. (2006), Song and Cornford (2006), Abanumy and Mayhew (2005), Antovski and Gusev (2005), Bataineh and Jdaitawi (2005), Borucki et al. (2005), Ghyasi and Kushchu (2004)	24
Adoption and Acceptance	Aloudat et al. (2014), Al Thunibat et al. (2011b, 2014), Liu et al. (2014),Ohme (2014), Reddick (2014), Shareef et al. (2014), Wang (2014), Al-Masaeed and Love (2013), Alotaibi (2013),	22

Table 2 Continued

	Hung et al. (2013), Mahmood (2013), Yfantis et al. (2013), Abdelghaffar and Magdy (2012), Shareef et al. (2012), Al-Hadidi (2010), Alrazooqi and De Silva (2010a, 2010b), Napoleon and Bhuiyan (2010), Hassan et al. (2009), Ntaliani et al. (2008), Al-Khamayseh et al. (2006), Sandy and McMillan (2005)	
Implementation	Choi et al. (2014), Henning et al. (2014), Amailef and Lu (2008, 2013), Medeni et al. (2012), Nkosi and Mekuria (2010), Fasanghari and Samimi (2009a), Vincent and Harris (2008), Antovski (2007), Cao and Luee (2007), Abramowicz et al. (2005), El-Kiki et al. (2005), Foghlú (2005), Gouscos et al. (2005), Knopp (2005), Mukherjee and Biswas (2005), Nava and Dávila (2005)	17
Challenges and Barriers	Abu Tair and Abu-Shanab (2014), Al-Hujran (2012), Hellström (2011), Zefferer (2011), Al Thunibat et al. (2010), Mengistu et al. (2009), Snellen and Thaens (2008), El-Kiki and Lawrence (2007), Fidel et al. (2007), Kushchu and Kuscu (2003)	10
User Requirements	Al Thunibat et al. (2011a), Kirillov et al. (2011), Carroll (2005, 2006), Germanakos et al. (2006), El-Kiki and Lawrence (2006)	6

2.4.1 Assessment

The papers that evaluated m-government's state and applications were further subdivided into three categories: those that discussed the current state in general, those specific to certain countries, and those that evaluated current m-government applications. Among the authors who addressed the current state in general, Rossel et al. (2006) evaluated m- government by analysing their historical development. Further, Fasanghari and Samimi (2009b) suggested criteria that help in assessing the performance of public organisations in order to assure the development of m-government. In addition, Peining et al. (2012) proposed a value analysis framework for evaluating m-government. Moreover, a recent study by Müller et al. (2014) proposed a model that helps to evaluate the m-government state. Thus, all the papers that evaluated the current state in general tried to present trustable techniques for assessment.

Not all papers were so general; some focused on certain countries or nations, such as developing countries or the Arab countries. For example, Ghyasi and Kushchu (2004) compared the current states of a number of developing countries. Numerous other studies were conducted for specific countries. For instance, Antovski and Gusev (2005) tried to assess m-government in Macedonia. They found that Macedonian government has no reliable strategy for m-government. Several other studies talked about the status of m-government in Jordan (Abu-Samaha and Samad, 2008; Bataineh and Jdaitawi, 2005). They believe that m-government in Jordan is still in its early stages, and it lacks essential resources and secure infrastructure. Similar results were found in Beijing (Song and Cornford, 2006). Further, the current state of m-government in Oman was examined by several studies (AlShihi, 2007; Naqvi and AlShihi, 2009). Results showed that mobile activity has not been legalised in Oman, which has led to less contribution through mobile services. De Kervenoael et al. (2012) assessed the development of m- government strategy in Turkey by examining the role of choice. Brown (2011) evaluated

the relationship between m-government and civic engagement.

Additionally, a number of papers evaluated current m-government applications. Earliest papers considered using short message service (SMS) for pulling or pushing information as an application. For example, the Ministry of Education in Saudi Arabia sends final exam results to high school students using the SMS (Abanumy and Mayhew, 2005). With the increased use of smart phones and other mobile devices like iPads, m-government applications (apps) could refer to mobile web apps which basically downscale the full version of a website (Al-Khalifa, 2011). Also, m-government could refer to stand-alone apps, also called native apps, which are installed in mobile devices through an app store such as Google Play or Apple's App Store. In general, apps in developing countries lack sufficient technical support. Eroglu and Sağır (2010) conducted a general assessment of Turkish apps. They found that the Turkish government should improve the infrastructure and provide technical assistance in order to make their apps more efficient. Similar results have been found in Saudi Arabia (Bashehab and Buddhapriya, 2013). Joseph and Lee (2015) evaluated citizens' perceptions to use m-government for emergency notifications.

Due to the big increase in the number of apps, some papers have started to propose models and frameworks that can assess those apps. One paper (Borucki et al., 2005) tested specific apps and concluded with an enhancement model. Another paper (Shareef et al., 2010) proposed an architectural design for m-government apps. This study focused on the apps that were implemented in the Kurdistan region of Iraq, specifically apps that belonged to the police information system. The proposed application improves information access and offers up-to-date real time data that can be shared with security forces to protect the general public and enhance the traffic information system. Another study (Yu, 2013) provided an integrated framework to

assess the value of apps. The main purpose of this framework was to assure user acceptance. A recent study (Rodrigo and Yaneileth, 2014) tried to classify Mexican apps by applying a new model. However, the results showed that m-government apps are hard to classify.

2.4.2 Adoption and Acceptance

Researchers have tried to define the factors that lead to the success of m-government and to apply and expand upon theories and models that can help explain its success. For instance, an early study (Sandy and McMillan, 2005) defined a success factor model which could help governmental agencies to build useful m-government services. This model had been applied to Australian case studies, and it proved to be useful and valid. Al-Khamayseh et al. (2006) distributed 31 surveys to global experts in an attempt to identify success factors. The participating experts presented various responses. Privacy and security ranked the most important success factors, while legal issues were ranked as the least important factor. Al-Masaeed and Love (2013) also found that privacy and security ranked the highest when testing success factors in Jordan. A recent study (Reddick, 2014) tried to identify and then test the factors that encourage the use of m-government services. The authors of this study conducted a public opinion survey. The results showed that, unlike social factors, demographic factors were not found to be highly correlated with the use of mobile government.

Researchers have also tried to pinpoint the driving factors that lead to the acceptance of m-government by applying specific well-known models and theories. For example, Hung et al. (2013) used the theory of planned behaviour to determine user acceptance of m-government in Taiwan. Al Thunibat et al. (2014) applied the technology acceptance model (TAM) to test the citizens' acceptance of m-government in Jordan. They found that perceived usefulness (PU) and perceived ease of use (PEOU), which are the two factors of TAM, have influenced citizens'

acceptance of m-government in Jordan. Aloudat et al. (2014) used TAM to examine the acceptance of m-government for emergency management. Wang (2014) extended TAM to examine the perceived value on m-government in China.

Several studies have even added factors to TAM, and in doing so, some have produced new models. For instance, Al-Hadidi (2010) combined a (TAM) and the theory of diffusion in order to create a model suitable for the Omani cultural context. This model was tested using a questionnaire and interviews. The results showed a true reflection of the Omani situation. Al Thunibat et al. (2011b) added social influence to TAM in order to test the adoption of m-government in Malaysia. Similarly, Liu et al. (2014) added social factors and trust when examining adoption in a rural province in China. Other studies combined TAM with more than one theory in order to test additional factors believed to be essential to testing the acceptance of m-government (Shareef et al., 2012, 2014; Ohme, 2014). The common added theories were the theory of reasoned action (TRA) and the theory of planned behaviour (TPB). As a result of these efforts, a new model was created to overcome the limitations of TAM. The new model is called the Unified Theory of Acceptance and Use of Technology (UTAUT). This model has been used in several studies in the area of m-government (Abdelghaffar and Magdy, 2012; Alotaibi, 2013).

However, some researchers still add factors to this new model, too. For instance, Mahmood (2013) added trust and privacy when testing the adoption of m-government in Jordan. Also, Yfantis et al. (2013) added trust, context of use, and human development index when exploring the factors that influence m-government adoption in developing countries.

2.4.3 Implementation

A number of studies looked at m-government implementation. They either proposed frameworks or architectures that could support m-government implementation or discussed different issues involved in that implementation. For example, an early study (Gouscos et al., 2005) demonstrated an architecture that enhances the workflow of m-government transactions. The authors of this study believe that this architecture supports the delivery of m-government benefits. Other studies looked at the networking side of implementation. For example, Foghlú (2005) looked at infrastructure and proposed the concept of open access networks (OANs). Similarly, Mukherjee and Biswas (2005) proposed a network framework to be used India. Knopp (2005) looked at different issues while implementing m-government, such as mobile signatures. Meanwhile, El-Kiki et al. (2005) and Fasanghari and Samimi (2009a) presented frameworks that provided a clear picture of implementation. Nava and Dávila (2005) proposed the concept of digital cities, which showed that collaborative work can assure successful implementation. Cao and Luee (2007) designed a framework for Beijing, China. Medeni et al. (2012) proposed a knowledge model to facilitate the transition from e-government to m-government in Turkey.

Other studies were specific to certain systems or projects. For example, Amailef and Lu (2008) proposed a framework that aids in managing disasters in emergency situations. Ntaliani et al. (2008) proposed a framework that can support interaction between agricultural agencies and producers. Abramowicz et al. (2005) looked at a specific project that was shared by six countries in Europe. This project provides a solution that enables public organizations and authorities to use mobile devices.

Further, Henning et al. (2014) introduced the concept of "Mobile Governance for Sustainable Development (MGOV4SD)" and developed a framework for it. Choi et al. (2014) presented a new framework that supports secure information sharing between governmental

organizations in Korea. This model includes the newest technologies used for sharing information via mobile devices.

Several studies focused on implementation rather than on frameworks. For example, Antovski (2007) looked at the implementation of e-government and m-government in Macedonia. In this paper, a new architecture was provided and tested in a laboratory. It was essentially based on fuzzy logic ontology. Nkosi and Mekuria (2010) proposed a model for implementation in South Africa. Vincent and Harris (2008) discussed cases in different counties with a focus on using mobile phones. A recent study by Amailef and Lu (2013) presented a specific method which is called Ontology-Supported Case-Based Reasoning (OS-CBR) to support emergency decision makers to effectively respond to emergencies.

2.4.4 Challenges and Barriers

Many studies have aimed to describe m-government barriers and challenges in detail. An early study (Kushchu and Kuscu, 2003) enumerated a number of challenges, such as infrastructure development, legal issues, and cell phone limitation. This study was one of the first in the field of m-government, and it has been cited in numerous research papers. Other studies divided the challenges into three dimensions: technical, organizational, and social (El-Kiki and Lawrence, 2007; Snellen and Thaens, 2008). In fact, El-Kiki and Lawrence (2007) found that social challenges such as awareness, privacy, security, and trust are the most prevalent the challenges. A recent study (Abu Tair and Abu-Shanab, 2014) addressed the challenges and opportunities of m-government. This study mentioned the transition from e-government to m-government as a challenge.

In contrast to these broader works, several papers specifically examine certain locations or projects. For instance, Fidel et al. (2007) talked about the challenges of specific prototypical

projects in Seattle, and Mengistu et al. (2009) identified challenges in developing countries. Al Thunibat et al. (2010) investigated the challenges in Malaysia. Similarly, Hellström (2011) explored problems in East Africa. In addition, Al-Hujran (2012) targeted the Arab countries and Jordan in particular. Earlier papers discussed challenges like the limitation of cell-phones, the absence of usage laws, and the weakness of the infrastructure that have been overcome by a number of counties who showed advanced progress in the area of m-government. However, there are other challenges like awareness, trust, privacy, and security that remain as challenges. Many developing countries are still struggling with most of the discussed challenges.

2.4.5 User Requirements

Among the extant papers in m-government, a few of them investigated the citizens' needs and requirements. Conducting surveys was the method most commonly used to measure these variables. Surveys were distributed among citizens to help researchers understand their needs and expectations. One study asked whether citizens would accept m- government in the long term (Carroll, 2005). In this study, the preferences of various groups of citizens when accessing public services were discussed in detail. The results showed that citizens preferred to have larger mobile devices and more convenient apps in terms of cost and usability. Carroll (2006) presented a framework that analyzed the influences on using m-government based on citizens' needs. El-Kiki and Lawrence (2006) analyzed and defined mobile users' needs with a focus on the satisfaction of those users. The authors claim that users' satisfaction is the gateway to increasing the use of m-government. Further, Germanakos et al. (2006) highlighted the importance of user profiling. This research defined a new comprehensive user profiling method which assists filtering m-government services content. The authors believe that new user profiling can deal with heterogeneous users' needs and requirements.

As was true of papers in several of the other categories, some studies of user requirements were specific to certain countries. For example, Kirillov et al. (2011) looked at the needs of Estonian citizens. They found that Estonian citizens prefer stand-alone mobile apps more than web-based apps. Additionally, Al Thunibat et al. (2011a) investigated the potential needs of Malaysian citizens. Citizens are looking for secure apps that are easy to use and have good quality. In short, it seems clear that citizens used to be less engaged in m-government services due to the inefficiency of mobile devices and especially cell-phones. However, with the recent improvement in mobile devices, the features of big screens and modern stand-alone apps could meet the users' needs.

2.5 Discussion

When previous researchers looked at different parts and functions of m-government, most of their research took citizens into consideration. For instance, researchers who attempted to assess the current state of m-government made their assessment based on the availability of m-government services for citizens. Additionally, the apps that were evaluated were mostly designed to help citizens. When the authors examined the acceptance of m-government, they looked at citizens' willingness to use m-government services. In fact, some studies were undertaken solely to understand citizens' needs in this area. Studying interactions between government and citizens, whether (G2C) or (C2G), was the aim of the majority of the collected papers. However, very few papers considered other types of interactions such as (G2G), (G2E), or (G2B), and therefore more studies are needed in these areas.

The results of this paper showed that several of the discussed aspects in the area of m-government were also discussed in the area of e-government. For instance, citizens' trust in both

types of government was tested. While some authors added trust as a valuable factor to test the adoption of e-government, other authors added the same factor to test the adoption of m-government (Liu et al., 2014). Furthermore, citizens' awareness of the provided services was tested in e-government and m-government (El-Kiki and Lawrence, 2007). There are, however, other important aspects that were commonly tested in the area of e-government but not in the area of m-government. For example, the relationship between civic engagement and e-government was examined by several authors (Park, 2007; Pham, 2012), but only one study has examined the same for m- government.

The factors that support the use of m-government which had been explained in details in the beginning of this paper encourages testing if they lead to better civic engagement. Those factors are the high penetration of mobile devices, the large development in the mobile devices and especially smart phones, and the emergence of mobile apps. Furthermore, as it was discussed early, several researchers believe that m-government narrows the digital divide and provides on time communication between citizens and government. However, we are not sure if those motivations have impact on civic engagement.

Civic engagement has a variety of different meanings and hence lacks a specific definition that can cover all people's understanding of the term. Adler and Goggin (2005) found 383,000 citations for this term in Google. They conducted research that helps more thoroughly understand civic engagement. They claim that the definition of civic engagement highly depends on the perspective and interests of the definer. Adler and Goggin explained that some experts look at this term as social change. In this case, "civic engagement describes how an active citizen participates in the life of the community in order to help shape its future" (p.239). Adler and Goggin showed that other experts proved a broad definition, defining civic engagement as "individual and

collective actions designed to identify and address issues of public concern" (p.239). Yet, Adler and Goggin (2005) believe that the simplest definition of civic engagement is "the interactions of citizens with their society and their government" (p.241).

Civic engagement is a broad term that covers both the political participation and the social change. However, the impact of using m-government can significantly be seen in the aspects that can develop a community. This development includes raising the awareness for both citizens and government. For instance, different government agencies can send notifications for their new services or events. Furthermore, they can send emergency alerts for public safety or weather forecast. On the other hand, citizens can improve their community by sending their recommendations, suggestions or complaints to government through some mobile apps. For example, the Ministry of Commerce in Saudi Arabia designed a mobile app that allows citizens to report any commercial violation (https://play.google.com/store). Also, the Dubai Police developed a mobile app that has the feature of sending information that can prevent crimes (see Figure 3). This information can be sent by filling a form or recording an audio (https://play.google. com/store).

Figure 3   An example of civic engagement by using a mobile app. Steps for sending information about a crime to Dubai Police (see online version for colors)

Some researchers have proposed that the internet is the future of civic engagement (Turner-Lee, 2010). In fact, several researchers found that the use of e-government has a positive impact on civic engagement (Park, 2007; Pham, 2012), while only one paper that examined the relationship between civic engagement and m-government was identified. Brown (2011) looked at whether mobile technology had affected the engagement between the different US states' departments of transportation and the US public. The study results found that mobile technology affected the rate of civic engagement. However, this study could not prove whether mobile technology improved the public's relationship with the states' departments of transportation. Therefore, a new study should be conducted to determine whether the use of m-government has a significant positive impact on civic engagement.

Liu et al. (2014) found that there is a gap between rural and urban areas in developing countries in terms of delivering information. This study claimed that mobile devices such as cell phones could be the solution to this problem, enhancing the participation of rural citizens. It therefore becomes important to study whether citizens who live in rural areas have similar opportunities for civic engagement through the use of m-government compared to those opportunities available to citizens who live in urban areas. The results may differ from one region to another. Thus, it is important to define the scope of the study.

The results of this paper showed new topics that were not available in the area of e-government such as the mobile apps. Generally speaking, "in July 2013, Apple Cooperation celebrated 5 years of the iTunes App Store with 850,000 apps available in the store and accounted for more than 50 billion of apps, being used over 800 apps per second" (Rodrigo and Yaneileth, 2014, p.204). In particular, the number of m-government apps is increasing rapidly all over the world (Snellen and Thaens, 2008). Those apps have become a commonly adopted way of

increasing citizen interaction with government in several countries (Reddick, 2014). Mobile apps provide guidance information based on the location or context of the user. In India, government designed more than 20 apps which facilitated more than 3 million interactions between the government and the citizens from the period 2010 to 2012 (Oghuma et al., 2012). The majority of the studies on m-government looked at m-government as a group and designed classification or enhancement models. However, more studies are needed to examine those apps individually to ensure their effectiveness.

2.6 Conclusion

Research in the area of m-government has been carried out for almost ten years. Different topics in m-government have been covered. Earlier papers have discussed various challenges of m-government such as the limitation of cell-phones, the absence of usage laws, and the weakness of the infrastructure. However, those challenges have been overcome by many countries that have shown advanced progress in m-government work. In the past, the main benefit of m-government was the use of SMS. The evolution of mobile apps that can be downloaded on various types of mobile devices that are carried most of the time has increased the essential benefits of m-government. However, those apps have also made specific challenges such as security and data privacy more complex. Researchers have commonly used TAM and UTAUT to test the acceptance of m-government. Some researchers added factors to the models such as awareness or trust. Researchers who have studied the implementation of m-government have proposed new frameworks or architectures that can enhance m-government implementation. Some of them have proposed frameworks for secure workflow while others focused on business functions.

Although many aspects of e-government and m-government are shared, researchers have conducted studies on them separately. The reason for this is the difference in interaction between the two categories. M-government pushes e-government beyond the barriers of location and time. Thus, studies could find different results for each category. Therefore, we intend to research a topic that has been already tested; that is, e-government has been demonstrated to have a positive impact on civic engagement. In the area of m-government, this impact has not been addressed.

2.7 Proposed Future Research

Our next study will test essential hypotheses that are related to the effects of m-government on civic engagement. The main hypothesis is that m-government has a significant positive impact on civic engagement. The secondary hypothesis is that citizens who live in rural areas get similar opportunities for civic engagement by the use of m-government to those opportunities available to citizens who live in urban areas. In order to make the results of this hypothesis accurate, we plan to test this hypothesis in some developing countries.

CHAPTER 3 CIVIC ENGAGEMENT WITH TRADITIONAL GOVERNMENT AND MOBILE GOVERNMENT: COMPARING RURAL TO URBAN CITIZENS IN SAUDI ARABIA

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Abstract

The new nature of engagement between government and citizens through mobile devices needs to be studied intensively in order to make it more effective. Earlier study showed lack of research in this essential area. Thus, this research examines the relationship between mobile government (M-government) and civic engagement deeply. In particular, it compares civic engagement with traditional government (T-government) to civic engagement with M-government in order to determine if M-government increases civic engagement. Furthermore, it compares civic engagement of urban citizens to civic engagement of rural citizens in the case of T-government and in the case of M-government. The main author collected 439 filled questionnaires from urban and rural regions across Saudi Arabia. 11 were not filled completely, 69 missed either M or T-government, and 359 were filled completely. This study used the completed questionnaires for the analysis. Participants completed the questionnaires that were directly administered on site and were thus afforded the opportunity to ask the main researcher questions if needed. Inferential statistics were used to analyze the collected data. Our results revealed highly significant evidence for the increase in civic engagement with M-government compared to T-government. Moreover, the results indicated that M-government allows similar levels of civic engagement between urban and rural citizens. However, the results did not detect significant difference between civic

engagement of urban and rural citizens with T-government since the difference was more complex than what we expected.

3.1 Introduction

Traditional means of communication between people, such as face-to-face conversation, utilize body language to make the communication easier and more understandable. However, this type of communication is limited by congruence of time and place. As a result, people sometimes have to wait for the opportunity to communicate in person. In contrast, mobile technologies allow communication to occur almost anytime and anywhere. The variety of mobile devices grants users many ways of communicating. For instance, text messages are not limited to cell phones anymore; text messages can be used with other mobile devices such as laptops and tablets via different applications (apps) like Facebook and Twitter. The choice of communication type has implications for the nature of interactions between citizens and government.

Communication between government and citizens using traditional government (T-government) occurs face-to-face, or by using telephone, fax, and post (Albesher & Stone, 2015). The use of face-to-face or telephone resources to obtain governmental help allows citizens to explain their issues more flexibly and get immediate responses. However, those methods are only available during certain working hours, which means they may not be convenient for some citizens. Additionally, citizens who use those means suffer from waiting on hold and getting redirected to another department or person (Shareef et al., 2010). While fax and post remove the restrictions of time and place, they introduce new restrictions such as immediacy.

On the other hand, communication between government and citizens by the use of mobile government (M-government) generally allows for 24/7 communication between government and citizens from anywhere with immediate, automated feedback. The mobility includes user, service,

and device mobility (Albesher & Stone, 2015). However, M-government has some potential disadvantages such as the so-called digital divide. Digital divide creates a gap between citizens who use Information and Communication Technologies (ICT) and those who cannot use them due to economic or social issues (Chinn and Fairlie, 2004)

Thus, the means of communication will affect the nature of engagement between government and citizens. Our previous study (Albesher & Stone, 2015) conducted a comprehensive literature review of M-government. The study found that only Brown (2011) considered the relationship between M-government and civic engagement and found that using mobile devices affected the relationship. However, Brown's findings did not provide evidence to support the notion that the affect made the relationship between government and public more effective. Furthermore, Brown's research was specific to transportation departments in the United States. Therefore, the current study examines whether civic engagement is positively affected by M-government in other contexts.

As more rural places lack essential government agencies, rural citizens may not have the same levels of civic engagement as the urban citizens. In fact, Liu et al. (2014) argued that there is a gap between rural and urban areas in developing countries in terms of delivering information. Albesher and Stone (2015) suggested that M-government could close this gap by enhancing the participation of rural citizens. Therefore, it becomes necessary to compare civic engagement in rural and urban contexts for T and M-government in order to find out if M-government really results in similar levels of civic engagement for both rural and urban citizens.

This study examines the levels of civic engagement by citizens using traditional communication means (face-to-face, fax, mail, and telephone) and the levels of civic engagement by citizens using mobile devices (laptops, cell phones, and tablets). Additionally, this study

compares the levels of civic engagement of both rural and urban citizens using traditional government and the levels of civic engagement of both rural and urban citizens using M-government. The first part of this paper describes civic engagement in detail and then defines the scope of the study. The second part explains the questionnaire's methodology that is used in this study. The third part demonstrates the results of the study, and highlights the important results in tables. Finally, a detailed discussion is presented, followed by a conclusion and future work suggestions.

3.2 Civic Engagement in the Era of M-Government

Civic engagement has different meanings, mainly based on the definers' perspectives and interests (Adler & Goggin, 2005). Kang and Gearhart (2010) indicated that various scholars have defined civic engagement differently. Adler & Goggin, found that civic engagement was defined as community service ("how an active citizen participates in the life of the community in order to help shape its future"), social change ("how an active citizen participates in the life of the community in order to help shape its future"), and political involvement ("directing individual efforts toward collective action in solving problems through political process"). However, Adler & Goggin believe that the simplest definition for civic engagement is "the interactions of citizens with their society and their government". Currently, this study looks at civic engagement as the interaction between citizens and government for the purpose of community service and social change but not as political involvement.

M-government has opened the door for creative methods and techniques of civic engagement. Those methods and techniques can be clearly seen in aspects of emergency management and awareness raising. For instance, text messages are a useful method for sending

alerts and warnings since senders can target specific people and reach them quickly. Additionally, text messages send responses and feedback in real time since a cellular phone is usually carried and switched on all the time (Yfantis et al., 2013).

Another method and technique for M-government is the use of *stand-alone apps* (also called *native apps*) that can be downloaded and installed in mobile devices through an app store such as Google Play or Apple's App Store. Various governments have used native apps to enable better civic engagement. For example, the Bangladeshi government designed an app that sends pre-disaster warnings to citizens and allows users to share information about health hazards (Alkhamayseh et al., 2006). Additionally, the Ministry of Commerce and Industry (MCIS) in Saudi Arabia designed a mobile app that tracks the prices of products. When there is a change in the prices shown in the app, citizens can send notifications to government (Albesher & Stone, 2015).

3.3 Background

Governments are attempted to reengineer their services structure and delivery to higher the efficiency and lower the cost through the E-government (Shareef et al., 2010). In Estonia more than 150 government organizations, ministries, and departments provided E-services (Kirillov et al., 2011). In Jordan, the government lunched E-government Mobile Portal in 2011 that offers 27 online services. With the high penetration of mobile devices, governments are more encouraged to create services compatible with mobile devices. The International Telecommunication Union (ITU) indicated that in 2013, mobile penetration rates reached 96% globally (Liu et al., 2014). In fact, many governments have different types of apps in Google Play and Apple Store. For instance, the Dubai Police developed a mobile app where citizens can pay for traffic tickets, and report crimes without visiting a police office (https://play.google.com/store). Furthermore, in India, government designed more than 20 apps that facilitated the interactions between the government

and the citizens (Oghuma et al., 2012)

The scope of this research is limited to Saudi Arabia for several reasons. First of all, the country has a clear strategy that supports M-government. In particular, it has a specific program called "YESSER" which is responsible for enhancing the electronic services that are provided by the public sector (Bashehab & Buddhapriya, 2013). "YESSER" is an Arabic word that means make it easy. In fact, Saudi Arabia's expertise in the area of electronic government (E-government) generally has been improving in recent years. For instance, the ranking of Saudi Arabia in the United Nations (UN) reports of top countries offering E-government rapidly rose from 105th in 2003, to 70th in 2008, to 36th in 2014 (http://www.yesser.gov.sa). Moreover, the spending on ICT in Saudi Arabia has been increasing. A study by The Communications and Information Technology Commission (CITC) of Saudi Arabia showed that the spending on ICT has grown 9% from 2013 to 2014, and is expected to grow another 9% from 2014 to 2015 (CITC, 2014).

Furthermore, Saudi Arabia has the largest number of mobile phone users in the world according to a report by the United Nations Conference on Trade and Development (UNCTAD). Specifically, the report indicated that there are 180 mobile phones for every 100 residents (Alsenaidy & Ahmad, 2012). The penetration of Internet usage in Saudi Arabia recently increased significantly. It rose from 13% in 2005 to 63.7% by the end of 2014. The total number of Internet users rose from 36% of the population in 2008 to 63.7% in 2014 (CITC, 2014). Additionally, Saudi Arabia is expected to be the leader of the 4G (Generation) market in the Middle East by 2016 (Alsenaidy & Ahmad, 2012). Finally, Saudi Arabia is thirsty for research like this, because research on an essential area like M-government is very limited.

3.4 Hypotheses

In this study, we aim to test civic engagement in Saudi Arabia. In particular, this study aims to examine the following hypotheses:

H1: M-government increases the level of civic engagement compared to T-government.

H2: Urban citizens are more engaged than rural citizens with T-government.

H3: There is no difference between rural and urban citizens in their levels of civic engagement with M-government.

3.5 Methodology

The current study used questionnaires as the method for testing the three hypotheses. Questionnaire use is a common method for testing hypotheses (Mathiyazhagan & Nandan, 2010; Brancato et al., 2006). Fraenkel and Wallen (2000), and Privitera (2013) argue that questionnaire is an appropriate method for investigating people's attitudes, opinions, and beliefs regarding a specific issue. Thus, the current study used questionnaires to compare civic engagement with T-government to civic engagement with M-government in Saudi Arabia, by investigating Saudi citizens' opinions and beliefs about both types of government. The questionnaires were reviewed and approved by the Office of Responsible Research at Iowa State University. Additionally, King Faisal University (KFU) granted the main researcher permission to conduct the questionnaires in Saudi Arabia. The data collection was done under the supervision of the College of Computer Sciences and Information Technologies at KFU.

The questionnaires were developed in English, but they were distributed in Arabic, the first language in Saudi Arabia. The *back translation* method was used, meaning the questionnaires were translated back to the original language (English) in order to ensure the accuracy of the translation (Brislin, 1970). This method has been used by several researchers for accurate survey translation (Homburg et al., 1999; Unger and Molina, 1999; Hofstede et al., 1999).

The translation process was followed by a limited preliminary study. The purpose of the preliminary study was to ensure that the questionnaires were viable and fit with Saudis' cultural understanding. Furthermore, the preliminary study was used to ensure that the results of the questionnaires could show a trend, which should indicate the difference in civic engagement between T- and M-government, and the difference in civic engagement between urban and rural citizens. Based on the results of the preliminary study, the wording of some questions was modified to make the questions clearer. Moreover, the results showed an emergent trend in civic engagement between T- and M-government, and between urban and rural citizens.

3.5.1 Questionnaires Structure

The questionnaires of this study have three sections (see Appendix A). The first section is for demographic information. The second section has items that evaluate civic engagement with T-government, and the third section has items that evaluate civic engagement with M-government. When the questionnaires were distributed, the order of sections two and three was reversed for approximately half of the questionnaires in order to ensure that the order had no effects on assessment of T- or M-government. In other words, flipping the order was to ensure that both types of government obtained similar attention.

Both sections two and three have two categories of items and both used Likert scales for measurement. The first category used a "time-based" Likert scale (always, often, sometimes, rarely, never) to measure the frequency of civic engagement. On the other hand, the second category used an "opinion-based" Likert scale (strongly agree, agree, neutral, disagree, strongly disagree) to measure the means of civic engagement. The first category contains items that were found in other studies (Chen & Dimitrova, 2006; Kang & Gearhart, 2010) as measurements for civic engagement. Those items include asking the participants about how frequently they send comments and complaints to government, and how frequently they receive responses and alerts from the government. The second category measures the means of engagement through some essential characteristics. Those characteristics are ease of use, time consumption, effort, convenience, and encouragement to support the community.

Since the results of the questionnaires are analyzed quantitatively, all items used in the questionnaires are closed-ended. Closed-ended items are preferable for hypothesis-testing and are commonly used in quantitative research (Bird, 2009). Two of the five items in the opinion category were worded negatively. Several researchers argue that measures should have a mix of positive and negative items (Anastasi, 1976; Burke 1999; Chang 1995; Garg 1996; Likert, 1932; Mehrens & Lehmann, 1983; Nunnally, 1978; Scott, 1968; Worcester & Burns 1975). The main reason for mixing positively and negatively worded items is to avoid acquiescence response biases (Cronbach, 1950; Roszkowski & Soven, 2010; Schriesheim & Hill, 1981). Another reason is to ensure that participants responded to the content of the item more than to their general feelings about the subject (Barnette, 2000).

3.5.2 Participants

The main researcher in this study delivered all questionnaires to all participants by hand. One reason of delivering questionnaires by hand instead of submitting them online is to avoid digital divide. Another reason is providing the chance for participants to ask for any further explanation while they were completing the questionnaires. Participants were given full privacy to answer the questionnaires independently and without the pressure of time. Questionnaires were collected from four different regions in Saudi Arabia. The sample was intended to be representative of the population for each region. The questionnaires were distributed at mosques, colleges, offices of public sectors, and offices of private sectors. In every region, the main researcher collected data from both an urban and rural place.

There are varying definitions of rural and urban areas. One distinction between urban and rural could be based on geographical size, while another could rest on population size. This study defines urban and rural places based on population; however no specific definitions for rural and urban areas in Saudi Arabia were found. Thus, this study applies the definition of the *rural* as a place with less than 50,000 people, and *urban* as a place with 50,000 people or more.

The sample size for questionnaires generally varies from one study to another. There is no required number of responses. In the areas of E-government and M-government, several studies distributed approximately 300 to 550 questionnaires (Alomari et al., 2010; Alhussain & Drew, 2010; Gilbert et al., 2004; Mitra & Gupta, 2007; Sung et al., 2009). In this research, the total number of completed questionnaires is 359. They were collected in 10 weeks, from June to August 2015. All respondents were Saudi adults (i.e., age 18 and older), and among those respondents, 234 were male and 122 were female (gender was unknown in 3 cases). Furthermore, 177 participants were from urban area, while 182 were from rural areas.

3.5.3 Data Analysis

Prior to distributing the questionnaires, items were coded in a separate PDF file in order to facilitate data entry and storage in an Excel worksheet. After storing all the data in an Excel worksheet, the R software was used for data analysis. Responses of these questionnaires were coded as "5" for always/agree, and "1" for never/disagree. When the total score for all items is calculated, the scores of the negatively worded items were reversed so that their valences matched the positively worded items.

The aim of the current study is to compare civic engagement between two sets of groups: T-government to M-government, and rural to urban citizens. Thus, this study conducts a trend analysis through applying inferential statistics. The t-test is used to obtain a p-value that indicates if the difference of the means is significantly different than zero. Two types of *t*-test were used: paired and unpaired. The paired *t*-test is used for H1 because the two groups (T-government and M-government) are not independent. In other words, each person created a pair of responses because they answered each question on both T and M-government. On the other hand, the unpaired t-test was used for H2 and H3 since there are two independent samples (rural and urban). For the unpaired *t*-test, the Brown Forsythe test was used to decide whether to use the Student's 2-sample *t*-test (equal variances t-test), or the Welch's 2-sample *t*-test (unequal variances *t*-test).

3.6 Results

The results are shown in two different manners for each hypothesis. The first manner illustrates comparisons of each item individually, while the second manner illustrates comparisons for each category as a whole (i.e., the frequency of civic engagement and citizens' opinions on the means of engagement). Both manners show the *p value*s and the differences in the means.

3.6.1 H1: M-government increases the level of civic engagement compared to T-government

The comparison in the frequency of civic engagement between T- and M-government varies if items for measurement are viewed individually (see Table 3). The *p value* from the paired *t test*, which compares responses for how frequently Saudi citizens send comments or file complaints to the government, does not show a significant difference between using T- and M-government. On the other hand, the *p value* from the paired *t test* comparing responses regarding how frequently Saudi citizens receive responses or alerts from the government showed highly significant differences between using postal (T-government) and text messages (M-government). Thus, text messages appear to help citizens to be more engaged with government in terms of receiving responses and alerts.

Table 3. Comparing the Frequency of Civic Engagement between T- and M-government, Comparing Each Item Individually

T-government	M-government	The Mean of the Differences	*P* value
I use the traditional means to give comments to government officials.	I use my mobile device to give comments to government officials.	-0.08913649	0.1933
I use the traditional means to file complaints.	I use my mobile device to file complaints.	-0.1225627	0.112
I receive responses from government via post.	I receive responses from government in text messages.	0.6796657	< 0.0001

Table 3 Continued

I receive alerts from government via post.	I receive alerts from government in text messages.	0.9805014	< 0.0001

Note. The difference in the means results from subtracting T-government from M-government.

Table 4 shows individual comparisons between the measurement items for citizens' opinions on the means of engagement for T- and M-governments. The *p value* for every comparison shows a highly significant difference between respondents' answers on the means of engagement for T- and M-governments. Saudi citizens believe that the means of M-government are easier and more convenient, take less time, require less effort, and encourage them to improve their community compared to the means of T-government.

Table 4. Comparing Citizens' Opinions on the Means of Engagement for T- and M-government, Comparing Each Item Individually

T-government	M-government	The Mean of the Differences	*P* value
Communicating with government by using traditional means is easy.	Communicating with government by using mobile devices is easy.	0.6880223	< 0.0001

Table 4 Continued

Communicating with government by using traditional means is not time consuming.	Communicating with government by using mobile devices is not time consuming.	0.7437326	< 0.0001
Communicating with government by using traditional means requires a little effort.	Communicating with government by using mobile devices requires a little effort.	0.6935933	< 0.0001
Communicating with government by using traditional means is convenient.	Communicating with government by using mobile devices is convenient.	0.9526462	< 0.0001
Communicating with government by using traditional means encourages me to improve my community.	Communicating with government by using mobile devices encourage me to improve my community.	0.6824513	< 0.0001

Note. The difference in the means results from subtracting T-government from M-government.

Table 5 shows a comparison between all items at once in the category of frequency of civic engagement (see Appendix A) & all items in the category of the means of engagement (see Table

2). The *p value* for comparing the overall items in the frequency of civic engagement shows a highly significant difference between using T- and M-government. Similarly, the *p value* for comparing the overall items in the citizens' opinions on the means of engagement for T- and M-government shows a highly significant difference. Saudi citizens use M-government more than T-government, and they believe that the means of M-government help them to be more engaged with government than with the means of T-government. Thus, Saudi citizens seem to be more engaged with their government when using mobile devices than when using the traditional means.

Table 5. Comparing all Items in the Category of Frequency of Civic Engagement & All Items in the Category of the Means of Engagement (see Appendix A)

	The Mean of the Differences	*P* value
The Frequency of Civic Engagement	0.1671309	< 0.0001
The Means of Engagement	0.7520891	< 0.0001

Note. The difference in the means results from subtracting T-government from M-government.

3.6.2 H2: Urban citizens are more engaged than rural citizens with T-government

Table 6 shows a comparison between urban and rural citizens in their usage of T-government. Each item was compared between urban and rural citizens individually. None of the *p value*s for the comparisons in each item showed a significant difference in the usage of T-government between urban and rural citizens. Similarly, none of the *p value*s for the

comparisons in each item in Table 7 showed a significant difference in urban and rural citizens'
opinions on the means of engagement for T-government.

Table 8 shows comparisons for the overall items in the frequency of civic engagement for
T-government by urban and rural citizens and the overall items for their opinions on the means of
engagement of T-government. The *p value*s for both comparisons do not show a significant
difference in the civic engagement between urban and rural citizens in Saudi Arabia. As a result,
it appears that there is no significant difference between rural and urban citizens in their levels of
civic engagement with T-government.

Table 6. Comparing the Frequency of Civic Engagement for T-government by Urban and
Rural, Comparing Each Item Individually.

	Urban-Rural	
Item	The Difference in the Means	*P* value
I use the traditional means to give comments to government officials.	-0.069038	0.5836
I use the traditional means to file complaints.	-0.015863	0.9058
I receive responses from government via post.	0.061929	0.6522
I receive alerts from government via post.	0.049233	0.7236

Note. The difference in the means results from subtracting rural from urban.

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Table 7. Comparing Rural and Urban Citizens' Opinions on the Means of Engagement

with T-government, Comparing Each Item Individually

| | Urban-Rural | |
Item	The Difference in the Means	*P* value
Communicating with government by using traditional means is easy.	0.038183	0.7571
Communicating with government by using traditional means is not time consuming.	0.047309	0.6829
Communicating with government by using traditional means requires a little effort.	0.103868	0.423
Communicating with government by using traditional means is convenient.	0.042373	0.74
Communicating with government by using traditional means encourages me to improve my community.	0.117899	0.3464

Note. The difference in the means results from subtracting rural from urban.

Table 8. Comparing All Items in the Category of Frequency of Civic Engagement & All Items in the Category of the Means of Engagement (See Appendix A)

	Urban-Rural	
	The Difference of the Means	*P* value
The Frequency of Civic Engagement	0.052591	0.3585
The Means of Engagement	0.069926	0.2405

Note. The difference in the means results from subtracting rural from urban.

3.6.3 H3: There is no difference between rural and urban citizens in their levels of civic engagement with M-government

The results of H3 are demonstrated in the same manner as H2. Table 9 shows a comparison between urban and rural citizens individually in their usage of M-government. The *p value*s for all items except *receiving alerts* do not show a significant difference in the usage of M-government between urban and rural citizens. The *p value* for receiving alerts in text messages showed a significant difference between urban and rural citizens. Thus, receiving alerts in text messages appears to be more useful for urban citizens. However, the *p value* of the overall category of frequency of civic engagement, as shown in Table 9, does not suggest a significant difference between the usage of M-government by urban and rural citizens in Saudi Arabia.

Table 9. Comparing the Frequency of Civic Engagement for M-government by Urban and Rural Citizens, Comparing Each Item Individually

	Urban-Rural	
Item	The Difference in the Means	*P* value
I use my mobile devices to give comments to government officials.	-0.049233	0.7155
I use my traditional means to file complaints.	-0.086142	0.5366
I receive responses from in text messages.	0.103154	0.4859
I receive alerts from government in text messages.	0.332868	0.02324

Note. The difference in the means results from subtracting rural from urban.

Table 10 shows comparisons of rural versus urban citizens' opinions on the means of engagement for M-government for each item individually. The *p value*s for the items in Table 10 showed a significant difference between the opinions of urban and rural citizens. The *p value* and the sign of the difference in the means of those items indicate that urban citizens seem to believe that mobile devices are easier and less time-consuming than rural citizens do. On the other hand, the rest of the items in Table 10 do not show a significant difference between the thoughts of urban and rural citizens regarding the means of engagement of M-government. However, the *p value*

from comparison of the larger manner of *citizen opinions on means of engagement* (i.e., all items in Table 11) shows a significant difference between urban and rural citizens. That is, urban citizens appear to like the means of engagement for M-government more than rural citizens.

Table 10. Comparing Rural Versus Urban Citizens' Opinions on M-government's Means of Engagement, Comparing Each Item Individually

Item	Urban-Rural	
	The Difference in the Means	*P* value
Communicating with government by using mobile devices is easy.	0.218943	0.02509
Communicating with government by using mobile devices is not time consuming.	0.341063	0.00504
Communicating with government by using mobile devices requires a little effort.	-0.004967	0.9632
Communicating with government by using mobile devices is convenient.	0.146924	0.2074
Communicating with government by using mobile devices encourages me to improve my community.	0.120196	0.2173

Note. The difference in the means results from subtracting rural from urban.

Table 11. Comparing All Items in the Category of Frequency of Usage & All Items in

the Category of the Means of Engagement (See Appendix A)

	Urban-Rural	
	The Difference in the Means	*P* value
The Frequency of Civic Engagement	-0.002189	0.9694
The Means of Engagement	0.164432	0.00156

Note. The difference in the means results from subtracting rural from urban.

3.7 Discussion

The major hypothesis of the current research stated that M-government increases the level

of civic engagement when compared to T-government. The result of this study supports this

hypothesis and showed evidence that clearly indicate that Saudi citizens are more engaged with

government when using mobile devices. The current study covers the limitation of Brown's

research. Brown studied the relationship between M-government and civic engagement through

examining the engagement between state departments of transportation in the U.S and the public.

Brown's research was limited to a specific department while the current research looked at all

government agencies as one construct. Furthermore, Brown's suggested a difference in the engagement but could not indicate if the difference is positive or negative.

The other two hypotheses of the current research claim that the levels of civic engagement of rural and urban are different with T-government but similar with M-government. As Liu et al. (2014) claims that there is a difference between the engagement of rural and urban citizens with T-government, the authors of the current study believe that mobile technology could remove this difference. The findings of the current research support that there is no difference in the engagement of rural and urban citizens with M-government. However, the result could not support that urban citizens are more engaged than rural citizens with T-government.

M-government in Saudi Arabia is still in its early stages and only a few ministries and government offices have online services. In fact, a big number of Saudi government agencies have yet to make plans for providing online services. In 2014, YESSER published a report that examined the current status of the Saudi government agencies' plans for shifting to E-government. In particular, the report assessed the quality of 22 Saudi agencies' plans as medium-quality, 77 as low quality, and 42 as having no plans yet (YESSER, 2014). Although the majority of government services in Saudi Arabia are still not provided online, the results of the current paper suggest that M-government increases the level of civic engagement compared to T-government.

The results of the current paper suggest that Saudi citizens believe that text messages are more useful than post in terms of receiving responses and alerts from the government. Text messages have been used as the start of M-government methods in different countries. For example, Bataineh et al. (2009) indicated that text messages were the first mobile service provided by the Dubai government. Furthermore, the Omani government started to use M-government by pushing and pulling information in text messages. In Saudi Arabia, text messages have been used

by different government agencies since 2003 (Abanumy and Mayhew, 2005). Thus, the early usage of text messages may have allowed citizens to recognize the efficiency of this method in civic engagement.

On the other hand, all Saudi citizens who want to receive mails used to visit a post office until 2005 when the government began to identify home addresses for mail delivery service. However, very few citizens receive mails at their home since home delivery service is limited to major cities and includes a fee (Alfuraih, 2008). In fact, only 2% of the population in Saudi Arabia owns an individual home mailbox (AlGhamdi and Drew, 2012). Saudi post would need a long time until they can identify home addresses for rural areas. Therefore, rural citizens do not benefit from this service. Thus, it is not surprising that both urban and rural citizens in Saudi Arabia benefit from receiving responses and alerts from government via text messages more than post.

The results of the current paper suggest no significant difference in rate of use between using T-government and M-government in filing complaints or sending comments to officials. This information raises the question of whether the online services in Saudi Arabia allow citizens to comment or complain yet. As it has been discussed earlier, there are some *stand-alone apps* that have been developed by different Saudi government agencies for receiving citizens' input like the example of MCIS. The goal of these apps is to encourage citizens to send comments or file complaints. Therefore, it is important to investigate these apps and evaluate their usability in order to enhance their efficiency which should result in more civic engagement. Furthermore, it is important to find out if citizens are aware of those apps and how they believe they can be improved.

One of the surprising results of the current paper is the indication of no significant difference between the levels of civic engagement of rural and urban citizens with T-government. As urban citizens are close to government agencies in terms of distance, it was expected that this

would allow them to have a higher civic engagement than rural citizens. In other words, distance was seen as a barrier to civic engagement for rural citizens. However, the results of the current paper did not specifically show this expected difference. Thus, it is important to conduct further examination to find out if the distance required to reach a government agency has significant effects on civic engagement.

The results of this paper reveal that M-government generally allows similar levels of engagement for rural and urban citizens in Saudi Arabia. However, there are some significant differences in some measurements of civic engagement such as receiving alerts. Although urban citizens seem to receive alerts in text messages more than rural citizens, there was no significant difference in receiving responses in text messages between the two categories of citizens. Thus, the difference between responses and alerts could have been not clearly understood by all citizens. Further, investigations on the types of responses and alerts that are received by Saudi citizens need to be discovered and discussed.

Another significant difference in the civic engagement of rural and urban citizens with M-government is seen in the ease of use and the time consumption of the M-government's means of engagement. As it appears in the results, urban citizens have higher civic engagement than rural citizens. Rural areas may have limited Internet which may make the task of completing a government procedure difficult and time consuming. Therefore, further investigation is needed to find out the reasons that make the means of engagement for M-government vary between rural and urban citizens in terms of ease of use and time consumption.

In conclusion, the majority of the findings of the questioners provided strong evidence that support the major hypotheses of the current study. There is clear evidence that citizens are more engaged with government by using M-government than T-government. Furthermore, there is

evidence that urban and rural citizens showed generally similar levels of civic engagement when using M-government. However, there is no evidence that could show a significant difference in civic engagement between urban and rural citizens when using T-government.

3.8 Limitation

The questionnaires used in the current study include only closed-ended questions. Therefore, citizens did not have the chance to express their feelings and opinions in an open and flexible manner. There might be issues that were not covered in the questionnaires.

3.9 Future Work

Based on the lack of a clear distinction between civic engagement of rural and urban citizens with T-government, we plan to conduct further investigations to test if it is truly that there is no significant difference or other confounding factors that may have affected the results of the current study. Therefore, to investigate more thoroughly, we will pursue other methods of data collection and analysis.

We will conduct semi-structured interviews with Saudi citizens which will allow them to express their feelings and opinions in an open and flexible manner. Interviews will provide opportunities for clarifying issues discovered in the results of the current questionnaires. Thus, interviews will provide a more robust description of the data. Furthermore, interviews will provide further evidence that the major findings of the current study are accurate and trustable. Moreover, interviews will be analyzed qualitatively which will allow this research to apply mixed methods (i.e. qualitative and quantitative).

CHAPTER 4 INTERVIEWING URBAN AND RURAL SAUDI CITIZENS TO COMPARE THEIR CIVIC ENGAGEMENT WITH T-GOVERNMENT AND M-GOVERNMENT

A paper submitted to the International Journal of Human-Computer Interaction

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Abstract

The current paper is an extension to our recent study that used questionnaires to test certain hypotheses about civic engagement with T-government and civic engagement with M-government. The hypotheses also were about civic engagement of urban citizens and civic engagement of rural citizens. The current study confirms the findings of questionnaires and provides more detailed explanations through conducting interviews with a number of Saudi citizens. Interviewees were from urban and rural areas in Saudi Arabia. The interviews of the current study are analyzed qualitatively through deductive content analysis. The results of the current study confirm that M-government allows higher civic engagement than T-government. The results also suggest no difference between urban and rural citizens with T-government. Moreover, the results suggest that M-government allows similar levels of engagement between urban and rural citizens. The major finding of the current study is that Human-to-Computer interaction is more effective than Human-to-Human interaction in terms of civic engagement.

4.1 Introduction

The communication between citizens and governments has been changing rapidly since the emergence of online services. Communication used to be difficult and complicated due to limitations of the traditional means. For example, while face-to-face and telephone communication allow immediate response, they are limited to a specific time. Communication must occur during certain hours and days. Although communication using fax and post could solve this time restriction, they are not suitable for quick feedback.

Governments have begun to provide online services in order to allow a wider range of communication with citizens. With Electronic Government (E-government), communication between government and citizens can occur anytime and anywhere. In fact, the usage of mobile technology allows this communication generally all the time. For instance, government can communicate with citizens via cell phones which are normally carried and switched on all the time. The usage of cell phones helps government to target specific people. Furthermore, cell phones help citizens to receive notifications from government and reply on time.

The usage of mobile devices to communicate with government is one type of Mobile Government (M-government). This type of communication is called Government to Citizens (G2C) (Trimi and Sheng, 2008). Although this type of government can solve the majority of the limitations that can occur due to using Traditional Government (T-government), it brings a new limitation that is called *digital divide*. In case of the M-government, digital divide occurs between those who have access to the Internet and mobile technology and those who do not (Sipior & Ward, 2009).

Earlier work (Albesher and Stone, in press) conducted an extensive review on the current state of M-government. This paper found that there is a gap in understanding the relationship between M-government and civic engagement. According to this paper, only one study (Brown,

2011) has looked at this relationship. However, this study was limited to the state department of transportation agencies in the U.S. Furthermore, this study suggested that there were effects on civic engagement when using M-government. However, it concluded that it remains unclear if those effects made the relationship between government and citizens richer. Thus, our recent paper (Albesher and Stone, 2015) filled this gap through studying whether M-government increases civic engagement or not.

Albesher and Stone, (2015) compared civic engagement with T-government to civic engagement with M-government in order to detect the differences in the levels of civic engagement. Questionnaires were used in this paper in order to gain a large number of responses. 359 completed questionnaires were collected from the citizens of Saudi Arabia. Participants were given the opportunity to ask the main researcher questions if needed while they were answering the questionnaires. The results provided highly significant evidence for the increase in civic engagement with M-government compared to T-government.

Another gap that was found by (Albesher and Stone, in press) in the area of M-government is the effect of M-government in rural and urban citizens. Liu et al. (2014) claimed that government services with T-government are not delivered to rural and urban citizens equally. Albesher and Stone (in press) claimed that rural and urban citizens could get similar levels of civic engagement with M-government. In fact, the questionnaires that were mentioned earlier validate this claim. The questionnaires' results found evidences for the capability of M-government to allow similar levels of civic engagement for rural and urban citizens.

The current paper is an extension to our recent paper that used questionnaires to test certain hypotheses. The current paper confirms the findings of questionnaires and provides more detailed explanations through conducting interviews with a number of Saudi citizens. Interviewees were

from urban and rural areas in Saudi Arabia. The first part of the current paper talks about civic engagement and how M-government can provide new methods of civic engagement. This part shows different examples of these methods generally all over the world and specifically in Saudi Arabia. The second part describes how interviews were conducted, how participants were recruited, and how results were coded and analyzed. The following part shows the results in themes and then discusses the major findings with more details. The paper concludes with an interpretation of the findings and a discussion possible future work.

4.2 Civic Engagement

Civic engagement can have a broad definition that includes any individual or collective actions done by citizens to help their community (Ekman & Amnå, 2012). In this case, civic engagement would include political involvement, community service, and social change. An example of a broad definition is proposed by Adler & Goggin (2005) since they define civic engagement as "the interactions of citizens with their society and their government" (p. 241). In fact, they indicated that this definition is the simplest definition of civic engagement. On the other hand, civic engagement can have a narrow definition that indicates only political involvement, community service, or social change.

One definition limits civic engagement to political involvement by stating that civic engagement "directs individual efforts toward collective action in solving problems through political process" (Diller, 2001, p. 7). Another definition limits civic engagement to community service by stating that civic engagement is "an individual's duty to embrace the responsibilities of citizenship with the obligation to actively participate, alone or in concert with others, in volunteer service activities that strengthen the local community" (Diller, 2001, p.21). Yet another definition

limits civic engagement to social change by stating that civic engagement is "how an active citizen participates in the life of the community in order to help shape its future" (Adler & Goggin, 2005, p. 239).

Adler & Goggin (2005) conducted extensive research to understand civic engagement. They found that civic engagement has 383,000 citations in Google. The results of their research suggested that there is no specific definition for civic engagement and its definition is mainly based on the definer's prospective and interests. Thus, the current research has looked at civic engagement as community service and as social change.

4.3 New Methods for Civic Engagement

Mobile devices have created new opportunities for civic engagement. These opportunities were granted by the unique characteristics of mobile devices. One of the characteristics is the variety of mobile devices. Mobile devices are not only limited to smart phones, but also include laptops, tablets and any other device that can be carried (Alrazooqi and De Silva, 2010). This variety of mobile devices supports the continuous interaction between citizens and government by enhancing citizens' ability to access information. As a result, citizens are able to receive information in a timely manner and reply immediately. The variety enables the communication to occur through calls, Short Message Service (SMS), Multimedia Messaging Service (MMS), voice messages, emails, webpages, or native applications (apps).

SMS is a very commonly used method for immediate communication. This service has been used for different purposes. One purpose of using SMS is for emergency management. For example, the government of Bangladesh designed a system that enables sharing pre-disaster and post-disaster warning SMS. This system also allows citizens to ask for relief assistance and share

information about health hazards. Another example is the usage of the SMS by the Italian government to communicate with their citizens who were struggling with the 2004 tsunami in Thailand (Al-Khamayseh & Lawrence, 2006). Other purposes include payment, transportation (Gouscos, Drossos, & Marias, 2005), voting (Rossel, Finger, and Misuraca, 2006), and education (Rannu, Saksing, & Mahlakõiv, 2010).

In addition to variety, another characteristic of mobile devices is its unique capabilities such as the ability to take photos and videos, and share location. Taking photos and videos is a useful method for proof and documentation. In Saudi Arabia, various government agencies have started to benefit from those capabilities. For instance, the Ministry of Commerce and Industry designed a mobile app that allows citizens to report merchant violations (https://play.google.com/store). One example of violation is unlawful mark-up of prices on products. If a citizen encounters such price mark-ups he or she can take a photo of the product using his or her smart phone and then send a violation report to the Ministry of Commerce and Industry. They can also share a precise location for a merchant though using their smart phone's GPS.

The app called Najm (https://play.google.com/store) provides another example of the potential benefits of the unique capabilities of mobile devices. This app allows citizens to report motor vehicle accidents in an effective and efficient manner. When there is an accident, a citizen can take photos of the damaged cars and therefore move the car before authorities arrive in order to avoid blocking traffic. After that, the citizen can report the accident and share his or her location using the mobile app. The nearest investigation officer will be notified and the incident reporter can track the officer's arrival by following up his or her location on the map.

4.4 Methodology

In the current study, interviews were conducted with Saudi citizens in order to provide detailed explanations for the findings of our recent questionnaires (Albesher & Stone, 2015). According to McNamara (1999), interviews are appropriate for exploring the stories behind participants' experiences. In the current study, semi-structured interviews were used because they afford flexibility. Brown (1995) believes that semi-structured interviews encourage people to reveal information more than structured interviews. In semi-structured interviews, the order of the questions can be changed and interviewers can ask additional questions if further explanation is needed (Myers and Newman, 2007).

4.4.1 Participants and Procedures

Interview questions were reviewed and accepted by the Office of Responsible Research at a large mid-western university in the United States. Moreover, King Faisal University (KFU) granted the main researcher the permission to conduct the interviews with Saudi citizens. In fact, the College of Computer Sciences and Information Technology at KFU recruited the interviewees and supervised the data collection. They provided the main researcher with the interviewees' contact information and they coordinated the interviews. Every interviewee was met face to face or called by phone prior the interview in order to get his or her permission to participate. Interviews were conducted either at the main researcher's office at KFU or at the interviewees' offices.

Interviews were conducted in Saudi Arabia during the period of December 2015 to February 2016. Interviewees were met individually and each interview took 30 to 45 minutes. The main researcher received permission from each interviewee to record his or her voice by using "QuickTime Player" before beginning the interview. The total number of interviews was 30. 15 interviews were conducted with rural and urban citizens respectively. Bertaux (1981) believes that

15 interviews is an acceptable number for qualitative research. All interviewees were older than 18 years old, and 9 interviewees were female. For both rural and urban areas, the selection for interviewees intended to have participants from different gender, age, level of education, and occupation.

Interviews' questions were developed in English then were translated to Arabic, the first language in Saudi Arabia. Questions were translated back to English in order to ensure accurate translation. This method is called *back translation* and it is commonly used for accurate survey translation (Brislin, 1970; Homburg et al., 1999; Unger and Molina, 1999; Hofstede et al., 1999). The translation process was followed by a limited preliminary study. The aim of the preliminary study was to ensure that the interview's questions were viable and fit with Saudis' cultural understanding. Based on the results of the preliminary study, some questions were re-written to make them clearer.

4.4.2 Interview Questions

Questions are divided into 3 groups. The first group includes questions that tests civic engagement with T-government while the second group includes questions that tests civic engagement with M-government. The third group includes two questions that compare citizens' interaction with T-government to citizens' interaction with M-government. Additional questions about M-government were asked since it is the primary focus of the current research. Thus, participants were asked about what they like and dislike about M-government in Saudi Arabia. Furthermore, they were asked for recommendations that can improve their interaction with government through M-government.

The interview questions were generated with the purpose of providing detailed explanations for the findings of our recent (Albesher & Stone, 2015). The result of questionnaires suggested no significant difference between the civic engagement of rural and urban citizens with T-government. Urban citizens were expected to have more civic engagement since they are close to government offices. However, there might be other reasons that account for less civic engagement of urban citizens with T-government. Thus, in the current study, all interviewees (urban and rural) were asked if reaching a government office is difficult. In this question, the interviewee was asked to elaborate in order to get a detailed answer.

As revealed by the questionnaire, there was no significant difference between using T and M-government for the optional engagement such as filing complaints and sending comments. This finding raises the question of whether M-government in Saudi Arabia allows citizens to comment or complain. Thus, in the current study, a few questions were used to compare and evaluate filing complaints and sending comments with T and M-government. Some government offices in Saudi Arabia have stand-alone apps and these apps allow citizens to comment or complain. Therefore, a question that explores citizens' awareness and opinions on these apps was asked.

The results of the questionnaires lead to the recommendation that urban and rural citizens have similar levels of receiving responses from government in text messages. However, the result showed that urban citizens receive significantly more alerts from government in text messages than rural citizens. Thus, the current study asked participants about the examples of responses and alerts they receive in order to detect if the difference between responses and alerts is clear. Furthermore, each interviewee was asked about the network coverage for the basic services such as calls and text messages in order to find if some rural citizens suffer from weak coverage.

Additionally, the results of the questionnaires suggest that urban citizens, unlike rural citizens, believe that M-government is easy and less time consuming. Rural areas could have weak or unstable Internet connection which might have led some rural citizens to believe that completing tasks at government offices is difficult or time consuming. Thus, one interview question compares the Internet connection of urban areas to rural areas.

4.4.3 Analysis

Questionnaires of our previous study were analyzed quantitatively, and the interviews of the current study are analyzed qualitatively. Various scholars believe that combining qualitative and quantitative methodologies is recommended (Tripp-Reimer, 1985; Clark & Creswell, 2011). Miles & Huberman (1994) and Maxwell (1984) disagree with the idea that "qualitative studies are only good for exploratory forays, and for developing hypotheses - and that strong explanations, including casual attributions, can be derived only through quantitative studies" (p .147). They believe that quantitative analysis tells us nothing how or why a case occurred, and can only predict at the mechanisms involved. In contrast, they believe that qualitative analysis is considered to be a very effective method for estimating causality. Furthermore, qualitative methods are certainly useful when the investigator is looking for rich descriptive information about a topic or a phenomenon (Tripp-Reimer, 1985).

Interviews' data was analyzed using deductive approach since the researchers already have predefined themes. Those themes were emerged from the results of the recent questionnaires. Various scholars discussed the deductive approach and explained that there are no systematic rules for analyzing qualitative data (Burnard et al, 2008; Elo Kyngäs, 2008). However, they indicate that data analysis should go through three stages: preparation, organizing and reporting. In the current

study, the recording for each interviewee was re-played and each answer was stored in a Word documents. Data was stored in two documents; one document has responses from urban citizens while the other has responses from rural citizens. After that, content analysis was used which is a systematic coding to determine the frequency, and the trends and patterns of the used words (Mayring, 2000; Gbrich, 2007). Finally, the results are presented in figures and explained in text.

4.5 Results

4.5.1 Is reaching a government office difficult?

All interviewees stated that reaching a government office is difficult for various reasons. Those reasons are generally similar. The first reason is the difficulty of getting permission from work to visit a government office. Other reasons include distance, traffic, time consuming, and parking. Although interviewees' give similar explanations about why reaching a government office is difficult, the degree of difficulty for one reason to another varies from one interviewee to another. For example, some interviewees stated that getting permission to leave work is very difficult because of the nature of their jobs, while others found it difficult only under specific circumstances. Another example can be clearly seen with respect to distance. Some interviewees live or work far away from the city center, where most of the government offices are, so distance is a major obstacle for them. On the other hand, other interviewees looked at distance as only a minor obstacle, but they mentioned traffic as a major hindrance.

The difference between urban and rural citizens in saying distance as a major reason could not be clearly noticed. In fact, only three urban citizens mentioned that distance is not a major hurdle since they live and work close to government offices. On the other hand, there were rural citizens who stated that they live in rural areas but work in urban areas so they are close to

government offices during the working hours. In short, distance alone is not enough of a factor that can make a clear difference between the civic engagements of urban citizens to the civic engagement of rural citizens with T-government. Both rural and urban citizens struggle with reaching a government office for generally the same reasons.

Interviewees talked about some difficulties after reaching some government offices. These difficulties include waiting in a long line, redirection, and unclear procedures. One interviewee said:

> I hate asking my manager to leave my work to complete a task at a government office because I can't tell him how long they will take. It becomes worse when I have to revisit a government office several times to complete one task. My manager can't know if I really used the whole time for finishing one task and I can't blame him.

4.5.2 Optional Engagement

Not all engagement with government is mandatory. There is also optional engagement such as filing complaints, and sending comments, notes, or suggestions. Around one third of the interviewees have participated in optional engagement with government using traditional means (See Figure 4). However, the majority of the interviewees felt that government offices ignore instances of optional engagement (e.g., complaints) that are sent through traditional means. Moreover, they mentioned that it is hard to follow up with a complaint sent through traditional means since there is no reference number like what they receive when filing complaints through mobile devices. Some of the interviewees discussed that they have either used verbal complaints or put their complaints in the suggestions and complaints box. However, they stated they could not

get any proof that they have complained. In fact, only half of the interviewees who used T-government for complaints and comments received responses.
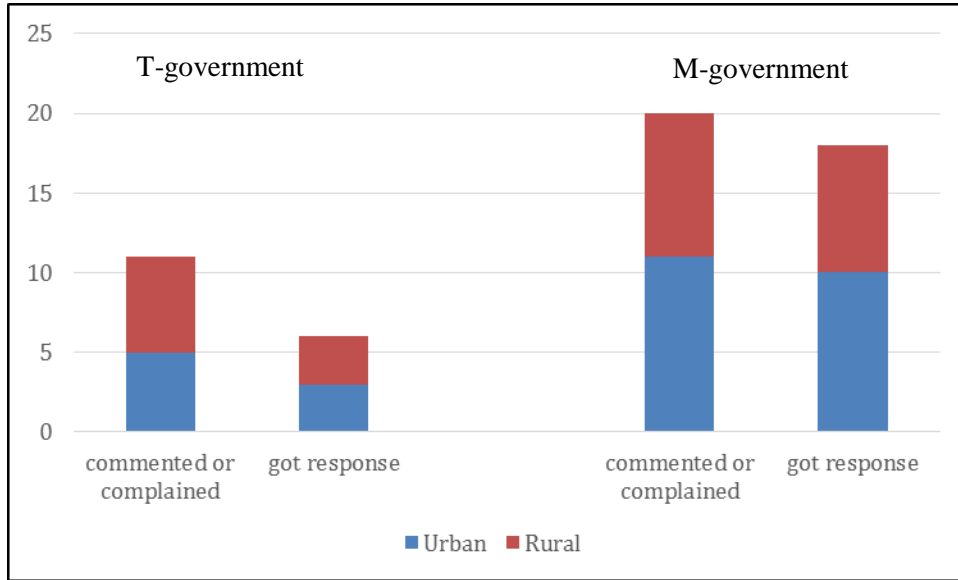

Figure 4: Optional Engagement is compared between T-government and M-government, as well as rural and urban contexts**.**

On the other hand, two thirds of the interviewees have participated in optional engagement with government via mobile devices. The majority of interviewees stated that they were encouraged to file complaints or send comments using their devices because they saw that some government offices replied to citizens through Twitter. Some of them stated that M-government allows different channels to file complaints or send comments. In fact, around one third of the interviewees used their phones to document complaints by taking photos and then sending them through stand-alone apps. All but two of the interviewees who used M-government for filing complaints or sending got responses from government. The two interviewees explained that some government offices have created opportunities for filing complaints or sending comments through M-government but they are not prepared to reply to them.

4.5.3 Receiving Responses and Alerts from Government

All interviewees have received responses and alerts from government in text messages except two interviewees (see Figure 5). On the other hand, only four interviewees received responses or alerts from government via post. In fact, some interviewees stated that they do not have a personal mailbox. Moreover, most the other interviewees share one mailbox in the post office with their family or friends. Only a few interviewees have a personal mailbox at their houses. This finding is not surprising since the Saudi government has just begun to establish personal mailboxes for home addresses, and only 2% of the population has personal mailboxes at their home addresses (AlGhamdi and Drew, 2012).

Interviewees talked about various examples of the text messages (SMS) they receive from government. Received messages include alerts, notifications, reminders, and awareness information. Interviewees mentioned weather alerts such as heavy rain or sand storms as examples of alerts. Interviewees agree on the importance of weather alerts. In fact, some of them stated that they really benefited from these alerts and had changed their plans effectively. One interviewee said:

> I had a plan to travel to another city the next day to supervise a workshop. My plan was to travel in the morning. However, when I received a weather alert that warned me for heavy rain, I left before sunrise to avoid the rain. If I had not received this alert, I would have been stuck and my workshop would have been cancelled.

Interviewees discussed other types of text messages. For instance, they mentioned that they receive reminders in text messages when their official documents such as driving license or passport are about to expire. They discussed how theses reminders help them to be organized and avoid late renewal fee. Most of interviewees asserted that they have received notifications in text messages that described the status of their requests in government offices. Furthermore,

interviewees talked about messages for awareness. These messages include information about public events. They also include information about health and traffic safety. Interviewees discussed the importance of these messages in protecting and developing the society.
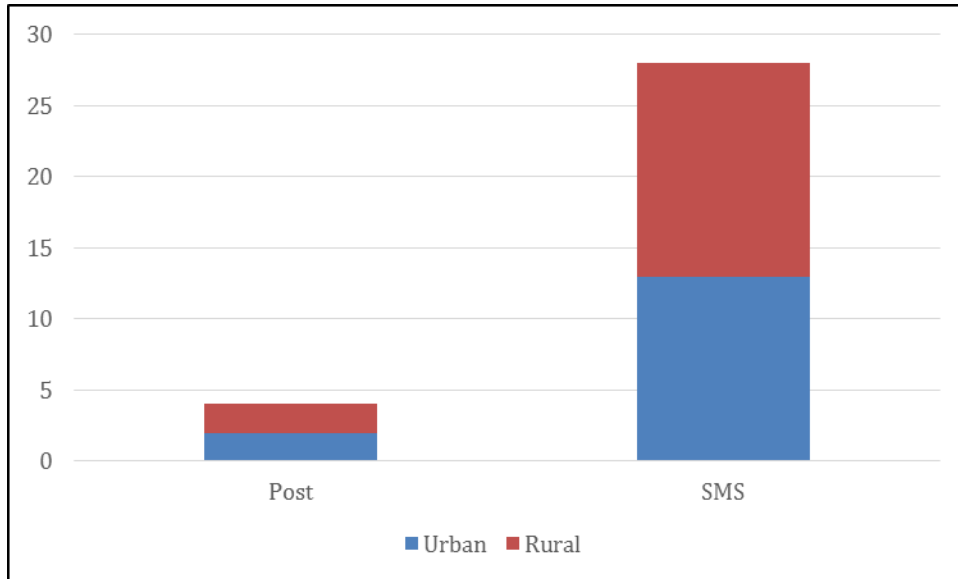

Figure 5: Comparing Receiving Responses from Government via Post to Receiving Responses from Government via SMS

All interviewees agreed that using text messages to communicate with government is a very attractive technique. They appreciate that this technique saves time and effort. They discussed that this technique is unique since it is delivered on time and can reach them anytime and anywhere. They indicated that this technique guarantees that information is sent to the right person and in a timely manner. Some interviewees stated that text message is better than email since email needs an Internet connection. Some of the interviewees indicated that they read text messages more than any other messages because they feel that text messages are more personal and important.

However, interviewees indicated that the text messages that they receive are one-way communication. They wish that government offices could use text messages for two-way communication where citizens can reply to some messages. One-way interaction is called push-

or-pull information, while two-way communication is called push-and-pull information (Shareef et al., 2010). An example of push-and-pull information is the SMS-parking services system in Oman which enables motorists to pay parking fees via SMS (Naqvi & Unicersity, 2011).

Using text messages for the interaction between government and citizens allows the interaction to be simple and quick. Various scholars discussed the importance of using SMS for the communication between citizens and government. For instance, Susanto & Goodwin (2010) stated that "SMS channel has significantly reduced time and cost; introduced a cheaper, easier and faster information-accessing channel; improved transparency, accountability, communication, and relationship between government and citizens; made the services and procedures easier for the citizens…" (p.55). Although information is better to be sent in text messages than mail, post is still important to deliver official documents. Without post, the integrity of the electronic services becomes incomplete.

4.5.4 Stand-Alone Apps

All urban and rural citizens who were interviewed in the current study are aware of the stand-alone apps (see Figure 6). The awareness varies from one interviewee to another. Only three urban and three rural were aware of most government apps while the rest were aware of only some government apps. Thus, only a few interviewees used most of the apps while more used only a few apps (see Figure 7). In fact, two urban and six rural citizens have not used any apps at all. Some interviewees were worried about the privacy and the security of these apps. They explained that their personal data could get stolen. The other interviewees talked about the limitation of their smart phones' memory. A couple of interviewees prefer to use their laptops and work with websites. They mentioned that smart phone screens are not big enough to complete government procedures. However, they stated that apps could be good for notifications.
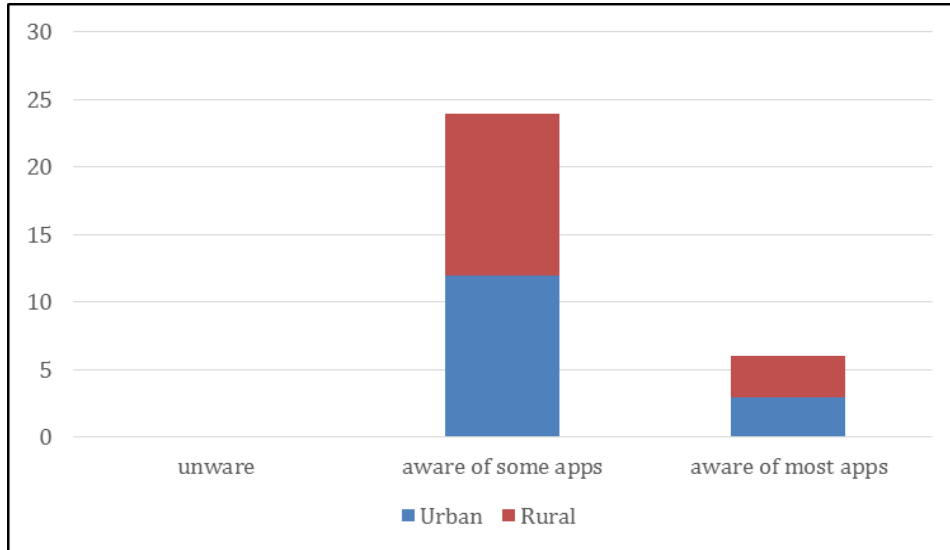
Figure 6: Saudi Citizens' Awareness of Mobile Government Apps.

Although all citizens who used these apps appreciate that apps simplify government procedures, they talked about various problems. For instance, some interviewees mentioned the computability of these apps to work with different operating systems. They explained that the interfaces for certain apps do not fit with the screens of their phones. Furthermore, some interviewees stated that apps sometimes freeze. They are not sure if the freezing occurs due to the size of the apps or their phones not having sufficient memory and/or processing power. Additionally, some interviewees talked about incomplete apps. They mentioned that some apps are not ready to be used since they miss a lot of basic requirements. Some interviewees discussed that government offices should not publish any app until it is completely ready. They explained that when citizens download an incomplete app, they would delete it and would never download it again. In fact, one of interviewees had experienced this scenario.
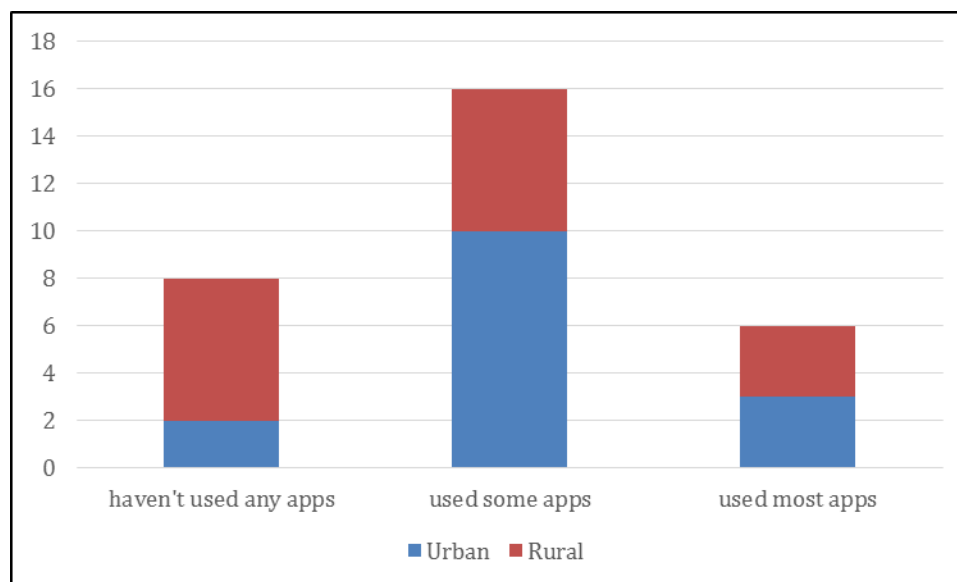
Figure 7: Frequency of Use of Mobile Government Apps in Saudi Arabia

4.5.5 Network Coverage for Basic Services & the Internet

Some interviewed rural citizens indicated that the network coverage for basic services (calls and SMS) is weak while no one from the interviewed urban citizens mentioned that (see Figure 8). In fact, the majority of the interviewed urban citizens stated that the coverage is strong.

The majority of the interviewed urban citizens indicated that their Internet connection is fast and excellent (see Figure 9). In fact, some of them stated that they had fiber optic cables at their houses. Fiber optic cables allows for much greater bandwidth than metal cables (Wellbrock, 2010). A recent report by the Communication and Information Technology Commission (CITC) showed that optical fiber cables have been installed recently in some districts in the major cities of Saudi Arabia (CITC Annual Report, 2015). Only one urban citizen indicated that the Internet connection was slow while a few stated that it varied from one place to another, and from one time to another.
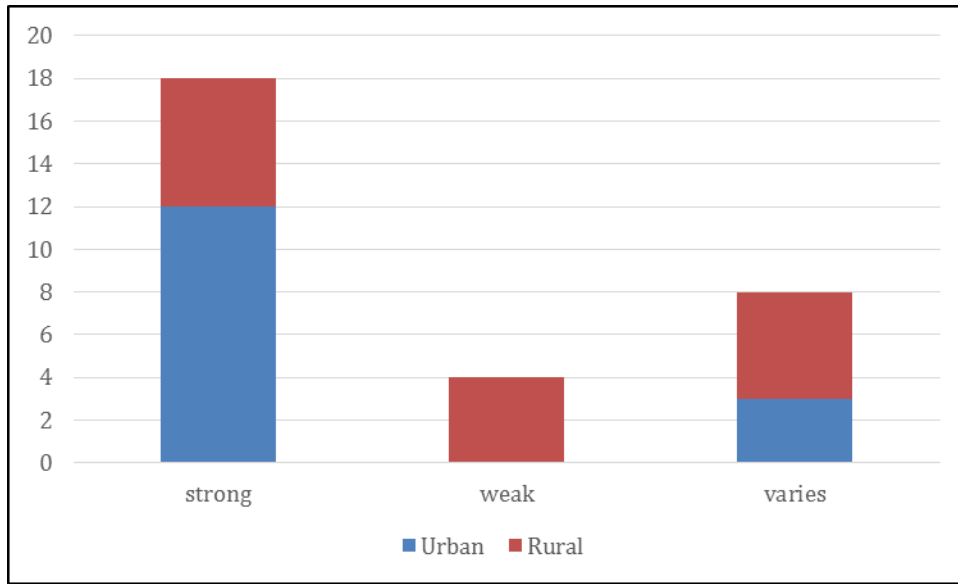
Figure 8: Saudi Citizens' Evaluation of Network Coverage for Basic Services (Calls and SMS)

On the other hand, the majority of the interviewed rural citizens asserted that the Internet connection was slow and it got disconnected often. Only two rural citizens indicated that the Internet connection was strong and stable while a few mentioned that it varied based on time and location. One of the rural citizens said:

I have tried the three Internet service providers in my area. Although one provider can be a bit better than the other, they all still provide slow and unstable Internet. I believe that the date palms in my area, and the insulation in my house make the connection slower.

The clear difference between urban and rural citizens in terms of the Internet connection can answer why there was a significant difference between urban and rural citizens in their thought of looking at M-government as easier and less time consuming than T-government (Albesher & Stone, 2015). In other words, some rural citizens struggle with the Internet connection, which makes completing government procedures through M-government difficult and time consuming
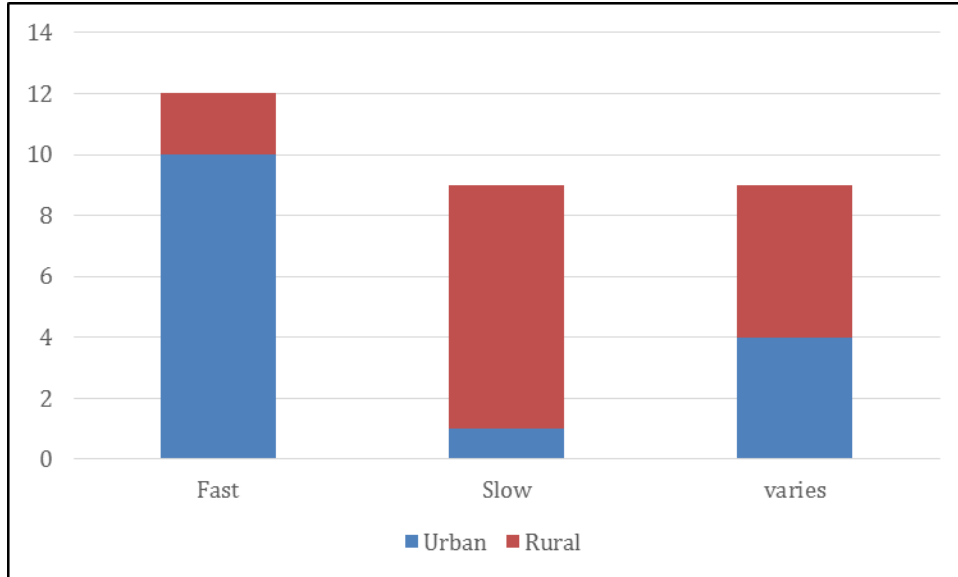
Figure 9: Saudi Citizens' Evaluation of the Internet Connection.

4.5.6 Citizens Likes & Dislikes of M-government in Saudi Arabia

Interviewees were asked what they like and dislike about M-government in Saudi Arabia. All interviewees agree that M-government is easier, faster, and more convenient than T-government. However, some interviewees from rural areas mentioned that sometimes they take long time to complete government procedures because of the slow Internet. A couple of rural citizens mentioned that they could not complete some government procedures because the process was not clear for them. One of them said:

I was completing the process for renewing my car's registration online using my laptop for the first time. I had an error while I was completing the process. I didn't know what exactly the error was, and I didn't know how to fix this error to move on. I didn't see any information for assistance. Therefore, I had to go to the traffic office in person, and I had to do the process again from scratch.

The interviewees discussed different advantages of M-government. Interviewees talked about the variety of channels that M-government can provide for the interaction between citizens and government. Additionally, they appreciate that M-government allows them to communicate with government offices from anywhere and at any time, even in the holidays. Some of the interviewees expressed that they had to communicate with specific government offices in the holidays for urgent issues. For instance, two interviewees described their stories with getting permission for their cars to enter another country during the holidays. They stated that without M-government services they would not have been able to have a quick convenient communication with the traffic office and get that permission easily and within a few minutes.

Generally speaking, interviewees are happy with M-government services in Saudi Arabia and they talked about a fast improvement in the mobile services. All of them mentioned the mobile services that are provided by the Ministry of Commerce and Industry (MCI), and Ministry of Interior (MOI) as ideal examples of M-government services. However, the majority of the interviewees complained about the bad management for mobile services provided by specific government offices. They mentioned that different examples for government offices that have mobile services only as interfaces. They talked about specific mobile services and how they are not active. Interviewees were questioning how a government office develops mobile services without the preparation of managing them. They were also questioning why government does not evaluate these mobile services. Some interviewees discussed how these unready mobile services could damage the reputation of M-government while the others understand that this failure is by a particular government office not the M-government itself.

Interviewees mentioned other advantages of M-government. For example, some of the Interviewees stated that dealing with electronic systems is better than dealing with human. They

explained that some government representatives (employees) treat them harshly. Other interviewees explained that some employees treat specific people whom they know better than those they do not know. Interviewees believe that electronic systems allow equal communication with all people and first come is first served. Furthermore, some interviewees talked about the availability. They commented that electronic systems are generally available all the time, unlike employees. Interviewees discussed that they suffer sometimes when visiting government offices since a specific employee is not there. They mentioned that they either wait a long time until an employee come back or had to return another time. Moreover, all interviewees appreciated that they can finish government procedures while they are at their offices without the need to ask for permission to leave work. All interviewees hated that they did not know how much time they will need to finish a specific government procedure when vising a government office. They said that this issue puts them in trouble with their managers at work or teachers at school.

4.5.7 Recommendations to Improve the Interaction through M-government

Some interviewees suggested a telephone number for each government department that can serve citizens 24/7. They suggested that this number should be specific for technical issues of the electronic services. In fact, MOI has a telephone number that is specific for technical issues (https://www.moi.gov.sa). Instead, other interviewees recommended live chat. They mentioned that technical problems could be easily explained and handled with synchronous communication through live chat. On the other hand, some interviewees suggested that each government office building should have a division for technical assistance. Additionally, one interview stated that each area should have a small office that has a couple of government employees who can help

citizens to finish any type of online government procedure. The interviewee explained that this office is temporarily until citizens understand how to deal with the electronic services.

A few interviewees believe that government offices should promote their electronic services more efficiently. Some interviewees suggested showing advertisements in the TV in order to raise the awareness of specific online services. Other interviewees suggested using social media such as Twitter and YouTube to show electronic services and explain how to use them. In fact, some government offices have started applying this idea. For example, the MCI has official videos that demonstrate different online services (https://www.youtube.com/user/SaudiMCI). They have other videos that aim to educate citizens about their rights. Moreover, some videos show citizens how to report merchant violations. The MCI uses social media as effective channels for civic engagement since it can reach a large mass of citizens within a short time. In fact, the minster himself interacts with citizens in Twitter through his official account.

The majority of the interviewees asserted that government should push government offices to deliver electronic services. In fact, Yesser, the Saudi government program that is responsible for the electronic services in Saudi Arabia has asked government offices for their plans to have complete electronic services. Yesser generates annual reports about the move toward digital government (http://www.yesser.gov.sa). However, interviewees feel that every government office works separately. They stated that one government procedure could require approval from different government offices. Thus, without a connection between government offices, citizens would still need to visit some of them in person. Interviewees hope that all government offices get connected online. They are looking forward to using a unified system that combines all government offices together.

4.6 Conclusion

Reaching a government office is difficult for both urban and rural citizens. Both discussed generally the same reasons which included distance, traffic, time consuming, and parking. The levels of civic engagement is affected by all of those reasons together. Therefore, distance alone could not show a difference in the civic engagement between urban and rural citizens as it was expected. Moreover, both urban and rural citizens discussed generally the same issues of struggle with T-government which included waiting in a long line, redirection, and unclear procedures. This finding confirms the results of our recent questionnaires which suggested no difference between the civic engagement of rural and urban citizens with T-government.

The results of the current study showed that citizens participated in the optional engagement such as filing complaints and sending comments with M-government more than with T-government. Citizens discussed various reasons that discourage their optional engagement with T-government, and encourage their optional engagement with M-government. For instance, optional engagement with M-government allows citizens to get a proof for their participation by receiving a reference number. Furthermore, participation can be easily retrieved and tracked with M-government. However, M-government channels for the optional engagement are still under development in Saudi Arabia. A lot of the Saudi government offices are still not prepared to receive various types of optional engagement. Only specific government offices such as the Ministry of Commerce and Industry are fully ready to receive different types of optional engagement and reply in a timely manner. Therefore, this finding confirms the results of our recent questionnaires which suggested no significant differences between using T and M-government for the optional engagement.

The network coverage for basic services such as calls and SMS varies between urban and rural areas. Urban areas generally have better coverage than rural areas. Similarly, the internet

connection in urban areas are stronger than rural areas. Thus, this finding approve why the results of the questionnaires suggested that urban citizens unlike rural citizens believe that M-government is easy and less time consuming. This finding raises a question of whether the Saudi government has plans to deliver robust network coverage in the rural areas. This finding is important to be considered by YESSER program.

Although a lot of M-government apps in Saudi Arabia have been suffering from technical issues, and they are still under development, citizens still prefer to interact with government through M-government more than T-government. M-government allows the interaction between government and citizens to be active generally all the time. Furthermore, citizens are more engaged with M-government than T-government because the engagement needs less effort and time consuming. Saudi citizens generally prefer to interact with computer more than human for several reasons. For instance, citizens discussed the availability of computers since they are available 24/7 and even in the holidays. Moreover, citizens mentioned that computers would treat them equally unlike human who may treat some citizens better than the others. Thus, civic engagement through human-to-computer interaction is better than human-to-human interaction.

CHAPTER 5 GENERAL CONCLUSION

5.1 Conclusion

Scholars have different views about the relationship between E-government and M-government and those views had been confusing researchers and readers in the area of M-government. M-government is a new field and scholars have failed to bring a full consideration of M-government and how it is related to E-government. This dissertation provided a new view which presents a full consideration of M-government and its relation to E-government. This view indicated that M-government is a subset of E-government in terms of time and place, utility, and accessibility. In contrast, this view indicated that E-government is a subset of M-government in terms of services.

This dissertation found that M-government increases civic engagement compared to T-government. Furthermore, this dissertation found that M-government allows similar levels of civic engagement between rural and urban citizens. Furthermore, it showed how distance alone is not enough factor that can indicate a difference in the levels of civic engagement between rural and urban citizens with T-government. However, this dissertation found that both rural and urban citizens suffer from the same obstacles which include traffic, time consuming, and parking. This dissertation also discussed other obstacles that are faced by both types of citizens and have effects on civic engagement with T-government. Those obstacles include waiting in a long line, redirection, and unclear procedures.

This dissertation indicates that Saudi citizens believe that Human-to-Computer interaction is more efficient and effective than Human-to-Human interaction for their communication with government. This dissertation showed how interaction with computers makes the communication between citizens and government generally available 24/7, and how computers can allow equal

interaction between governments and all citizens. Additionally, this dissertation presented and discussed how M-government can allow new methods of civic engagement. Those methods are highly essential and effective with the optional engagement and emergency management.

This dissertation found that the limitations of the basic network coverage services such calls and SMS, and the Internet, are generally the major problems of civic engagement with M-government in rural areas and some parts of urban areas. However, with the continuous improvement in the network coverage, civic engagement will continue to be enhanced (increased). Finally, this dissertation found that although mobile government services and especially mobile government apps are still limited and they are in their early stages in Saudi Arabia, Saudi citizens loved and preferred to communicate with government via M-government.

5.2 Limitation

Civic engagement was defined after comprehensive research on the meaning of civic engagement. This research led to finding various meanings for civic engagement. We selected what we believed was the most appropriate definition for the purposes of our study. The selected definition is the one that showed the importance of the new civic engagement by using M-government. On the other hand, other scholars may define it differently such as defining it as political involvement. Thus, their evaluation of civic engagement will be different.

Additionally, the questions that were used in the questionnaires for evaluating civic engagement were partially taken from other studies which defined civic engagement similarly to us, but we have used them for evaluating E-government not M-government. The other questions were created by us since we tested M-government, and therefore we aimed to test the new methods in the new era of civic engagement. In order to make sure our assessment is valid and reliable,

civic engagement with T-government was compared to civic engagement with M-government, and the exact questions for both types of government were used.

Our definition for rural and urban areas was based on the definition of the U.S. Census Bureau since we have not found a specific definition for rural and urban areas in Saudi Arabia. The U.S. Census Bureau defines "rural" as a place with less than 50,000 people and "urban" as a place with 50,000 people or more (Cromartie and Bucholtz, 2008). Saudi Arabia is divided into 13 regions and each region has a number of cities that encompass a number of villages (www.moi.gov.sa). Some villages have a population greater than that of some cities, so the administrative divisions do not provide a proper measurement. The definition of rural and urban areas could be based on either geographical size or population size—ours was based on population size.

5.3 Future Work

This dissertation looked at civic engagement with T-government and civic engagement with M-government generally without looking specifically at ages, gender, education…etc. It appears from the results of this dissertation that M-government showed social equalizing effects. For instance, women in Saudi Arabia were not equally engaged with government by using T-government. However, M-government would probably allow equal levels of civic engagement between men and women in Saudi Arabia. This claim although supported, requires further analysis and study.

Furthermore, it looks from the results of the current research that the usability of mobile devices is highly affected by the availability of those devices. Saudi citizens preferred to interact with government via mobile devices although mobile services are still in the early stages. Yet, the

question remains whether usability of mobile devices is affected by the availability more than other factors such as ease of use, education, and experience.

User resistance has been framed as the major obstacle for marketing new devices, applications, software, programs...etc. However, nowadays with the simplicity and accessibility of new and intuitive products that need only simple clicks, user resistance might become only a minor obstacle. Future research can gauge whether or not the field of HCI has been able to address and ameliorate issues of user resistance to new technology.

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APPENDIX A. QUESTIONNAIRES IN ENGLISH

Civic Engagement in Saudi Arabia;
Comparing Traditional Government and M-government

Dear Participant,

I am Abdulmohsen Albesher, a doctoral student in the Human Computer Interaction at Iowa State University, at the United States and a faculty member at King Faisal University at Saudi Arabia. I am currently undertaking a dissertation research on Civic Engagement in Saudi Arabia. The purpose of this study is to examine the level of civic engagement by using traditional means (fact-to-face, fax, mail, and telephone) and the level of civic engagement by using mobile devices (laptops, cell phones, and tablets). Additionally, this study compares the level of civic engagement of rural and urban citizens with traditional government and the level of civic engagement of rural and urban citizens with M-government.

You are invited to participate in this doctoral research by completing a simple survey which will take approximately 5-15 minutes. Your participation is voluntary and anonymous. All information provided by you will be treated with confidentiality and will not be shared with to any individual/s or parties. Importantly, your responses are for the purpose of this research study only and there are no right or wrong answers. You may withdraw from participating at any time or for any reasons without explanation. There is no risk or loss of benefits if you choose not to participate in this study. Also, data or records containing individual information will be destroyed upon the completion of the dissertation process.

Section#1 (Demographic Information**):**

- **Please mark the box that best describes your answer:**

Gender:
- ☐ Male
- ☐ Female

Age:
- ☐ 18-25
- ☐ 26-40
- ☐ 41-60
- ☐ Over 60

Education level:
- ☐ Less than high School
- ☐ High school
- ☐ Diploma
- ☐ Bachelor
- ☐ Post graduate

The number of population at your place of residence:
- ☐ Less than 15,000
- ☐ 15,000-less than 50,0000
- ☐ 50,000–less than 150,000
- ☐ More than 150,000

Occupation:
- ☐ Student
- ☐ Public sector
- ☐ Private sector
- ☐ Other: ……………

Monthly income:
- ☐ Less than 5,000 SR
- ☐ 5,000-less than 10,000 SR
- ☐ 10,000-less than 20,000 SR
- ☐ 20,000 SR or more

Section#2 (civic engagement by using the **traditional means):**

- **Please mark the traditional means you use to communicate with government:**
(You can select more than one answer)
  - ☐ Face to face
  - ☐ Fax
  - ☐ Mail
  - ☐ Telephone
  - ☐ None of the above

- **Please mark the box that best describes your answer for each of the following statements:**

Statement	Always	Often	Sometimes	Rarely	Never
1- I discuss ways for city improvement when gathered with people.	☐	☐	☐	☐	☐
2- I volunteer for your community.	☐	☐	☐	☐	☐
3- I use traditional means to give comments to government officials.	☐	☐	☐	☐	☐
4- I use traditional means to file complaints.	☐	☐	☐	☐	☐
5- I receive responses from government via post.	☐	☐	☐	☐	☐
6- I receive alerts from government via post.	☐	☐	☐	☐	☐

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1- Communicating with government by using traditional means is easy.	☐	☐	☐	☐	☐
2- Communicating with government by using traditional means is time consuming.	☐	☐	☐	☐	☐
3- Communicating with government by using traditional means requires a little effort.	☐	☐	☐	☐	☐
4- Communicating with government by using traditional means is inconvenient.	☐	☐	☐	☐	☐
5- Communicating with government by using traditional means encourages me to improve my community.	☐	☐	☐	☐	☐

Section#3 (civic engagement by using <u>**mobile devices**</u>):

- **Please mark the mobile device that you use to communicate with government:**
(You can select more than one answer)

    ☐ Laptop

    ☐ Cell phone

    ☐ Tablet (i.e., IPad)

    ☐ None of the above

(If you have not used any mobile device to communicate with government, you can skip this section)

- **If you have chosen more than a mobile device in the previous question - determine your usage for the devices:**

    ☐ I use laptop more

    ☐ I use cell phone more

    ☐ I use tablet more

    ☐ The devices are used almost equally

- **Mark the box that best describes your answer for each of the following statements:**

Statement	Always	Often	Sometimes	Rarely	Never
1- I use my mobile device to get information about the impact of government decisions on my community.	☐	☐	☐	☐	☐
2- I use my mobile device to submit information to assist in ensuring public safety, protecting the environment…etc.	☐	☐	☐	☐	☐
3- I use my mobile device to give comments to government officials.	☐	☐	☐	☐	☐
4- I use my mobile device to file complaints.	☐	☐	☐	☐	☐
5- I receive responses from government in text messages.	☐	☐	☐	☐	☐
6- I receive alerts from government in text messages.	☐	☐	☐	☐	☐

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1- Communicating with government by using mobile devices is easy.	☐	☐	☐	☐	☐
2- Communicating with government by using mobile devices is time consuming.	☐	☐	☐	☐	☐
3- Communicating with government by using mobile devices requires a little effort.	☐	☐	☐	☐	☐
4- Communicating with government by using mobile devices is inconvenient.	☐	☐	☐	☐	☐
5- Communicating with government by using mobile devices encourage me to improve my community.	☐	☐	☐	☐	☐

Thank you for your participation

APPENDIX B. QUESTIONNAIRES IN ARABIC

<div dir="rtl">

المشاركة المدنية في المملكة العربية السعودية
مقارنة الحكومة التقليدية بالحكومة المتنقلة

عزيزي المشارك،

أنا عبدالمحسن البشر، طالب دكتوراه في تخصص تواصل الإنسان مع الحاسب الآلي بجامعة أيوا ستيت بالولايات المتحدة الأمريكية، وعضو هيئة التدريس بجامعة الملك فيصل بالمملكة العربية السعودية. حالياً أقوم بالعمل على أطروحة تتعلق بالمشاركة المدنية في السعودية. الغرض من هذه الدراسة هو اختبار مستوى المشاركة المدنية باستخدام الوسائل التقليدية (وجهاً لوجه، فاكس، البريد، الهاتف)، واختبار مستوى المشاركة المدنية باستخدام الأجهزة المحمولة (لابتوب، جوال، جهاز لوحي). هذه الدراسة أيضاً تقارن مستوى المشاركة المدنية للمواطنين ساكني القرى والمواطنين ساكني المدن باستخدام الوسائل التقليدية، والمشاركة المدنية للمواطنين ساكني القرى والمواطنين ساكني المدن باستخدام الأجهزة المحمولة.

أنت مدعو للمشاركة في هذا البحث من خلال استكمال استبيان بسيط يستغرق حوالي 5-15 دقيقة. مشاركتك تطوعية ومجهولة، وسيتم التعامل مع جميع المعلومات التي تقدمها بسرية، ولن يتم تقاسمها مع أي أفراد أو أطراف. الأهم من ذلك، ردودك هي لأغراض هذه الدراسة البحثية فقط، وليس هناك إجابات صحيحة أو خاطئة. تستطيع الانسحاب من المشاركة في أي وقت أو لأي سبب دون تفسير، ولا يوجد أي خطر أو خسارة من عدم المشاركة في هذه الدراسة. وسيتم إتلاف البيانات أو السجلات التي تحتوي على المعلومات الفردية عند الانتهاء من الأطروحة.

</div>

القسم الأول (معلومات ديموغرافية):

- **الرجاء وضع علامة على المربع الذي يناسب إجابتك:**

الجنس:	**عدد السكان في مكان إقامتك:**
☐ ذكر	☐ أقل من 15000
☐ أنثى	☐ 15000 - أقل من 50000
	☐ 50000 - أقل من 150000
العمر:	☐ أكثر من 150000
☐ 18-25	
☐ 26-40	**المهنة:**
☐ 41-60	☐ طالب
☐ أكثر من 60	☐ القطاع الحكومي
	☐ القطاع الخاص
مستوى التعليم:	☐ أخرى: ....
☐ أقل من ثانوي.	
☐ ثانوي.	**الدخل الشهري:**
☐ دبلوم.	☐ أقل من 5000
☐ بكالوريوس.	☐ 5000 - أقل من 10000
☐ دراسات عليا.	☐ 10000 - أقل من 20000
	☐ 20000 أو أكثر

القسم الثاني (المشاركة المدنية باستخدام الوسائل التقليدية):

- **يرجى وضع علامة على الوسيلة التقليدية التي تستخدمها للتواصل مع الحكومة:**
  (*يمكنك اختيار أكثر من إجابة*)

  ☐ وجهاً لوجه
  ☐ الفاكس
  ☐ البريد
  ☐ الهاتف
  ☐ لا شئ مما سبق

- **الرجاء وضع علامة على المربع الذي يناسب إجابتك لكل عبارة من العبارات التالية:**

أبداً	نادراً	أحياناً	غالباً	دائماً	العبارة
☐	☐	☐	☐	☐	1- أناقش سبل تحسين مدينتي عندما أجتمع مع الناس.
☐	☐	☐	☐	☐	2- أتطوع لمجتمعي.
☐	☐	☐	☐	☐	3- استخدم الوسائل التقليدية لإعطاء ملاحظات للمسئولين.
☐	☐	☐	☐	☐	4- استخدم الوسائل التقليدية لتقديم شكاوى.
☐	☐	☐	☐	☐	5- تصلني ردود من الحكومة عن طريق البريد.
☐	☐	☐	☐	☐	6- تصلني تنبيهات من الحكومة عن طريق البريد.

لا أوافق بشدة	لا أوافق	محايد	أوافق	أوافق بشدة	العبارة
☐	☐	☐	☐	☐	1- التواصل مع الحكومة باستخدام الوسائل التقليدية سهل.
☐	☐	☐	☐	☐	2- التواصل مع الحكومة باستخدام الوسائل التقليدية يستغرق وقتاً طويلاً.
☐	☐	☐	☐	☐	3- التواصل مع الحكومة باستخدام الوسائل التقليدية يتطلب القليل من الجهد.
☐	☐	☐	☐	☐	4- التواصل مع الحكومة باستخدام الوسائل التقليدية **غير** مريح.
☐	☐	☐	☐	☐	5- التواصل مع الحكومة باستخدام الوسائل التقليدية يحفزني لتحسين مجتمعي.

القسم الثالث (المشاركة المدنية با ستخدام **الأجهزة المحمولة**):

▪ **يرجى وضع علامة على الأجهزة المحمولة التي تستخدمها للتواصل مع الحكومة:**
(يمكنك اختيار أكثر من إجابة)

☐ لابتوب

☐ جوال

☐ جهاز لوحي (مثل الاياد)

☐ لا شئ مما سبق

(إذا كنت لم تستخدم جهازاً محمولاً للتواصل مع الحكومة من قبل، بإمكانك تخطي هذا القسم)

▪ **إذا كنت قد اخترت أكثر من جهاز محمول في السؤال السابق- حدد مدى استخدامك للأجهزة:**

☐ استخدم اللابتوب أكثر

☐ استخدم الجوال أكثر

☐ استخدم الجهاز اللوحي أكثر

☐ استخدم الأجهزة بشكل متساوي تقريباً

▪ **الرجاء وضع علامة على المربع الذي يناسب إجابتك لكل عبارة من العبارات التالية:**

أبداً	نادراً	أحياناً	غالباً	دائماً	العبارة
☐	☐	☐	☐	☐	1- استخدم جهازي المحمول للحصول على معلومات حول تأثير قرارات الحكومة على مجتمعي.
☐	☐	☐	☐	☐	2- استخدم جهازي المحمول لتقديم معلومات للمساعدة في ضمان السلامة العامة، وحماية البيئة وغيرها.
☐	☐	☐	☐	☐	3- استخدم جهازي المحمول لإعطاء ملاحظات للمسئولين.
☐	☐	☐	☐	☐	4- استخدم جهازي المحمول لتقديم شكاوى.
☐	☐	☐	☐	☐	5- تصلني ردود من الحكومة في رسائل نصية.
☐	☐	☐	☐	☐	6- تصلني تنبيهات من الحكومة في رسائل نصية.

لا أوافق بشدة	لا أوافق	محايد	أوافق	أوافق بشدة	العبارة
☐	☐	☐	☐	☐	1- التواصل مع الحكومة باستخدام الأجهزة المحمولة سهل.
☐	☐	☐	☐	☐	2- التواصل مع الحكومة باستخدام الأجهزة المحمولة يستغرق وقتاً طويلاً.
☐	☐	☐	☐	☐	3- التواصل مع الحكومة باستخدام الأجهزة المحمولة يتطلب القليل من الجهد.
☐	☐	☐	☐	☐	4- التواصل مع الحكومة باستخدام الأجهزة المحمولة **غير** مريح.
☐	☐	☐	☐	☐	5- التواصل مع الحكومة باستخدام الأجهزة المحمولة يحفزني لتحسين مجتمعي.

شكراً على مشاركتك

APPENDIX C. ISU APPROVAL FOR THE QUESTIONNAIRES

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office for Responsible Research
Vice President for Research
1138 Pearson Hall
Ames, Iowa 50011-2207
515 294-4566
FAX 515 294-4267

Date:	5/15/2015

To: Abdulmohsen Albesher   **CC:** Dr. Richard T Stone
1415 South Grand Ave   3004 Black Engineering
Ames, IA 50010

From: Office for Responsible Research

Title: Mobile government and Civic Engagement in Saudi Arabia; Comparing Traditional Government and M-government

IRB ID: 15-300

Study Review Date: 5/15/2015

The project referenced above has been declared exempt from the requirements of the human subject protections regulations as described in 45 CFR 46.101(b) because it meets the following federal requirements for exemption:

- (2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey or interview procedures with adults or observation of public behavior where
    - Information obtained is recorded in such a manner that human subjects cannot be identified directly or through identifiers linked to the subjects; or
    - Any disclosure of the human subjects' responses outside the research could not reasonably place the subject at risk of criminal or civil liability or be damaging to their financial standing, employability, or reputation.

The determination of exemption means that:

- **You do not need to submit an application for annual continuing review.**

- **You must carry out the research as described in the IRB application.** Review by IRB staff is required prior to implementing modifications that may change the exempt status of the research. In general, review is required for any modifications to the research procedures (e.g., method of data collection, nature or scope of information to be collected, changes in confidentiality measures, etc.), modifications that result in the inclusion of participants from vulnerable populations, and/or any change that may increase the risk or discomfort to participants. Changes to key personnel must also be approved. The purpose of review is to determine if the project still meets the federal criteria for exemption.

    Non-exempt research is subject to many regulatory requirements that must be addressed prior to implementation of the study. Conducting non-exempt research without IRB review and approval may constitute non-compliance with federal regulations and/or academic misconduct according to ISU policy.

    Detailed information about requirements for submission of modifications can be found on the Exempt Study Modification Form. A Personnel Change Form may be submitted when the only modification involves changes in study staff. If it is determined that exemption is no longer warranted, then an Application for Approval of Research Involving Humans Form will need to be submitted and approved before proceeding with data collection.

Please note that you must submit all research involving human participants for review. **Only the IRB or designees may make the determination of exemption**, even if you conduct a study in the future that is exactly like this study.

Please be aware that **approval from other entities may also be needed.** For example, access to data from private records (e.g. student, medical, or employment records, etc.) that are protected by FERPA, HIPAA, or other confidentiality policies requires permission from the holders of those records. Similarly, for research conducted in institutions other than ISU (e.g., schools, other colleges or universities, medical facilities, companies, etc.), investigators must obtain permission from the institution(s) as required by their policies. **An IRB determination of exemption in no way implies or guarantees that permission from these other entities will be granted.**

APPENDIX D. KFU APPROVAL FOR THE QUESTIONNAIRES

KINGDOM OF SAUDI ARABIA
Ministry of Higher Education
KING FAISAL UNIVERSITY
(037)

الموضوع: ....

March 13, 2015

Dear Mr. Abdulmohsen Albesher,

Based on my review of your research proposal, I grant permission for you to conduct the survey entitled "M-government and Civic Engagement in Saudi Arabia" and to distribute the survey to Saudi citizens. The data collection will be under our supervision at the College of Computer Sciences and Information Technology at King Faisal University.

I understand that Individuals' participation will be voluntary and at their own discretion. I also understand that all data provided by the participants will be treated with confidentiality and will not be identifiable to any individuals or parties. There is no risk or loss of benefits if citizens choose not to participate in this study. Also, data or records containing individual information will be destroyed upon the completion of the dissertation process.

Sincerely,

Majed A. Alshamari
College of Computer Sciences and Information Technology, Dean
King Faisal University
Saudi Arabia
Alahssa 31982 P.O. Box 400
Tel +966 (013)5898113
Fax + 966 (013) 5899236

الرقم: التاريخ: المرفقات:

www.kfu.edu.sa

Kingdom of Saudi Arabia P.O.Box 400 Al-Hassa - 31982 Tel: 035800000 Fax: 035816980

APPENDIX E. ISU APPROVAL FOR THE INTERVIEWS

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office for Responsible Research
Vice President for Research
1138 Pearson Hall
Ames, Iowa 50011-2207
515-294-4566
FAX 515-294-4267

Date: 1/5/2016

To: Dr. Abdulmohsen Albesher   **CC:** Dr. Richard T Stone
1415 South Grand Ave   3004 Black Engineering
Ames, IA 50010

From: Office for Responsible Research

Title: M-government and Civic Engagement in Saudi Arabia; Comparing Traditional Government and M-government

IRB ID: 15-677

Study Review Date: 1/4/2016

The project referenced above has been declared exempt from the requirements of the human subject protections regulations as described in 45 CFR 46.101(b) because it meets the following federal requirements for exemption:

- (2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey or interview procedures with adults or observation of public behavior where
  - Information obtained is recorded in such a manner that human subjects cannot be identified directly or through identifiers linked to the subjects; or
  - Any disclosure of the human subjects' responses outside the research could not reasonably place the subject at risk of criminal or civil liability or be damaging to their financial standing, employability, or reputation.

The determination of exemption means that:

- **You do not need to submit an application for annual continuing review.**

- **You must carry out the research as described in the IRB application.** Review by IRB staff is required prior to implementing modifications that may change the exempt status of the research. In general, review is required for any modifications to the research procedures (e.g., method of data collection, nature or scope of information to be collected, changes in confidentiality measures, etc.), modifications that result in the inclusion of participants from vulnerable populations, and/or any change that may increase the risk or discomfort to participants. Changes to key personnel must also be approved. The purpose of review is to determine if the project still meets the federal criteria for exemption.

  Non-exempt research is subject to many regulatory requirements that must be addressed prior to implementation of the study. Conducting non-exempt research without IRB review and approval may constitute non-compliance with federal regulations and/or academic misconduct according to ISU policy.

  Detailed information about requirements for submission of modifications can be found on the Exempt Study Modification Form. A Personnel Change Form may be submitted when the only modification involves changes in study staff. If it is determined that exemption is no longer warranted, then an Application for Approval of Research Involving Humans Form will need to be submitted and approved before proceeding with data collection.

Please note that you must submit all research involving human participants for review. **Only the IRB or designees may make the determination of exemption,** even if you conduct a study in the future that is exactly like this study.

Please be aware that **approval from other entities may also be needed.** For example, access to data from private records (e.g. student, medical, or employment records, etc.) that are protected by FERPA, HIPAA, or other confidentiality policies requires permission from the holders of those records. Similarly, for research conducted in institutions other than ISU (e.g., schools, other colleges or universities, medical facilities, companies, etc.), investigators must obtain permission from the institution(s) as required by their policies. **An IRB determination of exemption in no way implies or guarantees that permission from these other entities will be granted.**

Please don't hesitate to contact us if you have questions or concerns at 515-294-4566 or IRB@iastate.edu.

APPENDIX F. KFU APPROVAL FOR THE INTERVIEWS

KINGDOM OF SAUDI ARABIA
Ministry of Higher Education
KING FAISAL UNIVERSITY
(037)

المملكة العربية السعودية
وزارة التعليم العالي
جامعة الملك فيصل
(٠٣٧)

الموضوع: ....

October 11, 2015

Dear Mr.Abdulmohsen Albesher,

Based on my review of your research proposal, I grant permission for you to conduct open interviews entitled "M-government and Civic Engagement in Saudi Arabia" with Saudi citizens. The data collection will be under our supervision at the College of Computer Sciences and Information Technology at King Faisal University. I understand that Individuals' participation will be voluntary and at their own discretion. I also understand that all data provided by the participants will be treated with confidentiality and will not be identifiable to any individuals or parties. There is no risk or loss of benefits if citizens choose not to participate in this study. Also, data or records containing individual information will be destroyed upon the completion of the dissertation process.

Sincerely,

Majed A. Alshamary

College of Computer Sciences and Information Technology, Dean

King Faisal University

Saudi Arabia

Alahssa 31982 P.O. Box 400

Tel +966 (013)5898113
Fax + 966 (013) 5899236

الرقم: _____   التاريخ: _____   المرفقات: _____

www.kfu.edu.sa

المملكة العربية السعودية ص.ب ٤٠٠ الأحساء – ٣١٩٨٢ الهاتف : ٠٣٥٨٠٠٠٠٠ فاكس : ٠٣٥٨١٦٩٨٠   Kingdom of Saudi Arabia P.O.Box 400 Al-Hassa - 31982 Tel: 035800000 Fax: 035816980

مطابع جامعة الملك فيصل 2459