

Mobile Government Services among Iraqi Citizens in Rural Areas: A Pilot Study

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Abstract: Information and Communication Technologies (ICTs) serve as one of the main resources of promoting products, services or delivering and broadcasting information but also connecting organizations and communities together in terms of better interaction and better communication possibilities. The advance of information systems played important role in developing the communities through providing the necessary information and services to public sector. Therefore, governments have tried to establish information system projects, with exploit modern ICTs, leading to expenditure of huge amount of money for implementation of information systems. Iraq's government has adopted mG system to provide better services to citizens, employees, organization and other stakeholders. However, the mG system utilization among citizens and government is limited. Therefore, the evaluation of mG success of individuals' point view in Iraq is critical. The main objective of this study is to check the reliability of each item of research instrument by using Cronbach's alph tool. In this study, a theoretical conceptual model that includes the influencing factors of mG success was proposed to evaluate mG success among citizens. A questionnaire was designed to examine the hypothesis for every factor. In order to verify questionnaire reliability, a pilot study was done. All values obtained by a pilot study were accepted.

Key words: Mobile government; pilot study; influence factors, (ICTs), public sector

INTRODUCTION

Mobile Government (mG) deemed as important part from e-Government, according to Abdelghaffar and Magdy (2012) who define e-Government as systems that use the web to provide information and services to citizens, businesses and governments. e-Government systems are delivered via electronic devices or wired technology. Recent rapid growth and success of mobile/wireless application and services delivered by different sectors provide an opportunity for the government to exploit new developments and enhance electronic government implementation moving to another era called mobile government (m-Government) systems. Such systems employ mobile devices and wireless technology to run their operations (Fasanghari and Samimi, 2009). Mobile government defines as strategy using mobile and wireless technology to deliver services and application to improving the benefit of electronic government (Antovski and Gusev, 2005).

The main value proposition from m-Government are ubiquity of services that could be access from any location any time, the convenience of the services when the specific comfort created by agility and accessibility of mobile devices, adaptability which refer to the ability to receive the relevant information within the specific context, the opportunity of fast and easy access and personalization of services (Alijerban and Saghafi,

2010). In addition, an m-Government service operates between government on one side and four levels of interaction from another side (citizens, business, employee and government) agencies (Mengistu *et al.*, 2009).

Moreover, most of the developing and developed countries harness these technologies to deliver the information and service for their citizen. Such as, SMS broadcasting system used in Mexico City, Mexico, sends alert messages to citizens in the district regarding meteorological and high-rain risks, low temperatures, potential disasters and emergency locations as well as contact numbers. Singapore's citizen alert system sends notification for library book deadlines and passport renewals as well as flight information. Additionally, Rwanda's eNota Project, a mobile-based system that allows students to access their national examination results via their mobile phones. Bahrain's mobile portal, a mobile version of the national portal via WAP-equipped phones, enables anyone with a mobile phone to communicate with all government entities and access their services. India's DakNet, a store and forward wireless broadband network, uses a Mobile Access Point (MAP) mounted on a regular passenger bus to transmit information between village and district headquarters. The Republic of Korea provides public transportation maps (subway and buses) with real-time operation information and traffic information of main

roads via mobile devices. In Turkey mobile signature is valid for signing commercial and public services and banking transactions. Two of three mobile phone operators offer m-signature services, namely (ITU, 2013).

Ntalani *et al.* (2008) stated, utilization of mG services derive more benefits in terms of in-time information delivery, ease of use, mobility and improvising while emergency management. Most of these benefits are eventually handled by government researchers and they call it opportunities. mG facilitates the accessibility of information 24/7 and also limits the bureaucracy in order to improve the quality of services, whether in terms of time, price or convenience. These possible benefits will not be achieved if the use of these services is not optimal (Accenture, 2003). Thus, using the services of mG is deemed as crucial element to success mG projects. In 2003, Iraq government sought to utilize modern technologies in the public sector. It has invested hefty amounts of money for implementation of ICTs projects with huge investments of nearly 20 billion USD annually in recent years. Regrettably, with all these efforts the percentage of usage of the online services still limited (Faaeq *et al.*, 2013).

Research barriers: The current study aims to evaluate mG success among citizens in Iraq. However, a number of limitations should be addressed. First, evaluation of Information System (IS) success studies in developing countries context is exceedingly few (Bigdeli *et al.*, 2013) thus, the present study faced difficulty in designing the questionnaire. Second, citizens (especially in rural areas rather than urban areas) have limited understanding of the benefits of mG services, given that mG project in Iraq is a new technology (Mohammed *et al.*, 2013). Third, there are large number of citizens who do not use mG services. Fourth, the different levels of education between citizens are considered as issues in the questionnaire answers. Fifth, most of the participants have been used mG services for one time or used mG services before within the last 1-2 years thus, they already do not have any idea about the new enhancement in mG project. Sixth, unstable environment in Iraq has made the distribution of questionnaires more difficulty. Finally, the political climate is considered important challenge in Iraq which added other challenges in the present study.

MATERIALS AND METHODS

The theoretical conceptual model and the questionnaire of this study have built based on the prior studies of IS success.

Theoretical conceptual model: The theoretical conceptual model of this study was adopted from the IS Success

Updated Model developed by Delone and McLean (2003). The IS Success Updated Model was likewise selected because of its ability to address the objectives of this study. Furthermore, the Delone and McLeane updated model of IS success has been considered as the strong theoretical framework for the measurement of IS success as referred by Chatterjee *et al.* (2009). Furthermore, researchers such as Visser *et al.* (2013) also declared the updated D and M's IS success model as the most adequate for IS success evaluation. Moreover, Gable *et al.* (2008) applied various IS success models along with D and M and Seddon's Model for testing their empirical data and recognized that D and M Model has proven to be the best option for the success evaluation of an enterprise system.

This study has adapted IS Success Updated Model in order to make it more suitable for evaluation IS success area. Thus, IS Success Updated Model as well as the previous studies were employed to investigate the factors that influence of mG success among citizens of Iraq. IS Success Updated Model have been applied in IS success studies (Chatterjee *et al.*, 2009; Teo *et al.*, 2008). All constructs of IS Success Updated Model were used, except the intention to use construct was excluded. In Delone and McLean updated model, the use and intention to use are alternatives in their model and that intention to use may be a more acceptable variable in the context of mandatory usage (Wang and Liao, 2008). Therefore, citizens' use of mG system is entirely voluntary and system use is an actual behavior which has been considered as the variable closer in meaning to success than behavioral intention to use. Thus, this study adopts the use instead of intention to use as an mG system success measure. Moreover, the remaining factors were adopted from the previous studies. The influencing factors of the current research are information quality, system quality, service quality, interface design quality, communication tool quality, user satisfaction, use of mG, civil conflicts and net benefits of mG. Moreover, the present study has 19 hypothesize with 14 main hypotheses, 4 mediating hypotheses and with one moderating hypothesis. Figure 1 shows the theoretical conceptual model of this study. The factors that can promote engagement in evaluation of mG success among citizens in Iraq have been identified. The pilot study was conducted to assess the questionnaire items and to define the appropriate questions for the survey. The questionnaire has been distributed among citizens who use mG services. The next section explains the questionnaire design.

Mobile Weather Service (MWS): Iraqi government has presented several mobile services to provide the information and services government to their citizens,

such as the Independent High Electoral Commission (IHEC), Iraq Weather Mobile Service (WMS), National Investment Commission (NIC) Service; Traffic Police Service (TPS).

In this study, ‘Mobile Weather Service’ (MWS) is considered the most common mG service being used in Iraq, because it is closely linked with the lives of citizens (rural and urban) it has a significant impact on rural economic social conditions, also, this service provides multiple tasks for the Iraqi rural farmers, including: weather conditions (temperatures and cooler air that affect crop farming), warnings, weather forecast notifications and agricultural consulting. Therefore, in this study, the researcher will use MWS as an example of mG service which is available in all Iraqi provinces.

Designed questionnaire: In this study, survey method was used due to the ability of this technique to provide description and exploration of a phenomenon, a good way to start reports and is the appropriate method for testing factors and hypotheses. A questionnaire is used for data collection. According to Sekaran and Bougie (2013). Part B is designed to measure nine constructs. These are (1) IQ, (2) SYQ, (3) SQ, (4) CIQ, (5) IDQ, (6) CC, (7) US, (8) U and (9) NB. While Part C includes three questions (comments and advices) (appendix A).

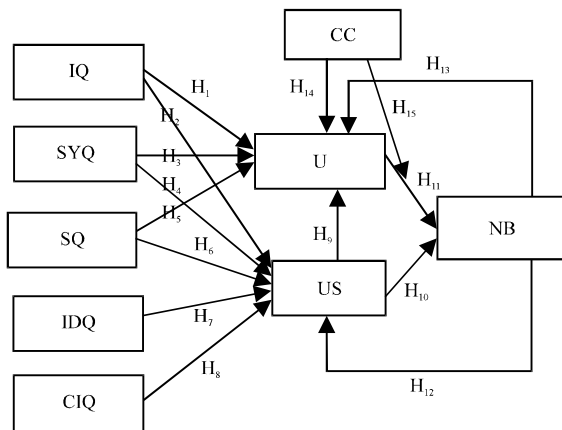


Fig. 1: Research model

Table 1: Operation of the factors and items

Constructs	Items	Sources
Information quality	10	(Chen and Cheng, 2009; Delone and McLean, 2003; Teo <i>et al.</i> , 2008; Chen <i>et al.</i> , 2015)
System quality	10	(Alshibly, 2014; Chen and Cheng, 2009; Delone and McLean, 2003; El-Kiki and Lawrence, 2006; Zhou, 2013)
Service quality	14	(Alshibly, 2014; Chen and Cheng, 2009; Delone and McLean, 2003; Teo <i>et al.</i> , 2008; Chen <i>et al.</i> , 2015; Chen and Cheng, 2009; Zhou, 2013)
Communication tool quality	5	(Alhendawi and Baharudin, 2014; Lawson-Body <i>et al.</i> , 2010)
Interface design quality	4	(Kim <i>et al.</i> , 2013; Muylle <i>et al.</i> , 2004)
Civil conflicts	6	(Faaeq <i>et al.</i> , 2013; Khan <i>et al.</i> , 2012)
User satisfaction	5	(Alshibly, 2014; Teo <i>et al.</i> , 2008)
Net benefits	8	(Teo <i>et al.</i> , 2008; Iivari, 2005; Chen <i>et al.</i> , 2015; Chen and Cheng, 2009)
use of a system	5	(Alhendawi and Baharudin, 2014; Teo <i>et al.</i> , 2008)

The research instrument is designed based on the content of every factor. Suggestions and advice from supervisors were taken into consideration to improve the design of the instrument, in addition to build the questionnaire. The questionnaire is written in English and then translated into Arabic language which is the official language in Iraq. Table 1 shows the operationalization of the factors and items.

RESULTS AND DISCUSSION

Pilot study is a small test of a study that utilizes to check the reliability and validity of procedures and measures (Cox and Donnelly, 2011). However, the main objective of doing the pilot study is to examine the validity and reliability of the items. According to Zikmund pilot study utilizes to test the study aimed in order to enhance the particular research items. Thus, the pilot study has been performed as a prerequisite to the collection of main data from the rural farmers of the southern region of Iraq which helped to obtain quality data for the analysis. In the pilot study, questionnaire was distributed amongst Iraqi citizens who are staying in rural areas in the southern region of Iraq and who registered at Farm Association in Al-Shatra, Shatra county which belongs to Federation of Farm Associations in Dhi-Qar, Southern region of Iraq on March 7th, 2015.

Process of gathering data during pilot study: The Farm Association (FA) in Al-Shatra is located at Shatra county in Dhi-Qar province of Iraq which is far 40 km from Nasria City. Firstly, in March 5th, 2015 the researcher visit the manager of Farm Association in Al-Shatra, Mr. Mohammed Bachai. Bachai in 2015 he said that the farm association in Al-Shatra has weekly meetings for farmers. Therefore, the researcher asked the manager, whether he can allocate part of the next meeting for data collection he agreed to allow part of the next meeting day for data collection. Also, to ensure they come, the manager made several contacts with farmers by telephone according to the lists he has. The appointment for data collection was fixed on March 7th, 2015.

About 65 farmers were present at Agricultural Association in Al-Shatra; Shatra county, Dhi-Qar province Iraq on the specified date. The respondents were given brief introduction about objectives of the pilot study and the benefits of using mG services. Subsequently, the fishbowl draw was used to choose 50 respondents to select randomly selected from the 65 invited farmers at the association while the appointment was fixed for returning the questionnaires at next meeting was scheduled on March 11th, 2015. This is because most of the farmers are very busy on their farms (watering crops, vaccination palm and applying agricultural pest control). It should be noted that some farmers are employees and some are students.

Data collection for pilot study: Checking for errors and correction of errors is important before the analysis of data set in order to ensure achievement of data quality after the analysis (Cox and Donnelly, 2011; Pallant, 2011). Therefore, the data view of the SPSS Software was thoroughly checked while entering the collected data from the respondents of questionnaire during the pilot study.

Furthermore, 47 questionnaires were returned out of 50 questionnaires that were distributed to the participants. The questionnaires have a filter question to classify the respondents to user mG services who tick on “YES” and non-user mG services who tick on “NO”. The number of the non-user is 6 responders and 41 of responding users of mG services in ACA of Al-Shatra. However, some questionnaires are not totally answered in questionnaire survey this issue is referred as missing data. The issue of missing data is familiar issue in surveys process (Hair *et al.*, 2014). Therefore, only one questionnaire of 41 questionnaires is excluded because it incomplete where it contains >50% of missing data. The final data comes from 40 questionnaires that were used in pilot test’ analysis. Table 2 illustrates the demographic characteristics of the pilot study of this research.

As shown in Table 2, the gender of participants to the pilot study, 35 are male while only 5 are female out of 40 participants who represent 87.5 and 12.5% of the distribution, respectively. This result reflects the rural society in Iraq makes differences between males and females, due to the habits and traditions that prevail in rural areas, where the woman,s responsibility focuses in managing the home and child-rearing.

In terms of the age group of the participants show that participants are between the ages of 23-35 have highest rate (37.5%) for using mG services. The main

Table 2: Demographic characteristics

Demographic variable/category	No. of participants	Participants (%)
Gender		
Male	35	87.5
Female	5	12.5
Age		
18-22	10	25.0
23-35	15	37.5
36-45	11	27.5
46-55	4	10.0
Marital status		
Single	8	20.0
Married	32	80.0
Education level		
Primary school	10	25.0
Secondary school	17	42.5
Diploma	5	12.5
Bachelor degree	5	12.5
Others	3	7.5
Income monthly (thousand)		
≤250	20	50.0
251-500	16	40.0
501-750	4	10.0
Mobile device		
Hand phone	9	22.5
Laptop	2	5.0
Smart phone	22	55.0
Others	7	17.5
Experience (years)		
<1	3	7.5
1-3	14	35.0
4-6	15	37.5
>6	8	20.0

reason behind that may be the citizens in this age have more education, more contact with urban citizens through schools and universities. While participants are between 46-55 years (10%) are lower in number in using mG services because most of the old people may not accept the new technology.

In addition, the majority of the participants (32) were married which made up 80%, followed by unmarried (single) participants which were 8 in number and made up 20%. The uneven distribution of the participant’s answers to the study questionnaire confirm and approve that the current study sampling are including all population kinds (families and individual states). Besides that, the study inquired the education level of participants and found that 10 (25%) of the participants had primary school education, 17 (42.5%) of them had secondary degrees education, 5 (12.5%) of the participants had diploma education background, 5 (12.5%) of the participants had bachelor degrees education and 3 (7.5%) of the participants had others (do not have education background or write and read only).

In terms of type of mobile devices using by participants, the study reveals that 22 (55%) participants

have smartphone, 9 (22.5%) participants have hand phone, 2 (5%) participants have Laptop, 7 (12.5%) participants have others devices (such as tablets, black bary). This results showed that most of people who are residents in rural areas are using mobile devices, especially smartphone. Moreover, this study reveals the experience level of using mobile devices and found that 33 (9%) participants have experience <1 year, 101 (27.7%) participants have experience 1-3 years, 136 (37.3%) participants have experience 4-6 years and 95 (26%) participants have >6 years. Besides that the study inquired the income-monthly of participants and found that 167 (45.8%) of the participants have an income between 251-500 thousand (Iraqi Dinar per month), 156 (42.7%) of them have an income <250 thousand (Iraqi Dinar per month), 40 (11%) of the participants have an income between 501-750 thousand (Iraqi Dinar per month) and 2 (.5%) of the participants have an income higher than 750 thousand (Iraqi Dinar per month).

Checking the reliability of instrument: Reliability is a method for testing the consistency and stability of the measuring instrument (Sekaran and Bougie, 2013). Pallant (2011) stated that reliability of a scale refers to what extent it is free of random errors and brings the extent of correlation found between any two scales. He also emphasises that internal consistency needs to be measured while checking for the reliability of the scale. Thus, internal consistency is the degree to which the items that make up the scale are all measuring the same underlying attribute which can be done by calculating Cronbach's coefficient alpha (Pallant, 2011). Moreover, according to Cronbach (1957) internal consistency reliability is assessed on the pilot data using Cronbach's alpha. Besides, Cronbach's coefficient alpha is a statistic that provides indication of the average correlation among all the items that make up the scale which ranges from 0-1 (Pallant, 2011). Indeed, Cronbach's alpha is expected to be of high value when the correlation between the respective questionnaire's items is high while the minimum level of 0.6 is recommended (Hair *et al.*, 2006).

In addition, 67 items were used to measure the entire 9 constructs of the conceptual research model during the pilot study of the instrument and their distribution is shown in Table 1. Indeed, the results of the pilot test which is represented by the internal consistency of the scale have high values of Cronbach's alpha. Besides that the entire 9 constructs have their Cronbach's alpha

Table 3: Reliability test for the pilot study

Constructs	No. of items	Cronbach's alpha	Items deleted	Cronbach's alpha if item deleted
Information quality	10	0.865	Nil	0.865
System quality	10	0.797	Nil	0.797
Service quality	14	0.884	Nil	0.884
Communication quality	5	0.718	Nil	0.718
Interface design quality	4	0.675	Nil	0.675
Civil conflicts	6	0.940	Nil	0.940
User satisfaction	5	0.757	Nil	0.757
Usage mG services	5	0.804	Nil	0.804
Net benefits of mG services	8	0.871	Nil	0.871

greater than 0.6 and shown in Table 3. Hence, the results of reliability test are acceptable for further analysis based on the recommendation of some researchers (Hair *et al.*, 2006).

As shown in Table 3, all the constructs show Cronbach's alpha readings of acceptable values of above 0.60 (Hair *et al.*, 2006). The reliability value for all constructs ranged from 0.675-0.940. Thus, the final actual distribution was conducted without any modification as explained in the distribution method.

CONCLUSION

The main objective of the study proposed is to examine the contributing factors of mG success among Iraqi citizens in rural areas. Questionnaire was designed based on prior studies of IS success.

In the pilot study, all the factors have values >0.6 which are acceptable. The pilot study has been performed using the questionnaire which is distributed among Iraqi citizens who are staying in the rural area in the Southern region of Iraq and who registered at farm association in Al-Shatra, Shatra county which belong to Federation of farm associations in Dhi-Qar, Southern region of Iraq. This study has some limitations such as this study focus on one region (Southern region) of Iraq while the behavior of other citizens in other regions (Northern and middle regions of Iraq) towards evaluate mG success are not reflected in this study. The second limitation is that many items can be add and also many factors can be investigated such as trust, motivation, security and cost. In future work, a research paper to view results of the analysis of survey data will follow this study. The following research study will test the hypothesis and validate the theoretical conceptual model. The test results can help provide further understanding towards the success of mG services among citizens.

APPENDIX

Appendix A (factors and items):

Constructs	Items
Information quality	Through MWS, I get the information I need in time Information provided by MWS meets my needs Information provided by MWS is in a useful format Information provided by MWS is clear Information provided by MWS is easy to understand I am satisfied with the accuracy of information by MWS MWS provides me accurate information MWS provides the most current information MWS provides me with up-to-date information Overall, the MWS provides me with high-quality information.
System quality	MWS performs reliably and securely MWS operates smoothly without errors MWS can be accessed immediately MWS quickly loads all the text and graphics MWS provides high-speed information access MWS can be adapted to meet a variety of needs MWS is easy to use MWS is easy to navigate MWS is user friendly Overall, in terms of system quality I would rate the MWS highly
Service quality	When I have a problem, the MWS shows a sincere interest in solving it MWS provides on-time services it promises MWS is dependable MWS provides prompt responses MWS is responsive to farmer's request MWS responds quickly to my needs The behaviour of MWS helpdesk instils confidence in me MWS provides professional services MWS helpdesk have the knowledge to do their job well I feel safe when I use the MWS MWS helpdesk gives me individual attention The MWS helpdesk has my best interest at heart The MWS helpdesk understands my needs Overall, I rate the quality of service provided by MWS highly
Communication quality	The MWS provides a discussion form The MWS provides a feedback form The MWS presents a page of Frequently Asked Questions (FAQs) The MWS provides a form to subscribe to related news groups The MWS provides a form to chat with other users and experts
Interface design quality	I can read and view the main menu of MWS easily I like the layout of the MWS's interfaces There is compatibility between colours and images of MWS's interfaces The presentation style of MWS is easy to understand
Civil conflicts	Latent conflict: there are clear differences in the positions regarding objectives between individuals and groups around me which deter me from using MWS There are continuous conflicts (unmanifested) around me which deter me from using MWS Verbal threats and abuse can be heard around me which deter me from using MWS Crises: there are manifest conflicts between individuals/groups around me which deter me from using MWS Severe crises: there are severe conflicts around me which deter me from using MWS Strong conflicts: strong conflicts generate crises around me which deter me from using MWS
User satisfaction	I feel satisfied with using MWS I feel contented with using MWS I feel pleased with using MWS I feel delighted with using MWS MWS has met my expectations
Net benefits	Using the MWS in my job enables me to accomplish works more quickly MWS improves my job performance Using the MWS in my work increases my productivity MWS improves my income level MWS saves my time and money MWS increases knowledge as a result of the exchange information MWS establishes and maintains a good image and reputation for me MWS satisfies my requirements

Appendix A: continue

Use of a system	How many times do you use MWS during a Month? About once (Abdelghaffar and Magdy, 2012) 2-4 times (Fasanghari and Samimi, 2009) 5-7 times (Antovski and Gusev, 2005) 8-10 times (Alijeban and Saghafi, 2010) >10 times (Mengistu <i>et al.</i> , 2009) How many days do you visit MWS during a Month? <1 day (Abdelghaffar and Magdy, 2012) 2-4 days (Fasanghari and Samimi, 2009) 5-7 days (Antovski and Gusev, 2005) 8-10 days (Alijeban and Saghafi, 2010) <10 days (Mengistu <i>et al.</i> , 2009) How many hours do you use MWS during a Month? <1 h (Abdelghaffar and Magdy, 2012) 1-2 h (Fasanghari and Samimi, 2009) 3-4 h (Antovski and Gusev, 2005) 5-6 h (Alijeban and Saghafi, 2010) <6 h (Mengistu <i>et al.</i> , 2009) How much time do you spend with the MWS during the ordinary day when you use mobile device? <1/2 h (Abdelghaffar and Magdy, 2012) 1/2-1 h (Fasanghari and Samimi, 2009) 1-2 h (Antovski and Gusev, 2005) 2-3 h (Alijeban and Saghafi, 2010) <3 h (Mengistu <i>et al.</i> , 2009) How frequent do you use MWS? Very irregular (Abdelghaffar and Magdy, 2012) Irregular (Fasanghari and Samimi, 2009) Neither (Antovski and Gusev, 2005) regular (Alijeban and Saghafi, 2010) Very Regular (Mengistu <i>et al.</i> , 2009)
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MYVS: Mobile weather service

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