Egyptian Computer Science Journal (ISSN-1110-2586)
Volume 41– Issue 2, May 2017

Empirical Investigation of M-Government Adoption in Egypt

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Abstract

Mobile government (m-government) services become more significant to effectively improve the user-to government communication. This research study is focused on the use of Mobile Government in Egypt. Based on 436 questionnaires collected from people of different age groups in Egypt, the study quantifies how their intention to use mobile government is influenced by technology attributes (perceived usefulness and perceived ease of use), and image, trust and social factors. SPSS is used to analysis the collected data. The results show that technology factors, image, trust and social influence are all significant toward the citizens' intention to use mobile government services.

Keywords: *Mobile government, trust, social influence, mobile technologies, usefulness, adaptation, Technology Acceptance Model (TAM).*

1. Introduction

Mobile government services have become a powerful component of the e-government in facilitating the delivery of better services to citizens. Such services are significant for improving user-to-government communication effectiveness and maintaining relationships [1]. Mobile government can be considered as a subset of E-Government. Mobile Government is implemented to provide mobile services and data to government employees, citizens and businesses through mobile and/or wireless technologies [2, 3]. M-government deals with the wireless exchange of digitalized information between government agencies and citizens, and between governments and their employees [3, 1]. The technological changes force government agencies to move toward m-government. These changes include: (1) mobile device penetration that allows the users to deliver and access government services anywhere and anytime, (2) convergence of wired Internet and wireless telecommunication networks, (3) and the higher data transfer rates through mobile internet applications and services [4]. M-government is advances in wireless and mobile communications infrastructure are enabling governments to manage and deliver information and services to citizen efficiently and economically. Governments that utilize these advances effectively are able to move to the next generation of e-government services [5]. According to The International Telecommunications Union (ITU) estimated that there are around 7.377 million mobile cellular subscriptions worldwide in 2016 [6]. Therefore, the success of m-government initiatives across the world has been proven through increasing productivity of the government agencies or improving convenience for citizens. However, security, privacy and

information overload are significant issues and considered to be risks of m-government as well as user readiness in terms of technology readiness and psychology readiness [3].

The rest of this paper is organized as follows. Section 2 discusses previous studies. Section 3 discusses research model and hypotheses. Section 4 presents research methodology. Section 5 provides reliability and validity. Section 6 focuses on the results and discussion. Section 7 provides the concluding remarks.

2. Related Work

A survey was conducted to investigate the youth intention of using m-government services. This survey was based on the collected data from four universities located in Egypt targeting undergraduate students using questionnaire. The results showed that the perceived usefulness, awareness, social influence, compatibility, and face-to-face interactions significantly contribute to the prediction of the intention to use mobile government. Whereas the internet experience, trust, perceived ease of use and personal connections do not significantly contribute to the prediction of the intention to use m-government [7]. Another study was conducted in Saudi Arabia through sample of registered students in the Ministry of Higher Education and Technical and Vocational Training Corporation as well as sample of employees working at the Ministry of Communication and Information Technology. The results of this study showed that m-government services are ineffective and expensive for students. However, employees found implementing m-government services is an effective option and it would enhance the technological development in Saudi Arabia [8]. In [9], the authors investigated the adoption of mobile government by collecting 409 questionnaires from families living in rural China. The study examined their access to and perceptions of m-government, and quantifies how their intention to use mobile government is influenced by technology attributes, trust and social factors. The results indicated that perceived ease of use, near-term usefulness, long-term usefulness, integrity, image, benevolence and social influence have positive and significant influences on the intention to use mobile government. In [1], the authors identified the factors that determine user acceptance of mobile government services Based on a sample of 331 users of m-government services in Taiwan. Their findings showed that perceived usefulness, trust, perceived ease of use, interactivity, external influence, self efficacy interpersonal influence, and facilitating conditions are critical factors.

3. Research Model and Hypotheses

The Technology Acceptance Model (TAM) has been the only one that has captured the most attention of the information systems community. It is used to study user acceptance of technology and this model is also used in our proposed research model [10]. In [11], the author illustrated that people tend to use or not to use system if they believe that it will enhance their jobs (perceive usefulness) and also the system that they use is free of mental and physical effort (perceive ease of use). Prior studies add factors that have significant impact on e-government such as social influence and intention [12, 13]. Social influence is the degree to which an individual perceives that important others believe he/she should use the new system [12]. Other researchers have concluded that m-government services attitude is affected mainly by both useful performance-related services and trustworthy responses to citizens' questions [1, 14]. In [15], the authors found that trustworthiness of internet and state government agencies is significant indicator of citizens' intention to use e-government services. Another author [1] also found that there is a significant indirect influence of trust on the intention to use m-government among Taiwan e-government website users. Therefore,

trust is an important factor for studying user acceptance of m-government services. In [14], the authors has presented image factor to investigate the adoption of e-government. In [16], the authors suggested that image refers to one's perceptions of an innovation as a status symbol, while other authors [9] defined image as citizens' perceptions that the adoption of m-government would enhance the adopters' status in the social system. Mobile government is emerging as a new information technology solution for accessing government information; therefore, the technology acceptance model (TAM) is used for developing our research model. In addition to the technology attributes emphasized by TAM, we include other factor, which are image, trust and social influence to demonstrate the driving factors behind mobile government adoption. The research hypotheses are as shown in figure 1:

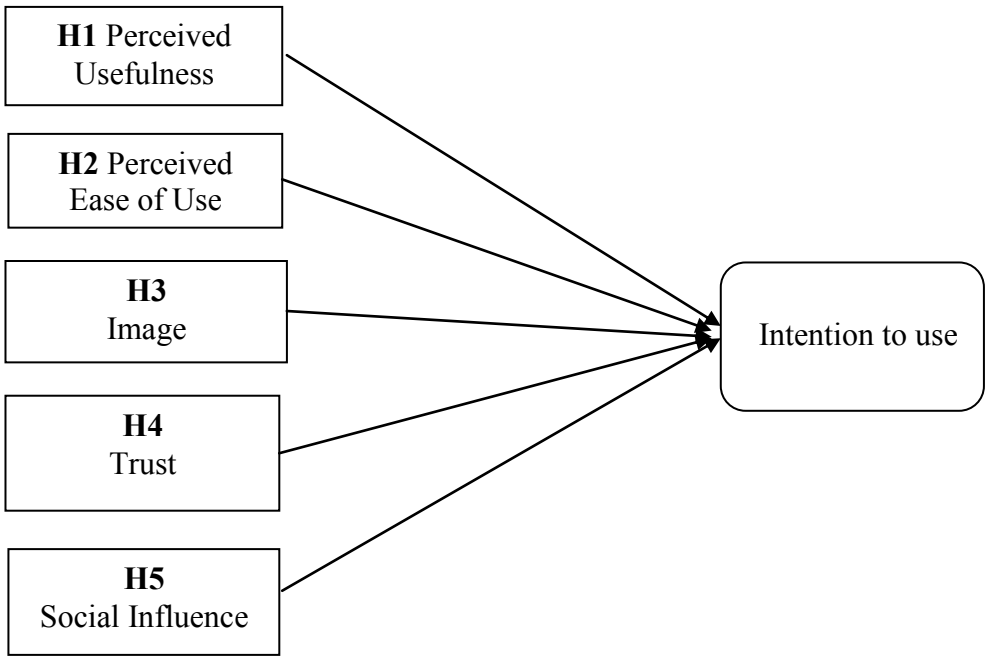

Figure 1. The Research Model

H1. A higher level of perceived usefulness is positively related to intention to use m-government services

H2. A higher level of perceived ease of use is positively related to intention to use m-government services

H3. A higher level of perceived image is positively related to intention to use m-government services

H4. A higher level of trust in government agencies is positively related to intention to use mobile government services.

H5 A higher level of social influence is positively relates to intention to use mobile government services.

4. Research Methodology

A questionnaire survey was conducted to gather data for evaluating the research model. The measurements for the constructs of our research model are included in the Appendix A. These measurements are derived from prior studies. The items for measuring perceived usefulness and perceived ease of use are based on ATM model [11]. The measurements for image are derived from the work of authors [15, 17]. The items for trust are derived from measurements used by authors [15]. The measurements for social influence are based on the work of authors [12].

The sample consists of 436; the ages ranged from 16 to 70 years with males accounting for 59.2% of the sample as shown in table 1. For accessing government information, the survey indicates that only 23.6% of respondents have used mobile to access government information as shown in Table 2. Forty two percent of the respondents receive SMS from government agencies. However, 24.1% of respondents avoid using M-government services because of security issues followed by the network slowdown 19.7%.

Table 1. Demographic Characteristics of Respondents

Demographic profile	Option	Frequency	Percentage
Gender	Male	258	59.2
	Female	178	40.0
Age	16 - 25	256	58.7
	25 - <40	94	21.6
	40 - < 60	38	8.7
	> 60	48	11
Educational Level	High School	47	10.8
	High Diploma	55	12.6
	Bachelor Degree	334	76.6
	Student	85	19.5
Occupation	Governmental	116	26.6
	employee	174	39.9
	Private sector	61	14
	Others		

5. Reliability and Validity

Table 3 shows the values of Cronbach's Alpha (α), composite reliability (CR) and average variance extracted (AVE) for six constructs The values of Cronbach's Alfa that measure the internal consistency are acceptable and their range are from 0.841 to 0.94. The composite reliability values are higher than 0.7 for all constructs of a measurement model and also the AVE of the construct are higher than 0.5.

Table 4 shows the discriminant validity, the degree of measuring different constructs that are related to each other. To assess discriminant validity, the square roots of each AVE is calculated each construct and its value should be higher than the off-diagonal correlation elements. Table 4 shows the bold diagonals, which represent the square roots of the AVEs of the individual constructs. Off diagonal values are the correlations between the constructs.

Table 2. Respondents' accessibility to government information

Accessibility	Option	Frequency	Percentage
Access to e-government website via your mobile phone	Users	103	23.6
	Non-users	333	76.4
	Yes	184	42.2
Receive SMS from government agencies	No	252	57.8
	Information security	105	24.1
Reasons for avoiding to use M-government services	Network slowdown	86	19.7
	Have no time to access the website	18	4.1
	Missing value	227	52.1

Table 3. Reliability and convergent validity statistics

Construct	(no. of items)	α	CR	AVE
Trust	2	0.926	0.957	0.918
Usefulness	3	0.917	0.935	0.829
Ease of use	3	0.941	0.948	0.859
Image	2	0.841	0.893	0.807
Social Influence	2	0.849	0.910	0.836
Intention	2	0.914	0.927	0.864

Table 4. Discriminant validity

Construct	TR	PU	PEU	IM	SI	INT
Trust (TR)	**0.958**					
Perceived Usefulness (PU)	0.183	**0.910**				
Perceived Ease of Use (PEU)	0.242	0.298	**0.927**			
Image (IM)	0.227	0.356	0.318	**0.898**		
Social Influence (SI)	0.249	0.311	0.372	0.348	**0.914**	
Intention (INT)	0.284	0.271	0.298	0.326	0.337	**0.929**

6. Results and Discussion

Regression analysis is a statistical process to test the hypotheses and estimate the relationships between a dependent variable and one or more independent variables [18]. Determining the relationships among the variables, β is very important because it compares the contribution of each independent variable to explain the dependent variable [19].

Our study quantified how five factors affect the intention of citizens to adopt with mobile government. All factors have a significant influence on intention to use mobile government. Table 5 illustrates that all of the hypotheses proposed are supported. Perceived of Usefulness ($\beta = 0.182$, p-value < 0.001), perceived ease of use ($\beta = 0.201$, p-value < 0.001), image ($\beta = 0.209$, p-value < 0.001), trust ($\beta = 0.098$, p-value < 0.01), and social influence ($\beta = 0.118$, p-value < 0.01). All the hypotheses are direct determinants of the intention to use the mobile government.

The hypothesis, H1 is supported as in table 5 means that citizens' intentions to use a state m-government services will increase if citizens perceive the service to be easy to use. In general, this indicates that it is imperative for online government services to be intuitive. If a user becomes frustrated because of the inability to seamlessly locate information and complete transactions, this will decrease his or her intention to adopt m-government services. Higher levels of perceived usefulness (hypothesis H2) directly affect citizens' intentions to use mobile government services; higher levels of perceived image (hypothesis H3) is also affect citizens' intentions to use mobile government services. Hypothesis H4 is also supported. This suggests that higher levels of perceived trustworthiness are positively related to citizens' intentions to use a state mobile government services. Citizens who perceive low reliability and security of the internet will be less likely to adopt mobile government services. Finally hypothesis, H5 demonstrated that higher levels of social influence have significant influences on intention to use m-government services.

Table 5. Hypothesis Testing

	Variable	Coefficient	β	Significance	Support
H1.	Perceived usefulness	0.238	0.182	0.000	Yes
H2.	Perceived ease of use	0.141	0.163	0.000	Yes
H3.	Image	0.189	0.219	0.000	Yes
H4.	Trust	0.083	0.098	0.026	Yes
H5.	Social influence	0.117	0.118	0.009	Yes

7. Conclusion

This paper investigated the intention to use mobile government services in Egypt. Different models and theories of technology adoption are reviewed to identify the proposed framework. To test the proposed framework, questionnaire was conducted targeting people of different age groups in Egypt. The results indicate that the perceived usefulness, perceived ease of use, image, trust and social influence, are significant indicators citizens' intention to use mobile government services. In the future work, we will focus on more variables or attributes that affect the intention to use mobile government in Egypt and the future consequences of accessing government information in the hope of improving the quality of life

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Appendix

Perceived Usefulness (PU)

- PU1: Using M-government system save my time and effort to access government information
- PU2: I find M-government system is useful to me

- PU3: Using M-government system improve my performance to access government information

Perceived Ease of Use (PEU)

- PEU1: It is easy for me to access government information using mobile phone
- PEU2: I believe it is easy to access government information using mobile phone
- PEU3: Overall I find M-government is easy to use

Trust

- TR1: M-government is trustworthy
- TR2: M-government is reliable

Image

- IM1: People who use M-government have high the prestige
- IM2: People who use M-government have a better social status.

Social Influence (SI)

- SI1: My friends think I should use M-government
- SI2: The people I know think I should use M-government

Intention

- INT1: I plan to use M-government system in the future
- INT2: I expect that I will use the M-government in the future