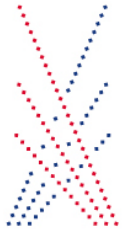

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Factors that affect the intention to use m-Government services from the users' perspectives: An empirical study in the UAE

Abstract*: The growing popularity of mobile technology has led governments to develop mobile business models and encouraged different governments all over the world to move from E-Government to m-Government. However, there is very few systematic evidence regarding m-Government implementation in less developed countries and the users' behavioral intention to use m-Government services. Therefore, the present study proposed to identify factors that affect UAE citizens and residents' acceptance of m-Government, to examine the interrelationships between m-Government service characteristics, m-Government technology characteristics, perceived ease of use, perceived usefulness, attitude towards m-Government use and behavioral intention to use m-Government. Moreover, 12 hypotheses were developed and tested using a sample* of 326 users *of m-government services in the UAE. The results show that the suggested m-Government model are crucial to achieving user acceptance of m-Government services. This study has improved our understanding of the critical mobile technology factors that are needed to improve user acceptance of m-Government services. The study presents important implications for both theory and practice.*

Keywords: Mobile-Government, User Acceptance, Behavioral Intention, TAM, UAE, Structural Equation Modeling

Introduction

Modeling antecedents of IT application acceptance (Ayeh, 2015; Djamasbi et al., 2010; Lin and Kim, 2016), end user attitudes (Abzari et al., 2014; Ajzen and Fishbein, 1980; Almarashdeh, 2016, Liu et al., 2014), and end user behavioral intentions (Lee et al., 2013; Shareef et al., 2016) remains a common research agenda in Information Technology (IT) domain. Meanwhile, the last decade has witnessed an unprecedented change in the way government's services are provided, largely as a result of utilizing the information technology in the governmental sector (Almarashdeh and Alsmadi, 2017; Wang, 2014). This has also opened new opportunities for the local governments to achieve better service quality at lower cost. These changes have facilitated the growth of new services that improve the communication between citizens and governments and have been heralded in the information technology literature as a significant mean for improving government outputs (Madden et al., 2013; Walravens, 2015).

Moreover, the recent mobile communications technology developments have encouraged different governments all over the world to move from E-Government to m-Government (Wang, 2014). m-Government, only one element of e-government (Lallana, 2004), is the use of various mobile platforms (e.g., cell phones, smart tablets) that enables governments to provide a wide verities of services to different stakeholders via smart mobile devices and in a way that is independent of time and location (Ishmatova and Obi, 2009; Lee et al., 2006, Liu, 2014; Wang, 2014).

Governments around the globe are taking advantage of the phenomenal growth of wireless technology that is facilitating the reach of government services by making it available through mobile devices. The fast pace and falling cost of IT tools has increased the awareness of citizens about their rights and voicing their concerns about issues important to public. The growing popularity of mobile technology has led businesses develop mobile commerce models and is altering the approach of the governments to deliver their services (Sharma and Gupta, 2004). Growth of mobile technology is contributing greatly to the reduction of digital divide as it improves the accessibility of m-Government services, considered as the starting point to minimize the digital divide. Furthermore, mobile technology reduces the barriers of availability and cost for citizens to reach and access data and documents that are related to government actions and decisions and provides opportunities for more transparent and consequently accountable government actions (Bertot et al., 2010).

m-Government in the UAE is at the awakening stage comparing with consumers in the developed countries such as the UK and has been implemented by the government to help run business smoothly while mobile communication is becoming more and more available. However, e-Government's previous literature has focused mainly on Non-m-Government

services acceptance, neglecting factors that are affecting mobile technology acceptance by users (Hung et al., 2013). To date, research on m-Government applications is very limited (Almarashdeh and Alsmadi, 2017; Chen et al., 2016; Liu et al., 2014), regardless of the critical role of m-Government applications on delivering and sustaining effective governmental services and the fact that while a massive investment is needed for most m-Government applications, they fail to be accepted by the end users (Chen et al., 2016; Wang, 2014).

Furthermore, it is insufficient for m-Government services to concentrates only on Non-Mobile services' delivery factors, neglecting the mobile technology factors (e.g., Hung et al., 2013; Liu et al., 2014; Wang, 2014). Therefore, factors covered in this research may be of significance in determining end user acceptance of m-Government services. It aims to assess the final users' acceptance of m-Governments by locating the important factors that play a significant role from the end user's perspective.

Research Objectives

Developed countries have already moved towards m-Government adoption over the last decade, while developing countries are showing a keen interest in the adoption of m-Government (Abdelghaffar and Magdy, 2012). The main purpose of this paper, therefore, is to understand behavioral intention to use m-government by UAE citizens and residents. Our research model will be based on Technology Acceptance Model (TAM), to investigate the antecedents of the behavioral intention to use m-Government applications. In the following sections, first the development of the theoretical model and the hypotheses of the study are offered. Next, the methodology of the study is explained followed by the statistical analysis and results. More specifically, the theoretical model is checked using path analysis, with the AMOS 22 structural equation modeling package, and data collected by drop and collect survey

of 326 UAE m-Government users. Finally, a conclusion and suggestions for future research are provided.

Literature review, conceptual model and hypothesized relationships

Mobile Government service in UAE[1]

On May 22, 2013 m-Government was ignited by Sheikh Mohammed bin Rashid Al Maktoum who ambitiously said "A successful government reaches out to the people rather than wait for them to come to it". His Highness had instructed all local and federal government agencies to make their services available via mobile phones and fully around the clock by 2015. The aim was to ensure a more convenient and easily accessible tool of acquiring services from government entities. This was also, an eminently substantial cutback in waiting time at government offices during working hours. This initiative was launched at the Mobile Government Forum and was thoroughly established at a time when mobile phone usage was vastly at its peak. It was monumentally expected that 14 million phones would be used in the United Arab of Emirates. An average of just slightly below 2 per person.

Currently, m-Government applications are available on Google Play and Apple online stores. There are 103 mobile applications that deliver more than 700 services, both local and federal. Also there are around 1,800 government services available online now. Furthermore, built on the lines of Google Now, Dubai Now will allow users to log in once and will be able to access 2,000 government services, managed by 19 different government entities through 25 micro applications widely across 11 categories. Finally, three years ago, UAE Government announced the successful establishment of the "Best m-Government Service Award". Best m-

[1] Information on UAE obtained from http://www.uaeinteract.com/news/default3.asp?ID=449.and.tour.operators/explore.al.ain.aspx on Jan 20, 2018.

Government Service Award is an annual global award that aims to strongly motivate government units to develop innovative solutions through smart phone applications, mobile phones and SMS solutions.

Technology Acceptance Model

User intention to use an IT application has always been the most known approaches that have been used to assess the success of the introduced application (Eid, 2009). Most of the previous research has often used the Technology Acceptance Model (TAM) to achieve an in-depth understanding of the utilization of different information technology applications (Lederer et al., 2000). TAM is considered one of the most widely researched models in consumer behavior studies in different contexts (Nguyen et al., 2017). Davis presented an improved version of Theory of Reasoned Action (TRA), a very strong intention model that has been found to be very successful in explaining behavior in different contexts (Fishbein and Ajzen, 1975), but the TAM was originally developed to provide an understanding of the causal link between external variables and user acceptance of PC-based applications (Fenech, 1998).

According to Davis et al. (1989) TAM is considerably more specific than TRA and is applicable only to information technology usage behavior. However, as TAM incorporates findings accumulated from over three decades of information technology research, it may be especially well-suited for modelling information systems acceptance and that is why we are going to use it in our study. Consequently, TAM is an adaptation of TRA specifically tailored to model user acceptance of information technology. The goal of TAM is to provide an explanation of the determinants of IT application acceptance that is general, capable of explaining user behavior across broad range of End-User populations, while at the same time being theoretically justified. A key purpose of TAM is to provide a basis for tracing the impact of external factors

on internal beliefs, attitudes and intention. TAM hypothesizes that computer usage is determined by behavioral intention (BI) and BI is jointly determined by the person's attitudes toward using the system (A) and its perceived usefulness.

TAM uses TRA as a theoretical basis for specifying the causal linkages between two key beliefs: perceived usefulness (PU), and perceived ease of use (PEOU), and how these benefits relate to users' attitudes and intentions and actual IT application acceptance behavior (Davis, et al., 1989). TAM assumes that the usage of any IT application (i.e. the acceptance of the technology) can be expected as behavior by the user's intention to use the IT application. Furthermore, according to TAM the user's intention to use an IT application i.e. m-Government can be predicted by his/her attitude towards using that IT application. Similarly, TAM assumes that both attitude and intention are used as the main determinants of accepting the IT application. Furthermore, the attitude is assumed to behave as a mediator between the behavioral intention and two key powerful beliefs: the perceived ease of use of the IT application, and its perceived usefulness. TAM suggests a direct relation between perceived usefulness and behavioral intention. The model also suggests that the perceived usefulness of the technology is directly influenced by the perceived ease of use of that IT application. Even though, PU and PEU were significantly correlated with both attitude and intention to use the IT application, Davis et al. (1989) found that PU mediates the effect of PEU on attitude to use the IT application (Karahanna and Straub, 1999). The model was shown to have good predictive validity for the use of several information technologies including E-Mail and WWW (Eid, 2009). Therefore, based on TAM, the research hypotheses supporting these proposals are then as follows:

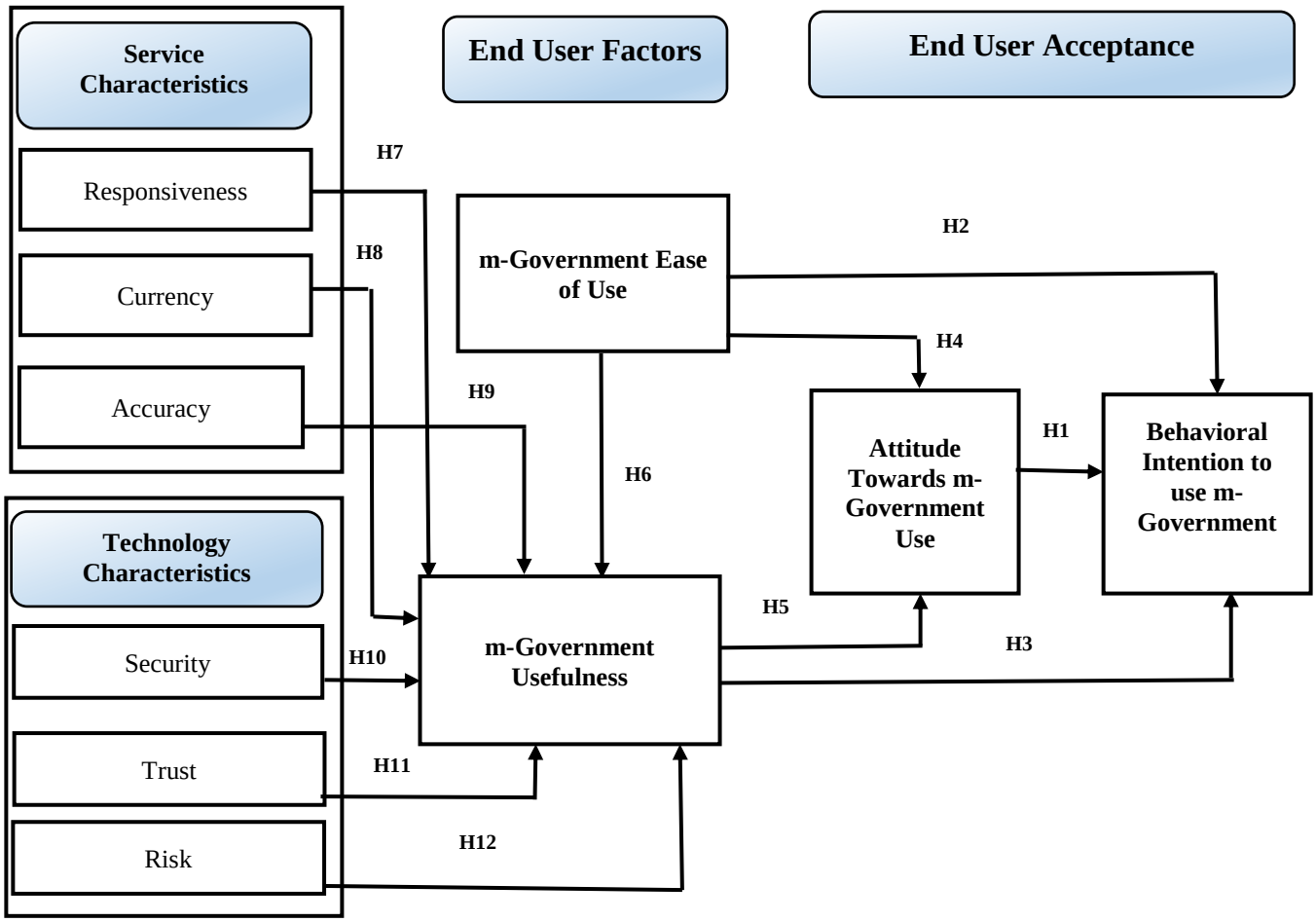


Figure 1: Research Model

H1. Attitude Towards m-Government Use will positively influence End User Behavioral Intention to use m-Government.

H2. m-Government Ease of Use will positively influence End User Behavioral Intention to use m-Government.

H3. m-Government Usefulness will positively influence End User Behavioral Intention to use m-Government.

H4. m-Government Ease of Use will positively influence End User Attitude Towards m-Government Use

H5. m-Government Usefulness will positively influence End User Attitude Towards m-Government Use.

H6. m-Government Ease of Use will positively influence m-Government Usefulness.

Many authors have extended TAM by using other constructs in an attempt to improve its ability to predict usage. For example, Liu et al. (2014) has extended TAM to include both long-term and short-term perceived usefulness. The results reflect that perceived short-term usefulness has the most significant influence on the behavioral intention to use the technology. Eid (2009) has extended it to include individual, organizational and system characteristics. Their results confirm that individual, organizational, and system characteristics have a strong influence on perceived ease of use and perceived usefulness. TAM theorizes that some external variables affect the user behavioral intention to use the IT application through enhancing both the perceived usefulness and perceived ease of use of the system. As such, this research utilizes both service characteristics and technology characteristics as external factors affecting perceived usefulness in TAM.

Effect of perceived service characteristics on perceived usefulness

According to Aloudat et al. (2014), the end user perception of how useful m-Government is would be highly affected by the degree to which the m-Government end user perceives the services to be accurate, current, and responsive. Similarly, other researcher pointed out other service characteristics related factors as important determinants for the acceptance of m-Government. For example, Lee et al. (2005) showed the importance of providing timely information (***responsiveness***) as one of the service quality features for m-Government. On the other hand, Hung et al. (2013) suggested that ***currency*** and ***accuracy*** quality features are expected to provide an insight into the extent to which m-Government is generally considered

sufficiently trustworthy to be utilized by end users. Based on the previous discussion and following the trails of TAM, the currency, accuracy, and responsiveness service characteristics factors are hypothesized in the research model as independent variables that affect the perceived usefulness of m-Government application. Based on the above discussion, the following hypotheses have been proposed:

H7. Perceived Responsiveness of m-Government will positively influence its Perceived Usefulness.

H8. Perceived Currency of m-Government will positively influence its Perceived Usefulness.

H9. Perceived Accuracy of m-Government will positively influence its Perceived Usefulness.

Effect of Perceived Technology Characteristics on Perceived Usefulness

A number of studies were carried out to identify technology characteristics most critical to m-Government acceptance. Smith (2010) noted that security standard has a central role to play in the m-Government implementation. However, trust (Teo et al., 2008) are essential to m-Government services' delivery. Pavlou and Gefen (2004) agreed that perceived risk level is important to m-Government implementation. According to Hong and Tam (2006) security has become an important problem in virtual environments, which has an impact on users' acceptance of IT applications. Perceived Security reflects the extent to which an end- user feels that the use of a specific IT application is free of risk. However, although recent studies show that perceived security is a significant variable that influences users' acceptance e-commerce or m-commerce (Chellappa and Pavlou, 2002), few studies considered security perception as an important factor in e-government or m-government domain. Therefore, researchers should pay great attention to security in an instable environment of mobile applications, hence this study will extend TAM by adding perceived security into it.

Furthermore, according to Aloudat et al. (2014), regardless of the mutual relationship between ***trust*** and ***risk***, the two constructs should be investigated separately when examining their impact on m-Government as they always show different sets of effects (Junglas and Spitzmuller, 2006). Trust reduces uncertainty and therefore establishes a positive view regarding the usefulness of m-Government and gives predictions of a good level of performance. As such, trust is hypothesized to positively influence the perceived usefulness of m-Government services Aloudat et al. (2014). Finally, risk increases uncertainty and therefore establishes a negative view regarding the usefulness of m-Government and gives predictions of a bad level of performance. As such, risk is hypothesized to positively influence the perceived usefulness of m-Government services Aloudat et al. (2014). Therefore, we give the following hypothesis:

H10. Perceived Security of m-Government will positively influence its Perceived Usefulness.

H11. Perceived Trust on m-Government will positively influence its Perceived Usefulness.

H12. Perceived Risk of m-Government will positively influence its Perceived Usefulness.

Based on the suggested hypotheses, the research model is presented in Figure. 1.

Research methodology

Data collection

A questionnaire survey was designed to collect data for assessing the suggested research model. The survey includes two parts. The first part contains information about the demographic characteristics of the m-Government users, while the second part seeks information about their perceptions of the service characteristic and technology characteristics of m-Government. A five-point Likert-scale ranging from strongly disagree (1) to strongly agree (5) was used to measure each attitude item. Relevant forms have been directly translated

into Arabic according to research requirements and a few modifications to the measures were made in order to match UAE m-Government context. Following the conventional back-translation protocol (Brislin, 1970), A translator who was unaware of the research project has been asked to translate the Arabic version back into English. The two English questionnaires were compared and changes were made when necessary to ensure that the Arabic version was similar to the original English questionnaire.

The generalizability of a study relies on the representativeness of the respondents. Therefore, for the present study a representative selection of UAE locals and residents was selected. Before the data collection, we offered enough training to the research assistants and clarified the research aim. The research assistants were asked to visit about 750–1000 different local and residential families in the seven UAE Emirates, and collect a response from one person per family visited. Finally, we collected **350 responses, 326** of which are retained for analysis.

The sample can be described as follows: 144 were local (44.1%) and 182 were non local (55.9%), 198 were men (60.7 %) and 128 were women (39.7 %). The majority of participants were aged between 25 and 35 (69.3 %), had bachelor degree (52.3 %), had an income between 1000-2000 USD (48.8%) and had engaged in using m-Government services between within the previous year (88.2 %).

Research Instrument Development—Measures

This research wherever possible, used validated measures that had been previously applied. Our procedure was as follows: a) in conceptualizing Perceived Ease of Use and Perceived Usefulness, the original scale of Davis (1989) and Agarwal and Prasad (1999) was used in this study. Four five-point Likert-type questions were used to measure the perceived ease of use

and four five-point Likert-type questions were then used to measure perceived Usefulness; b) in conceptualizing the Attitude Towards m-Government Use construct, we used four different sources (Agarwal and Prasad, 1999; Bhattacherjee, 2000; Taylor and Todd, 1995; Van der Heijden et al., 2004) and used three items to operationalize it; three five-point Likert-type questions were used to measure it; c) similarly, three sources have been used (Bhattacherjee, 2000; Junglas and Spitzmuller, 2005; Taylor and Todd, 1995) to operationalize the Behavioral Intention to use m-Government; three five-point Likert-type questions were used to measure it; d) in conceptualizing m-Government Service Characteristics we followed Aloudat et al. (2014) approach that deal with m-Government Service Characteristics as a multidimensional construct that includes Responsiveness, Currency and Accuracy and three five-point Likert-type questions were used to operationalize each dimension; E) finally, m-Government technology Characteristics was conceptualized as a multidimensional construct that includes; Security (Almarashdeh and Alsmadi, 2017; Fang et al., 2006), Trust (Flavián et al., 2006; Kananukul et al., 2015; Phua et al., 2017; Ruan and Durresi, 2016) and Risk (Pavlou and Gefen, 2004; Phua et al., 2017; Ruan & Durresi, 2016); three five-point Likert-type questions were used to operationalize each dimension.

Next, our operationalized measures were purified by the work of a panel of six m-Government experts. It consisted of three academic professors specialized in research on information technology applications and three m-Government practitioners. Content validity was performed on each question and on the overall scale. Finally, exploratory factor analysis (EFA), a reliability assessment, and construct validity assessment were used to assess the reliability and validity of constructs.

Data Analysis

Following Anderson and Gerbing's (1988) recommendation, we used the two-step approach by separating the measurement model from the structural model. First, the psychometric properties (discriminant validity, convergent and reliability,) of the measures used in this research were assessed. Next, structural equation modelling (SEM) was used to examine the hypothesized relationships between the research constructs.

5.1 Reliability and Validity of the Measures

First, Cronbach's alpha reliability coefficient and items-to-total correlation were calculated. This analysis led to the deletion of two items from the construct of the guanxi relationship and of one item from the construct of organizational trust which reduced the value of the reliability coefficients. Table I shows that all the scales had reliability coefficients ranging from 0.901 to 0.967, which all exceeded the cut-off level of 0.65 set for basic research (Bagozzi, 1994, p. 96).

Table I: Reliability Analysis

Constructs	N of Items	Mean	SD	Reliability %
Perceived Responsiveness (PR)	3	4.094	0.786	**90.2**
Perceived Currency (PC)	3	4.218	0.771	**90.1**
Perceived Accuracy (PA)	3	4.290	0.822	**91.4**
Perceived Security (PS)	3	4.027	0.864	**93.4**
Perceived Trust (PT)	4	4.120	0.785	**93.6**
Perceived Risk (PRK)	3	2.113	0.961	**92.6**
M-Government Ease of Use (MGEOU)	4	3.888	0.846	**95.4**
M-Government Ease of Usefulness (MGU)	4	4.171	0.822	**95.8**
Attitude Towards M-Government Use (AMGU)	3	4.217	0.879	**96.7**
Behavioral Intention to use M-Government (BIMG)	3	4.115	0.831	**96.1**

Next, an exploratory factor analysis was conducted (see Table II) using all the items (with varimax rotation) to check the unidimensionality of the underlying factor structure. Elements which did not meet the following two conditions were deleted: they had to have (1) dominant loadings greater than 0.5, and (2) cross-loadings less than 0.50 (Hair et al., 2006). Using an eigenvalue of 1.0 as the cut-off point, ten constructs were extracted (explaining more than 88.71% of the extracted variance).

Table II: Appendix. Scale items, factor loadings, and sources

Construct/Items	Factor Loading	Source
Perceived Responsiveness (PR): ***[variance extracted: 3.83%] 7***		
M-Government applications is carried out in a reasonable time.	.827	Adopted from Aloudat et al. (2014).
If I used M-Government applications, I would always expect a prompt response.	.840	
Overall, M-Government applications should offer information in a timely manner.	.800	
Perceived Currency (PC): ***[variance extracted: 3.47%] 8***		
M-Government applications provide up-to-the-minute information.	.778	Adopted from Aloudat et al. (2014).
I would be concerned if the information provided to me by M-Government applications was not up-to-date.	.846	
M-Government applications always have the latest information in order to be reliable	.813	
Perceived Accuracy (PA)*: [variance extracted: 3.27%] 9*		
The information delivered to me through M-Government applications is always accurate.	.811	Adopted from Aloudat et al. (2014).
It is unacceptable to get inaccurate information when using M-Government applications.	.803	
Overall, M-Government applications are reliable to be used only when they are accurate.	.756	
Perceived Security (PS): ***[variance extracted: 4.38%] 6***		
I trust the ability of M-Government applications to protect my privacy.	.813	Adopted from Almarashdeh and Alsmadi (2017).
Using M-Government applications is financially secured.	.846	
I am not worried about the security of M-Government applications.	.827	
Perceived Trust (PT): ***[variance extracted: 6.84%] 3***		
I believe the information offered by the M-Government applications is genuine.	.769	Adopted from Phua et al. (2017).
I think M-Government applications are trusted applications.	.803	
I can rely on M-Government applications for the information about different services.	.790	
M-Government applications serves the best interests of its users.	.776	
Perceived Risk (PRK): ***[variance extracted: 4.88%] 5***		
There is a considerable risk involved in using M-Government applications.	.917	Adopted from Phua et al. (2017) and Ruan & Durresi (2016).
My decision to use M-Government applications would be risky.	.933	
There is too much uncertainty associated with using M-Government applications.	.888	
M-Government Ease of Use (MGEOU): ***[variance extracted: 42.80%] 1***		
Learning how to use M-Government applications would be easy for me.	.863	Adopted from Davis (1989) and Agarwal and Prasad (1999).
I found M-Government services easy to use.	.880	
M-Government applications are clear and understandable.	.884	
I find it easy to get M-Government applications to do what I want them to do.	.845	
M-Government Ease of Usefulness (MGU): ***[variance extracted: 9.57%] 2***		
Using M-Government applications helps me to accomplish things more quickly.	.780	Adopted from Davis (1989) and Agarwal and Prasad (1999).
Using M-Government applications makes my life easier.	.811	
I find M-Government applications useful to my life.	.813	
Using the M-Government applications would increase my productivity.	.791	
Attitude Towards M-Government Use (ATMG): ***[variance extracted: 6.05%] 4***		Adopted from Agarwal and Prasad, (1999), Bhattacherjee (2000), Taylor and Todd (1995) and Van der Heijden et al. (2004).
I like the idea of using M-Government applications instead of visiting the government entity.	.884	
I consider using M-Government applications for getting the governmental services is good idea.	.893	
In general, the idea of using M-Government applications might be beneficial to my family and me.	.882	
Behavioral Intention to use M-Government (BI): ***[variance extracted: 1.01%] 10***		Adopted from Bhattacherjee (2000), Junglas and Spitzmuller (2005) and Taylor and Todd (1995).
I intend to use M-Government applications to do my work.	.805	
I intend to use M-Government applications frequently.	.781	
Given the opportunity, I will use M-Government applications.	.794	

5.2 Measurement-Model Testing

Finally, to achieve strong convergent and discriminant validity, this research used confirmatory factor analysis to examine the ten measures. Convergent validity explains how the items of a

certain variable congregate or share a high percentage of variance (Hair, Black, Babin Ralph & Ronald, 2006). As the average variance extracted (AVE) for the different measures was more than 0.50, convergent validity was met. The convergent validity analysis results are presented in Table III. Convergent validity for all measures was accepted. As suggested by Fornell and Larcker (1981), Table II displays that the variances extracted by variable (AVE) were higher than any squared correlation among the variables; which means that the measures were practically different (Fornell and Larcker, 1981).

Table III: Measurement Model Results: Confirmatory Factor Analysis

	Correlations									
	PR	**PC**	**PA**	**PS**	**PT**	**PRK**	**MGEOU**	**MGU**	**AMGU**	**BIMG**
PR	**.869**									
PC	.284**	**.867**								
PA	.274**	.318**	**0.882**							
PS	.164**	.202**	.250**	**0.909**						
PT	.206**	.201**	.351**	.386**	**0.883**					
PRK	.047**	.042**	.085**	.051**	.082**	**0.898**				
MGEOU	.114**	.087**	.076**	.135**	.184**	.013*	**0.916**			
MGU	.195**	.195**	.196**	.235**	.303**	.071**	.310**	**0.922**		
AMGU	.123**	.123**	.131**	.109**	.151**	.027**	.209**	.256**	**0.952**	
BIMG	.219**	.196**	.219**	.205**	.290**	.050**	.287**	.412**	.262**	**0.945**
Coefficient Alpha	.902	.901	.914	.934	.936	.926	.954	.958	.967	.961

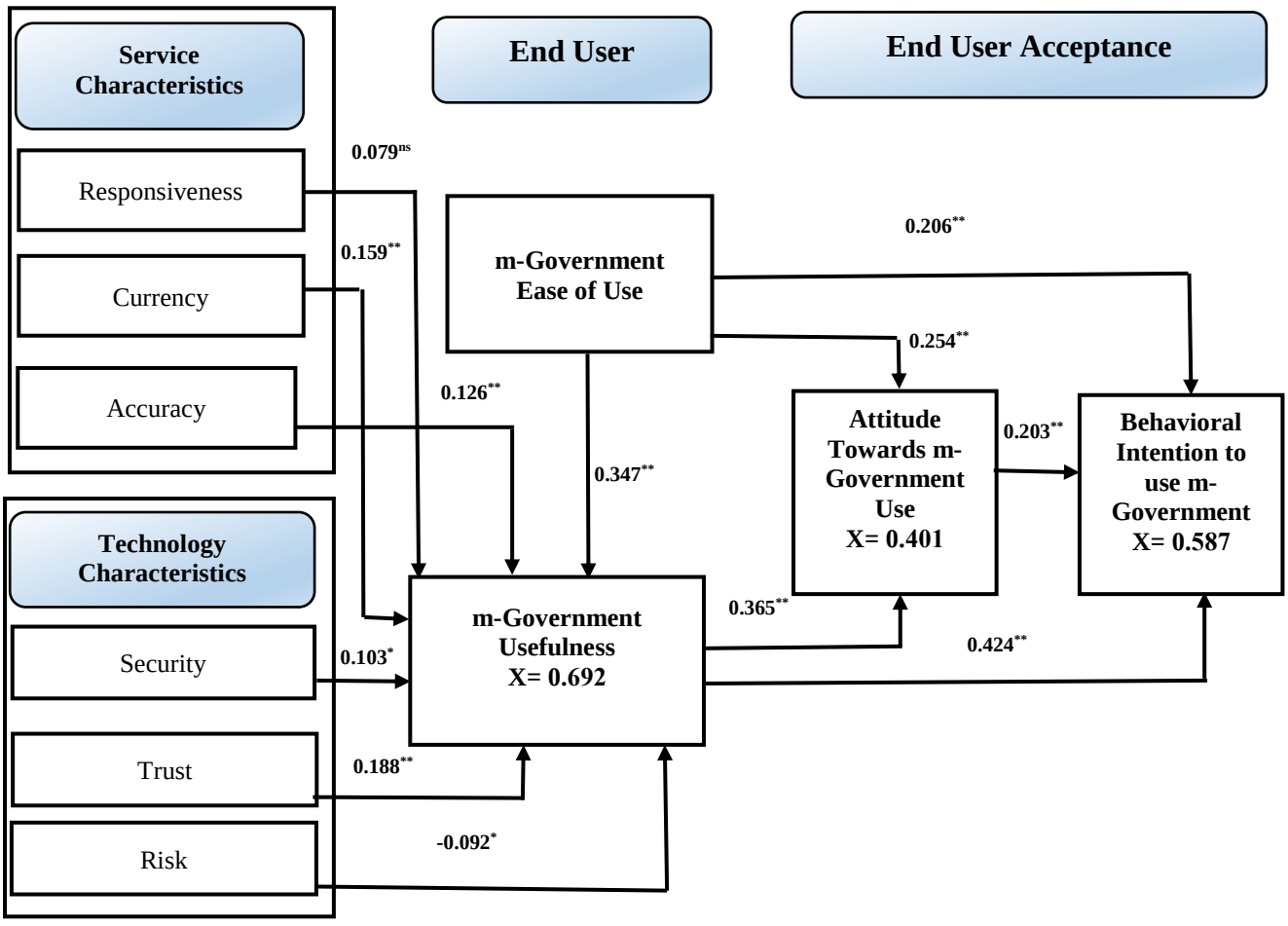
** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
The diagonals represent the **AVE** and the lower cells represent the squared correlations among the measures.

5.3 Structural-Model Testing

As mentioned before, testing the hypotheses or the structure model evaluation considered the second step in order to assess our proposed model after the measurement model assessment. Factor scores have been used to represent single item indicators to each construct within the model. This research follows the guidelines suggested by Joreskog and Sorbom (1982), in that such a path analysis was performed implementing the maximum likelihood estimates (MLE)

method. Table IV presents a more detailed analysis of the analysis results and measure for model fit is presented in Table IV.

Before testing the hypotheses, different non-normal distributions tests have been used to check the normality of the constructs (Bagozzi & Yi, 1988). Skewness, kurtosis and mahalanobis distance statistics of the final measures were checked (Bagozzi & Yi, 1988). No deviation from normality has been reported for any measure. All the constructs were normally distributed with little deviations from normality that were well within acceptable ranges. Next, we progressed to use the MLE method to establish the model. Figure 2 illustrates the path diagram for the causal model.



** Significant at 0.05, **Significant at 0.011, ns not significant and * Squared Multiple Correlation*

Figure 2: Tested Model

The current study model explains 69.2% for attitude towards m-Government Usefulness, 40.1 % for attitude towards m-Government use and 58.7 % for the behavioral intention to use m-Government which indicates that it has a stronger prediction capacity. The results of testing hypotheses from H1 to H12 using MLE-SEM approach were illustrated in figure 2. Since there is no definitive standard of fit, different indicators were utilized. The Chi-square test was not statistically significant, which reflected a good fit. The other fit indicators, along with the squared multiple correlations, reflect a good overall fit with the data (GFI = .974, AGFI = .882, CFI = .974, NFI = .965, RMSEA = .072). As these indicators are acceptable, it was decided that the structural model was an appropriate tool for hypothesis testing.

Table IV: Standardized Regression Weights

Predictor variables	**Criterion Variables**	**Hypothesized relationship**	**Standardized coefficient**	**R^{2a}**
Attitude m- GOVT	BI to use m- GOVT	H1	0.203^{**}	
Ease of Use	BI to use m- GOVT	H2	0.206^{**}	0.587
Usefulness	BI to use m- GOVT	H3	0.424^{**}	
Ease of Use	Attitude m- GOVT	H4	0.254^{**}	0.401
Usefulness	Attitude m- GOVT	H5	0.365^{**}	
Ease of Use	m- GOVT Usefulness	H6	0.347^{**}	
Responsiveness	m- GOVT Usefulness	H7	0.079^{ns}	
Currency	m- GOVT Usefulness	H8	0.159^{**}	
Accuracy	m- GOVT Usefulness	H9	0.126^{**}	0.692
Security	m- GOVT Usefulness	H10	0.103^{*}	
Trust	m- GOVT Usefulness	H11	0.188^{**}	
Risk	m- GOVT Usefulness	H12	-0.092^{*}	
Statistic			**Suggested**	**Obtained**
Chi-Square Significance			≥0.05	0.416
GFI			≥0.90	0.974
AGFI			≥0.80	0.882
CFI			≥0.90	0.974
RMSEA			≤0.08	0.072

** Significant at 0.05, **Significant at 0.011, ns not significant and ᵃ Squared Multiple Correlation*

Undoubtedly, all proposed hypotheses were supported in our study except H7 and H9 (Table III). Attitude towards m-Government use positively influence the behavioral intention to use m-Government (β=0.203, $p<0.001$), which supported **H1**. M-Government ease of use has a positive effect on the behavioral intention to use m-Government (β=0.206, $p<0.001$), which supported **H2**. M-Government usefulness of use has a positive effect on the behavioral intention to use m-Government (β=0.424, $p<0.001$), which supported **H3**. Attitude towards m-Government use is influenced by m-Government ease of use and m-Government, usefulness (β = 0.254, 0.365, $p< 0.001$), respectively, which supports H4 and H6. Finally, m-Government, usefulness is influenced by m-Government ease of use, currency, security, trust and risk (β = 0.347, 0.159, 0.126, 0.103, 0.188, -0.092, $p<0.05$, 0.001), respectively, which supports **H6** and **H8**, **H9**, **H10**, **H11** and **H12**. However, hypothesis **H7** was not supported as responsiveness was not found to have significant influence on m-Government, usefulness (β = 0.079, p = 0.120).

Discussion and Implications

Using SEM technique, the current study attempts to investigate the determinants of users' intentions to use m-Government in the UAE context. Overall, the findings of the current study provide support for the proposed model of users' intention to use m-Government applications. As expected, attitude towards m-Government use, m-Government ease of use, and m-Government usefulness are found to be determinants of users' intention to use m-Government applications in the UAE. These results are compatible with Almarashdeh (2016), Almarashdeh and Alsmadi (2017), Shareef et al. (2016) and Wang (2014) who found that attitude towards m-Government use, m-Government ease of use, and m-Government usefulness positively affect users' intention to use m-Government applications. In other words, user's intention to

use m-Government applications is influenced by his/her attitude towards m-Government applications, m-Government ease of use, and m-Government usefulness.

The results from the path analysis show that among all independent variables, the perceived usefulness of m-Government applications was the key driver behind the user intention to utilize the m-Government services as m-Government usefulness has the strongest effect on citizen's intention to use mobile government services ($\beta = 0.424$). It also affects the attitude towards m-Government with regression value of 0.365. Those results give the m-government factor the first priority among the factors that might affect user intention to use m-Government. The second priority is given to perceived ease of use of m-Government, which affects user intention significantly in regression value of 0.206. Finally, attitude towards m-Government also affect user intention to use m-Government significantly in regression value of 0.203.

According to the results, m-Government usefulness has a significant influence on user attitudes towards m-Government ($\beta = 0.365$). similarly, the results confirmed that m-Government ease of use has significant effect on user attitudes towards m-Governments ($\beta = 0.254$) which is supporting TAM's results in previous researches. These results are consistent with previous TAM studies (AlAwadhi and Morris, 2009, Alzahrani and Goodwin, 2012, Davis et al., 1989, Wang, 2014). However, these results are contradicting Liu et al. (2014) recommendation that Technology Acceptance Model and specially perceived usefulness should be used with caution to explain the user acceptance of m-Government.

Our findings suggest that the antecedents of m-Government perceived usefulness were: perceived ease of use of the service, currency of the services, accuracy of the provided information, the security concerns associated with the utilization of the services, trust in the m-Government services and the risks perceived in using the service. These factors were collectively successful in explaining more than 69.2% of the usefulness variance of the m-Government services. The findings are consistent with the results of Almarashdeh et al. (2017), Aloudat et al. (2014) and Wang (2014) regarding the significant and positive effect of perceived ease of use, currency of the services, accuracy of the provided information, trust in the m-Government services, risks perceived in utilizing the m-Government service on customers' intention to use the m-Government services. Therefore, governments who wish to implement m-Government should focus on M-government system, promote accuracy, currency, usefulness, security, trust and risk. Governments also should improve M-government service to increasing perceived usefulness of m-Government according to users' suggestions. However, the findings support Aloudat et al. (2014) findings and demonstrate the insignificant role of the responsiveness feature of m-Government services in affecting the user perception of the usefulness of the m-Government services. This might be because m-Government services are automated services that is delivered based on automated procedures.

Furthermore, the results from the path analysis show that among all independent variables, the perceived ease of use of m-Government applications was the key driver behind the user perception of the m-Government usefulness as m-Government ease of use has the strongest effect on citizen's perceived usefulness of m-Government services ($\beta = 0.347$). The findings did verify the strong impact of m-Government perceived ease of use on the m-Government perceived usefulness, which provides a strong indication that users would perceive the m-Government services to be more useful if they were easier to use. Furthermore, the strong

explanation of the m-Government services usefulness variance, standing at 69.2%, gives reasonable explanations of the factors that can be highlighted if there is ever an urgent need by governments to improve people perception of the usefulness of m-Government services.

Conclusion, Limitations and Directions for Future Research

The main contribution of this research is that it presents an extensive model of the antecedents and consequences of m-Government implementation. This conclusion is based on the grounds that all of the 11 hypotheses in our model were supported. Overall, the research findings indicate that: (a) users' intention to use m-Government applications has three determinants – attitude towards m-Government use, m-Government ease of use, and m-Government usefulness; (b) m-Government usefulness and ease of use have significant influence on user attitudes towards m-Government; and (c) perceived ease of use of the service, currency of the services, accuracy of the provided information, the security concerns associated with the utilization of the m-Government services, trust in the m-Government services and the risks perceived in using the m-Government service are antecedents of users' perceptions of the m-Government services.

As with any research, there are some limitations that should be mentioned. First, this study has been conducted exclusively in the UAE. Therefore, the generalizability of our findings could be limited by the UAE context environment. An important future research direction is to study the suggested M-government model in other populations.

Second, we assessed the quality of m-Government services using only two dimensions; the service characteristics and the technology characteristics. The service characteristics have been assessed using three attributes; responsiveness, accuracy and currency. A more construct and

measurement of the service characteristics would be required to discover other important elements of the service characteristics such as cost of service (Almarashdeh, et al., 2017) and personal control (Chen et al., 2016). Similarly, a more construct and measurement of the technology characteristics would be required to discover other important elements of the technology characteristics such as compatibility (Agag and El-Masry (2016) visibility (Aloudat et al., 2014). Therefore, future research should investigate these elements. Finally, this study targeted only hotel guests in its investigations. Future research is encouraged to target also other tourism and hospitality sectors to strengthen the generalizability of the research findings. Finally, since this research is limited to the behavioral intention to use m-Government, we believe that measuring the effect of suggested factors in the user actual use of m-Government services will bring great result for the future research.

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