Chapter 13
Evaluating the Current Situation of Mobile Services (M-Services) in the Kingdom of Saudi Arabia

Abdullah Mohammed Baabdullah, Ali Abdallah Alalwan, and Naim Salameh Al Qadi

Abstract The main aim of this study is to provide further understanding about the adoption of mobile services (mobile Internet and mobile government) over the context of Saudi Arabia. Through a careful evaluation of the current situation of mobile services in Saudi Arabia, researchers have noticed that the lower adoption of these services is the main barrier that could prevent citizens and service providers the full utilisation of these applications. It was also noticed that the related issues of mobile services have been rarely examined in Saudi Arabia as well as there is a necessity to select a theoretical foundation suitable for the perspective of Saudi customers. Therefore, the unified theory of acceptance and use of technology (UTAUT2) was adopted to propose the conceptual model of the current study. This is expanded by considering trust and awareness alongside UTAUT2 factors. Further, it was proposed that a survey questionnaire could be more appropriate to test the conceptual model and verify the research hypotheses. The main limitations and future research directions are discussed further in the last section of this study.

Keywords Mobile services · Mobile Internet · Mobile government · Saudi Arabia · UTAUT2

A. M. Baabdullah (✉)
Department of Management Information Systems, Faculty of Economics and Administration, King Abdulaziz University, Jeddah, Saudi Arabia
e-mail: baabdullah@kau.edu.sa

A. A. Alalwan · N. S. Al Qadi
Amman University College for Financial & Administrative Sciences, Al-Balqa′ Applied University, Salt, Jordan
e-mail: alwan.a.a.ali@gmail.com; dr.naem@bau.edu.jo

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13.1 Introduction

Several countries worldwide are increasingly keen to utilise the technological revolution in the communication and mobile field to improve their quality of life for their own people. Indeed, mobile and telecommunication is one of the most valuable sectors for any country. For instance, in the Kingdom of Saudi Arabia (KSA), the largest share of investment and spending in the area of information and communication technology (ICT) is for the communication sector (80%). This means that there are a lot of opportunities in the KSA that are also available to expand the scope of mobile services (M-Services) provided to the Saudi citizens. Nevertheless, the adoption rate of the mobile Internet (M-Internet) by Saudi citizens is very low (less than 10%). This is in addition to the fact that such innovative services have never been used by about 8% of customers in the KSA. Accurately, the adoption rate of these services goes to the lowest level in the southern side of the KSA and for the age group of 55 years and more. According to a report published by the Communications and Information Technology Commission CITC (2007), M-Internet services are realised by more than half of Saudi users as substitute services for traditional platforms (i.e. landline phone and computers) of communication. The same situation of M-Internet services could also be noticed regarding Saudi private sector where the adoption rate of these services does not go more than 8%. As for the public sector, the Communications and Information Technology Commission CITC (2007) reported that only 5% of the public organisations have already adopted mobile government (M-Gov). Based on these statistics for the current situation of M-Services for either individuals or business customers, it could be concluded that the adoption of these services does not reach what has been planned and expected (Abanumy & Mayhew, 2005; Alhussain, Drew, & Von Hellens, 2010; Al-Khalifa, 2011; Almutairi, 2011; Alsenaidy & Ahmad, 2012; Baabdullah, Alalwan, Rana, Dwivedi, & Weerakkody, 2017). Accordingly, a lot of research and practical efforts are requested to accelerate the current understanding about the main reasons hindering or motivating the acceptance of such innovative services in the KSA among all kinds of users. Therefore, this study was motivated to analyse the current situation of two kinds of M-Services (M-Internet and M-Gov) as well as to identify the main factors that could shape the Saudi citizens' intention to adopt such services.

In fact, an understanding of the main reasons behind the customers' intention and adoption of M-Services will definitely help to move those potential adopters to be actual users of these services. Thus, the main concertation of this paper is to discover and identify the most important factor that could have an impact on the behavioural intention to adopt M-Services by Saudi citizens. The fundamental challenge to let M-Services get success in the KSA is to know how M-Services' providers and the Saudi government can effectively introduce such innovative applications in an attractive manner as well as motivate Saudi citizens to adopt such applications as more useful and productive channels in comparison with traditional human encounter (Alsenaidy & Ahmad, 2012). This, in turn, encourages a good number of

researchers to examine and figure out the key factor that could play a critical role in hindering or motivating individuals' inclination to accept and adopt M-Services (see Abanumy & Mayhew, 2005; Alhussain et al., 2010; Al-Khalifa, 2011; Almutairi, 2011; Alsenaidy & Ahmad, 2012; Alwahaishi & Snášel, 2013a, 2013b; Analysys Mason, 2012; Venkatesh, Morris, Davis, & Davis, 2003; Weidong, Keyi, Linlin, & Likun, 2009).

In spite of the fact that these studies' efforts expand the current understanding about the adoption of M-Services, there is always a need to build a comprehensive conceptual model covering the main personal, perceptual, environmental and psychological dimensions from the perspective of citizens in the KSA. For the aim of this study, the new model of Venkatesh, Thong, and Xu (2012), the unified theory of acceptance and use of technology (UTAUT2), was adopted as a theoretical foundation of the current study model. In detail, the Saudi citizens' intention to adopt M-Internet and M-Gov is supposed to be predicted by performance expectancy (PE), effort expectancy (EE), social influence (SI), facilitating conditions (FC), perceived value (PV) and hedonic motivation (HM). This is in addition to two other factors – trust (TR) and awareness (AWA) – which are proposed to have a direct impact on the behavioural intention as well.

13.2 The Current State of Literature of M-Internet and M-Gov in the Saudi Arabian Context

As discussed in the prior section, the related issues of M-Internet have attracted a considerable interest for researchers and practitioners. This interest could be a return to the developments and expansions in the mobile and telecommunication industry in the KSA especially over the commercial and financial market (STC Group, 2011). As the customers' intention is the main challenge for moving potential adopters to be actual users of the M-Internet, there is a need to discover and identify the main factors that could have an influence on customers' intention and, accordingly, understand how the actual adoption of these services could be enhanced. Therefore, there are several researchers worldwide who have examined the related issues of adoption of the M-Internet services such as Das (2011), Hailin (2010), Hong, Thong, and Tam (2006), Hsu, Lu, and Hsu (2007), Venkatesh et al. (2003) and Weidong et al. (2009). However, over the Saudi context, there are quite a few researchers who have paid attention to examining the adoption of M-Internet services (see Alwahaishi & Snášel, 2013a, 2013b; Baabdullah, Nasseef, & Alalwan, 2016). From this perspective, current research aspires to expand the current understanding about the main factors that could predict the citizens' intention in the KSA as well as add a theoretical contribution to the existing literature in the KSA.

In their endeavours to explore factors that could predict Saudi citizens' adoption of the M-Internet, Alwahaishi and Snášel (2013a) expanded the UTAUT by considering the role of perceived value, attention focus and playfulness. Their empirical

results supported the statistical impact of performance expectancy, facilitating conditions, social influences and perceived playfulness on the Saudi citizens' intention to adopt M-Internet services. In a different study, Alwahaishi and Snášel (2013b) were also able to prove that customers' inclination to use the M-Internet is significantly predicted by the impact performance expectancy and perceived playfulness. Earlier in 2005, Abanumy and Mayhew examined the acceptance of M-Gov. Abanumy and Mayhew (2005) indicated that the level of adoption of M-Gov is not as expected and this lowest level could be attributed to the lower level of adoption of overall E-Gov services. Accordingly, Abanumy and Mayhew (2005) claimed this situation to the fact that the Saudi government has not spent sufficient efforts to motivate Saudi citizens to adopt such innovative services.

In his study, Al-Khalifa (2011) asserted the importance of examining Saudi citizens' intention towards kinds of mobile phones and which new or traditional applications are available over these phones as well. By the same token, Al-Solbi and Mayhew (2005) focused on how technology readiness either in the public or private context could influence on the success of M-Gov applications in the KSA. One of the main outcomes reached by Al-Solbi and Mayhew (2005) is the importance of having a well-planned strategy by the Saudi government to firstly accelerate the level of technology readiness at the level of governmental organisations and secondly work hard to learn and educate people about the existing and importance of such innovative services in their daily life. Similarly, Alhussain and Drew (2010) empirically approved that customers in the KSA are more likely to be interested in using M-Gov services if they perceived that such services were well secured and protecting their privacy. Alhussain and Drew (2010) also concluded that the adoption of M-Gov is most likely to reach the highest level among those customers who have a higher willingness to use these emerging services. Alsenaidy and Ahmad (2012) presented a number of benefits that could be utilised from both perspectives: service providers (i.e. productivity, effectiveness, less paper work, cost reduction, feasibility) and customers (i.e. public information, quick and accurate service delivery, accessibility). Despite these benefits, customers in the KSA are still hesitating to actually adopt the M-Gov services. This is attributed by Alhussain and Drew (2010) and Alsenaidy and Ahmad (2012) to the fact that Saudi customers are not fully aware of these services positively; there is also distrust in using these services. Other obstacles of adoption of M-Gov in the KSA were mentioned by Almutairi (2011) such as M-authentication, M-payment, location-aware applications and the content display management. Later, Ahmad, Ansari, Akhtar, and Parveen (2014) attributed the lower level of customers' knowledge and awareness of M-Gov to the fact that these services are not commonly used and adopted by people in the KSA. Among the main reasons behind this level of adoption of M-Gov are the levels of perceived risk as well as that the main technical and informational facilities are not adequately available in the KSA (see Ahmad et al., 2014). One of the main solutions suggested to enhance the adoption of these services is biometric technology to decrease the level of customer risk as well as provide more secured and trustworthy services (see Alhussain et al., 2010; Alhussain & Drew, 2012; Baabdullah, Dwivedi, & Williams, 2015a, 2015b).

All things considered, it seems that the main challenge of success for such innovative services is not only related to introducing and implementing these services but also the extent of how much citizens in the KSA could be converted to be actual users. This is especially in the light of the fact that these services have recently been implemented in the KSA, and accordingly, the related issues of M-Internet and M-Gov have not been adequately examined and well covered in the KSA.

13.3 Research Gap

In fact, the related issues of the M-Internet and M-Gov have received less attention by researchers in the KSA (see Table 13.1). Practically, different research methods have been adopted by researchers to test the adoption of M-Internet and M-Gov. As M-Internet and M-Gov represent new issues to be discovered in the KSA, there are very few studies examining these applications. Thus, some researchers have employed the qualitative approach to discover the related issues of M-Internet and M-Gov in the KSA (see Table 13.1). To put it differently, theory building has been the main standpoint for these qualitative studies because of the absence of a solid theoretical foundation in the KSA for the adoption of M-Internet and M-Gov. On the other hand, quite a few studies have adopted the quantitative approach and theory testing standpoint. Noticeably, students were the main source of the empirical data for these quantitative studies. This, in turn, reflects negatively on the generalisability of these studies' results for other categories of people in the KSA.

Based on critical reviewing of the most studies in the KSA, it could be noticed that well-known models and theories (i.e. theory of reasoned action (TRA), theory of planned behaviour (TPB), innovation diffusion theory (IDT), motivational model (MM) or technology acceptance model (TAM)) have not been adopted or integrated to examine the related issues of M-Internet and M-Gov issues. Accordingly, one of the main challenges for the current study is to select a theoretical base covering the most important aspects from the Saudi citizens' perspective and provide a more accurate view regarding the adoption of such innovative systems in the KSA.

As such, this study recognises a need to propose a solid conceptual model based on a well-established theoretical foundation. This is in addition to the fact that there is a necessity to explore the related issues of M-Internet and M-Gov adoption based on a theoretical foundation focusing on the customers' perspective rather than an organisational perspective which has never happened prior to these studies being conducted in the KSA. Therefore, as the UTAUT2 proposed by Venkatesh et al. (2012) is fully focused on customer context, the decision was to select UTAUT2 as a theoretical base for the current study model. Also, to override the generalisability concern existing in the prior study over the KSA, this study in its proposed research methodology indicates that all categories of people will be presented and targeted in the current study sample.

Table 13.1 Examples of M-Internet/M-Gov studies within the context of Saudi Arabia

Technology	Study	Citation	Methodology, key findings, contributions, limitations and future research recommendations
M-Internet	M-Internet Diffusion	Alwahaishi and Snášel (2013c)	Quantitative and qualitative studies have been followed. The findings constitute a starting point for theoretical framework to identify the factors affecting the acceptance and use of mobile in a consumer context. Nevertheless, future research is demanded in order to increase the amount of collected data in order to establish robust theoretical framework
	M-Internet Acceptance/Use	Alwahaishi and Snášel (2013a)	
	M-internet adoption	Alwahaishi and Snášel (2013b)	
M-Gov	Adoption of Biometrics in M-Gov Applications	Alhussain and Drew (2012)	In these studies, a qualitative research with secondary data resources has been followed. The papers reviewed the M-Gov implementation in the KSA. There is a need for gradual transition from E-Gov to M-Gov services. Generally speaking, they did not investigate the factors that can have an effect on the implementation of M-Gov
	M-Gov Security	Alhussain et al. (2010)	
	M-Gov Websites	Al-Khalifa (2011)	
	A review of current state M-Gov	Ahmad et al. (2014); Alsenaidy and Ahmad (2012)	
	Challenges and Key Success Factors in M-Gov	Almutairi (2011)	

13.4 Conceptual Model

As discussed before, the selection of UTAUT2 was based on the fact that this model was especially proposed by Venkatesh et al. (2012) to address the innovation adoption from the customers' perspective. Besides that, the original model of Venkatesh et al. (2012) has been tested and supported by several researchers (i.e. Alalwan, Dwivedi, & Rana, 2017; Alalwan, Dwivedi, Rana, & Williams, 2016; Alalwan, Dwivedi, & Williams, 2016; Alwahaishi & Snášel, 2013c; Wang & Wang, 2010; Yfantis, Vassilopoulou, Pateli, & Usoro, 2013) in the context of M-Services. Thus, the main factors of UTAUT2 [PE, EE, SI, HM, PV, FC) are formulated as key predictors of the Saudi customers' intention to adopt M-Internet and M-Gov services (see Fig. 13.1). As the targeted respondents of the current study are potential users who have not yet used or adopted M-Internet and M-Gov, habit was dropped from the conceptual model of the current study.

Due to the fact that UTAUT2 does not cover all the dimensions that could have an impact on the customers' intention as stated by Alalwan et al. (2017), Alalwan, Dwivedi, Rana, Lal, and Williams (2015), Alalwan, Dwivedi, Rana, and Williams (2016), Alalwan, Dwivedi, and Williams (2016), Alalwan, Dwivedi, Rana, and Williams (2016), there was a need to expand the theoretical horizon of UTAUT2 by considering other constructs. This was highly recommended by Venkatesh et al.

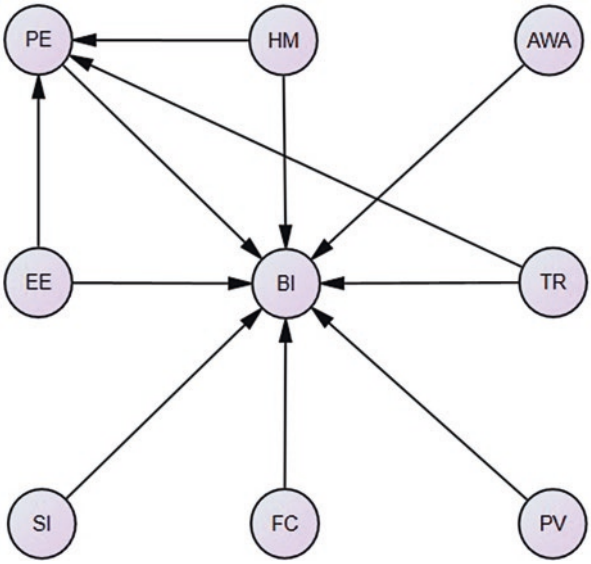

Fig. 13.1 Proposed research model (Adapted from: Gefen, Karahanna, & Straub, 2003; Venkatesh et al., 2012).

(2012) who assured the importance of expanding the UTAUT2 theoretically by considering different factors and practically by applying UTAUT2 in different countries and context and for different applications as well. Indeed, a closer scrutiny of the prior literature of M-Services leads to discovering two main factors; they are trust (TR) and awareness (AWA) as key predictors of the customers' intention over this area (i.e. Almutairi, 2011; Alsenaidy & Ahmad, 2012; Chong, Ooi, Lin, & Bao, 2012; Pedersen, 2005; Shareef, Kumar, Kumar, & Dwivedi, 2011; Shi, Wu, Zhou, & Chen, 2009; Zhang, Huang, & Chen, 2010), and therefore, both were considered over the conceptual model. Furthermore, as seen in Fig. 13.1, it was added as a new causal relationship among the UTAUT constructs. Therefore, PE was supposed to be predicted by three factors: EE as suggested by Davis, Bagozzi, and Warshaw (1989), TR as suggested by Gefen et al. (2003) and HM as recommended by Van der Heijden (2004).

13.5 The Proposed Research Methodology

It was mentioned above that the conceptual model of the current study was built and based on a strong theoretical foundation (UTAUT2), and accordingly, the nature of this study seems to be more theory testing rather than theory building (Bhattacherjee, 2012). According to Orlikowski and Baroudi (1991) and Straub, Boudreau, and Gefen (2004), this is in addition to the fact that the area of information system and technology acceptance is well-established and a lot of models and theories have been

validated and tested. Hence, the positivist paradigm is more applicable to the current study (Bhattacherjee, 2012). Validating such a conceptual model and testing its hypotheses require more statistical evidences based on a large amount of quantitative data that should be collected for both M-Internet and M-Gov. In this instance, a survey was found to be a more suitable research method to collect such data from a large number of Saudi citizens in many geographical areas in the KSA (Bhattacherjee, 2012; Remenyi, Williams, Money, & Swartz, 1998). To obtain the required data, a self-administered questionnaire will be developed based on item measurements that will be selected from a well-established scale. Then, the collected data will be processed and saved to be empirically examined using two stages of the structural equation modelling (SEM) analysis. At the first stage, the measurement model (confirmatory factor analysis (CFA)) will be undertaken to test the model fitness as well as the construct reliability and validity. The predictive validity of the conceptual model and the main research hypotheses will be tested and verified over the second stage.

13.6 Potential Contribution

There is a considerable amount of theoretical contribution that could hopefully be captured by the current study. First of all, this study addresses the problem which has rarely been tested over the Saudi context. Accordingly, this will make a contribution to the current understanding for the related issues of M-Services over this emerging country. Further, this study will be a foundation for future empirical studies that will be undertaken in the KSA by extracting very critical factors from a very well-known theory (UTAUT2) and other M-Internet and M-Gov literature. By doing so, this study was also able expand the validity of UTAUT to a new emerging context (the KSA) as well as to test the Saudi citizens' intention to adopt new applications (M-Internet and M-Gov). Likewise, adding both trust and awareness in the conceptual model expands the theoretical scope of UTAUT2. This was largely suggested and recommended by Venkatesh et al. (2012). By the same token, other relationships were added over the conceptual model as well. For instance, the important role of intrinsic utilities (hedonic motivation) on performance expectancy will add a deep view on how customers could perceive such new systems as more useful and productive in their daily life. Also, according to Gefen et al. (2003), it will be an important contribution for the current study to see how the aspects of trust could shape the perception of Saudi citizens towards these innovative services.

13.7 Limitations and Future Research

Indeed, this study seems to be a more theoretical and conceptual attempt to understand how Saudi citizens could react and perceive M-Services. However, it does not provide empirical evidence about the main factors that could actually influence the

Saudi citizens' intention and adoption. Thus, it is important to empirically examine the proposition introduced in the current study by collecting empirical data from customers who are interested in such services in the KSA. Even though adding both trust and awareness could expand the theoretical horizon of the UTAUT2, it would be appropriate to conduct a construct relationships' analysis and mapping to identify other relevant factors for examining M-Services adoption. For example, some recent studies (Alenezi, Tarhini, Masa'deh, Alalwan, & Al-Qirim, 2017; Dwivedi et al., 2017; Dwivedi, Rana, Jeyaraj, Clement, & Williams, 2017; Rana, Dwivedi, Lal, Williams, & Clement, 2017; Rana, Dwivedi, Williams, & Weerakkody, 2016) have highlighted the need of reintroducing and examining the role of attitude in UTAUT and UTAUT2, which may also be appropriate for examining M-Services in Saudi Arabia. Likewise, Kapoor, Dwivedi, and Williams (2014a, 2014b, 2014c, 2014d, 2015a, 2015b) has highlighted the role of a number of innovation attributes for explaining consumer intention and adoption of mobile-based innovations in a developing country context, which may also be appropriate for explaining the adoption of a mobile-based innovation in Saudi Arabia. This could be the focus of attention by future researchers to consider. The current study model just presents the main causal paths between independent and dependent factors without any justification or explanations. Accordingly, future work should discuss these hypotheses more by providing more logical and theoretical justifications for each causal path.

References

Abanumy, A., & Mayhew, P. (2005). M-government implications for e-government in developing countries: The case of Saudi Arabia. *EURO mGOV, 2005*, 1–6.

Ahmad, T., Ansari, A. A., Akhtar, A., & Parveen, S. (2014). Current review of ICT and m-government services in Saudi Arabia. *International Journal of Computer and Engineering Applications*, *7*(2):71–77.

Alalwan, A. A., Dwivedi, Y. K., & Rana, N. P. (2017). Factors influencing adoption of mobile banking by Jordanian bank customers: Extending UTAUT2 with trust. *International Journal of Information Management, 37*(3), 99–110.

Alalwan, A. A., Dwivedi, Y. K., Rana, N. P., Lal, B., & Williams, M. D. (2015). Consumer adoption of internet banking in Jordan: Examining the role of hedonic motivation, habit, self-efficacy and trust. *Journal of Financial Services Marketing, 20*(2), 145–157.

Alalwan, A. A., Dwivedi, Y. K., Rana, N. P., & Williams, M. D. (2016). Consumer adoption of mobile banking in Jordan: Examining the role of usefulness, ease of use, perceived risk and self-efficacy. *Journal of Enterprise Information Management, 29*(1), 118–139.

Alalwan, A. A., Dwivedi, Y. K., & Williams, M. D. (2016). Customers' intention and adoption of telebanking in Jordan. *Information Systems Management, 33*(2), 154–178.

Alenezi, H., Tarhini, A., Masa'deh, R. E., Alalwan, A., & Al-Qirim, N. (2017). Factors affecting the adoption of e-government in Kuwait: A qualitative study. *Electronic Journal of e-Government, 15*(2), 84–102.

Alhussain, T. O. M., & Drew, S. (2010). Towards secure m-gov applications*:* A survey study in the Kingdom of Saudi Arabia. In *International conference on intelligent network and computing* (ICINC 2010). IEEE. 26th to 28th November 2010 Kuala Lumpur, Malaysia

Alhussain, T. O. M., & Drew, S. (2012). *Developing a theoretical framework for the adoption of biometrics in m-gov applications using grounded theory*. INTECH Open Access Publisher. London, UK

Alhussain, T. O. M., Drew, S., & Von Hellens, L. A. (2010). Qualitative study on implementing biometric technology in m-gov security: A grounded theory approach. *In 5th international conference on qualitative research in IT and IT in qualitative research* (*QuallT2010*). QUT, Griffith University and ANU. QualIT 2010 - Brisbane, QLD, Australia Duration: 29 Nov 2010 - 30 Nov 2010

Al-Khalifa, H. S. (2011). Development of m-gov websites: A functional design approach. In *Proceedings of the 13th international conference on information integration and web-based applications and services* (pp. 455–458). ACM. 5-7 December 2011 Ho Chi Minh City, Vietnam

Almutairi, M. S. (2011). M-gov: Challenges and key success factors. Saudi Arabia case study. In M. Almutairi & L. A. Mohammed (Eds.), *Cases on ICT utilization, practice and solutions: Tools for managing day-to-day issues* (pp. 78–96). Hershey, PA: IGI Global.

Alsenaidy, A., & Ahmad, T. (2012). *A review of current state m-Gov in Saudi Arabia*. Department of Biochemistry, King Saudi University. Hang Tuah Jaya, Melaka.

Al-Solbi, A., & Mayhew, P. J. (2005). *Measuring e-readiness assessment in Saudi organisations preliminary results from a survey study from e-government to m-government* (pp. 467–475). Brighton, UK: Mobile Government Consortium International LLC.

Alwahaishi, S., & Snášel, V. (2013a). Acceptance and use of information and communications technology: A UTAUT and flow-based theoretical model. *Journal of Technology Management and Innovation, 8*(2), 61–73.

Alwahaishi, S., & Snášel, V. (2013b). Factors influencing the consumers' adoption of mobile Internet. In *the third international conference on digital information and communication technology and its applications* (*DICTAP2013*) (pp. 31–39). The Society of Digital Information and Wireless Communication. 8th to 10th July 2013 OStrava, Czech Republic

Alwahaishi, S., & Snášel, V. (2013c). Modeling the determinants influencing the diffusion of mobile internet. *Journal of Physics: Conference Series, 423*(1), 012037. IOP Publishing.

Analysys Mason. (2012). Available on: http://www.gsma.com/spectrum/wp-content/uploads/2012/05/GSMA_ report_on_KSA_DD2_6GHz_2012-04-30.pdf. Accessed 10 Oct 2015.

Baabdullah, A. M., Alalwan, A. A., Rana, N. P., Dwivedi, Y., & Weerakkody, V. (2017). *Assessing consumers' intention to adopt mobile internet services in the Kingdom of Saudi Arabia*. Boston, MS: AMCIS.

Baabdullah, A. M., Dwivedi, Y. K., & Williams, M. D. (2015a). *Understanding the adoption of mobile internet in the Saudi Arabian context: Results from a descriptive analysis. Open and Big Data Management and Innovation* (pp. 95–106). Cham, Switzerland: Springer International Publishing.

Baabdullah, A. M., Dwivedi, Y. K., & Williams, M. D. (2015b). Towards examining factors influencing the adoption of mobile government (m-Gov) in Saudi Arabia. In *British Academy of management (BAM) conference proceedings, 08th–10th September 2014*. Portsmouth, UK: University of Portsmouth.

Baabdullah, A. M., Nasseef, O., & Alalwan, A. A. (2016). Consumer adoption of mobile government in the Kingdom of Saudi Arabia: The role of usefulness, ease of use, perceived risk and innovativeness. In *Conference on e-Business, e-Services and e-Society* (pp. 267–279). Cham, Switzerland: Springer International Publishing.

Bhattacherjee, A. (2012). *Social science research: Principles, methods, and practices* (2nd ed.). Tampa, FL: Anol Bhattacherjee.

Chong, A. Y. L., Ooi, K. B., Lin, B., & Bao, H. (2012). An empirical analysis of the determinants of 3G adoption in China. *Computers in Human Behavior, 28*(2), 360–369.

Communications and Information Technology Commission CITC. (2007). Available on: http://www.citc.gov.sa/ english/Pages/default.aspx. Accessed 19 Feb 2016.

Das, C. (2011). *A study on validity of modified technology acceptance model of mobile*. Nagpur, India: RTM Nagpur University.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science, 35*(8), 982–1003.

Dwivedi, Y. K., Rana, N. P., Janssen, M., Lal, B., Williams, M. D., and Clement, R. M. (2017). An empirical validation of a unified model of electronic government adoption (UMEGA).

Government Information Quarterly. Available at http://www.sciencedirect.com/science/article/pii/ S0740624X1730103X

Dwivedi, Y. K., Rana, N. P., Jeyaraj, A., Clement, M., and Williams, M. D (2017). Re-examining the unified theory of acceptance and use of technology (UTAUT): Towards a revised theoretical model. *Information Systems Frontiers.* Available at https://link.springer.com/article/10.1007/s10796-017-9774-y

Gefen, D., Karahanna, E., & Straub, D. W. (2003). Trust and TAM in online shopping: An integrated model. *MIS Quarterly, 27*(1), 51–90.

Hailin, S. (2010). Mobile Internet experience research – Based on TAM. In *E-Product E-Service and E-Entertainment (ICEEE), 2010 international conference on* (pp. 1–4). IEEE. 07 Nov - 09 Nov 2010 Henan, China

Hong, S., Thong, J. Y., & Tam, K. Y. (2006). Understanding continued information technology usage behavior: A comparison of three models in the context of mobile internet. *Decision Support Systems, 42*(3), 1819–1834.

Hsu, H. H., Lu, H. P., & Hsu, C. L. (2007). Adoption of the mobile internet: An empirical study of multimedia message service (MMS). *Omega, 35*(6), 715–726.

Kapoor, K. K., Dwivedi, Y. K., & Williams, M. D. (2014a). Innovation adoption attributes: A review and synthesis of research findings. *European Journal of Innovation Management, 17*(3), 327–348.

Kapoor, K. K., Dwivedi, Y. K., & Williams, M. D. (2014b). Rogers' innovation adoption attributes: A systematic review and synthesis of existing research. *Information Systems Management, 31*(1), 74–91.

Kapoor, K. K., Dwivedi, Y. K., & Williams, M. D. (2014c). The interbank mobile payment acceptance in an Indian context. *International Journal of Indian Culture and Business Management, 8*(4), 473–494.

Kapoor, K. K., Dwivedi, Y. K., & Williams, M. D. (2014d). Conceptualizing the role of innovation-attributes for examining consumer adoption of mobile innovations. *The Marketing Review, 14*(4), 407–430.

Kapoor, K. K., Dwivedi, Y. K., & Williams, M. D. (2015a). Examining the role of three sets of innovation attributes for determining adoption of the interbank mobile payment service. *Information Systems Frontiers, 17*(5), 1039–1056.

Kapoor, K. K., Dwivedi, Y. K., & Williams, M. D. (2015b). An empirical examination of the role of three sets of innovation attributes for determining adoption of the IRCTC mobile ticketing service. *Information Systems Management, 32*(2), 153–173.

Orlikowski, W., & Baroudi, J. J. (1991). Studying information technology in organizations: Research approaches and assumptions. *Information Systems Research, 2*(1), 1–28.

Pedersen, P. E. (2005). Adoption of mobile internet services: An exploratory study of mobile commerce early adopters. *Journal of Organizational Computing and Electronic Commerce, 15*(3), 203–222.

Rana, N. P., Dwivedi, Y. K., Lal, B., Williams, M. D., & Clement, M. (2017). Citizens' adoption of an electronic government system: Towards a unified view. *Information Systems Frontiers, 19*(3), 549–568.

Rana, N. P., Dwivedi, Y. K., Williams, M. D., & Weerakkody, V. (2016). Adoption of online public grievance redressal system in India: Toward developing a unified view. *Computers in Human Behavior, 59*, 265–282.

Remenyi, D., Williams, B., Money, A., & Swartz, E. (1998). *Doing research in business and management: An introduction to process and method*. London, UK: Sage Publications Ltd..

Shareef, M. A., Kumar, U., Kumar, V., & Dwivedi, Y. K. (2011). E-government adoption model (GAM): Differing service maturity levels. *Government Information Quarterly, 28*(1), 17–35.

Shi, W., Wu, P. & Zhou, W., Chen, J. (2009). Gender differences in purchase intention on mobile data services. In *computational sciences and optimization, 2009.CSO 2009. International joint conference on* (Vol. 1, pp. 773–777). IEEE. Sanya, Hainan, China, 24–26 April 2009

STC Group. (2011). Saudi telecom company annual report. Available on: https://www.stc.com.sa/wps/wcm/connect/english/stc/resources/e/8/e82a0cad-43ca-4b7b-ab5c-50d333c77b88/AnnualReport-2011-en.pdf. Accessed 19 Feb 2016.

Straub, D., Boudreau, M. C., & Gefen, D. (2004). Validation guidelines for IS positivist research. *The*. *Communications of the Association for Information Systems, 13*(1), 63.

Van der Heijden, H. (2004). User acceptance of hedonic information systems. *MIS Quarterly, 28*, 695–704.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly, 27*(3), 425–478.

Venkatesh, V., Thong, J., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly, 36*(1), 157–178.

Wang, H. Y., & Wang, S. H. (2010). User acceptance of mobile internet based on the unified theory of acceptance and use of technology: Investigating the determinants and gender differences. *Social Behavior and Personality: An International Journal, 38*(3), 415–426.

Weidong, T., Keyi, W., Linlin, L. Likun, X. (2009). Study on consumer behavior of wireless music. In *Management and service science, 2009.MASS'09. International conference on* (pp. 1–6). IEEE.

Yfantis, V., Vassilopoulou, K., Pateli, A., & Usoro, A. (2013). The influential factors of m-gov's adoption in the developing countries. In *Mobile web and information systems* (pp. 157–171). Berlin/Heidelberg, Germany: Springer.

Zhang, J., Huang, J., & Chen, J. (2010). Empirical research on user acceptance of mobile searches. *Tsinghua Science and Technology, 15*(2), 235–245.

Baabdullah is an Assistant Professor of Information Systems at the Department of Management Information Systems, Faculty of Economics and Administration, King Abdulaziz University, Jeddah, Kingdom of Saudi Arabia. His academic qualifications include a PhD in Information Systems from Swansea University in Wales, MSc in Management Information Systems from University of Surrey and BSc in Management Information Systems from King Abdulaziz University. Dr. Baabdullah's research interests are in the area of information systems, analysis/development of IS theories/models, IT/IS adoption, diffusion of emerging ICTs, acceptance and use of E-services and M-applications, E-Government/M-Government and social media/social networking.

Ali Abdallah Alalwan is an Assistant Professor at Amman College of Banking and Finance at Al-Balqa′ Applied University, Jordan. He holds a PhD from Swansea University in Wales. He also holds a Bachelor's Degree in Marketing and an MBA/Marketing Degree from the University of Jordan. His current research interest is in the area of information systems, technology acceptance, electronic marketing, social media, Internet of things, self-service technologies, Internet banking and mobile banking. A part of his work has been published in some refereed journals including *JFSM*, *JEIM*, *ISM* and *Dirasat: Administrative Sciences*.

Naim Salameh Al Qadi is an Associate Professor at Amman University College of Finance and Administrative Sciences, affiliated to Al-Balqa' Applied University, Jordan. His Bachelor's and Master's Degrees are in Finance and Credit from Donetsk State University of Management, USSR. Dr. Al Qadi is a PhD bearer from the Institute of Oriental Studies, USSR. His research field interests are finance and financial social capital; economics; electronic banking, Internet banking and mobile banking; and entrepreneurship and business skills. Dr. Al Qadi is the present dean of the abovesaid college, i.e. Amman University College.