Assessing Consumers’ Intention to Adopt Mobile Internet Services in the Kingdom of Saudi Arabia

Full Paper

Abdullah Baabdullah
Department of Management Information Systems, Faculty of Economics and Administration, King Abdulaziz University, Jeddah, Kingdom of Saudi Arabia
baabdullah@kau.edu.sa

Ali Abdallah Alalwan
Amman College of Banking and Financial Sciences, Al-Balqa' Applied University, Amman, Jordan P.O: Amman 1705 Jordan
alwan.a.a.ali@gmail.com

Nripendra P Rana
Emerging Markets Research Centre, School of Management, Swansea University Bay Campus, Fabian Way, Swansea SA1 8EN, UK
nrnanap@gmail.com

Yogesh K Dwivedi
Emerging Markets Research Centre, School of Management, Swansea University Bay Campus, Fabian Way, Swansea SA1 8EN, UK
ykdwivedi@gmail.com

Vishanth Weerakkody
University of Bradford School of Management Emm Lane, Bradford, West Yorkshire BD9 4JL, UK
vweerakk@bradford.ac.uk

Abstract

This study was conducted with intention to provide a further understanding about the most predictive factors that could shape the customers’ intention to adopt Mobile Internet services in the Kingdom of Saudi Arabia. Thus, and according to critical reviewing of the main body of literature over the relevant area, researchers were able to identify four main factors that could have impact on the behavioural intention. These factors are performance expectancy, effort expectancy, hedonic motivation, and awareness that all are proposed in the same conceptual model of the current study. The current study data was collected from three main cities in Saudi Arabia (Jeddah, Riyadh and Dammam). Then structural equation modelling using AMOS was adopted to examine the proposed model and verify the research hypotheses. Statistical results largely supported the factors included as all of these factors have a significant influence on the customers’ intention to adopt Mobile Internet services. Hopefully, such results will provide accurate clues for designers and practitioners to focus more on the most important aspects that attract attention from customers in the Kingdom of Saudi Arabia.

Key words: Adoption, Mobile Internet services, Kingdom of Saudi Arabia, UTAUT2, Awareness

Introduction

Mobile technology has been increasingly utilised to deliver and access electronic services known as Mobile Services (M-Services) that represents the ability to deliver various services to users and/or consumers using mobile devices (Jiang and Deng, 2011; Shareef et al. 2016). Given the ubiquitous nature of the mobile devices, the M-Internet establishes a world where users, consumers and/or citizens can use their
mobile devices irrespective of time and space (Hsu et al., 2007; Sharma et al., 2017). M-Internet is merging M-Technologies with the Internet, which together forms a platform for the delivery of M-Services. Indeed, the distinguished features of such technology, and their link to M-Internet, have led to an astounding level of M-Internet usage around the world.

Mobile-based technologies and services have altered the business environment through changing the way in which customers interact with service suppliers; for example, traditional services have a high degree of human-to-human contact and have low technological dependency in contrast to M-Services that are characterised by a low degree of dependency on physical contact between the customer and the supplier (e.g. Stofega and Llamas, 2009; Yadav et al., 2016). The use of mobile technologies and services enhances the organisational effectiveness and offers the ability to supply clients with a reliable service of quality and greater suitability, aiding to meet their increasing requirements (e.g. Boateng et al., 2014).

Such recent developments can be attributed to the recent technological revolution as well as to easy access of the technical infrastructure needed for their effective development and implementation (Hailin, 2010). Moreover, M-Services have been suggested to play a vital role in boosting customer approval, value, and trust, and consequently acquiring an organisation’s market share (Sharma et al., 2017). Furthermore, the M-Services permit entrance to new customers and allows for enhanced geographical coverage without exhausting additional human and financial resources that are usually needed to establish and operate physical branches (Lee and Jun, 2007). Hence, M-Services have been widely considered as a useful alternative channel, saving customers time, cost, and effort (Ling and Donner, 2013). It is worth noting that adopting M-Services could be regarded as being part of a modern lifestyle, which contributes to its value for customers who care about innovation and modernism (e.g. López-Nicolás et al., 2008).

M-Services adoption has been considered as a significant matter due to the fact that M-Services can benefit customers, private and public organisations. This matter is especially important in Saudi Arabia as the country has geographic area of 830,000 square miles which is sparsely populated; hence, doing services through direct contact between customers and service providers are both costly and time-consuming (Ipsos, 2012). However, the number of M-Services’ adopters in Saudi Arabia is still below the expectations domestically when compared with other states (Ipsos, 2012). Moreover, there is the necessity of having clients accepting such services at least with an acceptable degree so that making an investment in such new technologies is built upon justifiable grounds (Lee et al., 2010). This research will examine and discuss in detail this fact that, within the context of Saudi Arabia, although there is a growth in ICTs in the country especially in mobile subscriptions, the adoption rate of M-Services (M-Internet) is still low compared to other developed countries due to very limited services, lack of awareness, and infrastructure (Siau and Shen, 2003). Therefore, the main aim of this research is to examine the factors affecting intention to adopt Mobile Internet at an individual level (i.e. citizens, consumers) in Saudi Arabia.

**Literature Review**

M-Services can be used using a number of channels (e.g. telephones and mobile devices). This study has researched M-Services to understand clients’ intention to use such services and has resorted to a number of theories and models taken from different fields; from Information System (IS), Information Technology (IT), and ending up with disciplines relating to human behaviour (Zarmpou et al., 2012). Theoretically, a number of studies have focused on studying M-Internet (e.g. Hailin, 2010; Lu and Zhu, 2011; Lu et al., 2005).

A number of studies have critically examined this service on the organisational level. For example, Zhou and Lu (2011) indicated that the m-loyalty towards the brand of a specific organisation is related to the level of perceived usefulness provided by an organisation. Furthermore, Zhou and Lu (2011) referred that level of loyalty for the organisation depends mainly on the amount of accompanied satisfaction that the customers feel towards the service. Indeed, the innovation characteristics play a significant role in adopting the M-Internet. As such, reducing the level of technical complexity, which is one of the innovation’s characteristics, positively increase the perceived usefulness and perceived ease of use among customers and this, in turn, increases the intention to use M-Internet (Parveen and Sulaiman, 2008). This helps users to get their needs even in remote places where the setting up of centres might be impractical (Das, 2011; Roostika, 2012). The importance of increasing the positive attitude of customers as it plays a vital role in the customers’ intention to use the M-Internet (i.e. Liu and Li, 2011).
Apart from the specific Islamic Arabic culture in Saudi Arabia, which might consider as a predicament for extending M-Internet and M-Gov services, a considerable number of studies suggest various variables that might increase or decrease the intention to use these services (e.g. Alsenaidy and Ahmad, 2012; Alwahaishi and Snášel, 2013a). Within the context of Saudi Arabia, Alwahaishi and Snášel (2013a) identified variables that might affect the acceptance of M-Internet and use in Saudi Arabia. Alwahaishi and Snášel's (2013a) research contributed in giving a better understanding of the M-Internet particularly for people in the profession and for researchers. Likewise, Alwahaishi and Snášel (2013b) adopted eight constructs: i.e. performance expectancy, effort expectancy, facilitating conditions, social influences, perceived value, perceived playfulness, attention focus and behavioural intention in order to study the variables that might influence the acceptance and use of M-Internet in the Saudi consumer context. They found that performance expectancy and perceived playfulness had the highest influence over behavioural intention of consumers. These evidences suggest that M-Internet services in Saudi Arabia have not been heavily used yet, and Saudi users have not yet adopted these services. Therefore, this study will examine the factors that may affect the adoption of this technology by the potential users by examining the factors that might influence behaviour intention of the potential users towards using the M-Internet in the Saudi context.

**Conceptual Model**

As presented in Figure 1, five main factors are considered in the conceptual model. Indeed, three factors: efforts expectancy (EE), performance expectancy (PE), hedonic motivations (HM) were derived from the new model of Venkatesh et al.’s (2012) (i.e. extended unified theory of acceptance and use of technology (UTAUT2)). Awareness (AW) as an external factor was also included among the model proposed to provide an accurate picture about such phenomenon in the KSA. So, four factors performance expectancy, efforts expectancy, hedonic motivation, and awareness were proposed to have a direct impact on the behavioural intention (BI) to adopt mobile services by customers in the KSA. Further discussions regarding the main hypotheses are presented below.

![Figure 1. Conceptual Model (Adapted from: Venkatesh et al., 2012)](image)

**Performance Expectancy (PE)**

PE is considered as the utilities and the benefits such as efficiency in using, easier accessibility, greater convenience, giving the customers the ability to customize their service, and saving efforts and time (Dwivedi et al. 2017; 2016; Rana et al. 2015; 2016; Venkatesh et al. 2003). Generally, customers are more driven to adopt and get a novel service such as MoGov and M-Internet if they consider that this service is more beneficial and valuable in their day-to-day life (Alalwan et al., 2017; Kim and Hahn, 2012). Theoretically, different studies have supported the impact of performance expectancy on the customers’ intention to adopt mobile Internet services. For example, Tai and Ku (2013) recognised a strong direct influence of performance expectancy on behavioural intention. Moreover, PE has proved to be a positive influential construct in studies that researched M-Internet (Zhou, 2011c). As a result, the following hypothesis can be formulated:

**H1 Performance expectancy will have a positive and significant influence on individual’s behavioural intention to apply M-Internet.**
Assessing Consumer’s Intention to Adopt Mobile Internet Services

**Effort expectancy (EE)**

EE is defined as the extension of easiness regarding the use of information system (Dwivedi et al. 2017; 2016; Rana et al. 2015; 2016; Venkatesh et al., 2003). Consequently, as M-Service demands certain degree of knowledge, EE might have a vital role in determining the individuals’ intention to adopt the service (Alsheikh and Bojei, 2014; Chong, 2012; Yun et al., 2013). In a study relating to M-Internet in Taiwan, Wang and Wang (2010a) acknowledged the positive influence of EE on BI. Similarly, Tai and Ku's (2013) study on mobile stock trading stated that EE has a positive influence over consumers’ behaviour. Consequently, M-Internet suppliers should develop a user friendly and more comfortable use of M-Internet to magnetise more users. This research put the second hypothesis as follows:

**H2: Effort expectancy will have a positive and significant influence on consumer’s behavioural intention to apply M-Internet.**

**Hedonic Motivation (HM)**

Hedonic motivation is defined as the pleasure stemmed from adopting technology and it has been referred to play a significant part in shaping technology acceptance and use (Brown and Venkatesh, 2005). HM is conceptualised as the sensation of happiness, joyfulness, and cheerfulness. HM has also been established as an essential determinant of technology acceptance and use in the consumer context (Brown and Venkatesh, 2005; Venkatesh et al., 2012). Similarly, Chang et al. (2013) pointed out that HM positively affects consumers’ mobile TV app. As the importance of HM has been endorsed by a considerable number of researchers, the following hypothesis can be formulated:

**H3: HM positively and significantly influences consumer’s behavioural intention to adopt M-Internet.**

According to Venkatesh (2000), hedonic motivation is not only able to accelerate the customers’ willingness to adopt new technology but also to their perception that such technology is more productive and help them to perform their tasks more efficiently and effectively. Such proposition was supported by Alalwan et al. (2014) and Alalwan et al. (2015a) in their study to examine the adoption of Internet banking in Jordan. Cheng et al. (2006) also noticed significant relationship between intrinsic motivations on perceived usefulness. Therefore, HM has also been proposed to have a direct influence on the performance expectancy. Therefore, the following hypothesis can be formulated:

**H4: HM positively and significantly influences performance expectancy related to M-Internet.**

**Awareness**

According to Rogers (2003), individuals should formulate adequate level of knowledge (awareness) toward new systems or subject that they have to adopt or reject. To put differently, customers’ awareness is an integral and initial stage that according to customers can have attitudes, intention toward the new innovation (Rogers, 2003; Shareef et al. 2011). By the same token, customers’ awareness about the mobile services technology is a critical prerequisite of the customers’ decision-making process to adopt or reject mobile Internet services in the KSA as reported by Alsheikh and Bojei (2014). This thought was supported by Luarn and Lin (2005) in their study to examine the adoption of cell phone banking. Likewise, Kim et al. (2010) found that mobile customers’ knowledge (awareness) has a crucial role in shaping their perception and intention to adopt mobile payment services. According to above-mentioned discussion, this study proposes that as long as customers have an adequate knowledge and awareness, they will be motivated to adopt mobile Internet services. Therefore, the following hypothesis can be formulated:

**H5: Awareness positively influences consumer’s behavioural intention to adopt M-Internet.**

**Methodology**

Using a convenience sampling of M-Internet users, 600 self-administered questionnaires were assigned to collect the required data from three main cities (Jeddah, Riyadh and Dammam) in Saudi Arabia.
However, 417 valid responses were captured and subjected for further analyses. 59.2% of the respondents were males, whereas 40.8% of the 417 usable responses were females. The largest part (i.e. 58%) of M-Internet respondents was within the range of 21-29 years followed by the age group of 30-39 (i.e. 16.3%). 45.8% of the respondents hold a Bachelor’s degree followed by those attending high school (i.e. 18.5%) and diploma holders (i.e. 17.7%). More than half of the responses were from government employees (i.e. 52.3%) followed by 23.3% for private sector employees. Students also represent 12% of the M-Internet respondents. The largest group of 43.9% of the overall sample was those who had a monthly income of 8,001-14,000 Saudi Riyal (SR) followed by those who obtain a monthly income between 4,001-8,000 SR (i.e. 21.8%). Main constructs (EE, PE, HM, and BI) in the conceptual model were measured by items extracted from the study of Venkatesh et al. (2012) while awareness was measured using items from Shareef et al. (2011). As for Mobile Internet services considered in the current study, we included the following digital data services: exchange messages, pictures, and e-mail, check flight schedules, book concert tickets, games.

Results

An approach that is made from the two stages of the SEM using AMOS 22.0 (i.e. measurement model and structural model) was employed to examine and study the empirical data of M-Internet. In order to examine the level of unidimensionality and model goodness of fit, a number of fit indices including Chi Square/Degree of Freedom (CMIN/DF), Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Normed Fit Index (NFI), Comparative Fit Index (CFI) and Root Mean Square Error of Approximation (RMSEA) were used (Bagozzi and Yi, 1988; Byrne, 2010; Hair et al., 2010). According to the main fit indices extracted for the measurement model after the revision process, the model seems to fit to the observed data as all fit indices were found to be within their recommended level as such CMIN/DF was 2.456, GFI= 0.941, AGFI= 0.891, NFI= 0.981, CFI= 0.991, RMSEA = 0.045. All constructs were also able to have adequate value composite reliability (CR) with value higher than 0.70 and average variance extracted higher than 0.60 (see Table 1).

<table>
<thead>
<tr>
<th>CR</th>
<th>AVE</th>
<th>MSV</th>
<th>ASV</th>
<th>PE</th>
<th>HM</th>
<th>EE</th>
<th>AWR</th>
<th>BI</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE</td>
<td>0.991</td>
<td>0.973</td>
<td>0.635</td>
<td>0.450</td>
<td>0.986</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HM</td>
<td>0.975</td>
<td>0.928</td>
<td>0.267</td>
<td>0.201</td>
<td>0.466</td>
<td>0.963</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EE</td>
<td>0.932</td>
<td>0.820</td>
<td>0.533</td>
<td>0.361</td>
<td>0.730</td>
<td>0.376</td>
<td>0.906</td>
<td></td>
</tr>
<tr>
<td>AWR</td>
<td>0.836</td>
<td>0.651</td>
<td>0.635</td>
<td>0.427</td>
<td>0.797</td>
<td>0.423</td>
<td>0.662</td>
<td>0.807</td>
</tr>
<tr>
<td>BI</td>
<td>0.979</td>
<td>0.940</td>
<td>0.456</td>
<td>0.368</td>
<td>0.644</td>
<td>0.517</td>
<td>0.577</td>
<td>0.675</td>
</tr>
</tbody>
</table>

Table 1 Constructs Validity and Reliability

In the second stage, the structural model was tested to validate the conceptual model proposed. The main fit indices extracted were as follows: CMIN/DF= 2.456, GFI= 0.922, AGFI= 0.879, NFI= 0.9721, CFI= 0.982, RMSEA= 0.049. Thus, the model has adequate faintness to the observed data. As seen in Figure 2, regarding the analyses of the path coefficient, the path coefficient values ending to BI including PE (γ = 0.152, P= 0.006), AW (γ = 0.37, P<0.001), EE (γ = 0.13, P= 0.016), and HM (γ = 0.25, P= 0.0229) were found as statistically significant. Moreover, the path coefficient value of HM on PE (γ = 0.47, P<0.001) was found as statistically significant as well. Therefore, all research hypotheses were largely supported.
Assessing Consumer’s Intention to Adopt Mobile Internet Services

Discussion

We were motivated to conduct the current study with an intention to provide in-depth understanding about the main factors that could shape the customers’ intention to adopt Mobile Internet services. We were able to identify a group of the most important factors (i.e. PE, EE, HM and AW) that could have an influence on the customers’ intention. Such factors were then largely supported using data collected from the KSA and tested using structural equation modelling. As presented above all research hypotheses were strongly approved as well as the model was able to account for about 50 per cent as variance in the customers’ intention.

Earlier in this research, it was drawn that PE has a strong effect toward the inclination of clients to adopt M-Internet. What is implied when saying that PE is effective on clients’ inclination is that customers in Saudi Arabia look at things such as the efficiency of the channels, their productivity and usefulness. The reason is that the capability of the M-Internet for providing customers with easy means that disregards time and place will give them the ability to enter a large number of facilities of high quality. Aspects related to PE have been generally found to be crucial predictors of clients’ BI towards M-Services technologies and other electronic systems (Alalwan et al., 2017; Dwivedi et al. 2017; 2016; Rana et al. 2015; 2016; Tai and Ku, 2013; Venkatesh et al., 2012). The results suggest that there is a strong association between EE and BI to make use of M-Internet. That is, Saudi customers’ perspectives about using the M-Internet was reflected upon them as being easy and effortless; for this reason, they are more apt to make use of them. The result regarding EE in the context of M-Internet and M-Gov correspond to what has been concluded in the field of IT/IS (e.g. Venkatesh et al., 2003, 2012). The following studies related to adoption of electronic services recognise the significant influence of EE over BI (e.g. Alalwan et al., 2016a; Alsheikh and Bojei, 2014; Chong, 2012; Dwivedi et al. 2017; 2016; Rana et al. 2015; 2016; Yun et al., 2013).

According to the predictions made in this research regarding the effect of HM, it is evident that HM was a significant predictor of customers’ behaviour intention as well as of performance expectancy. Saudi Arabia is one of the leading countries than others in the Middle East when it comes to M-Services (e.g. Assar, 2015). Therefore, making use of the M-Internet would be regarded as a new and valuable addition for the Saudi people. In a similar fashion, different attempts were made earlier in the literature of M-Services and such attempts confirmed that HM or the variables related to it, such as perceived entertainment and
playfulness, had a significant effect on BI of the customers to make use of technological inventions (e.g. Alalwan et al., 2015; Algharabat et al., 2017; Yun et al., 2013; Zhang et al., 2010).

Results regarding the role of awareness were found to be in line with what has been proposed in the conceptual model, which supports including awareness as external factor in the current study along with PE, EE, and HM. That means, as long as customers are fully aware of all the related issues of Mobile Internet services, they will be enthused to adopt such new systems. This is clearly related with the scientific and technological development in Saudi Arabia at the moment. This is in line with the evidences presented by Kim et al. (2010); Alalwan et al. (2015b); and Alsheikh and Bojei (2014) who confirmed the impact of awareness on customers' intention to use Mobile Internet services.

Theoretical Contributions and Practical Implications

This research endows us with further comprehension and knowledge in relation to the main elements that should be taken into consideration in examining the customers’ intention toward M-Service channels adoption. This research also determined the areas that need to be examined and clarified more, and hence, undertaking them in the current research. Indeed, a careful examination of previous literature with regard to M-Internet has revealed that the customer intention and adoption of M-Internet has never been studied using a quantitative method in the Saudi Arabian context. This research is an important addition to the knowledge and literature in Saudi Arabia because it concentrates more on M-Internet as new technology in Saudi Arabia and are demanding further comprehension; analysing other significant elements; and implementing more developed statistical analyses approaches (e.g. SEM). Practically, this research has aimed at studying motivations that guide Saudi customers to adopt the M-Internet service. What can be seen statistically is that PE, EE, HM, and AW were the variables that managed to sustain their significant effect in this study. Regarding Shen and Chen (2008), communication on personal basis initiatives is one of the optimal techniques regarding convincing potential adopters to make use of the means of M-Internet. Consequently, giving clients the chance to use the new technologies by testing the performance in comparison to real ones might have the effect of creating an advantageous experience and in consequence allowing clients to know the extent to which they can have an advantage by using such applications (Dwivedi and Irani, 2009). The research at hand also made a contribution by raising the awareness to Saudi government and organisations toward the effect of performance expectancy. Consequently, while starting the channels, Saudi decision-makers should be certain that the Internet channels of their M-Services’ applications are reliable, effective and feasible when it comes to conducting any online dealings; furthermore, they have to be certain to provide enough information to assist customers in using such technologies effectively and in ways that correspond to their purposes on intentions (Alalwan et al., 2016b; Alhussain et al., 2010; Baabdullah et al., 2016; Al-Khalifa, 2011). In order to make clients aware about the benefits of using the M-Internet, private and public bodies can employ what is known as the 'push-strategy' in the market (Alalwan et al., 2016c).

Limitations and Future Research Directions

Although this research stands as a successful endeavour in the arena of M-Services, it has some shortcomings too. For example, the information used in this research was collected by employing a convenient sample for Saudi customers in three main Saudi cities (Riyadh, Jeddah and Dammam). They might have negative effects on the process of generalising findings in other cities. Accordingly future studies could apply mixed-method approach (quantitative and qualitative). Thus, future studies in Saudi should widen to the whole of the Saudi Arabian lands by including other cities and including urban, suburban and rural areas. The primary focus of this research was on using the quantitative approach to achieve the research purpose. This could limit the ability of this research to establish a comprehensive look that illustrates the topics concerned with Saudi customers’ intention and behaviour towards using M-Service.

REFERENCES


distribution in Taiwan - a channel function perspective”, Technovation, (26:7), 856-864.

University, Nagpur.

Validation of a Unified Model of Electronic Government Adoption (UMEGA)" Government
Information Quarterly. Available online at http://doi.org/10.1016/j.giq.2017.03.001

model for services: A cross-country comparison of mobile health (m-health)”, Government

Dwivedi, Y., and Irani, Z. 2009. “Understanding the adopters and non-adopters of broadband”,


to use mobile payment”, Computers in Human Behavior, 26(3), 310-322.

mobile internet services”, In Management of eBusiness. WCMeB 2007. 8th World Congress on (p.15).
IEEE.

Kim, J., and Hahn, K. H. 2012. “Effects of personal traits on generation Y consumers’ attitudes toward the
use of mobile devices for communication and commerce”, Human Technology: An Interdisciplinary
Journal on Humans in ICT Environments, (8:2), 133-156.


Lee, T., and Jun, J. 2007. "The role of contextual marketing offer in mobile commerce acceptance: Comparison
between mobile commerce users and non-users", International Journal of Mobile
Communications, (5:3), 339-356.


Liu, Y., and Li, H. 2011. “Exploring the impact of use context on mobile hedonic services adoption: An

services acceptance: contributions from TAM and diffusion theory models” Information and
Management, (45:6), 359-364.

Internet services via mobile technology”, The Journal of Strategic Information Systems, (14:3), 245-
268.


Rana, N.P., Dwivedi, Y.K., Williams, M.D., & Weerakkody, V. 2016. “Adoption of online public grievance

Available at https://link.springer.com/article/10.1007/s10796-015-9613-y


