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Understanding Factors Affecting the Adoption of M-commerce by Consumers

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Abstract: Mobile commerce has become the latest trend to do business instead of electronic commerce at the earlier time. However, its adoption and level of use is low in Jordan compared to other nations. This study aimed to understand some factors that influence the adoption of M-commerce in Jordan based on traditional technology models. The study adopted a quantitative approach and conducted a survey among Jordanian consumers. It also reported on the results of a survey of 160 Jordanians held mobile phone. It showed that perceived usefulness, perceived ease of use, perceived trust, perceived cost and perceived privacy were statistically significant and could affect the adoption of m-commerce. The overall findings of this study were very important for practitioners who intended to venture into mobile commerce in Jordan. As Jordan is going into a 4G network, the chances for mobile commerce are huge and provide that practitioners understand the potential user's behavioral intention to use mobile commerce. As suggested by the result, an effective promotion among targeted users to use mobile commerce would create more impact on mobile commerce adoption.

Keywords: Mobile commerce, adoption, consumers, usefulness, ease of use, trust, cost, privacy

INTRODUCTION

The development of mobile services and the growth has been phenomenal throughout the world (Habboush *et al.*, 2011; Jhangiani and Smith-Jackson, 2007; Nassuora, 2012). Mobile technology, which supports mobile computing using portable devices through wireless networks (Malladi and Agrawal, 2002; O'Hare *et al.*, 2006), has emerged as a new found technology in IT revolution. Additionally, mobile phone technologies a new found technology and cost effective (Motiwalla, 2007).

Currently, mobile commerce (M-commerce) has become the latest trend to conduct business instead of electronic commerce (e-commerce) in the earlier time (Hsieh, 2007). M-commerce is believed to have greater opportunities, faster access, more powerful, more effective and absolutely accessible anytime, anywhere for its users. Different from e-commerce, m-commerce is conducted and connected wirelessly through the use of mobile devices. This is the greatest advantage of m-commerce. So, m-commerce can offer better ubiquity and accessibility to its users as compared to e-commerce. Definitely, m-commerce is argued to be truly able to provide higher levels of customization anytime and anywhere (Khalifa and Shen, 2008a).

There are several definitions of mobile commerce. A simple definition would be the ways of business with the support of wireless technology (Sugianto *et al.*, 2008). According to Portio Research (2009) the global mobile phone subscribers hit 6.5 billion in 2011 and it will be 8.5 billion in 2016. Mobile services have generated more than $1.3 trillion in revenue worldwide in 2011 and it will reach nearly $1.8 trillion in 2016 (Portio Research, 2009). Furthermore, Sheng *et al.* (2008) also found that m-commerce had already begun to show strong momentum in some Asian countries.

According to Jordanian Ministry of Information and Communications Technology MICT (2007), M-commerce in Jordan has not taken off. This is as a result of several factors, mainly (a) The lack of a practical electronic payment system (b) The lack of legislation to support m-commerce processes and to protect consumers who use it (c) the lack of awareness among stakeholders (both consumers and business) concerning m-commerce and (d) Ability to pay-the cost of broadband access and the cost of computers. In addition, the lack of any execution m-payment device in Jordan means that nearly no payments are made between Jordanians and Jordanian companies online (MICT, 2007).

The new research survey conducted by Zain Group (2011) underscored that only 32% of the inhabitants of the Arab world are in the custom of trade products or services via the Web, compared with 62% in the United Kingdom. Furthermore, Abdelkarim and Nasereddin (2010) pointed out that organizations and individuals in Jordan are late in the use of wireless technology. This is not only in Jordan; many developing countries have the same problem. There are many reasons for this problem: (a) People are afraid to use mobile devices and purchase through it and manage

their business, because they think that any mistake or error could mean loss of money, (b) The literature shows that there is a problem in using mobile devices in the Middle East. There is a lack of experience within organizations and among individuals, (c) A lack of the necessary skills and experience and (d) Lack of government policies, regulations and wireless device laws to protect workers and to make their connection secure. In addition, Yaseen and Zayed (2010) mentioned out that the deployment of m-commerce technology in Jordan represents the first serious track to achieve and explore the influence of the deployment of mobile commerce technology.

M-commerce experiences a vast increase in terms of abilities of mobile devices, services, applications, standards and network achievement (Sugianto *et al.*, 2008). However, this fast growth of mobile technologies and the development of M-commerce models are reflected in the relatively low in M-commerce adoption rate in Jordan (Abdelkarim and Nasereddin, 2010). Although there is a great potential for business ventures in mobile commerce, compared with developed countries such as Japan and South Korea, M-commerce in Jordan is still at its early year's stage (Abdelkarim and Nasereddin, 2010). Using technologies such as 3G and WiMax is still quite low compared to other nations (Zain Group, 2011). The given situation mentioned in the previous paragraphs, the objective of this study is to understand factors affecting the adoption of m-commerce by consumers (users) in Jordan.

FACTORS INFLUENCING THE ADOPTION OF M-COMMERCE

The factors listed below are based on the literature concerning technology acceptance models. Next section investigated the factors affecting the adoption of M-commerce by consumers (users) in Jordan to be included in this study.

Perceived usefulness: According to Davis (1989), perceived usefulness of a system is defined as "the degree to which individuals believe that the use of new technology to improve their performance on the task". There are many studies in the field of information systems and mobile commerce that demonstrated a significant effect of perceived usefulness on intention to use or adopt (Kim and Garrison, 2009; Khalifa and Shen, 2008a). The researcher proposed that perceived usefulness will have a positive influence on the adoption of m-commerce. Therefore, it is essential to engage perceived usefulness into the model.

- **H1:** The first hypothesis (H1) stated that perceived usefulness will have a positive influence on the adoption of m-commerce

Perceived ease of use: Dholakia and Dholakia (2004) defined perceived ease of use as the "degree to which a person believes that using a particular system would be free of effort". While, Teo (2001) defined it as "the degree to which the user expects the use of the system to be user friendly". The perceived ease of use has been integrated as a significant factor in adopting Mobile commerce (Bhatti, 2007; Davis, 1989; Wei *et al.*, 2009). Many previous empirical studies showed that perceived ease of use has a positive influence to adopt mobile commerce (Khalifa and Shen, 2008b; Kim and Garrison, 2009; Wei *et al.*, 2009). Thus, perceived ease of use reflects the efforts resulting from use of mobile commerce (Khalifa and Shen, 2008a). The researcher proposed that perceived ease of use will have a positive influence on the adoption of m-commerce. Therefore, it is essential to engage perceived ease of use into the model.

- **H2:** The second hypothesis (H2) stated that perceived ease of use will have a positive influence on the adoption of m-commerce

Perceived trust: Cho *et al.* (2007) defined trust as "buyer-seller relationships as the perception by a prospective buyer of credibility and benevolence in the target of trust". Perceived trust is a significant concept affects consumer behavior and decides the achievement of m-commerce (Wei *et al.*, 2009). It is a significant analytical factor in explaining the adoption of m-commerce in many existing technology adoption studies (Cho *et al.*, 2007; Wei *et al.*, 2009). In addition, it helps build suitable favorable expectations of acting and other preferred benefits (Cho *et al.*, 2007). The researcher proposed that perceived trust of use will have a positive influence on the adoption of m-commerce. Therefore, it is essential to engage perceived trust into the model.

- **H3:** The third hypothesis (H3) stated that perceived trust will have a positive influence on the adoption of m-commerce

Perceived cost: Perceived cost is the key points in the creation and delivery of M-commerce (Sadi and Noordin, 2011). The serious concern for the user is a perceived cost to determine whether to use m-commerce or not (Hong *et al.*, 2008). Wei *et al.* (2009) pointed out that one of the causes that might slow expansion the of M-commerce is perceived cost factor. Li *et al.* (2007) found that cost is supposed to be a significant predictor of the use of M-commerce. Anil *et al.* (2003) found that
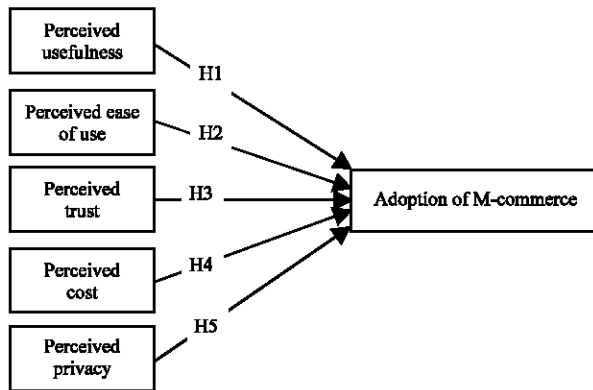
Fig. 1: Hypothesis research model

the cost is a factor influencing the use of mobile commerce. Muthaiyah (2004) reported that in turn to obtain an effective penetration level of mobile technology, it was required for a certain minimum level of income. The researcher proposed that the perceived cost of use will have a positive influence on the adoption of m-commerce. Hence, it is necessary to involve perceived cost into the model.

- **H4:** The fourth hypothesis (H4) stated that perceived cost will have a positive influence on the adoption of m-commerce

Perceived privacy: According to Chaffey (2003), privacy is defined as "the right of an individual to control the information held about them by third parties". Khalifa and Shen (2008b) stated that the privacy concerns with the next strong influence after the cost on the result of the use of m-commerce. Furthermore, Sheng *et al.* (2008) found a strong association between privacy and intentions to adopt of m-commerce. Korzaan and Boswell (2008) found that privacy strongly influenced the behavioral intentions. The researcher proposed that perceived privacy of use will have a positive influence on the adoption of m-commerce. Hence, it is necessary to involve perceived privacy into the model. The hypothesis research model is shown in Fig. 1.

- **H5:** The fifth hypothesis (H5) stated that perceived privacy will have a positive influence on the adoption of m-commerce

MATERIALS AND METHODS

A total of 270 survey questionnaires, using both online and paper survey, were distributed to consumers in Jordan using random sampling method. Targeted respondents were Jordanians held mobile phone devices. Out of 270 were distributed questionnaires, only 160 were returned, giving a response rate of 59.2%. Data collection for this study was conducted during the month of June in 2012. The questionnaire contained two parts; in which the first section consisted of demographic questions. The second section contained items for measuring structures identified in the literature review using a five point Likert scale.

A series of tests such as correlation and reliability analysis were conducted to confirm that the instruments were valid as well as reliable. Regression coefficient was used to determine which of the variables that were included in the model contributed to the prediction of the dependent variable. These values can be found in the Beta column under standardized coefficients.

DATA ANALYSIS AND RESEARCH RESULTS

Respondent's profile and background information: Based on the demographics and other personal background information obtained, out of 160 respondents, 57.5% were females. The Majority of the respondents (51%) were above 23 years old and (28%) were 21-23 years old. The largest educational group had bachelor degrees (53.1%). The study showed that 59.4% of respondents had Smart phones, 18.8%) IPhones, 15.6% Blackberry and 6.2% PDA phones. The majority of respondents 58.8% had a cell phone for more than 8 years and 35% had a cell phone between 4-8 years. The sample showed that 100% of respondents are using an Internet connection via cell phone. Finally, the number of respondents who currently used m-commerce in Jordan was 14.4%. Consequently, the use of m-commerce in Jordan can be seen to be in its infancy. Table 1 gives the demographic statistic.

Analysis validity and reliability: The internal consistency reliability and construct validity using SPSS was assessed by computing the Principal Axis Factoring with Varimax rotations and Cronbach's alpha coefficients ranged from 0.811-0.891 that is shown in Table 2. Hair *et al.* (2006) pointed out that the weakest value of the Cronbach Alpha in a reliability analysis is less than 0.6. All items measured in this study achieved reliability of internal consistency and valid instrument to form study.

Hypothesis testing: "Pearson product-moment correlation provides numerical summary of the direction and the strength of the linear relationship between two variables" (Hair *et al.*, 2006). Based on results illustrated in Table 3, it can be said that all hypothesized relationships were supported.

Table 1: Demographics statistic

Respondents' profile	Classification	Frequency	Percentage
Gender	Female	92	57.5
	Male	68	42.5
Age	18-20	33	21.0
	21-23	45	28.0
	Above 23	82	51.0
Education	High School	18	11.3
	Diploma	32	20.0
	Bachelor	85	53.1
	Master	25	15.6
Use mobile device	Yes	160	100.0
	No	0	0.0
Period In using device	1-3 years	10	6.2
	4-8 years	56	35.0
	More than 8 years	94	58.8
Type of portable	Personal digital assistant phone	10	6.2
	Blackberry	25	15.6
	IPhone	30	18.8
	Smart phone	95	59.4
Using internet connection via mobile	Yes	125	78.0
	No	35	22.0
Using m-commerce	Yes	23	14.4
	No	137	85.6

Table 2: Reliability statistics for independent and dependent variable

Variables	Mean	Cronbach's alpha	No of Item
Perceived usefulness	3.678	0.862	4
Perceived ease of use	3.782	0.814	4
Perceived trust	3.879	0.872	4
Perceived cost	3.541	0.811	4
Perceived privacy	3.629	0.832	4
Adoption	3.656	0.891	4

Table 3: Correlation matrix between the adoption of m-commerce and five factors influencing the adoption of M-commerce

Model	M-commerce	Usefulness	Ease of use	Trust	Cost
Usefulness	0.451	-	-	-	-
Ease of use	0.565	0.404	-	-	-
Trust	0.211	0.312	0.363	-	-
Cost	0.344	0.205	0.359	0.312	-
Privacy	0.543	0.220	0.276	0.267	0.273

Table 4: Regression analysis results

Variables	Beta	Sig.
Perceived usefulness	0.128	0.015
Perceived ease of use	0.092	0.121
Perceived trust	0.301	0.032
Perceived cost	0.104	0.038
Perceived privacy	0.057	0.007
R square (R^2)	53.8%	
F-value	11.342 Sig. (000)	
	Best Predictor: Perceived trust	
	Beta . 301 Sig. (.000)	

Factors affecting m-commerce adoption: Regression Analysis was carried out to test the relationship between the dimensions of perceived usefulness, perceived ease of use, perceived trust, perceived cost and perceived privacy on the adoption of M-commerce. The regression model involved perceived usefulness, perceived ease of use, perceived trust, perceived cost and perceived privacy as independent variables and adoption of M-commerce as the dependent variable. From regression in Table 4, the coefficient of R Square (R^2) = 0.538 indicates that all the independent variables account for 53.8% of the variance in adoption of M-commerce.

DISCUSSION

Empirical data from this study strongly supported the proposed theoretical model. As hypothesized, perceived usefulness, perceived ease of use, perceived trust, perceived cost and perceived privacy were important predictors for mobile commerce usage among Jordanian consumers. The perceived usefulness factor had a positive influence on intention to use mobile commerce. The correlation coefficient value of the tested relationship between both variables were 0.451 (medium correlation) at significant level $p < 0.01$. This result is consistent with other studies such as Hong *et al.* (2008), Wong and Hiew (2005) and Kim and Garrison (2009). The perceived ease of use factor had a positive influence on intention to use mobile commerce. The correlation coefficient value of the tested relationship between both variables were .565 (large correlation) at significant level $p < 0.01$. This result is reliable with other studies such as Chew (2006). The perceived trust factor had a positive influence on intention to use mobile commerce The correlation coefficient value of the tested relationship between both variables were 0.211 (low correlation) at significant level $p < 0.01$. This result is consistent with other studies such as Cho *et al.* (2007). It indicated that Jordanian consumers are trusting in mobile commerce. The Jordanian consumers are confident about the privacy and security system in m-commerce in Jordan. Li and Yeh (2010) stated that perceived usefulness and perceived ease of use improved trust in M-commerce. The perceived cost factor had a positive influence on intention to use mobile commerce. The correlation coefficient value of the tested relationship between both variables were 0.344 (medium correlation) at significant level $p < 0.01$. This result is reliable with other studies such as Sadi and Noordin (2011) and Li *et al.* (2007). The perceived privacy factor had a positive influence on intention to use mobile commerce. The correlation coefficient value of the tested relationship between both variables were 0.543 (large correlation) at significant level $p < 0.01$. This result is dependable with other studies such as Korzaan and Boswell (2008) and Sheng *et al.* (2008).

In general, the model explained 53.8% of an intention to use mobile commerce, but there were still 46.2% of the variance not captured by this theoretical framework. However, this study contributes to the existing mobile commerce literatures by providing an overview from Jordanian perceptions. The results of previous studies in

Jordan were a limited number of studies in Jordan compared to other studies achieved in developed countries. The findings of this study are very important for practitioners who intend to venture into mobile commerce in Jordan. The results of this study are an image of targeted mobile commerce users. As Jordan is going into a 4G network, the chances for mobile commerce are huge and provide that practitioners understand the potential user's behavioral intention to use mobile commerce. As suggested by the results, an effective promotion among targeted users to use mobile commerce would create more impact on mobile commerce adoption.

CONCLUSION

This study aimed to identify some factors that influenced the adoption of M-commerce in Jordan based on traditional technology models. It showed that perceived usefulness, perceived ease of use, perceived trust, perceived cost, perceived trust and perceived privacy were statistically significant and can affect the adoption of m-commerce. This study could be extended to include more relevant constructs, since there were still 46.2% of the variances not captured by this theoretical framework. One of the suggestions presented from the result was to include more social related constructs, since Jordanians are still considered as a collective society. This study showed that perceived trust factor with Beta = 0.301 and p = 0.000 is the most fundamental factor in leading to the adoption of M-commerce. Trust is significant since it helps consumers overcome perceptions of uncertainty and risk. This means that the building of trust between consumers and suppliers should be a major concern for service providers. Further researches should be done by using both quantitative and qualitative techniques in order to understand the factors that could lead to the adoption of M-commerce in Jordan.

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