Predicting Consumer Decisions to Adopt Mobile Commerce in Saudi Arabia

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Abstract

Developments in the field of wireless communications have enhanced the amount of people using mobile devices, which has also meant there has been significant growth in the mobile commerce arena.

This research is centred on examining the variables that can estimate consumer intention to adopt m-commerce within the context of Saudi Arabia. The research develops and expands on the TAM (Technology Acceptance Model), and makes reference to a number of critical areas, namely financial cost, individual differences and trust, with information gathered from 574 individual smartphone users located in the Kingdom of Saudi Arabia (K.S.A.).

The findings from this research are considered valuable for the fields of m-commerce, particularly when such organisations seek to devise and implement marketing strategies.

Keywords

M-commerce, Saudi Arabia, TAM, Adoption, User acceptance.

Introduction

Since first gaining popularity and wide utilisation in the 1990s, the field of e-commerce (electronic commerce) has revolutionised business(Chong, Chan, & Ooi, 2011), with its introduction into the business arena providing evidence as to the structure and competitiveness of industries. One key example of an industry seen to have undergone change in terms of their business structure following the application of e-commerce is that of travel. Nevertheless, following the expanse and development of wireless communication technologies, m-commerce has become regarded as the new business model platform, and is further acknowledged as having a significant and possibly greater impact than e-commerce on those industries operating within the business communications field. Importantly, it is recognised that m-commerce is an extension of e-commerce when considering that business transactions are carried out through a mobile device(Chong et al., 2011).

The main advantages linked with m-commerce utilisation can be seen through the adoption of networks and mobile terminals, where users may become involved in omnipresent communications without needing to manage the limitations associated with wired solutions. With this noted, it may be recognised that user effectiveness can be significantly enhanced through the use of m-commerce. Through such an approach, mobile users are in a position to gain access to real-time data, and can carry out purchasing and communication activities at all times and locations. When considering such benefits, it may be stated that m-commerce plays a fundamental role in innovation, and has been responsible for the introduction of various opportunities, especially amongst large, successful organisations by using this technology to improve the business (Chong et al., 2011). Moreover, it is recognised that user satisfaction may be developed further through m-commerce, providing the possibility for improved user satisfaction and user behaviours to be advocated.

Non-industrialised countries present a good market with significant potential for a number of service providers operating in the m-commerce and telecommunications sectors. In the view of (DeVere, 2012), in the context of Saudi Arabia, approximately 60% of mobile users own smartphones. When considering the USA, on the other hand, market penetration amounts to an estimated 44%, as established by the research. From this point, this research seeks to achieve greater understanding of the m-commerce acceptance in Saudi Arabia by extending TAM model with other relative consturacts: fincal cost, trust and individual differences.

Technology adoption: the theoretical background:

The utilisation of information technology and the user acceptance of such are fundamental factors with regard to the success achieved following enterprise adoption of the new technology. In an attempt to describe users' acceptance of information technology, a number of theories have been postulated by scholars, namely DTPB (Decomposed Theory of Planned Behaviour) (Taylor & Todd, 1995),IDT (Innovation Diffusion Theory) (Moore & Benbasat, 1991), TAM (Technology Acceptance Model) (Davis, 1989), Extended Technology Acceptance Model (TAM2) (Venkatesh & Davis, 2000), TPB (Theory of planned behaviour) (Ajzen, 1991), TRA (Fishbein *et al.*, 1975) (Theory of Reasoned Action), and UTAUT (Unified Theory of Acceptance and Use of Technology) (Venkatesh, Morris, Davis, & Davis, 2003). Amongst such theories, it is known that the most important and influencing IT-adotion theories are TAM, TAM2, TPB, TRA, and UTAUT (Min, Ji, & Qu, 2008).

 The TAM (Davis, 1989) represents an adaptation of the TRA, tailored to users' acceptance of information systems. It helps explain determinants of technology acceptance and can explicate user behaviors across a broad range of computing technologies and populations; it also is parsimonious and theoretically justified (Davis, 1989). The major determinants are perceived usefulness and ease of use. Perceived usefulness significantly influences attitude formation (Davis, 1989; Taylor & Todd, 1995; Venkatesh & Davis, 2000).

In previous times, there has been wide-rangeacknowledgement and support of the TAM in terms of application, replication and validation, with the system regarded for its ability to estimate data utilization (Al-Shafi & Weerakkody, 2008). Moreover, (Venkatesh & Davis, 2000) state that TAM is regarded as being the most important and capable framework in terms of describing IS/IT adoption behaviours.

Within this research, there will be the application of TAM as a theoretical basis for analysing the intention of users in regard to m-commerce application services. The context in which the study will be conducted is the Kingdom of Saudi Arabia. Moreover, the TAM model is extended further to comprise other relative constructs, namely financial cost, trust, and individual differences.

Conceptual Model and Hypothesis

The study framework examined in this research can be seen in Figure 1. In regard to the extended model, as per other works that have made changes to the framework (Al-maghrabi & Dennis, 2009; Al-Shafi & Weerakkody, 2008; Chong, 2012; Luarn & Lin, 2005; Wei, Marthandan, Chong, Ooi, & Arumugam, 2009), the attitude element is removed with the aim of simplifying the original system (Al-maghrabi & Dennis, 2009; Gefen & Straub, 2000). The contracts and associated hypotheses suggested are further supported through research conducted previously in the context of information system literature,

Perceived Ease of Use

Another valuable factor incorporated within the TAM is that of perceived ease of use. A great deal of research has been carried out during recent years, with many providing much evidence to support the noteworthy impacts this element has on a consumer's intention to utilise a product or service, i.e. whether or not it impacts perceived usefulness (Khalifa & Shen, 2008; S. Kim & Garrison, 2009; Luarn & Lin, 2005; Wei et al., 2009)

 H1: perceived ease of use has a significant and positive impact on a consumer's intention to adopt m-commerce.

H2: perceived ease of use will have a significant and positive impact on a consumer's perceived usefulness in regard to adopting m-commerce.

Perceived usefulness

It has been stated that, in consideration to TAM, the perceived usefulness element is linked with various critical factors, namely effectiveness, performance and productivity (Davis, 1989). A number of in-depth studies have been carried out amongst the IS/IT community, which delivers a wealth of evidence as to the link between usage intention and usefulness (Al-maghrabi & Dennis, 2009; Luarn & Lin, 2005; Venkatesh et al., 2003). In order to describe the perceived usefulness aspect in regard to the m-commerce arena, the following hypothesis is suggested by the writer:

H3: perceived usefulness has a significant and positive impact on utilisation intention in regard to m-commerce.

Trust

In the context of m-commerce, which is an extension of e-commerce, there is also the concern of trust, in addition to a number of other mobile-related factors(Siau & Shen, 2003). Previous studies found trust to be an important component to enhance customer satisfaction, which in turn improves consumer loyalty towards m-commerce (Lu, Liu, Yu, & Wang, 2008; Siau & Shen, 2003). It has been recognised that personal data will not be provided by customers without the presence of trust (Hoffman, Novak, & Peralta, 1999; Lu, Yu, Liu, & Yao, 2003). As such, the following hypotheses are suggested:

H4: Trust may have a significantly positive impact on the behavioural intention to utilise m-commerce.
H5: Trust has a significantly positive impact on perceived usefulness.

Perceived financial cost

The aspect of perceived financial cost is one of the most important elements linked with identifying and providing m-commerce. Dissimilar with other constructs, that of perceived financial cost is one of the most fundamental considerations for consumers in regard to establishing whether or not there will be the application of m-commerce (Hong, Thong, Moon, & Tam, 2008). Moreover, with regard to the acceptance of users in relation to m-commerce, there are a number of influential factors, empirical analysiswith a number of researches such as (Chong et al., 2011; Chong, 2012; Wei et al., 2009; Wu & Wang, 2005), with the conclusion drawn as a result, that there is a significant impact on behavioural intention by a number of other elements, including that of cost. As a result, this has influenced the creation of the following hypothesis:

H6: perceived financial cost has a significant and negative impact on intention to adopt m-commerce.

Individual differences

As its key focus, TAM directs attention to the identification and development of two main constructs, namely perceived ease of use and perceived usefulness; nevertheless, the TAM introduced originally did not comprise any moderating affects, with studies carried out subsequently including such elements so as to develop understanding and achieve further insight into the behaviours of consumers. Importantly, some of the amended versions of the TAM (Al-Shafi & Weerakkody, 2008; Choudrie & Lee, 2004; Choudrie & Papazafeiropoulou, 2006; Choudrie & Papazafeiropoulou, 2006; Morris & Venkatesh, 2000) include individual differences in order to facilitate examination into IT adoption and whether such differences do impact adoption in this regard. Accordingly, the following hypotheses are suggested by the writer:

H7. Individual differences have a significant link with to use m-commerce of the park in regard to age, education level, and gender.
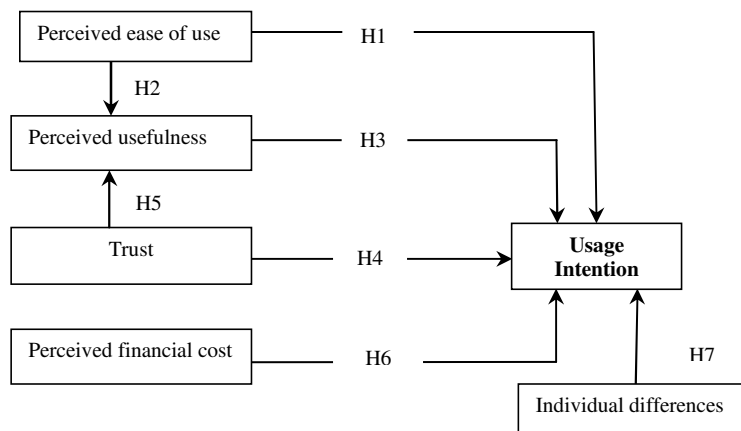

Figure1 : conceptual model

Research Methodology

Owing to the requirement to gather pertinent information, the decision was made to implement a positivist approach within the study; this would be carried out through the utilisation of a survey research tool, which is considered one of the most suitable approaches. Studies carried out previously in this same arena—such as those by (B. Kim, Choi, & Han, 2009; Lu et al., 2008; Wei et al., 2009; Wu & Wang, 2005) have adopted this same data-collection approach.

Following the design of the questionnaire, some minor testing was carried out with the assistance of five IT-related academic professionals. This was recognised as fundamental in terms of achieving survey improvements prior to the actual distribution of the survey (Lewis, Saunders, & Thornhill, 2009). Subsequently, the survey was distributed—both manually and online—to 50 individuals ranging in age between 18 and 45 years. Notably, all members of the sample were residents within the KSA. Following this, Cronbach's α (Alpha) was able to be utilised, which is known to assist in the calculation and analysis of SPSS reliability. Importantly, there is the need for the alpha score to exceed 0.7 before it can be accepted. The results were found to be over 0.7.

The actual distribution of the questionnaires was done both manually and online, and targeted 1,700 individuals living in Saudi Arabia and all of whom used mobile smartphones. Importantly, 820 of the 1,700 targeted completed the questionnaire, thus providing a response rate of 48.24%; 574 were found to be usable. The remaining 246 were recognised as incomplete and therefore could not be used. Table 1 summersie the dempgraphic differences.

Table1: demographic profile:

Demographic	Category	Frequencies (n)	%
Gender	Male	249	43
	Female	325	57
Age	15-18 years	65	11
	18-25 years	260	45
	26-35 years	198	34
	36-45 years	39	7
	46+ years	12	2
Education	Less than high school	31	5
	High school	121	21
	Diploma	43	7
	Bachelor	303	53
	Postgraduate	76	13

Reliability Test

Prior to performing multiple and hierarchical regression analysis, this study used reliability analysis (Cronbach's alpha) to calculate the internal consistency for the five subscales. According to (Gliem & Gliem, 2003) , when using Likert-type scales, it is imperative to calculate and report Cronbach's alpha coefficient for internal consistency reliability for any scales or subscales one may be using. The analysis of the data then must use these composite scales or subscales. The closer Cronbach's alpha coefficient is to 1.0 the greater the internal consistency of the items in the scale. The lowest threshold for adequate reliability is α = .7 (Gliem & Gliem, 2003), but to some extent it is acceptable at .6 levels (Hinton & Brownlow, 2004; Robinson, Wrightsman, & Andrews, 1991; Sekaran, 2000)suggest four points of reliability, excellent (0.90 and above), high (0.70 - 0.90), high moderate (0.50 – 0.70), and low (0.50 and below).

Table 2 illustrates the reliability for each construct, along with their interpretation. A high Cronbach's value for all five constructs indicates that they are internally consistent and measure the same content of the construct (Al-Shafi & Weerakkody, 2010). All items appeared to be worthy of retention.

Table 2: Reliability of Measurements

Constructs	N	Number Of Items	Cronbach's Alpha(α)	Type
Usage Intention	574	4	0.73	High Reliability
Perceived usefulness	574	5	0.88	High Reliability
Trust	574	4	0.85	High Reliability
Perceived ease of use	574	4	0.76	High Reliability
Perceived financial cost	574	3	0.79	High Reliability

N=Sample Size

Hypotheses Testing

In order to complete the testing of the hypotheses detailed in this study, hierarchical regression analysis and multiple regression analysis were carried out. This approach is recognised as appropriate owing to it facilitating the analysis of control variables impact, as well as the impacts of independent variables.

During the first stage of the hierarchical regression analysis, there was the entering of demographic variables with the aim of investing their impacts on the intention of consumers to adopt m-commerce. In the subsequent stage, there was the entering of adoption factors, with the imagination of any increase permitted in terms of rationalising variance over that contributed by the demographic variables (Teo, 2001). The results are shown in Table 3.

As can be seen when reviewing Table 3, the intention of consumers to adopt m-commerce was found to be impacted by demographic profile in only 1.8% of cases. On the other hand, it was found that, through the adoption factors incorporated within this research, 39.8% of Saudi consumers' adoption decisions could be predicted. In relation to the consumers targeted, gender was found to have a significant impact on implementation. Moreover, of the predictors, four were recognised as having a significant and positive effect on the intention of utilisation scores at the 0.001 level and level <.05, with the greater impact recognised in terms of perceived usefulness (β = .507, t=14.513, p<.001) owing to it demonstrating the greatest standardised Beta (β) and t-values. Financial cost was second (β = .194, t=5.832, p<.001), as it was found to be the second largest predictor of usage intention. Subsequently, there was Perceived ease of use (β = .151, t=4.303, p<.001) and Gender (β = -.117, t=-.085, p<.01), respectively.

Table 3: Mobile commerce Acceptance Predictors → Usage Intention

Research variable	Step 1	Step 2
Gender	,180*	-,117*
Age	,019	,031
Education	,011	,006
Trust		-,004
Financial cost		,194***
Perceived usefulness		,507***
Perceived ease of use		,151***
Adjusted R^2	,018	,398

Note:*P<.05, ** p<.01, *** p<.001

In order to examine the influence of ease of use and trust on perceived usefulness, the multiple regression model was used. In consideration to Table 4, it can be seen that the R square value (0.095) is low, thus suggesting that ease of use and trust

explain only 9.5% of the variation in terms of perceived usefulness. The model was highly significant (F = 29.968, MSE = .699, p<.001).

Based on Table 4, Ease of use and trust → Perceived usefulness

Products	Perceived usefulness
Trust	,120**
Perceived ease of use	,308***
Adjusted R^2	,095

<div align="center">**p<.01, *** p<.001</div>

Discussion

This research suggests an m-commerce framework that has been tested in the context of the KSA. As has been stated through the work of (Wei et al., 2009), future researches should examine whether the demographic profiles of consumers have an impact on the ability to predict the intention of users to adopt m-commerce. The findings garnered through this research emphasise that, in Saudi Arabia in particular, there are no differences in relation to age and education level; gender, on the other hand, highlights a significant difference in regard to intention to use. This may be rationalised by considering that a greater portion of men in Saudi Arabia have a different interst than women. This study has also come to recognise that the cost of m-commerce is relatively expensive in the view of Saudi people, although there is no negative impact inflicted on m-commerce usage behaviour. This is a surprising finding when considering that this research has established a positive link between cost and usage behaviour, when various other researches have established the opposite, i.e. a negative link (Chong et al., 2011; Luarn & Lin, 2005; Wei et al., 2009). This may be explained when considering that the income in Saudi Arabia is greater than in other countries, such as China and Malaysia, or otherwise Saudi people may enjoy and utilise technology on a greater scale.

As has been established, perceived usefulness was found to have had the greatest impact on user behaviour, with a number of other IT-centred researches carried out in the country also recognising this construct as being significant in terms of usage behaviour (Al-Ghaith, Sanzogni, & Sandhu, 2010; Al-Sobhi, Weerakkody, & El-Haddadeh, 2011). In relation to ease of use, this element is also seen to significantly impact intention to adopt m-commerce, with this finding also supported by other works (Al-Ghaith et al., 2010; Al-Sobhi et al., 2011). Moreover, perceived usefulness is also believed to be impacted by this construct. The findings show that, when considering trust, this is not recognised as a construct impacting the use of m-commerce services. Importantly, this result stands in stark contrast with other research, which highlight the significant positive relationship between trust and behavioural intention to use technology (Al-Ghaith et al., 2010; Al-Sobhi et al., 2011). One sound rationale for this is that the users targeted do not utilise this particular type of technology for financial purposes. On the other hand, had this research been carried out in the field of m-banking, it is considered that another result would have been garnered.

Conciliations and Implications

This study has examined the elements with the potential to impact m-commerce adoption within the context of Saudi Arabia, with the findings implying that trust and ease of use have impacts on perceived usefulness. Moreover, a number of other elements, namely financial costs, perceived ease of use, and perceived usefulness, have been found to have a significant relationship with the decision of consumers to utilise m-commerce services.

This research provides a number of implications. Firstly, this research is one of very few carried out in the arena of m-commerce application in a quickly developing country. Moreover, this research places emphasis on a developing country, where both infrastructure and mobile devices are quite advanced. In contrast to more industrialised countries, namely UK, Japan, Korea, and the USA, for example, developing countries are believed to fall into the same category of the Kingdom of

Saudi Arabia. Thus, the findings established through this study facilitate organisations operating within the m-commerce and telecommunications field to devise and implement strategies well targeted to consumers from gulf or developing countries owing to their similarity in culture, income, and infrastructure. Secondly, this study can be seen to provide further development of the TAM model through the incorporation of numerous new variables, including financial cost, trust and invivdeual differences in order to estimate the decisions of consumers to implement m-commerce. Thirdly, it can be seen through the findings that Saudi consumers are not particularly price conscious when applying m-commerce. Nevertheless, they are said to be aware of the usefulness associated with this service. In addition, the findings also emphasise that demographic profiles are sound predictors of the adoption of m-commerce. Although it has been established that there are differences between genders, this is not necessarily the case for age and education level, both of which are found to be irrelevant in regard to the adoption of m-commerce. Accordingly, general population target groups should be the focus of organisations operating in the relevant industries. Finally, this study provides value by expanding the current literature through the inclusion of various demographic variables and the prediction of the impact of trust on perceived usefulness. The findings show significantly different results than when compared to other research carried out in the same sector amongst Chinese and Malaysian populations. It is considered that this point is particularly relevant for future studies as a comparison may be carried out between Malaysian and Saudi individuals in an attempt to examine such differences in greater depth.

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