Conceptual Framework for understanding Mobile Commerce Applications

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Abstract: For progressive development and dissemination of mobile commerce applications, the most important thing is the satisfaction and consolation of consumer. The theoretical model proposed in this study is based on revised technology acceptance model (TAM) that comprises of the distinct features from mobile commerce, electronic business and information systems domain. It helps to enlarge our comprehension of the application, implication, utility and usage of mobile commerce applications. The crucial and critical factors, as identified from the literature, incorporated in the proposed model are social influences, facilitating conditions, interface design, and experience. This work will be helpful for designers and developers of mobile commerce applications.

Keyword: Mobile Commerce Acceptance, TAM, Technology Acceptance Model, Pakistan

I. INTRODUCTION

In the domain of information and communications technology sectors, the World Wide Web is one of the most characteristic advancements. The www has been an easy medium to provide an immense variety of services, not least, the ability to proceed out transactions and improve communications in business (Clarke 2001). Mobile commerce insinuates to any transaction with administrative value that is executed through mobile or wireless network. The mobile commerce proceeds ahead at greater speed in present world. According to Gartner, world wide mobile phone sales to consumers totalized 1.6 billion units in 2010, a 31.8% increase from 2009; and the smart phone sales to consumers were up 72.1% from 2009 and accounted for 19 % of total mobile phone sales in 2010.According to market researchers, worldwide sales of advances mobile phone more than quadrupled from 119.7 million in 2007 to 481.3 million in 2011 and supposed to enhance further to a sales volume of almost one billion devices by 2016(Strategy Analytics, 2011; Abbasi,2011) to a sales volume of almost one billion devices. The advantages and profits and progressive impact of using mobile commerce, efficiency, convenience limited selections, competitive praising, rich information and diversity are well known. As a result, the achievements and advances in mobile commerce, including adversity, shopping, investing, banking and other online services (email, information seeking, etc.) have created a diversified and broad field to connect with the mobile commerce in their daily lives. The number of mobile commerce consumers has thus continued to increase. Moreover, not enough consumers or user acceptance has long a hurdle to the successful new information mechanisms the same time mobile technologies and software are rapidly and widely developed for mobile commerce; it is most necessary and important to have a better understand with consumer's acceptance make use of mobile commerce.

Consumer acceptance is one of the most basic characteristics for successful development and dissemination of mobile commerce applications. Mobile commerce has enhanced competition within business organization; such that it has become quite difficult for organizations to survive without introducing new amendments into the way they execute business. This issue is prominently significant as with the enhanced business competition the fame of World Wide Web and mobile devices acceptance and usage. Achieving the loyalty of customers, a significant aim to gain the nature of the competitions in the market. On the other hand, concerned and nearby benefits or advantages to their creative innovative, invented technologies cannot be fully observed until there systems are not fully realized. The TAM did not describe what specific crucial factors from mobile commerce information domain and incorporated into model. Understanding the necessities and demands of what confides user's mobile commerce acceptance can provide amazing management insight into progressing effective policies and plans that will allow enterprises to sustain competitive and

hold their market, due to the distinct characteristics of mobile commerce believe that it is significant to revise the information systems acceptance theories and develop a new theoretical structure and model that are more appropriate for mobile commerce an important objective throughout is to develop a model capable of providing useful information to mobile commerce practitioners. It will be useful the practitioners to comprehend insights how to promote it to customers. Therefore, we accepted the revised technology acceptance model that includes distinct features for electronic commerce and information systems domains to increase our understanding of mobile commerce acceptance and application. This research is to comprise on study research gap by empirically establishing model to explain the factors influences the acceptance   and usage of mobile commerce in Pakistan. Thus, herein we report review on essential factors of mobile commerce acceptance and usage; developing a research model based on literature review.

II.   TECHNOLOGY ACCEPTANCE MODEL (TAM)

User of new technology and acceptance of modern technology constantly endure different connections and chance. Real user of a system and adopter of a modern technology constantly face some troubles and problems prior to use it. Service providers also experience major troubles regarding the usage of system, which they always struggling to satisfy their customers with the supplied service. The essential of ratiocination, the user of acceptance of Information technology IT has been well-known since 1980s. To interpret the process behind the impact factors of user acceptance and implementation for mobile commerce, it is necessary to understand the theory from which it is obtained. There are different theories regarding user acceptance, few of them are as follows: Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980), Theory of Planned Behavior (TPB) (Ajzen, 1985) and Technology Acceptance Model (TAM) Davis et al. (1989) seems to be the most commonly operated and acquired by the researchers of IT. The TRA and its derivate TAM and TBP follow obey the Attitude-Behavior is a model that recommends that comport in question is fixed via the target concerning of attitude. Therefore, the objective is governed by attitude and ultimately major opinions impact the attitude. However, the main focus of TAM is on the usage of IT/IS. The TAM has been extendedly used purely for the reason of estimating, interpreting and enriching the conception for the purpose of one's acceptance of technology in different fields. It is essential to observe here that the current study refers TAM-based detect as the foundation for the theoretical model progress. In 1989, TAM was originated by Davis is a theoretical base to describe and forecast the information of acceptance technology. TAM is originated from TRA, which was proposed by Davis, and it has been examined and expanded in (F.D. Davis, 1989) which recommends that

social behavior is propelled by the stance and purpose to execute. The indispensable notion behind TAM was to expound and assess user acceptance of IS from survey taken after a short time of communication with system the indigenous TAM. The native TAM comprised of Perceived Usefulness PU, Attitude toward using (ATU), Behavioral Intention (BI), and Actual System Use (AU) (WU, Jen-Her, and Shu Ching Wang, 2005) as it is shown in Figure 1. TAM begins by presenting extrinsic components Such as (Social influences, Facilitating Conditions, Experience and Interface Design) the beginning for pursuing the influence of extrinsic variables on two major intrinsic beliefs, that are Perceived Usefulness (PU), and perceived ease of use (PEOU), during the usage of Perceived ease it devastate extrinsic components and Perceived usefulness. Thus, Technology acceptance model is the major focus of this research study, therefore perceived ease and perceived usefulness of operation performs the major role. These two theories impact on the attitude of user regarding utilizing information systems. Thus, it has impact on behavior aim to operate, which is the main constituent for effective use of system.
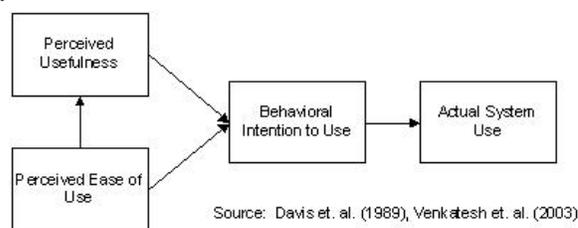

Figure 1: Technology Acceptance Model

A.   REVISED TECHNOLOGY ACCEPTANCE MODEL (TAM2)

Several models have been developed which are an expansion of each other in a series. TAM Davis et al. (1989).   is a model that was developed to foretell the reasons why, at certain times, the users accept the information system (IS) and why, at other times, they do not. It was discovered that the users sometimes were not able to evaluate and conceive the usefulness of a given system. Hence, they tried to come up with a revised version of the model which was believed to be more potential to predict the behaviour of the users regarding the acceptance or otherwise of an information system. The new model claimed to focus on the three main themes pertaining to human behaviour i.e. Behavioural Intention (IB), perceived usefulness (PU) and perceived ease of use (PEOU) (Davis, 1989: 997). The objective of the new model of TAM was to be able to predict the users' behaviour about the new information system whether they were going to accept it or reject it. This was to be done in collaboration with the original TAM version.   The researchers discovered the strong correlation among the above said three behavioural

constructs. Davis and Venkatesh (1996) are of the opinion that since the three behavioural elements are closely linked with one another, they can be perceived as necessary features of the core design of the TAM model. The concepts of PU and PEOU were taken from the revised model TAM Davis et al. (1989). This study intends to attempt further expansion of the revised model TAM by adding four crucial factors i.e. social influence (SI), facilitating condition (FC), experience (Ex) and interface design (ID). The addition of these factors will hopefully make the model strong enough to be able to predict the users' attitude towards the use of IS universally.
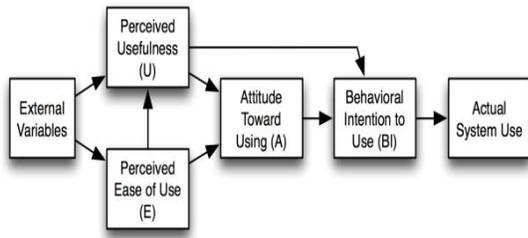

Figure 2: Revised Technology Acceptance Model

III. MODEL AND PROPOSED HYPOTHESES

This study is designed to comprehend the usage and acceptance of mobile commerce applications. The study is based on the grounded theory of TAM. The study includes important factors like PU and PEOU derived from the revised TAM model along with social influences, facilitating conditions, interface design and experience which have already been defined in the literature review section. The design is shown as under:
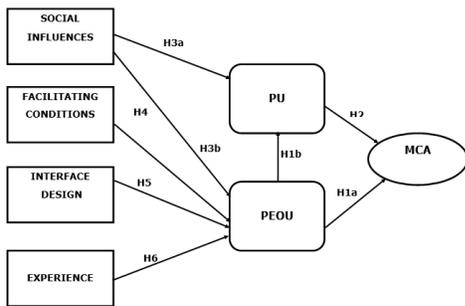

Figure 3 Mobile Commerce Acceptance

A. Dependent Variable

The TAM model is believed to be able to predict the usage and acceptance of an application with the help of ease of use and usefulness of the given application. This earlier model

depends on only two factors to perform its function i.e. PU and PEOU and in turn PEOU (Davis 1989) depends upon six factors in order to evaluate the use of any application in terms of perceived usefulness and perceived ease of use. Bothe PU and PEOU make the performance quicker, effective, understandable and exact. In other words, they make the application totally 'user- friendly'.

B. Hypotheses Drawn From the Revised Tam Model

The model hypothesizes that user acceptance of mobile commerce is jointly determined by PU and PEOU. In the light of the recommendations of other researchers' (Venkatesh and Davis, 2000) wherein external factors were suggested to be incorporated in the model to assess their effects on core beliefs of revised TAM, the proposed model integrates the antecedents of PEOU and PU based on earlier research studies that have extended the revised TAM. External variables being incorporated in the model include social influence, facilitating conditions, interface design and experience of four external factors, social influences are considered to have a direct influence on both PEOU and PU while other three external factors namely facilitating conditions and interface design, experience are proposed to have direct effect on PEOU. The model developed in the study also proposes that PU and PEOU mediate the effects on usage of mobile commerce acceptance and usage. Constructs and their putative hypothesized relationships are presented in Table 3.1.

Table 3.1 Definitions, Code Name, and Their Hypothesized Relationships

CONSTRUCT	CODE NAME	DEFINITIONS	HYPOTHESIZED RELATIONSHIPS
PERCEIVED USEFULNESS	PU	Refers the degree to which a person believes that using a particular system would enhance his/her job performance.	PU ->MCA
PERCEIVED EASE OF USE	PEOU	Refers to the degree to which a person believes that using a particular system would be free of efforts. PEOU	PEOU->MCA PEOU->PU
SOCIAL INFLUENCES	SI	The concept of social influences refers to the extent to which	SU->PU SU->PEOU

		an individual perceives that important others believe he or she should use the system.	
FACILITATING CONDITIONS	FC	Considers the extent to which an individual believes that a technical and organizational framework is present to support system utilization.	FC->PEOU
INTERFACE DESIGN	ID	The degree to which the interface is easy to use and easy to learn. The Ability of interface to learn Every user task correctly.	ID->PEOU
EXPERIENCE	E	For application encompasses the visual appearance, interactive behavior, and assistive capabilities of software.	E->PEOU

C. Perceived usefulness (PU)

PU is elucidated on the criteria of one's performance in the job ((Davis, 1989). The study of PI has been discussed many times studies (Lin and Wang, 2005; Luarn and Lin, 2005; Guriting and Ndubisi, 2006). For example, Wong and Hiew (2005) emphasized that the service of mobile commerce is used in rare case that is comprised of ubiquity, personalization, time, area and network. Therefore, PU is elaborated on one's belief on his/her performance in daily excercises.it does not only show the characteristics of mobile commerce, but also helps mobile commerce in order to achieve one's task for example, effect and result (Ho and Kwok, 2003). As a result, the research is processed further as,

H1: perceived usefulness has brought good impact on mobile commerce acceptance.

D. Perceived ease-of-use (PEOU)

It is the view of everyone that PU is helpful for he/she who may search that the network is difficult to adopt (Davis, 1989). PEOU has been focused in the field of information technologies, for instance (Chang, 2004), 3G (Liao et al., 2007), online banking (Guriting and Ndubisi, 2006; Jahangir and Begum, 2008), wireless internet (Lu et al., 2003), internet commerce (Cho et al., 2007) and mobile commerce (Lin and Wang, 2005; Wang and Barnes, 2007; Kurnia et al., 2006; Mallat et al., 2006). Rogers (1995), supports the system PU has stopped the innovation it is borrowed Davis (1989), PEOU relates to the level to which an individual believes that the usage of mobile commerce will be free of physical and mental struggles for instance, the person who is using mobile commerce and its features in order to find data. Therefore, the usage of mobile commerce will be easy to access.

H2: PEOU has shown positive effect on mobile commerce acceptance.

E. Social Influences (S I)

Social influences are asserted by Venkatesh et al. (2003) as the result of individual interest in the new approach. It builds up the concept of one's behaviour and interest towards the usage. It has brought a major impact on his/her behaviour to the system. Venkatesh et al. (2000) social impact has developed through a system, compliance, internalization and identification. The system of compliance effects on one's intention towards social pressure. It develops through social influences. He/she find his/her interest in result of system either gains or loss. It effects on one's interest on one's behaviour (Venkatesh et al. 2003).

H3: Social Influences has positive and significant on perceived usefulness and perceived ease of use.

F. Facilitating Conditions (FC)

Facilitating conditions regards the individual approach towards the system of using one's field in order to utilize the present framework (Venkatesh et al., 2003). The improved technology brings more developed results. (Garfield, 2005; Schaper & Pervan, 2007).in response to mobile commerce applications, facilitating conditions depends on compatibility and individual approach from TPB, TAM, and IDT models (Ajzen, 1991; Venkatesh et al., 2003). It is discussed by scholars (AlGahtani et al., 2007; I. Chang, Hwang, Hung, & Li, 2007) that facilitating conditions impact on one's actual use. In this story facilitating conditions have been measured through perception. Further the information of mobile internet services has brought good impact of the technology in order to use user's life styles. Hence, the condition of mobile commerce needs to be discussed, we propose:

H4: Facilitating Conditions has a positive effect on mobile commerce acceptance.

G. Interface Design (ID)

Powerful interface design for cellular apparatus eases the mobile users. The user interface style combines a user's communication and user interface devices (Kling & Elliott, 1994). Many fresh researchers are also conducted on it however interface design consists of three parts. The screen design system stands for visual presentation that influences a user's performance (Lindgaard, 1994). It has replaced many retrieval mechanisms. It also facilitates the user to search information easily. Second; terminology refers to the language of a system (Lindgaard, 1994). The popularity of mobile commerce applications also depends on its usage of terminology and the user's interaction with it. Lastly; navigation is the easiness of browsing (Lindgaard, 1994). Its smoothest the information searching. Therefore, we propose that interface design will positively affect perceived ease of use of the mobile commerce acceptance.

H5: Interface design will significantly impact on mobile commerce acceptance.

H. Experience

Experience related to the level of knowledge that an individual has of new type of systems (Venkatesh& Davis, 2000). Moreover, the concerned works suggest that one's growing experience of a mobile commerce applications leads to skill development mobile commerce applications and straight technological contact. It can also motivate others, emotionally and professionally (Agrawal & Prasad, 1997; Agrawal & Prasad, 1999). Although these experiences may not relate to mobile commerce applications directly, they can help users to learn how to use new system more easily therefore, we propose that more mobile commerce applications experience will lead to high level of perceived ease of use of the mobile commerce applications.

H6: Experience will significantly impact on mobile commerce acceptance.

IV. CONCLUSION

The study on mobile commerce user acceptance in Pakistan has been undertaken. The factors of the unique characteristics of mobile commerce in Pakistan culture are selected to user satisfaction. The present study suggests introducing system specific moderating factors such as system quality and information quality. The study has provided the theoretical frame work utilized in previous prominent theories and models in the technology acceptance research of domain called Technology acceptance model (TAM), Revised Technology acceptance model (TAM2), Theory of Reasoned Action (TRA) and Theory of Planned Behaviour (TBP). The study suggests that theoretical model leads to four factors which are affecting consumer satisfaction. These factors are social influence, facilitating conditions, interface design, experience. This study also suggested two further unique factors in revised TAM according to the results literature relevant. These unique features are PU and PEOU. For test to revised models the study should be formulated for proper research and designing a research according to the nature of work and develop research instrument to measure the construct of the research models and also collect and analyse data validation for model. Such parameters suggest that the past studies could also confirm the present work. This research work is unique and has not been studied previously.

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