Measuring the Impact of Trust and Social Influence on Mobile Commerce Adoption in Pakistan: An Extended TAM

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ABSTRACT

The aim of this study is to investigate the impact of trust and social influence on consumers' adoption of Mobile Commerce in Pakistan. A hypothesized research model based on Technology Acceptance Model (TAM) was proposed to investigative the simultaneous effect of trust and social influence. The proposed research model was validated through Structural Equation Modeling technique using Analysis of Moment Structures software. A total of 414 responses were collected using clustered sampling approach. Each variable was measured on seven point Likert scale. Research findings indicate significant relationship between all variables and 70.2% variance in behavioural intention is explained by its predictor variables. Results further indicate that Pakistani consumers are very much conscious about trusting this kind of virtual commercial activity in which consumers deals with unknown seller. This research seizes many practical and theoretical implications for researchers, practitioners, policy makers, retailers, managers, technology consultants, software vendors, information systems developers and investors.

Keywords: *Trust, Social Influence, PEOU, PU, TAM, Pakistan*

1. INTRODUCTION

The Information and communication tools have facilitated conventional trades into E-businesses and also Mobile Commerce (M-commerce). Modern mobile device with its features such as the convenience of its web browsing expertise, the screen resolution, memory capacity, and capability to run internet, has enriched it to perform the activities which usually were only performed through Personal Computers (PCs) [1]. Therefore, mobile phone users not only use their phones to access worldwide information on every time every place basis, but also the create trade easily, e.g., digital wallet [2]. M-commerce has received huge attention by consumers as well as by business organizations. Since, a huge figure of mobile users has already exceeded the Internet users around the world, there is enormous potential for M-commerce to be adopted in near future [3]. This opportunity has created a new era for business norms and broadened the scope and approaches being used by the traditional brick-and-mortar businesses. Likewise, it is also attracting the interest of the business organizations to provide convenience to their consumer at any place and at any time. Significantly, access to market via M-commerce is soaring trajectory [4]. M-commerce usage in developed countries like UK, USA, Australia and other technologically advanced countries has been accepted at large scale. However, M-commerce still seems to take very slow pace in developing economies such as Pakistan, where its acceptance is quite low. Considering the increasing role of M-commerce, it is important to investigate what influence its growth in the emerging new market of Pakistan.

In this paper the significance of trust and social influence on M-Commerce recognition in Pakistan is explored. Since, M-commerce recognition in Pakistan in still in its inception, outcomes of this study would help M-commerce operators to understand user's cognitive beliefs about this emerging new concept. This research paper is further organized as follows: First the research background highlights the current status of information technology acceptance in Pakistan. Next, proposed research model and hypotheses are discussed. Later on, research methodology including sampling, data collection, analysis tools used and techniques are presented. At the end, the discussion of research findings, implications along with limitations, conclusion and future research directions are provided.

2. RESEARCH BACKGROUND

2.1 Status of Online Shopping in Pakistan

According to 2015 statistics, Pakistan has overall GDP of 246.9 billion dollars and is increasing at 3.7% per annum [5]. Moreover, according to Pakistan Telecommunication Authority [6] there are 139.20 million mobile phone users in Pakistan. Recent development in the field of ICT has not only globalized business environments but also revolutionized business strategies of the organizations. Consequently, there is a strong impact of ICT on the development of e-business in developing countries such as Pakistan [7].

Atta [8] compared e-business status in Pakistan with America and found that 75% of American practise online approach of shopping to purchase and sell goods and services while Pakistani consumers were found reluctant to rely on e-business based on their, insecurity, dissatisfaction and lack of awareness with ICTs tools. Likewise, [9], highlighted that although internet in Pakistan was first introduced in 1995, but

its penetration has remained very low as compared to developed countries.

In addition to that an empirical study conducted by [10] tried to explore the significant factors of online shopping adoption in Pakistan. Researchers tested their hypothesized model based on four factors (perceived risk, perceived cost, perceived convenience and perceived enjoyment) using the feedback from 220 respondents. They found negative relationship between risk, perceived cost and online shopping behaviour, while positive correlation between perceived enjoyment and perceived convenience and online shopping behaviour.

According to [11] the trend towards e-commerce adoption in Pakistan is increasing rapidly. In their study they identified that although many internet users in Pakistan intend to purchase things online but there are some social, psychological, emotional and the privacy factors which affect the their online purchase attitudes. According to their research findings, protection of privacy and security are the most significant concern of Pakistani online consumers. They further added that most online consumers hesitate to conduct online shopping because of transaction costs, the lack of trust and fear of insecure transactions.

In another study conducted by Sabir [12] used an extended TAM to find the significant factors of mobile banking adoption in Pakistani. Researchers integrated many external factors such as trust, perceived cost, perceived risk, innovativeness, feelings, perceived compatibility, self-efficacy, and voluntariness in their research model. Proposed model of their research was empirically tested on the data sample of 300 university students and staff. Findings of their research revealed that perceived usefulness, perceived ease of use and self-efficacy are the most significant factors that heighten the intention to use mobile banking in Pakistan.

All things considered, Pakistan seems late entrant in the world of electronic business but the establishments of new online ventures are springing up to get maximum out of the available potential market of the country. Henceforth, the recent surge in the large scale penetration of internet and smart phone usage in Pakistan is a clear indication of the boom of electronic and M-commerce in near future [12, 13].

2.2 Technology Acceptance Model

TAM is among the most accepted models used to explore the acceptance of any technology, service or system. According to TAM (as shown in figure 1) individuals' belief are usually dependent on perceived usefulness (PU) and perceived ease of use (PEOU) [14]. Perceived usefulness is individuals' perception about the usefulness of a particular service, system or technology. Whereas, perceived ease of use is individual's perception regarding the easiness of the usage of a particular system, service or technology [14]. TAM has been tested to provide statistically reliable results in various contexts. Although, TAM has been extensively applied in different contextual settings to explain user acceptance of new IS, but TAM also have some restrictions i.e. very simple and broadly studied [15, 16]. Davis [14] himself believed that researchers can improve the predictive power of TAM by exploring other variables that could affect its primary

variables (PU, PEOU) to make it fit for explaining specific technology adoption contexts. Some researchers [17] believe that addition of some other external variable according to contextual settings can improve the prediction power of TAM.
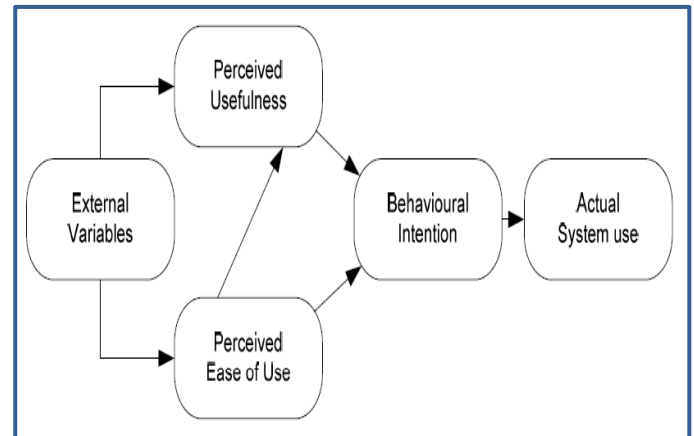

Figure.1. Technology Acceptance Model [14]

3. RESEARCH MODEL AND HYPOTHESES

Although IS/IT researchers have contributed and tested various models to see the individuals' adoption of new information technology innovation. Each researcher must consider which model is the most appropriate for studying the technology acceptance of new information systems. Moreover the selection of an appropriate model as baseline model depends on the different contexts and countries it is to be tested [18]. Among various models of IS acceptance, TAM has been extensively used, because of its strong predictive power and simplicity. However, according to Davis [14], its primary variables (PU, PEOU) can be integrated with some other external variable to improve its predictive power if it is used in different contextual settings. Accordingly, many researchers [16, 19] added additional variables and found improved results.
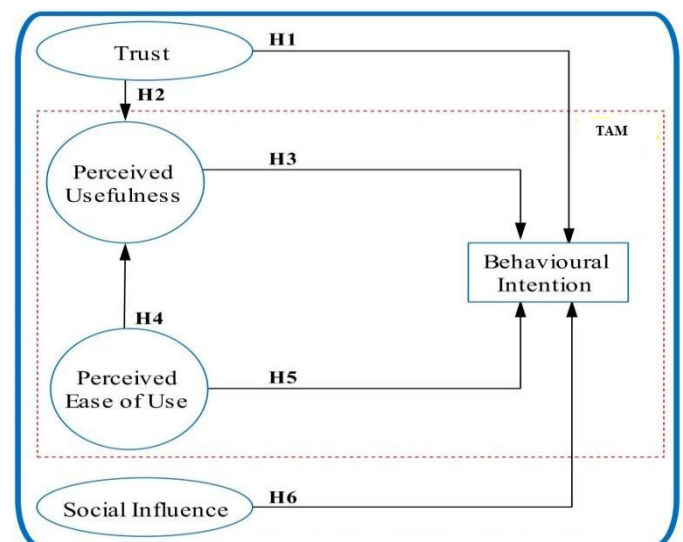

Figure.2. Model under study

Considering the nature and context of current research, researcher added some additional variables such as social

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influence and trust, with the core construct of TAM (i.e. PU, PEOU) to test its validity in the M-commerce adoption in Pakistan. Proposed research model and hypothesized relationships between variables (dependent and independent) is demonstrated in Fig.2. According to proposed research model trust and social influence are supposed to have significant impact on the users' acceptance of M-commerce in Pakistan. Therefore, behavioural intention to accept M-commerce can be jointly determined by PEOU, PU, trust and social influence.

3.1 Trust

Considering the virtual nature of commerce, consumers feel uncomfortable to share their secret and confidential information with unknown party they make business deals [21]. Many researchers found positive significant relationship between behavioural intention and trust [17]. Similarly, others also found positive correlation between trust and perceived usefulness of particular system [22]. From M-commerce perspective trust play a major role when transactions are done through a wireless handheld devices [23]. Moreover [24] believed that the role of trust becomes more crucial when relationship between a buyer and seller is virtual. Therefore, it is hypothesized that:

H1. *Trust has major influence on behavioral intent.*
H2. *Trust has major influence on observed usefulness.*

3.2 Perceived Usefulness (PU)

Perceived usefulness (PU) can be defined as an individuals' perception regarding the use belief of a particular technology that improve the enactment [14, 25]. Perceived usefulness plays significant role in the adoption of IS/IT services, systems and technologies [14, 26, 27, 28]. Similarly, researchers also identified its core role in M-commerce acceptance [29]. It is therefore hypothesized that:

H3. *Perceived usefulness has major effect on behavioral intention.*

3.3 Perceived Ease of Use (PEOU)

Perceived ease of use can be referred as individual's level of confidence to believe that using a particular service, technology or system is easy to use for him or her [14. 30]. Many researchers using TAM found significant association in perceived comfort of usage and behavioral intention [31]. Few studies conducted under different contextual settings such as 3G [32], M-Payments [26] online banking [20] and M-Commerce [33] also found that there is direct and indirect significant correlation between perceived ease of use and behavioural intention. Thus, we hypothesize that:

H4. *Perceived comfort of usage has significant effect on behavioral intention.*
H5. *Perceived comfort of usage will has significant effect on perceived usefulness.*

3.4 Social Influence (SI)

Venkatesh and others [34] believed that social impact has substantial effect on individuals' acceptance and usage of IS/IT system or service. According to them individuals usually accept others (including friends, family, and colleagues) suggestion before using new technology or systems. The role of social influence was tested and found significant in UTAUT [34, 35]. In UTAUT, Venkatesh and others combined the elementary hypotheses i.e. subjective norms (from Theory of Reasoned Action and Theory of Perceived Behaviour) Image (from Innovation Diffusion Theory) and social factors (from PC Utilization Theory), and formed as new construct named as social influence [36]. In IS/IT acceptance theories, social Influence is counted as an equivalent to subjective norm, in which an individual believes that, as per others he or she should use the new technology. It is assumed that consumers with high anxiety of technology are more concerned to social influence to use M-commerce than others with less anxiety [37]. Many empirical studies [16, 25, 26, 35], found significant correlation between social influence and behavioural intention to accept M-commerce. Therefore it is hypothesized that:

H6. *Social Influence has significant effect on behavioral intention.*

4. METHODOLOGY

4.1 Developments of Questionnaire

Data for this research was collected using a survey instrument. All variables were assessed using items adopted from previous literature. However, pretesting and pilot study were conducted to avoid any ambiguity or error in the final questionnaire. All variables were measured on seven-point Likert scale starting from (1) strongly disagree to (7) strongly agree. Whereas demographic questions were information was sought on nominal scale. Variables, number of items related to each variable and the source it is adopted are tabulated in Table 1.

Table 1. Sources of Questionnaires and Items

Constructs	No. of Items	Sources
Behavioural Intention (BI)	5	[14]
Perceived ease of use (PEOU)	7	[14]
Perceived usefulness (PU)	7	[14]
Trust (TR)	6	[22]
Social Influence (SI)	5	[34]

4.2 Sampling and Data collection

Clustered sampling approach was used to collect data from mobile device internet users. Five major cities of Pakistan including Quetta, Islamabad, Peshawar Lahore and Karachi were identified as clusters. However respondents were randomly approached at banks, shopping malls, educational institutes, town centers, train stations, and

organizational headquarters. In total 750 survey questionnaires were uniformly distributed in all clusters through mixed approach of hand to hand distribution, via postal mail and via web based online. 459 responses were sought after continuous follow-up activities. Out of which 45 responses were rejected due to incomplete feedback. Finally 414 useable responses were analyzed.

5. DATA ANYLYSIS

5.1 Respondents' profile

The demographic profiles of the surveyed respondents are demonstrated in Table 2. According to results the ratio of male and female respondents found 68.8% and 31.25% respectively. Statistics also revealed that respondents aged between 21-30 and 31-40 years showed great interest in survey with response rate of 50.9% and 30.4% respectively. Furthermore, participant having Bachelor's level education found to be highest proportion (46.3%), followed by those having postgraduate level of education (33.8%). Substantial number of the participants (34.1%,) were employed at private sector, followed by government (public) sector employees (31.4%). It was found that the highest percentage (32.6%) of respondents had their monthly income between Rs. 21,000-40,000, however only 5.3% respondents reported their monthly income is greater than Rs. 100,000.

5.2 Measurement Model

Researchers used two-stage structural equation modeling (SEM) technique to perform both Confirmatory Factor Analysis (CFA) and Structural Model (SM) testing. SEM has been most widely used approach to check relationships among measured and latent variables and to analyze the hypothesized relationships among variables of proposed framework [38]. During CFA the assessment of measurement model (MM) was tested to check if the data fits the model. Initial results indicated some low loading items related to social influence. However, after deleting all three low loaded items (i.e. SI1, SI2 and SI5), CFA was rerun to achieve better results. As shown in Table 3, factor loadings, Composite Reliability (CR) values and Average Variance Extracted (AVE) found well within recommended brackets (i.e. CR ≥ 0.7, AVE ≥ 0.5) [38]. Similarly, model fit indices for MM as shown in Table 4 indicate that data fits the model well and all fit indices are within the acceptable ranges.

Table. 2 The respondents' demographic detail

Variable	Category	Nos	(%)
Gender	Male	285	68.8
	Female	129	31.2
Age	<20	3	0.7
	21–30	211	50.9
	31–40	126	30.4
	41–50	60	14.5
	51–60	10	2.4
	>60	4	0.9
Education	Less than high school	0	0
	High school	22	5.3
	Intermediate	24	5.8
	Diploma	36	8.7
	Graduate	192	46.3
	Postgraduate	140	33.8
Occupation	Student	87	21.0
	Government employee	130	31.4
	Private sector	141	34.1
	Businessperson	39	9.4
	Other	17	4.1
Income (rupees)	<20,000 Rs	67	16.2
	21,000-40,000 Rs	135	32.6
	41,000–60,000 Rs	107	25.8
	61,000-80,000 Rs	59	14.3
	81,000-100,000 Rs	24	5.8
	>100,000 Rs	22	5.3

Table.3 Assessment of measurement model for constructs

Construct	Item	Factor Loading	CR	AVE
Behavioural Intention	BI1	0.832	0.932	0.732
	BI2	0.865		
	BI3	0.870		
	BI4	0.842		
	BI5	0.867		
Perceived ease of use	PEOU1	0.874	0.950	0.730
	PEOU2	0.889		
	PEOU3	0.888		
	PEOU4	0.836		
	PEOU5	0.854		
	PEOU6	0.857		
	PEOU7	0.877		
Perceived usefulness	PU1	0.842	0.943	0.703
	PU2	0.827		
	PU3	0.857		
	PU4	0.837		
	PU5	0.866		
	PU6	0.880		
	PU7	0.756		
Trust	TR1	0.842	0.931	0.692
	TR2	0.848		
	TR3	0.862		
	TR4	0.799		
	TR5	0.860		
	TR6	0.777		
Social Influence	SI3	0.777	0.734	0.580
	SI4	0.746		

Table.4 Model-fit indices

Fit indices	Criteria	Measurement Model	Structural Models	Ref.
X2/Df	$1 < \chi2/df < 3$	1.961	2.005	[38]
RMSEA	<0.05	0.048	0.049	[39]
NFI	≥ 0.90	0.940	0.938	[38]
TLI	≥ 0.90	0.966	0.964	[38]
CFI	≥ 0.90	0.969	0.968	[39]
GFI	≥ 0.90	0.903	0.900	[38]

5.2 Structural Model

In second stage of SEM, Structural Model (SM) was run to validate the hypothetical relationships among the constructs. Results of SM as shown in Table 4 demonstrate that all six hypotheses found strongly significant at p = <

0.001 and hence supported by the data. The values of path coefficients indicate that hypothesis H2 between trust and perceived usefulness is the strongest relationship as compared to all other hypotheses. Furthermore, according to Figure 3, in total 70% variance in BI is explained by all predictive variables, whereas 59% variance in PU is explained by its predictive variables (i.e trust and PEOU). These findings indicate strong predictive power of proposed research model in explaining the adoption of M-commerce in Pakistan.

Table. 5 Report of hypotheses testing

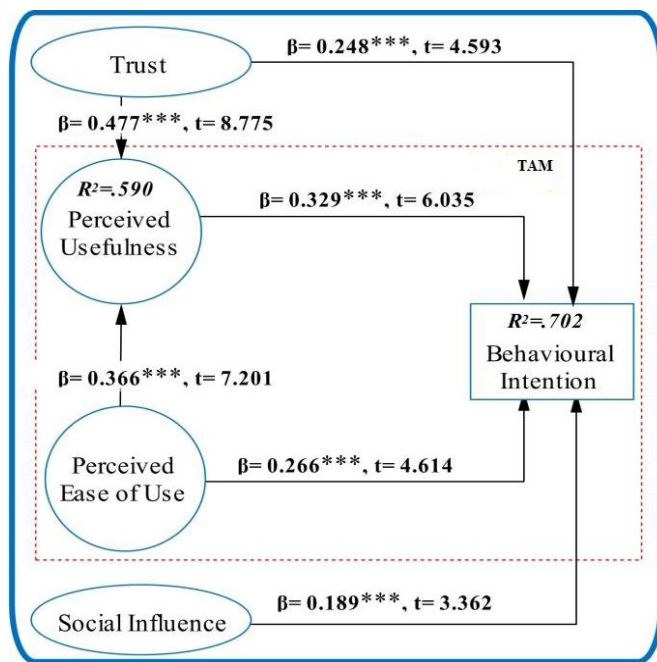| Hypothesis	Relationship	β values	t-Value	Results
H1	TR→BI	0.248***	4.593	Supported
H2	TR→PU	0.477***	8.775	Supported
H3	PU→BI	0.329***	6.035	Supported
H4	PEOU→PU	0.366***	7.201	Supported
H5	PEOU→BI	0.266***	4.614	Supported
H6	SI→BI	0.189***	3.362	Supported
Note: ***p<0.001				

Figure.3. Empirical Model

6. DISCUSSION

6.1 Relationship between PEOU, PU, and BI

Results of this study indicate significant relationship between core construct of TAM model i.e. between PEOU, PU and BI. Parameter estimates (β = 0.329, t-value = 6.035, p = 0.001) of the proposed hypothesis H3 (PU → BI) indicate that a strong significant positive relationship between PU and BI. Therefore, these empirical results supported the argument that usefulness beliefs of the potential users have positive influence on the behavioural intention to accept the M-commerce. These results are consistent with the findings of original TAM in which PU was found to have direct significant effect on the behaviour intention [14].

Additionally, empirical results (β = 0.366, t-value = 7.201, p = 0.001) of hypothetical relationship H4 (PEOU → PU) also validate that there is a significant positive relationship between these constructs. Evident from these results is the fact that PU of M-commerce is significantly influenced by its ease of use belief that may further affect its acceptance. Moreover, as tested in structural model the results of parameter estimates (β = 0.266, t-value = 4.614, p = 0.001) for hypothesis H5 (PEOU → BI) suggest that relationship between PEOU and BI is strongly significant. This indicates that PEOU is a strong predictor of BI and an increase in user's perception of the easiness of M-commerce would further enhance its acceptability. However compared to PU (β = 0.329), the effect of PEOU (β = 0.266) is found to be weaker on BI. These results are not surprising, but are consistent with many other earlier empirical studies conducted in similar contexts [14, 20, 22, 34 40].

6.2 Relationship between Trust and BI

In this study, trust was supposed to have positive direct and indirect (through PU) effect on the acceptance of M-commerce based on two hypotheses (H1 and H2). The results of parameter estimates (β = 0.248, t-value = 4.593) for hypothesis H1 found statistically significant at p = 0.001. These findings indicate that the hypothesis found significantly accepted and implied that an increase in trust would enhance user's acceptance of M-commerce. Additionally, rresults of parameter estimates (β = 0.477, t-value = 8.775) for hypothesis H2 tested through SEM found statistically significant at p = 0.001. This implies that trust increases the PU of the M- commerce. Theses statistical evidences demonstrate that trust is and strong direct (H1: TR → BI) as well as indirect (H2: TR → PU) positive predictor of BI to use M-commerce. These results are also in accordance with the findings of many pervious research studies [12, 20, 22, 24, 31, 33, 41].

6.3 Relationship between Social Influence and BI

The results of parameter estimates (β = 0.189, CR = 3.362) for hypothesis H6 (SI → BI) found statistically significant at p = 0.001 level and indicated that social influence is a strong predictor of BI to accept M-commerce. These results further demonstrated that potential users get socially motivated to consider M-commerce useful when they see their family members, friends and colleagues use it and also recommend them to use it. These findings are in similar to some previous research studies [42, 43, 44].

7. CONCLUSION

This research study was aimed to measure the impact of trust and social influence on the adoption behaviour of M-commerce in Pakistan. Results indicate strong predictive power of the proposed hypothetical model demonstrating 70% variance in dependent variable i.e. behavioural intention to accept M-commerce. Furthermore results indicate very significant role of predictive variables including perceived ease of use, perceived usefulness, trust and social influence on

the outcome variable. Among predictor variables, trust has the most significant impact followed by perceived usefulness and perceived ease of use. These empirical findings demonstrate that an increase in consumers' trust would enhance M-commerce usefulness and intention to accept it as a new mode of commercial transactions. Therefore, it can be predicted that M-commerce is more likely to be accepted on large scale in Pakistan once consumers' trust on the service providers of M-commerce.

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