
Measuring the Role of Trust in M-Commerce Acceptance: An Empirical Analysis in Context of Pakistan

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ABSTRACT

With the emergence of internet and WWW (World Wide Web), traditional businesses got a new opportunity to compete globally. A new term of M-Commerce (Mobile Commerce) emerged and set a new trend in commerce and business. Traditional bricks-and-mortar businesses became e-business (electronic business) with the help of ICT (Information & Communication Technology) tools. Evidences from literature review suggest that there has been little growth in the acceptance of M-commerce in developing economies such as Pakistan as compared to developed economies. There are doubts that users of M-commerce demonstrate a lack of enthusiasm, which may be because of the lack of trustworthiness. Based on the well-known and widely used TAM (Technology Acceptance Model), this study provides the theoretical underpinning and empirical evidence between the relationships of trust construct with the adoption of M-commerce in Pakistan. A cross sectional questionnaire survey was conducted to collect data from M-commerce users in Pakistan to check the influence of trust. After the analysis of 390 valid responses obtained results indicate that trust and other constructs of TAM are related and there is positive and significant role of trust in the acceptance of M-commerce in Pakistan. Results also prove the hypothesized relationship among all constructs of proposed Model.

Key Words: Mobile Commerce, Pakistan, Technology Acceptance Model, Perceived Usefulness, Perceived Ease of Use, Trust.

1. INTRODUCTION

Rapid developments in the field of Information and M-commerce technologies has provided new opportunities to business organizations to go beyond physical boundaries and step ahead towards the fast take-off in electronic (E-commerce) and M-commerce. According to [1] the future of business transactions are now in M-commerce activities. In recent past M-commerce has emerged to be new horizons of

opportunities for doing business and commerce activities with the help of mobile handheld devices [2]. M-commerce can be defined as the exchanging of services and goods or selling and buying of services and goods by using wireless handheld devices including smart phones, cellular phones, tablet computing devices, personal data assistants, and laptop computers [3]. Although unique features of M-commerce provide abundant flexibility to

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its users regarding time and place, but it is found that still customers have been reluctant to adopt it [4]. Since, in M-commerce the medium of transactions is actually a virtual environment, users usually feel uncomfortable to provide their personal and financial details, due to lack of trust, uncertainty and potential risk associated with virtual online environments [5]. Large scale adoption of commercial activities on the web is perceived to be limited because of mistrust between the buyers and sellers [5]. The role of trust is important in M-commerce since most of the time users are unaware of the vendor's credibility of the service delivery.

Mobile phone usage in Pakistan is increasing very rapidly due to cheaper rates of telecom services and increasing competition among mobile service operators. As per Pakistan telecommunication authority [6] total cellular teledensity has reached to 70.4%, which predicts huge opportunity for M-commerce market in Pakistan. Although, telecommunication infrastructures and mobile services in Pakistan has seen high penetration since telecom deregulation policy introduced by Ministry of IT and Telecommunication since 2000, however, so far, adoption of services like M-commerce has been lethargic [7]. Understanding the importance of trust factor in the adoption of technologies like M-Commerce is of significant concern for the organization offering online services in developing economies same as Pakistan before making huge investment in the sector. Therefore, the purpose of this study is to fill the gap in literature and thereby make a significant contribution by examining and identifying the degree to which trust influences the acceptance M-Commerce in Pakistan. As, M-commerce market in Pakistan is in early phases the results of this research can help M-commerce operators in understanding user's intention related to trust in the adoption of M-commerce in a more sophisticated way.

2. RESEARCH BACKGROUND

2.1 Trust in M-Commerce Perspective

Being an important element in commerce or business deals, trust has sought universal interest both in research and practice. The role of trust becomes more important if business or commerce deals are done with information technology enabled systems like E-commerce and M-commerce, where customers have concerns about their privacy and security [8-10]. Trust is a complex, context-dependent, multi-dimensional construct. Thus the meaning of trust has a different understanding in different contextual settings [5,11] suggest that "trust imitate a willingness to be in susceptibility based on the positive expectation toward another party's future behavior". Trust is therefore an important consideration while performing transactions through internet, as the customers need to have enough trust on other party while putting themselves in a vulnerable situation. Trust depends on three beliefs: integrity, ability, and benevolence [12]. Integrity relates to service providers promises that, never to deceive customers. Ability relates to service provider's ability and knowledge which is necessarily required to fulfill their tasks. In online commerce context initial trust has received considerable attention due to its significant role. Reputation, information quality, company size, willingness to customize and website qualities are identified as significant factors to affect the initial trust built up in online environment [13-15]. Regarding online business environment [16] also identified trust as a crucial element of online business activities since there is an uncertain and open nature of web-based systems and internet which are the only medium for financial transaction in the global environment.

2.2 Research Context: Pakistan

Having GDP of 246.9 billion dollars (as of year 2015 statistics) with the growth rate of 3.7% per annum,

Pakistan is the sixth most populous country in the world with total population of 185.1 million [17]. As per Pakistan Telecommunication Authority [6] statistics, the number of cellular mobile phone users in Pakistan reached 139.20 million at the end of May 2014. Thus, Pakistan is the fifth largest mobile phone base in Asia [17]. Pakistani users have not paid much attention towards the usage of M-commerce as compared to western world [18]. In Pakistan, the highest proportions of M-commerce users are the youth individual. This gives a rising exposure to the retailers to increase their investment in this sector [19]. Compared to other countries, online shopping is not in competitive condition in Pakistan [18]. After huge investment in IT & telecom sector and announcement of new IT policies in 2000, there has been a gradual proliferation in mobile phone and internet users. There are nearly 7 billion mobile subscriptions worldwide, which is equivalent to 95.5% of the world population [20]. Among top 14 mobile markets by number of subscriptions worldwide, Pakistan is ranked on 8th.

3. RESEARCH MODEL AND HYPOTHESIS

3.1 Proposed Research Model

Various methods have been adopted to analyze the important factors which predict the user's intention

behavior in particular contextual settings. On the basis of reviewed literature, TAM is the most suitable and widely used theory in IS and IT field to measure individual's acceptance and use behavior. TAM provides good understanding of most influential factors in acceptance, adoption, usage or rejection of IT and IS [21]. Due to large scale acceptance, robustness and clear focus on IT/IS usage [22], TAM is taken as a baseline model in this research. Along with core constructs of TAM, namely, PEOU (Perceived Ease of Use) and PU (Perceived Usefulness), trust is integrated as an additional variable. Previous research provide good evidence of the impact of trust on the behavior intention and PU [22-25].

In summary, the proposed research model (Fig. 1) intends to find individual's intention towards the usage of M-commerce having combined effect of perceived usefulness, perceived ease of use and trust. The emphasis of proposed model is on explaining the impact trust on behavioral intention to use M-commerce in Pakistan's context.

3.2 Behavioral Intention

Most of the IS and IT system usage theories and literature define "Actual usage" as a key construct in their framework. However, new research focused on TAM,

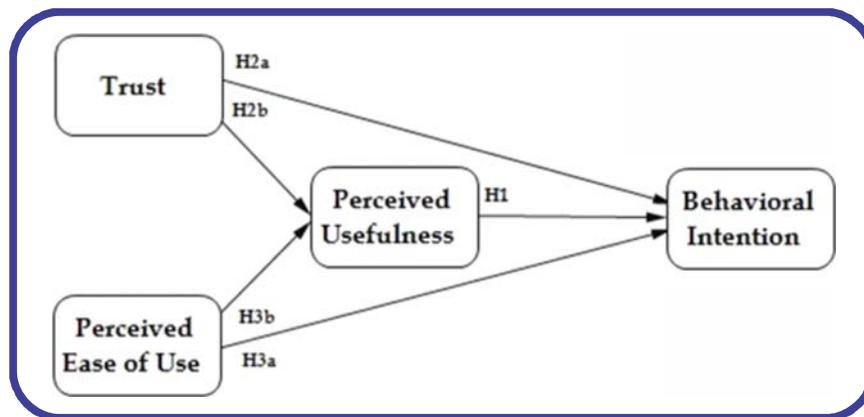


FIG. 1. RESEARCH MODEL

often use BI (Behavior Intention) to measure the individual's acceptance and adoption of IT and IS [22]. According to Davis [26] BI is an extent to which an individual intends to perform a specific behavior. Thus, as per TAM the impact of usefulness and ease of use is fully mediated towards the behavioral intention. In M-Commerce context it is the user's likelihood to engage in online transaction using their handheld mobile devices.

3.3 Perceived Usefulness

PU is an individual's belief that using a particular technology or systems can enhance his or her performance [26]. Furthermore it is a degree to which individual believe that the use of M-Commerce can improve his daily activities [3]. PU is found to have an positive effect on the adoption of mobile data services [27,28]. Many researchers identified that PU is a major factor that influences the adoption of ICT oriented services [8,26,29-32]. PU plays a pivotal role in usage of web portals and acceptance of mobile commerce services [33]. Consistent with the prior studies, it is hypothesized that:

H1: PU will have a positive significant effect on behavioral intention to accept M-Commerce.

3.4 Trust

While conducting online purchase or transaction activity customers feel anxious about sharing their personal information to third party which in this case is virtual [31]. There are both empirical and theoretical evidences regarding a considerable relationship between trust and BI. [34], in their research study, found evidences that behavioral intention is influenced by trust [23], empirically proved significant effect of trust on purchase intention and that, trust increases the individual's intention to use the M-commerce. Some other researchers also found significant relationship between trust and PU [5]. Similarly, [31] provided evidence that trust has positive impact on

PU and allows customers to become more vulnerable to the expectation that they would receive the predictable services or goods from the trusty vendors. Thus, on the basis of prior research, it is hypothesized as follows:

H2(a): Trust will have a positive significant effect on behavioral intention to accept M-Commerce.

H2(b): Trust will have a positive significant effect on perceived usefulness to accept M-Commerce.

3.5 Perceived Ease of Use

PEOU can be defined as an extent and individual's self-confidence which he or she claims is free of effort [26]. PEOU reflects the extent of perceived efforts in using M-Commerce [35]. Research studies related to TAM suggest that PEOU has direct or indirect effect on behavioral intention[36]. Literature review shows that PEOU is an important determinant for the acceptance and adoption of IT Systems, like 3G [37], online banking [22,38] Mobile services [39], M-Payments [28] and M-Commerce [40,41]. Thus, we hypothesize that:

H3a PEOU will have a positive significant effect on behavioral intention to accept M-Commerce.

H3b PEOU will have a positive significant effect on Perceived usefulness to accept M- Commerce.

4. METHODOLOGY

4.1 Questionnaire Development

In order to assess the impact of trust of Pakistani customers in using M-commerce a structured survey instrument was developed for data collection. Good questionnaire design principles were employed in questionnaire development process, such as avoidance of leading questions and use of positive questions as recommended by [22]. Although, items for each construct were adopted from previous research studies done in

context of IS/IT; experts/practitioners were involved to improve the wording and technical expressions to make questionnaires easily understandable to common M-commerce users. For all four constructs used in proposed framework a total of 24 items were finalized (see Appendix A). For BI all five items were adapted from [26], seven items for PU were adapted from [26,42], seven items for PEOU were also adapted from [26,42]. However six items related to trust were adapted from [5,43]. Seven-point Likert scale from (1) strongly disagree to (7) strongly agree was used to measure all items related to all four constructs of proposed model. While demographic related information was measured on a nominal scale. As per recommendation of various IS/IT related researcher [22,26,42,44] seven-point rating scale helps to better understand individual's agreement level for a given statement.

4.2 Sampling and Data Collection

A cross sectional quantitative survey questionnaire was used to collect data from M-commerce users located in five major cities of Pakistan including Lahore, Karachi, Quetta, Peshawar and Islamabad. In order to have sample representation of the whole population it is supposed that major population for our survey belongs to these five cities which can be identified as clusters. These clusters which occurred naturally in the population helped us save money and time. Furthermore participants in these five clusters were selected randomly in educational institutes, banks, organizational headquarters, shopping malls, town centers, and train stations. Participants which had experience in online shopping in particular M-commerce were requested for voluntary participation in the survey. Regarding sample size, [45] gave rating to different sample sizes and believed that a sample size of 50 is very poor, 100 is poor, 200 is fair, 300 is good, 500 is very good, and 1,000 is an excellent. Moreover, [46] also claimed that to achieve optimal results a sample size of at least 200 and not exceeding 400 would be a better approach.

5. EMPIRICAL STUDY

5.1 Descriptive Statistics

In field survey, approximately 600 questionnaires were distributed and after continuous follow-up activities 435 responses received. Out of which, 20 respondents provided incomplete response, 20 indicated they have never used internet and 5 provided completely blank copies of questionnaires. Thus, 390 valid responses were used for data analysis.

Table 1 portrays the descriptive statistical results based on the demographic data received from the respondents. Since internet and online shopping trend is new, results indicate that youngsters within the age bracket of 21-30 years and less are more interested and have highest proportion of approximately 60% of respondents. Results also indicate that, although online shopping activities are performed by approximately all age brackets of respondents but only 55% users have been using M-Commerce, while 45% of respondents have never used or reluctant towards M-commerce.

5.2 Measurement Model

SEM (Structural Equation Modeling) is one of the well accepted statistical data analysis technique most, commonly used for estimating, representing, and testing the relationships between variables (measured and latent constructs) [47]. We used IBM AMOS 21 for SEM to analyze the role and measure the hypothesized relationships among variables of proposed framework. According to the recommendation of [48], SEM should be done in two steps, first the assessment of convergent and discriminant validity of construct should be performed using MM (Measurement Model) approach, while in second step proposed hypotheses testing should be done using SM (Structural Model) approach.

TABLE 1. DEMOGRAPHIC STATISTICS

Variable	Category	Frequency	Percent (%)	Cumulative
Gender	Male	263	67.4	67.4
	Female	127	32.6	100.0
Age	<20	4	1.0	1.0
	21-30	231	59.2	60.3
	31-40	124	31.8	92.1
	41-50	24	6.2	98.2
	51-60	5	1.3	99.5
	>60	2	0.5	100.0
Education	High school	2	0.5	0.5
	Intermediate	3	0.8	1.3
	Diploma	6	1.5	2.8
	Bachelor	250	64.1	66.9
	Postgraduate	129	33.0	100.0
Occupation	Student	116	29.7	29.7
	Government employee	118	30.3	60
	Private sector	131	33.6	93.6
	Businessperson	8	2.1	95.6
	Other	17	4.4	100.0
Income (rupees)	<20,000 Rs	126	32.3	32.3
	21,000-40,000 Rs	98	25.1	57.4
	41,000-60,000 Rs	64	16.4	73.8
	61,000-80,000 Rs	56	14.4	88.2
	81,000-100,000 Rs	24	6.2	94.4
	>100,000 Rs	22	5.6	100.0
Online shopping experience	< 1 Year	54	13.8	13.8
	2-3 Years	85	21.8	35.6
	3-4 Years	104	26.7	62.3
	4-5 Years	42	10.8	73.1
	> 5 Years	105	26.9	100.0
M-Commerce usage frequency	Weekly	56	14.4	14.4
	Monthly	67	17.2	31.5
	Quarterly	51	13.1	44.6
	yearly	40	10.3	54.9
	Never	176	45.1	100
Name of City	Karachi	91	23.3	23.3
	Islamabad	83	21.2	44.5
	Lahore	81	20.7	65.2
	Peshawar	72	18.4	83.6
	Quetta	63	16.1	100

CFA (Confirmatory Factor Analysis) technique is helpful in establishing the construct validity of proposed MM [46,48]. CFA was run on the MM for the empirical assessment of convergent validity of measurement model. All 24 items related to four constructs (Appendix-A) namely; BI, PU, PEOU, and TR were measured in CFA. Standardized residual results indicated that the values of PU7 (related to PU construct), PEOU4 and PEOU7 (related to PEOU construct) found out of the acceptable limits (above 2.58 or below -2.58). These items were dropped due to high degree of residual variance. As per recommendation of [46,49], after dropping the problematic items MM needs to be re-run again. Table 2 illustrates the

factor loadings of proposed model, results show that values of all items related to four constructs exceed the threshold limit of 0.5 and all found significant. Internal consistency of each measure was identified by Cronbach's alpha. All the scale-wide reliability coefficients values found between 0.752-0.930 (Table 2) which are exceeding the recommended values of 0.70 [46], and suggest adequate scale reliability. As per requirement and recommendation, CR (Composite Reliability) values should exceed AVE (Average Variance Extracted), results indicate the all CR values exceed the threshold limit of 0.6, thus the valid results of convergent validity requirements are achieved.

TABLE 2. VARIABLES, FACTOR LOADING, RELIABILITY AND VALIDITY VALUES

Construct	Item Code	Factor Loading	Cronbach's (α)	Composite Reliability	Average Variance Extracted
Behavioral Intention	BI1	0.826	0.930	0.931	0.728
	BI2	0.856			
	BI3	0.876			
	BI4	0.859			
	BI5	0.849			
Perceived Usefulness	PU1	0.804	0.895	0.908	0.612
	PU2	0.824			
	PU3	0.862			
	PU4	0.859			
	PU5	0.862			
	PU6	0.853			
Perceived Usefulness	PEOU1	0.870	0.752	0.927	0.718
	PEOU2	0.873			
	PEOU3	0.788			
	PEOU5	0.847			
	PEOU6	0.856			
Trust	TR1	0.816	0.917	0.918	0.650
	TR2	0.807			
	TR3	0.803			
	TR4	0.785			
	TR5	0.858			
	TR6	0.765			
Note: Threshold limits (Cronbach's α ≥ 0.7, Factor Loading ≥ 0.5, CR ≥ 0.6, AVE ≥ 0.5)					

The MM indicates fairly reasonable results (Table 3 for model fit indices), i.e. absolute fit measures such as χ^2/df found 1.693, GFI (Goodness-of-Fit Index) found 0.920 and RMSEA (Root Mean Square of Approximation) found 0.042. Similarly incremental fit measures such as CFI (Comparative Fit Index) and NFI (Normated Fit Index) found 0.978 and 0.948, respectively. However, the parsimony fit measures like AGFI (Adjusted Goodness of Fit Index) found 0.90. Thus all these statistics results indicate that the model fits the data adequately.

By making the comparison of the AVE estimates for the corresponding constructs with the squared inter-construct correlations, results indicate that the AVE of each construct are greater than the corresponding squared inter construct correlation. Thus the results shown in Table 4 provide additional support of discriminant validity [46,50].

5.3 Structural Model

SM with AMOS helps to confirm the hypothesized relationships among the constructs. According to [49] SM helps to evaluate that which constructs directly or indirectly affects the values of other constructs in the proposed model. Table 5 shows hypothetical relationships, standardized regression coefficients, and t-values. Results show that all five hypothesis (H1, H2a, H2b, H3a, H3b) are highly significant (i.e. p-values

is < 0.001) and highly positive significant coefficients path is between PEOU and PU (β -value 0.428, t-value 9.180). However, there is least positive significant coefficient path between BI and PEOU ($\hat{\alpha}$ -value 0.161, t-value 3.595). Fig. 2 shows the model supported by the empirical data.

6. DISCUSSION

Motivated by the need to identify the factors influencing customer acceptance of M-commerce and the impact of trust, we conducted a cross-sectional self administrated quantitative survey and analyzed the results with

TABLE 4. DISCRIMINANT VALIDITY

Hypothesis	Relationship	Structural Coefficients	CR (t-Value)	Remarks
H1	PU'BI	0.359***	7.937	Supported
H2a	TR'BI	0.412***	9.324	
H2b	TR'PU	0.263***	6.029	
H3a	PEOU'BI	0.161***	3.595	
H3b	PEOU'PU	0.428***	9.180	

TABLE 5. REPORT OF HYPOTHESES TESTING

	PU	TR	BI	PEOU
PU	0.783			
TR	0.601	0.806		
BI	0.726	0.627	0.853	
PEOU	0.612	0.580	0.615	0.847

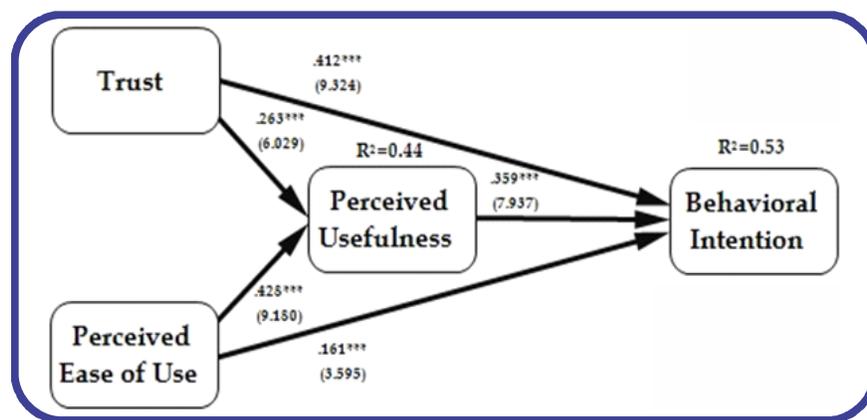
TABLE 3. MODEL FIT INDICES

Index	Measurement Model	Threshold	Suggested by Author (s)
χ^2/df	1.693	$1 < 3.0$	Hair, et. al. [48]
GFI	0.920	> 0.9	Gefen et al., [5]
AGFI	0.901	> 0.8	Gefen et al. [5]
CFI	0.978	> 0.9	Anderson, et. al. [47]
NFI	0.948	> 0.9	Bentler and Bonett, 1980
RMSEA	0.042	< 0.08	Anderson, et. al. [47]

statistical tools to empirically investigate proposed model and the factors affecting customer trust. Finding as shown in Fig. 2 indicate that the total variance of 53% in BI is explained by predictors: PU (0.359), trust (TR = 0.412), and PEOU (0.161). Thus trust (TR) is found to be the most significant direct predictors of BI, followed by PU and PEOU. Similarly variance in PU is found to be 44%, which is explained by PEOU (0.428) and TR (0.263) predictors, respectively. The results showed that these findings supported the proposed hypothesis. Results also indicate that trust is the most significant factor and an strong predictor of both BI and PU to use M-Commerce. This implies that users' intention to use M-Commerce is directly proportional to the increase of trust. Thus the finding of this research are consistent with previous research studies, conducted to understand the importance of trust in online banking information systems [22] and e-commerce [5]. Compared to previous studies the role of trust is complex in M-commerce as the user requires trusting on the unknown virtual vendor as well as users' need confidence in the confidentiality and security in online monetary transactions.

This research has some limitations. First, the data for this research was obtained from individuals in Pakistan using a cross-sectional (at a single point of time) quantitative approach. Second, the applicability of this research is constrained by small sample size and confined research area. Thus, additional samples and constructs should be taken to further examine the relationships before generalizing the results. Third, the proposed model was tested in Pakistan's context and findings may vary in other under developed economies. Additionally, the data for this research was collected under voluntary settings, which might not be the best.

The specific consequences identified through the belief elicitation process and empirically validated through this research provide important guidelines for M-commerce service providers, retailers, managers, technology consultants, software vendors, IS developers, investors and designers. Findings can guide them plan and optimize software platforms, prioritize service provisioning, formulate appropriate business strategies and improve their efficiency to enhance M-commerce adoption



Notes: A number in parentheses indicates t-values. A number without parenthesis indicates $\hat{\alpha}$ values. *** indicates that relations are highly significant at 0.001 level.

FIG. 2. MODEL SUPPORTED BY EMPIRICAL DATA

7. CONCLUSIONS

With significant growth, maturity and unique advantages of wireless technology, mobile phone penetration ratio has touched the global population. Business entities have taken great advantages of IS and IT in expanding their consumer market, attracting and competing globally to maximize their sales by reshaping their sales strategies. Being a new trend of electronic commerce, M-commerce has received huge market attraction for both, the business organizations and consumers in a short span of time. M-Commerce is a better choice for conducting daily commerce activities from anywhere and at any time. It is very important to analyze the main reasons of delay in large scale penetration of M-Commerce adoption in developing economies. Having realized the real benefits and huge market penetration in developed economies, M-Commerce seems to have huge market potential. It is observed that in developing countries academic research regarding M-commerce acceptance is very trivial, as it is still new concept and is yet to be fully adopted by consumers in their routine life.

Therefore, in this paper we proposed a novel framework to find the role of trust in the acceptance of M-commerce in Pakistan's context. Findings proved the hypothesized relationship among all constructs. Results indicate that the significant role of trust in the acceptance of M-commerce. At present Pakistani internet and mobile phone users have some doubts regarding their privacy risk, which in turn refrain them not to use mobile handheld device for carrying out commercial activities. We found that the role of trust is very crucial for the success and growth of M-commerce.

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APPENDIX-A. MEASUREMENT ITEMS

• Behavior Intention

- BI1: I intend to use the Mobile Commerce as often as needed.
- BI2: I intend to continue using Mobile Commerce in the future.
- BI3: Assuming I have access to Mobile Commerce, I intend to use it.
- BI4: Given that I may have access to Mobile Commerce, I predict that I will use it.
- BI5: I will strongly recommend others to use Mobile Commerce.

• Perceived Usefulness

- PU1: Using Mobile Commerce helps me complete my tasks more swiftly.
- PU2: Using Mobile Commerce increase my efficiency.
- PU3: Using Mobile Commerce improves my performance.
- PU4: Using Mobile Commerce enhances my effectiveness.
- PU5: Using Mobile Commerce makes it easier for me to engage in online commercial activities.

• Perceived Ease of Use

- PEOU1: Learning to use Mobile Commerce is easy for me.
- PEOU2: Finding anything that I want via Mobile Commerce is simple.
- PEOU3: My interaction with Mobile Commerce is clear and understandable.
- PEOU4: I find Mobile Commerce to be flexible to interact.

• Trust

- TR1: Mobile Commerce is trustworthy.
- TR2: I am quite certain what to expect from Mobile Commerce.
- TR3: I trust Mobile Commerce.
- TR4: Mobile Commerce would do the job right even if not monitored.

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