Security perception in the adoption of mobile payment and the moderating effect of gender

Md. Alamgir Hossain
Department of Management,
Hajee Mohammad Danesh Science and Technology University, Dinajpur, Bangladesh

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Abstract

Purpose – The mobile payment system has changed payment patterns and has the potential to improve people's quality of life and increase the bank's efficiency. In return, the risks and trust factors inevitably led to increased challenges and become a major concern in the adoption of mobile payment service. Yet, little is known about how risk and trust factors can affect the adoption of mobile payment. Hence, this paper aims to come into contact to solve these issues in the context.

Design/methodology/approach – A comprehensive research model that reflects the customer satisfaction and loyalty to the adoption of mobile payment services is developed and empirically tested using exploratory and confirmatory factor analysis and structural equation modeling.

Findings – Findings reveal that the perceived risk has a significant negative impact on perceived trust and customer satisfaction. Perceived trust is the most important variable in building customer satisfaction, and customer satisfaction is the reasonable predictor of customer loyalty. In addition, gender differences moderate the adoption of the mobile payment service.

Originality/value – The results of the study hold several implications for scholars in the field of technology adoption on financial transactions and offer valuable managerial insights to design their mobile payment adoption strategies to pursue greater acceptance and diffusion of this new payment system.

Keywords Satisfaction, Perceived risk, Perceived trust, Loyalty

Paper type Research paper

1. Introduction

The invention of mobile technologies makes life ever more comfortable and brings persistent benefits to businesses to reach the customer's premises. Personalized information, individualized use and feedbacks from subscribers make the mobile instrument superior. The uses of smartphones for payment are becoming more common and will continue to flourish in the future. This mobile payment comprises the use of Web pages or apps to make purchases on one's mobile phone, tablet or even make a payment using near-field communications. Mobile payment systems are becoming the core of effective e-commerce and its annual growth is 20 per cent worldwide and 30 per cent in emerging markets (Reportlinker, 2016). These trends demonstrate the significances of these markets that work as a motivator for this study. A significant number of people still prefer cash payment over

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e-commerce, this would be a great area of research from the perspective of emerging economies such as Bangladesh. Indeed, in the emerging country, nearly 82 per cent of total transactions are still done by physical cash (Sokołowska, 2015).

The purpose of the study is to recognize how consumers are integrating mobile payment systems into their daily lives and how they perceive the trust and risks that influence their usage pattern. As an alternative payment method, electronic payment systems have failed to be accepted because of lack of complete trust and risk perception (Zhou, 2013; Dahlberg *et al.*, 2015). When the mobile phone is used for payments in physical stores, trust issues appear with purchase anxiety and psychological model challenges (Hillman and Neustaedter, 2017). In addition, Rouibah *et al.* (2016) have quantified that the risk perception of the online payment method is neutralized by the trust and pleasure of the customers. In addition, prior researches show that respondent's demographics, like gender, play a useful moderating role in shaping their behavioral intentions. Gender variance exists between men and women due to the biological, behavioral, cognitive and social issues (Sun *et al.*, 2010), and has a significant impact on the adoption of mobile payment (Rouibah *et al.*, 2016).

Therefore, this study takes into account customer security constructs (e.g. perceived trust and perceived risk) to investigate the customer's behavioral intention toward mobile payment. The security issue remains a fundamental and restrictive concern for electronic payment (Bast, 2011). As a result, perceived risk and perceived trust are seen as an important aspect in the adoption of mobile payment systems. Based on the comprehensive analysis, this study aims to demonstrate the antecedents of risks and trusts on the relationship between customer satisfaction and loyalty. In addition, this study extensively examines the gender differences in the proposed relationships.

Section 2 reviews the theoretical framework and develops hypotheses to propose a conceptual model. Sections 3 and 4 then explain the research methodology and empirical results, respectively before discussions and conclusions in Sections 5 and 6, respectively.

2. Theoretical framework

Customer loyalty is the desire to buy the same products or services on an ongoing basis (Samad, 2014; Aktepe *et al.*, 2015). This is important for both the customers and service providers. Loyal customers are ready to repurchase the anticipated products from the same suppliers that create overall value for suppliers. Because of the constant increase in competition, each supplier needs loyal customer base since there is already a wide range of innovative alternatives in the market (Aktepe *et al.*, 2015; Chang, 2015; Ammari and Bilgihan, 2017). The consequent increase in the seller's revenue is directly affected by customer loyalty (Santouridis and Trivellas, 2010). Samad (2014) states that as loyal customers tend to repurchase from the same companies, therefore, almost all companies focus more on building loyalty among existing customers than on searching new potential ones. Moreover, retaining the existing customer is cost effective than targeting new one (Samad, 2014). In this regard, building customer confidence and eliminating the fear of risk are rational to keep the existing customers in the same sellers, affecting the long-term growth of the company. Figure 1 shows the conceptual research model of this study.

Privacy and security concerns in mobile payment systems influence consumer attitudes (Akturan and Tezcan, 2012; Mohammadi, 2015). The fear of risk arises during technological transactions, because the absence of human contact. Perceive risk generally appears as the predecessor of the perceived usefulness of a precise performance due to the use of particular systems (Mohammadi, 2015). Risk perception combines threefold of risk associations, such as the use of personal information without the permission of the owner (Akturan and Tezcan, 2012), the transfer of money to other parities without knowledge and authorization

(Akturan and Tezcan, 2012; Hanafizadeh *et al.*, 2014) and the vulnerability of mobile technologies to hackers, viruses, and information interception (Zhou, 2013). Tho *et al.* (2017) point out that perceived risk has a negative impact on the repurchase intention. In addition, perceived risks, security and trust have a significant effect on consumer behavioral intention (Rouibah *et al.*, 2016; Khalilzadeh *et al.*, 2017). Perception of risk has a substantial negative impact on trust (Al-Gahtani, 2011) and consumer intention (Khalilzadeh *et al.*, 2017). Therefore, this study assumes that the higher the perceived risk, the lower the perceived trust, which results in a lower degree of positive attitude toward payment systems, and proposes the following hypotheses:

H1. Perceived risk has a significant negative effect on (*H1a*) perceived trust, (*H1b*) customer satisfaction and (*H1c*) customer loyalty regarding mobile payment.

Trust refers to the exchange relationship with the customer and seller (Wang *et al.*, 2015). It is a foundation of relationship among the participating parties. Trust becomes an important factor for the consumer to building confidence with an exchange partner (Li and Yeh, 2010). In the mobile payment phenomena, consumers need to trust on the payment systems. According to Zhou (2013), consumers are worried about the security of payment due to viruses, which decreases their trust in mobile payment that can affect intention and usage behavior. If there is no trust between customer and e-commerce, there is no use of this technological use that leads to a low degree of customer satisfaction and loyalty. Trust becomes the ideal strategy for dealing with uncertainty and ambiguity in the future. Furthermore, trust and enjoyment become the dominant drivers of online payment that offset the risk perceptions (Rouibah *et al.*, 2016). Trust is therefore the important factor affecting mobile payment, accordingly, the following hypotheses are proposed:

H2. Perceived trust has a significant positive effect on (*H2a*) customer satisfaction and (*H2b*) customer loyalty.

Satisfaction is the general evaluation of the product by the customer, whether or not, the product meets the needs and desires of the customer (Hossain *et al.*, 2018). Customer satisfaction is based on the concept of satisfying one's needs and expectations to build loyalty and is a prerequisite for future purchases. Scholars have long been recognized that customer loyalty is very critical to the success of any business (Bowen and McCain, 2015). To achieve the organizational objective in the competitive market, customer satisfaction and loyalty become the strategic objectives set by many organizations. Customer satisfaction has a positive impact on customer loyalty (Ram and Wu, 2016) and future usage intention (Hossain *et al.*, 2018). Customer satisfaction has been treated as a fundamental factor affecting customer loyalty and satisfied customers are more likely to make the same

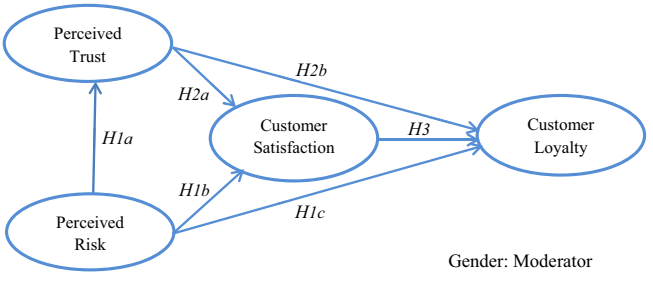

Figure 1.
Conceptual research model

purchasing decision (Hossain *et al.*, 2018). In addition, satisfaction with the loyalty base is the determining factor for a satisfactory association and customer retention (Aghdaie *et al.*, 2015; Ammari and Bilgihan, 2017). Satisfaction is therefore the dominant factor affecting customer loyalty, accordingly, the following hypothesis is proposed:

H3. Customer satisfaction has a significant positive effect on customer loyalty

Moreover, gender is considered a critical moderator variable in examining the behavioral intentions of mobile payment. Gender refers to the social paradigm of getting to know men and women with specific physical characteristics such as individual values, attitudes, roles and behavior (Palan, 2001). Gender variances exist between male and female due to the biological, behavioral, cognitive and social cause (Sun *et al.*, 2010). In addition, gender has a long and significant consideration in the adoption of mobile payment (Rouibah *et al.*, 2016). Men can interact better with technology (Anderson, 1996) and have more positive attitude toward computers than women (Korukonda, 2005). Women often like to relate a product on their precise level where as men may tend to read the product information in details (Fisher and Dube, 2005). Perceived trust in mobile banking is extensively predicted by gender (Malaquias and Hwang, 2016). Studies on the adoption of information technology also use gender as a moderation variable (Sun *et al.*, 2010; Malaquias and Hwang, 2016; Rouibah *et al.*, 2016). Therefore, this study proposes that male customers respond more positively than female in terms of mobile payment; hence, following hypothesis are suggested:

H4. The effect of perceived risk on (*H4a*) perceived trust, (*H4b*) customer satisfaction and (*H4c*) customer loyalty are greater for females than for males in mobile payment.

H5. The effect of perceived trust on (*H5a*) customer satisfaction and (*H5b*) customer loyalty are greater for females than for males in mobile payment.

H6. The effect of customer satisfaction on customer loyalty is greater for females than for males in mobile payment.

3. Research methodology

To validate the research model and test the hypothetical paths, a self-administered questionnaire is developed, which consists of questions about perceived risk, perceived trust, customer satisfaction and loyalty. The questionnaire items used to measure the construct are drawn from previous studies so that the researcher can align the final questionnaire with the context of mobile payment. Perceived risk and trust measures are adopted and modified form the study of Kim *et al.* (2010) and Rouibah *et al.* (2016). In addition, customer satisfaction and loyalty measures are adopted from Kim *et al.* (2010) and Yuan *et al.* (2014). All of the items are measured on a Five-point Likert scale ranging from strongly disagree (1) to strongly agree (5). Present study operationalized all the measurement constructs as a reflective construct.

Pre-test and pilot test were conducted to increase the reliability and validity of the measurements. As a pre-test, two expert academicians were involved in the first step to assess the relevance, readability and ambiguity of the questionnaire. Then, a pilot study was conducted using a draft of questionnaire with a convenience sampling of 42

Bangladeshi mobile payment users. Next, Cronbach's alpha test was carried out to test the reliability and internal consistency of the measurements. At the end of the process, minor modifications and changes were made to ensure that the questionnaire would be effective for data collection and achieve the objectives of the study. The final survey was conducted among different university students between 18 and 30 years old during the month of June 2017. A total of 264 completed and exploited questionnaires were collected (after succeeding cleaning and removal of inappropriate responses). Among them; 52.7 per cent of respondents are male and 47.3 per cent are female, about 50 per cent of the respondents have college education. The average age of the respondents is 26.51 years, the average transaction by mobile payment is 6.53 times a month, while their monthly average income is around USD 345. The sample size appears to be suitable for performing the structural equation model (SEM) analysis. Table I presents the demographic profile of the respondents.

Characteristics ($N = 264$)	Frequency	(%)
Gender		
Male	139	52.7
Female	125	47.3
Age group		
Below 20	28	10.60
20-25	135	51.13
26-30	44	16.66
31-35	23	8.71
Above 35	34	12.87
Mobile payment per month		
Below 5 times	117	44.31
5-10 min	83	31.43
More	31	11.74
Missing data	33	12.5
Household monthly income		
Up to 200 USD	83	31.43
200-300 USD	58	21.96
300-400 USD	40	15.15
More	63	23.86
Missing data	20	7.57
Education level		
Below secondary diploma	9	3.40
Secondary school diploma	18	6.80
High school diploma	129	48.90
Undergraduate diploma	69	26.10
Post graduate diploma	39	14.80
Occupation		
Current student	114	43.20
Business	46	17.40
Government employed	30	11.40
Private employed	46	17.40
Others	28	10.60

Source: Survey data

Table I. Respondents demographic profiles

4. Empirical results

4.1 Measurement model evaluation

An exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) of all items was simultaneously conducted to evaluate the measurement model reliability and validity. To test the reliability of the instrument used in this study, Cronbach's alpha and Composite reliability (CR) are used. As shown in Table II, both the alpha value and CR value of each construct are higher than the thresholds, representing that the scales were reliable (Hair *et al.*, 2010).

To assess the validity of the measurement model, CFA was conducted. Table II also presents the CFA results. The standardized estimate of each construct is significant at the 0.001 level and the average variance extracted (AVE) value of each construct exceed 0.50, indicating the convergent validity (Fornell and Larcker, 1981; Hair *et al.*, 2010). As shown in Table III, discriminant validity was verified as the square root of each construct's AVE is higher than its inter-construct correlations. Each factor loading is higher than their critical value of 0.70, which further support discriminant validity (shown in Table II). In addition, multicollinearity is not a major concern as the variance inflation factors (VIF) are below the threshold of 10 (Hair *et al.*, 2010) (shown in Table III). The results of Harman's single factor test reveals (first factor counts for 37.23 per cent and several factors with eigenvalues more than 1) that common method bias does not concern in this research (Podsakoff *et al.*, 2003).

Furthermore, this study examines the measurement model for the male and female sub-samples, respectively. As shown in Tables IV and V, values of Cronbach's alpha and CR are higher than 0.70, supporting the good reliability. The values of AVE exceeds 0.50, representing good validity of the model. Also, the square root of every construct's AVE is higher than its correlations with other variables, confirming discriminant validity.

After confirming the validity and reliability statistics, this study assess model fit indices, which is shown in Table VI. The overall the ratio of chi-square to degrees of freedom is

Table II. Results of exploratory factor analysis and confirmatory factor analysis

	Exploratory factor analysis (EFA)		Confirmatory factor analysis (CFA)		
Measurement constructs	Factor loadings	Cronbach's alpha	Standardized estimate	Composite reliability (CR)	Average variance extracted (AVE)
Trust	0.846-0.861	0.70	0.755-0.695	0.70	0.52
Risk	0.860-0.877	0.72	0.806-0.697	0.77	0.74
Satisfaction	0.862-0.881	0.78	0.815-0.791	0.81	0.75
Loyalty	0.917-0.930	0.93	0.880-0.930	0.93	0.82

Source: SEM-Amos and SPSS output

Table III. Discriminant validity

Measurement constructs	Mean	SD	Trust	Risk	Satisfaction	Loyalty	Tolerance	VIF
Trust	3.66	0.73	*0.72*				0.859	1.164
Risk	3.10	0.91	−0.40	*0.86*			0.894	1.119
Satisfaction	3.17	0.78	0.43	−0.32	*0.86*		0.873	1.145
Loyalty	2.33	1.10	0.16	−0.16	0.41	*0.90*		

Note: Italic diagonal numbers are the square roots of AVE
Source: SEM-Amos and SPSS output

Measurement constructs	Exploratory factor analysis: Factor loadings m	f	Cronbach's alpha m	f	Confirmatory factor analysis: Standardized estimate m	f	CR m	f	AVE m	f
Trust	0.873-0.875	0.805-0.856	0.73	0.65	0.717-0.809	0.699-0.712	0.73	0.69	0.58	0.50
Risk	0.826-0.880	0.876-0.890	0.70	0.75	0.603-0.864	0.722-0.839	0.70	0.75	0.55	0.61
Satisfaction	0.862-0.882	0.847-0.879	0.74	0.81	0.726-0.826	0.829-0.832	0.75	0.81	0.60	0.68
Loyalty	0.912-0.944	0.915-0.922	0.94	0.92	0.901-0.945	0.857-0.913	0.94	0.92	0.84	0.80

Notes: m = Male; f = female
Source: SEM-Amos and SPSS output

Table IV.
EFA and CFA results for sub-samples male ($N = 139$) vs female ($N = 125$)

Measurement constructs	Mean	SD	Trust	Risk	Satisfaction	Loyalty	Tolerance	VIF
Male (N = 139)								
Trust	3.62	0.73	*0.76*				0.89	1.11
Risk	3.15	0.88	−0.42	*0.74*			0.88	1.13
Satisfaction	3.13	0.72	0.25	−0.28	*0.77*		0.93	1.06
Loyalty	2.31	1.08	0.16	−0.24	0.39	*0.91*		
Female (N = 125)								
Trust	3.70	0.73	*0.70*				0.79	1.25
Risk	3.06	0.94	−0.34	*0.78*			0.90	1.11
Satisfaction	3.20	0.85	0.60	−0.36	*0.82*		0.78	1.27
Loyalty	2.35	1.11	0.15	−0.08	0.43	*0.89*		

Note: Italic diagonal numbers are the square roots of AVE
Source: SEM-Amos and SPSS output

Table V.
Discriminant validity for sub-samples: male and female

Model fit indices	Standard value	Measurement model
p-value	≥0.05	0.65
The ratio of chi-square to degrees of freedom (CMIN/df)	<3	0.95
Comparative fit index (CFI)	≥0.95	1.00
Goodness of fit index (GFI)	>0.90	0.98
Average GFI (AGFI)	≥0.80	0.96
Normalized fit index (NFI)	≥0.90	0.98
Tucker–Lewis index (TLI)	≥0.90	1.00
Incremental fit index (IFI)	≥0.90	1.00
Root mean square error of approximation (RMSEA)	≤0.05	0.01
p-close	≥0.05	0.97

Source: Amos output

Table VI.
Model fit indices

significant (CMIN/d.f. = 0.955, $p = 0.65$), which is within their standard value. All other goodness of fit indices are also within the acceptable ranges (CFI = 1, GFI = 0.98, AGFI = 0.96, NFI = 0.98 and RMSEA = 0.01). All the fit indices represent that the proposed model exhibits a reasonably good fit to the data (Hu and Bentler, 1999; Hair *et al.*, 2010).

4.2 Structural model evaluation

SEM is used to estimate the parameters of the structural model and standardized solutions produced by AMOS maximum-likelihood method, which are shown in Table VII. The model is evaluated by inspecting the path coefficients (β weights) which outline the quality of association among the constructs. Summary of results reveals that the explained variance of perceived trust is 16.0 per cent, customer satisfaction is 21.0 per cent, and customer loyalty is 17.0 per cent. As shown in Table VII, except the path perceived risk to customer loyalty ($\beta = -0.040$) and perceived trust to customer loyalty ($\beta = -0.029$), all other paths are significant, thus *H1a*, *H1b*, *H2a* and *H3* are accepted, while *H1c* and *H2b* are rejected.

4.3 Between group analysis: gender differences

This study also assesses the effect of gender as a moderator in the research model. This study compares the differences in coefficients of the corresponding structural paths for the two-sub samples. As shown in Table VIII, the effect of customer satisfaction on customer loyalty in the female model is significantly larger than in the male model, while the effect of perceived trust on perceived risk in the female model is significantly weaker than that in the male model. In addition, the effect of perceived trust on customer satisfaction in the female model is significantly positive but it is non-significant in the male model. However, perceived risk on customer satisfaction, perceived risk on customer loyalty and perceived trust on customer loyalty found to have no significant effect in both models. Therefore, *H5a* and *H6* are confirmed, while *H4a*, *H4b*, *H4c* and *H5b* are not supported.

5. Discussion

Previous studies have examined the adoption of mobile payment service typically based on influencing factors, whereas the current study provided a holistic overview of security

Hypothesized paths	Unstand. estimate	Stand. estimate	C.R.	*p*	Results
Perceived risk → Perceived trust	−0.347	−0.401	−3.998	***	*H1a*-accept
Perceived risk → Customer satisfaction	−0.177	−0.177	−1.966	**	*H1b*-accept
Perceived risk → Customer loyalty	−0.064	−0.040	−0.490	n.s.	*H1c*-reject
Perceived trust → Customer satisfaction	0.413	0.357	3.605	***	*H2a*-accept
Perceived trust → Customer loyalty	−0.054	−0.029	−0.322	n.s.	*H2b*-reject
Customer satisfaction → Customer loyalty	0.657	0.412	4.732	***	*H3*-accept

Table VII. Summary of hypotheses test

Notes: Explained variance: *R*-squared, Perceived trust: 16%, Customer satisfaction: 21% Customer loyalty: 17%, CMIN/d.f.=0.955, $p = 0.652$, GFI = 0.985, CFI = 1, NFI = 0.973, RMSEA = 0.010. ***$p < 0.001$, ** $p < 0.05$, n.s., not significant
Source: SEM-Amos output

Hypothesized paths	Path coefficient Male ($N = 139$)	Female ($N = 125$)
Perceived risk → Perceived trust	−0.42**	−0.34**
Perceived risk → Customer satisfaction	n.s.	n.s.
Perceived risk → Customer loyalty	n.s.	n.s.
Perceived trust → Customer satisfaction	n.s.	0.53***
Perceived trust → Customer loyalty	n.s.	n.s.
Customer satisfaction → Customer loyalty	0.35***	0.54***
Variance explained: R *squared*		
Perceived trust	18%	12%
Customer satisfaction	10%	38%
Customer loyalty	16%	20%

Notes: ***$p < 0.001$; **$p < 0.05$; n.s., not significant
Source: SEM-Amos output

Table VIII. Path comparison statistics between male and female Sub-samples

perceptions in mobile payment by first identifying the influence of perceived risk and trust on customer satisfaction and loyalty and then comparing the moderation effect of gender. The results of the study reveal that the perceived risk has a significant negative effect on perceived trust and customer satisfaction in mobile payment services, which is consistent with previous studies (Al-Gahtani, 2011; Rouibah *et al.*, 2016; Khalilzadeh *et al.*, 2017 among others). This implies that the perceived risk plays a driving role in building customer trust that determines their satisfaction level.

Perceived trust shows a significant positive association with customer satisfaction, this finding is consistent with Zhou (2013) and Rouibah *et al.* (2016), who found that perceived trust in mobile payment has an important influence on customer satisfaction. The results also reveal the relationship between customer satisfaction and loyalty in mobile payment that is also consistent with the finding of studies by Ram and Wu (2016) and Ammari and Bilgihan (2017). Therefore, it can be argue that perceived trust has a strong antecedent on customer satisfaction, and customer satisfaction is the pre-condition for customer loyalty. It is important to keep in mind that the lower the perceived risk, the higher the perceived trust, customer satisfaction and loyalty.

However, contrary to our expectations, a non-significant relationship is found between perceived risk and customer loyalty. The possible reason may be that the customers have many alternative payment methods, thus when customers need to pay for something they may not only depend on mobile payment rather than other payment methods (e.g. regular bank payment, cash payment). Surprisingly, a non-significant and confusing negative effect found in the relationship between perceived trust and customer loyalty. One possible reason is that customer's inadequate knowledge about the mobile payment system. Another possible reason could be that there is some kind of trust transference among mobile payment users, since social influence has had a positive effect on trust.

Moreover, consistent with prior studies on gender (Sun *et al.*, 2010; Malaquias and Hwang, 2016; Rouibah *et al.*, 2016), the current study has shown that there is a gender difference in the mobile payment adoption behavior. Gender exerts significant moderating roles on the pathways from perceived risk to perceived trust, perceived trust to customer satisfaction, and customer satisfaction to customer loyalty. Perceived risk reveals that it has a greater effect on perceived trust in the male sub-sample than in the female sub-sample. Perceived trust has stronger effects on customer satisfaction in the female sub-sample than in the male sub-sample. Likewise, customer satisfaction reveals to exert a greater effect on

customer loyalty in the female sub-sample than in the male sub-sample. This implies that females tend to be more satisfied and loyal to the adoption of mobile payment when they find sufficient trust and satisfaction respectively. Males tend to be more trustworthy towards the mobile payment adoption when they see lower risk in the context.

6. Conclusion

The purpose of the study is to demonstrate the antecedents of perceived risks and trusts in the relationship between customer satisfaction and loyalty, and examine the moderating effect of gender in the proposed relationships. The results of the study successfully validated the proposed relationships and suggest that the perceived risk has a significant negative influence on perceived trust and customer satisfaction. Perceived trust is the most important variable in building customer satisfaction, and customer satisfaction is the reasonable predictor of customer loyalty. In addition, gender differences moderate the adoption of mobile payment service. Therefore, the results of the study extensively contribute to the theoretical and managerial knowledge in adoption of mobile payment services.

From a theoretical standpoint, the findings of the study hold several implications for scholars in the field of technology adoption on financial transactions. Frist, this study provides a better theoretical insight into the perceived risk and trust factors that influence the adoption of mobile payment services by identifying their effects on the people who use this service. Existing studies have focused primarily on motivating factors, while current study focuses on customer security related factors and becomes more relevant, as security-related factors are pre-requisites for the adoption of technology in financial transactions. In addition, the study has successfully examined the moderating effect of gender, which provides a clearer picture of the different perceptions in mobile payment of different genders. Finally, the model and its constructs can be replicated in different economies to determine whether the results are similar or otherwise.

From the theoretical point of view, the results of the study have important implications for the managers or practitioners in designing their mobile payment adoption strategies to pursue greater acceptance and diffusion of this new payment system. First, service providers should carefully consider risk and trust issues. To control the perceived risk associated with mobile payment, service providers should ensure a strong security system when offering mobile payment services to customers. Service providers should install a mobile digital signature application and highly secure passwords when performing transactions that can guarantee authenticity and confidentiality. It is important to educate customers about the safety of transactions every time they make a mobile payment or offering potential users training and testing service before using mobile payment. Second, to build trust, users should provide a positive experience; mobile payment should ensure that it is free of technical errors, reliable, and highly responsive to any problems that might arise. In addition, a strong moderating effect of gender in this model reveals that there is no one-size-fits-all strategy for adopting mobile payments. Service providers could use different promotional and creative strategies for female and male customers to satisfy them.

All studies inevitably have limitations. First, this study focuses the security related factors only that theoretically connected to the adoption of technology, other motivational factors for the adoption of mobile payment are not taken into account in this study. Furthermore, this study has limited generalizability because it is based on data collection in one Asian country. Therefore, caution is required to apply these results in other context, and more longitudinal cross-cultural future research is suggested to further investigate the adoption of mobile payment services.

References

Aghdaie, S.F.A., Karimi, R. and Abasaltian, A. (2015), "The evaluation of effect electronic banking in customer satisfaction and loyalty", *International Journal of Marketing Studies*, Vol. 7 No. 2, pp. 90-98.

Aktepe, A., Ersöz, S. and Toklu, B. (2015), "Customer satisfaction and loyalty analysis with classification algorithms and structural equation modeling", *Computers and Industrial Engineering*, Vol. 86, pp. 95-106.

Akturan, U. and Tezcan, N. (2012), "Mobile banking adoption of the youth market", *Marketing Intelligence and Planning*, Vol. 30 No. 4, pp. 444-459.

Al-Gahtani, S.S. (2011), "Modeling the electronic transactions acceptance using an extended technology acceptance model", *Applied Computing and Informatics*, Vol. 9 No. 1, pp. 47-77.

Ammari, N.B. and Bilgihan, A. (2017), "The effects of distributive, procedural, and interactional justice on customer retention: an empirical investigation in the mobile telecom industry in Tunisia", *Journal of Retailing and Consumer Services*, Vol. 37, pp. 89-100.

Anderson, A.A. (1996), "Predictors of computer anxiety and performance in information systems", *Computers in Human Behavior*, Vol. 12 No. 1, pp. 61-77.

Bast, E. (2011), *Exploring Technology Acceptance Aspects of an NFC Enabled Mobile Shopping System: Perceptions of German Grocery Consumers*, Auckland University of Technology, Auckland.

Bowen, J.T. and McCain, S.-L.C. (2015), "Transitioning loyalty programs: a commentary on the relationship between customer loyalty and customer satisfaction", *International Journal of Contemporary Hospitality Management*, Vol. 27 No. 3, pp. 415-430.

Chang, C.C. (2015), "Exploring mobile application customer loyalty: the moderating effect of use contexts", *Telecommunications Policy*, Vol. 39 No. 8, pp. 678-690.

Dahlberg, T., Guo, J. and Ondrus, J. (2015), "A critical review of mobile payment research", *Electronic Commerce Research and Applications*, Vol. 14 No. 5, pp. 265-284.

Fisher, R.J. and Dube, L. (2005), "Gender differences in responses to emotional advertising: a social desirability perspective", *Journal of Consumer Research*, Vol. 31 No. 4, pp. 850-858.

Fornell, C. and Larcker, D.F. (1981), "Evaluating structural equation models with unobservable variables and measurement error", *Journal of Marketing Research*, Vol. 18 No. 1, pp. 39-50.

Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E. and Tatham, R.L. (2010), *Multivariate Data Analysis*, 7th ed., Pearson Education, Hoboken, NJ.

Hanafizadeh, P., Behboudi, M., Koshksaray, A.A. and Tabar, M.J.S. (2014), "Mobilebanking adoption by Iranian bank clients", *Telematics and Informatics*, Vol. 31 No. 1, pp. 62-78.

Hillman, S. and Neustaedter, C. (2017), "Trust and mobile commerce in North America", *Computers in Human Behavior*, Vol. 70, pp. 10-21.

Hossain, M.A., Hossain, M.S. and Jahan, N. (2018), "Predicting continuance usage intention of mobile payment: an experimental study of Bangladeshi customers", *Asian Economic and Financial Review*, Vol. 8 No. 4, p. 487.

Hu, L.T. and Bentler, P.M. (1999), "Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternative", *Structural Equation Modeling: A Multidisciplinary Journal*, Vol. 6 No. 1, pp. 1-55.

Khalilzadeh, J., Ozturk, A.B. and Bilgihan, A. (2017), "Security-related factors in extended UTAUT model for NFC based mobile payment in the restaurant industry", *Computers in Human Behavior*, Vol. 70, pp. 460-474.

Kim, C., Mirusmonov, M. and Lee, I. (2010), "An empirical examination of factors influencing the intention to use mobile payment", *Computers in Human Behavior*, Vol. 26 No. 3, pp. 310-322.

Korukonda, A.R. (2005), "Personality, individual characteristics, and predisposition to technophobia: some answers, questions, and points to ponder about", *Information Sciences*, Vol. 170 No. 2-4, pp. 309-328.

Li, Y.M. and Yeh, Y.S. (2010), "Increasing trust in mobile commerce through design aesthetics", *Computers in Human Behavior*, Vol. 26 No. 4, pp. 673-684.

Malaquias, R.F. and Hwang, Y. (2016), "An empirical study on trust in mobile banking: a developing country perspective", *Computers in Human Behavior*, Vol. 54, pp. 453-461.

Mohammadi, H. (2015), "Investigating users' perspectives on e-learning: an integration of TAM and IS success model", *Computers in Human Behavior*, Vol. 45, pp. 359-374.

Palan, K.M. (2001), "Gender identity in consumer behavior research: a literature review and research agenda", *Academy of Marketing Science Review*, Vol. 10, pp. 1-24.

Podsakoff, P.M., MacKenzie, S.B., Lee, J.Y. and Podsakoff, N.P. (2003), "Common method biases in behavioral research: a critical review of the literature and recommended remedies", *Journal of Applied Psychology*, Vol. 88 No. 5, pp. 879-903.

Ram, J. and Wu, M.L. (2016), "A fresh look at the role of switching cost in influencing customer loyalty: empirical investigation using structural equation modelling analysis", *Asia Pacific Journal of Marketing and Logistics*, Vol. 28 No. 4, pp. 616-633.

Reportlinker (2016), "World wide ecommerce is driven by emerging market", BRIC B2C E-Commerce Markets: The BRIC countries continue to lead in B2C Ecommerce growth, Reportlinker.

Rouibah, K., Lowry, P.B. and Hwang, Y. (2016), "The effects of perceived enjoyment and perceived risks on trust formation and intentions to use online payment systems: new perspectives from an Arab country", *Electronic Commerce Research and Applications*, Vol. 19, pp. 33-43.

Samad, A. (2014), "Examining the impact of perceived service quality demensions on repurchase intentions and word of mouth", *IOSR Journal of Business and Management*, Vol. 16 No. 1, pp. 37-41.

Santouridis, I. and Trivellas, P. (2010), "Investigating the impact of service quality and customer satisfaction on customer loyalty in mobile telephony in Greece", *The TQM Journal*, Vol. 22 No. 3, pp. 330-343.

Sokołowska, E. (2015), "Innovations in the payment card market: the case of Poland", *Electronic Commerce Research and Applications*, Vol. 14 No. 5, pp. 292-304.

Sun, Q., Wang, C. and Cao, H. (2010), "An extended TAM for analyzing adoption behavior of mobile commerce", *The eighth international conference on mobile business*, *IEEE*, *Dalian*.

Tho, N.T., Lai, M.T. and Yan, H. (2017), "The effect of perceived risk on repurchase intention and word-of-mouth in the mobile telecommunication market: a case study from Vietnam", *International Business Research*, Vol. 10 No. 3, pp. 8-19.

Wang, S.W., Ngamsiriudom, W. and Hsieh, C.H. (2015), "Trust disposition, trust antecedents, trust, and behavioral intention", *The Service Industries Journal*, Vol. 35 No. 10, pp. 555-572.

Yuan, S., Liu, Y. and Yao, R. (2014), "An investigation of users' continuance intention towards mobile banking in China", *Journal of Information Development*, Vol. 32 No. 1, pp. 20-34.

Zhou, T. (2013), "An empirical examination of continuance intention of mobile payment services", *Decision Support Systems*, Vol. 54 No. 2, pp. 1085-1091.

Corresponding author
Md. Alamgir Hossain can be contacted at: shamimru@gmail.com