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Identifying The Factors Affecting Adoption of Mobile Payment System by Small and Medium Sized Enterprises in Bangladesh

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Abstract: *Small and medium-sized enterprises (SMEs) is a priority sector in developing countries like Bangladesh. 90% of the employed people are involved in small businesses of Bangladesh, which contribute to 25% of GDP. Like the other sector, this industry may take advantage of cost savings and efficient financial management by adopting mobile payment systems. This study is designed to identify and analyze the factors influencing mobile payment systems adoption in small and medium-sized enterprises. Data has been collected from 200 SMEs through stratified sampling technique and analyzed using modified UTAUT model and PLS-SEM technique. It is found that effort expectancy, performance expectancy, social influence, cost, and voluntariness of use have a statistically significant effect on behavioral intention in adopting a mobile payment system.*

Keywords: *Factors, Adoption, Mobile Payment System, SME, Bangladesh, Extended UTAUT, PLS-SEM*

1. Introduction

'M-payment,' 'Mobile Payment,' 'Mobile Financial Systems,' 'Mobile Money System,' 'Mobile Money,' 'Mobile Wallet' and 'Mobile Transaction' are used interchangeably. The term "mobile payment" refers to an application that simplifies e-commerce transactions by giving mobile users a simple method of paying for products and services (Petrova & Mehra, 2010).

There has been a growing impetus worldwide towards adopting m-payment for the unbanked population in the past two decades. Not only does m-payment contribute to financial inclusion, but it also acts as a driver of building a cash-less society by creating a new financial and technical ecosystem. The ecosystem includes mobile phone operators, merchants, agents, financial institutions, and mobile phone users. Among these ecosystem partners, users and merchants need not have any bank accounts. Asia experienced the most prominent growth, followed by Latin America, Africa, and the Middle East, where most of the unbanked population resides (Best, 2021; Lee, 2021).

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Mobile payment worldwide has overtaken credit card payment in 2019 and is expected to reach 4.8 billion wallets by 2025 (Lee, 2021). Ali Pay, WeChat pay of China, Apple Pay, and Google pay of USA are the dominant world players, SadaPay in Pakistan, Mercado Pago and PicPay in Brazil, Paytm in India, M-Pesa and Kopo Kopo of Kenya, Rocket, bKash, and Nagad in Bangladesh are the dominant local players (Lee, 2021; Piper, 2020). However, M-Pesa and Kopo Kopo have shown the way to the world, and most countries replicated the mobile payment systems model.

Bangladesh, like the rest of the globe, the popularity and use of MFS have been exponentially increased since its inception in 2011 (Rahman et al., 2016). There are around 39.3 million active MFS users, who make daily 10,795,482 transactions of BDT 21, 800 million on average (Bangladesh Bank, 2022). Moreover, the Covid-19 pandemic has made it more relevant for the consumer and the merchant to extensively use the mobile payment system (MPS / MFS) that helps the users maintain social isolation.

The small and medium enterprises (SMEs) are part of the unbanked sector, deprived of sophisticated banking facilities while leading a significant economic role in the developing countries (Maiti, 2018; Nichter & Goldmark, 2009; Talom & Tengeh, 2019). SMEs in most countries, like their counterparts, always receive support and favorable banking facility. However, historically banking is one of the significant constraints for SMEs (Ardic et al., 2011; Maiti, 2018). For example, only 38% of the government's financial support in the form of SME loans could be disbursed through the banking channel in Bangladesh (Mannan, 2021).

In Bangladesh, 80% of the private enterprises are SMEs, which employ 90% of the employees and contribute 25% of the GDP of Bangladesh, whereas, in the developing world, SMEs contribute 50% - 60% of their GDP. Therefore, if SMEs could be included in the formal banking channel, Bangladesh could have seen more accelerated growth and achieved its vision of becoming a developed nation by 2041.

However, in Bangladesh, as of October 2021, the merchant payment constitutes only 4.36% of the total amount of m-payment transactions in Bangladesh (Bangladesh Bank, 2022). This meager percentage of business transactions reveals the poor adoption of m-payment by the SMEs of Bangladesh. In this context, the primary research questions of this empirical study are as follows:

RQ1: What factors affect the SMEs to adopt the M-Payment systems?

RQ2: What is the relative importance of the factor affecting SME's M-Payment system adoption?

Moreover, a systematic literature search shows different researchers (Acquah-Sam & Bugre, 2018; Au & Zafar, 2008; Blumenstock et al., 2014; Cheong et al., 2008; Chingapi & Steyn, 2022; Conwell & Stanslaus, 2020; Dahlberg & Öörni, 2007; Dennehy & Sammon, 2015; Heijden, 2002; Jain & Hundal, 2007; Kargin et al., 2009; Khalilzadeh et al., 2017; N. A. Khan et al., 2021; Kirui et al., 2020; Leavitt, 2010; Rampton, 2016; Tengeh & Gahapa Talom, 2020; Xin et al., 2013) have done ample research in the area of SME's M-Payment adoption around the world. However, a limited study in the Bangladeshi SME's M-Payment adoption perspective created a knowledge gap in this area.

Therefore, this study will identify the factors and their relative importance in adopting m-payment systems by SMEs in Bangladesh. The outcome of this study will augment existing mobile payment adoption literature and help the practitioners develop policies and strategies that will help build better mobile payment ecosystems in Bangladesh.

For studying ICT adoption, researchers have extensively used the UTAUT model (Williams et al., 2015). Since 2003 till date google scholar shows, more than 44,000 research has UTAUT model. The UTAUT model has distilled the critical factors and contingencies related to predicting behavioral intention to use technology and technology used primarily in organizational contexts (Venkatesh et al., 2012). UTAUT integrates four determinants: performance expectancy, efforts expectancy, and social influence and facilitation conditions. These factors influence the behavioral intention to adopt technology, and ultimately behavioral intention affects the actual use. Age, gender, experience, and the willingness to use are all factors that influence these relationships. (See Fig-1.1).

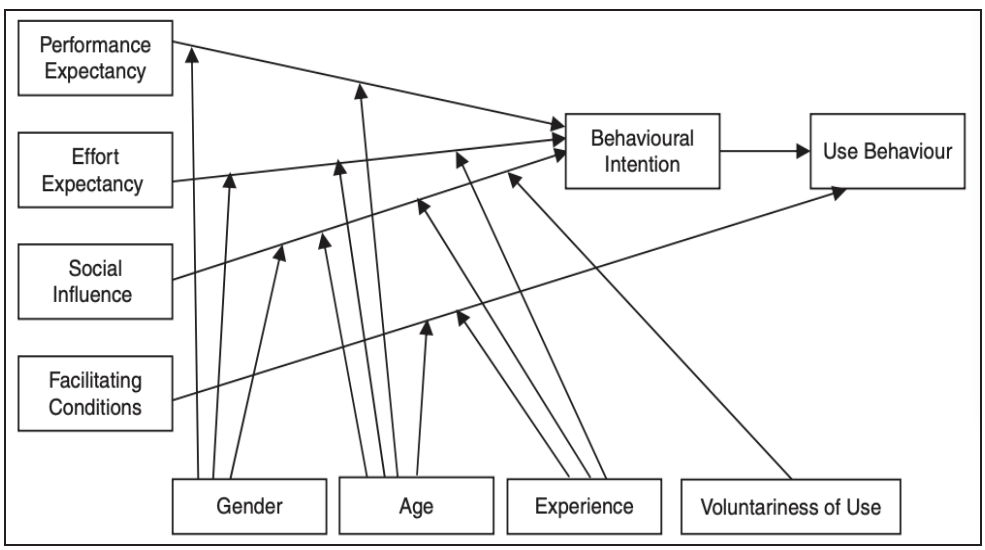

Fig 1-1: *Unified theory of acceptance and use of technology (UTAUT)*
Source: Venkatesh, Morris, et al., (2003)

The UTAUT model has outperformed the eight individual models such as the Technology Acceptance Model (TAM), Theory of Reasoned Action (TRA), the Motivational Model, the Model of PC Utilization, Innovation Diffusion Theory (IDT), the Theory of Planned Behavior (TPB), a combined TBP/TAM, and Social Cognitive Theory (SCT). The adjusted R^2 for UTAUT is 69%, whereas those individual eight models adjusted R^2 ranges from 17% - 53% (Venkatesh et al., 2003). Hence, an extensive model of the original UTAUT model has been used for this study.

The remaining of the paper has been mapped out as follows. The following Section 2 outlined the relevant literature and hypotheses. Section 3 represents the methodology of the study. The PLS-SEM results and discussion have presented in Section 4. The conclusion, implications, limitations, future research direction, and conclusions are stated in the final segment.

2. Literature Review

2.1 Mobile Payment

Kim et al., (2010) defined m-transaction as "*any payment in which a mobile device is utilized to initiate, authorize, and confirm a commercial transaction*." Dahlberg et al. (2008) defined it as "*payments for goods, services, and bills using a mobile device (such as a mobile phone, smart-phone, or personal digital assistant (PDA) by taking advantage of wireless and other communication technologies*."

Furthermore, mobile payment can be seen as a natural evolution of electronic payment, enabling feasible and convenient mobile commerce transactions (Mallat, 2007). Currently, mobile payment includes the NFC, QR Code, USSD, and App technologies.

Mobile payment has been modeled into four different domains (Chaix & Torre, 2012). These domains had been subdivided into the operator-centered model, the bank-centered model, the independent services model, and the collaborative model.

Nowadays, mobile payments are even offered by traditional banks through apps to reap the benefit of M-payment system's reach, access, cross-selling opportunity, cost-effectiveness (Acquah-Sam & Bugre, 2018) and to compete with the non-banking FinTech firms who offer mobile financial services such as money transactions, transfer, utility & bill payments, deposits, remittance disbursements, salary, and government allowances disbursements, etc.

2.2 Mobile Payment System Adoption by SMEs

The M-payment system over the last decade has exerted a profound impact on the financial inclusion of the unbanked society and businesses around the world. As part of the financially deprived sector, SMEs can now perform a financial transaction without a bank account, anywhere, anytime, cost-effectively (Ngaruiya et al., 2014).

Consequently, SMEs found significantly improving their revenue and, in turn, financial performance through the adoption of m-payment systems(Atueyi et al., 2019; Mahakittikun et al., 2021; Masocha & Dzomonda, 2018; Ngaruiya et al., 2014; Talom & Tengeh, 2019).

M-payment systems have enabled SMEs to tap the financial and banking service without the help of traditional banks and conduct business with the distant markets and unbanked societies, whom the formal banking sector left behind. Conwell & Stanslaus (2020) found that financial services features, perceived cost-saving, perceived security, and perceived convenience and reliability significantly influence mobile money services that spur SMEs internationalization.

Although both the formal banking sector and financially excluded sector are benefitted from the facilities of m-payment systems, the adoption of m-payment systems significantly varies according to the level of nation's development, infrastructure, access to education, finance, critical mass, complexity, observability, etc. (Atueyi et al., 2019; N. A. Khan et al., 2021; Kirui et al., 2020; Ngaruiya et al., 2014; Talom & Tengeh, 2019; Tengeh & Gahapa Talom, 2020; Tengeh & Talom, 2020; Wang et al., 2016). The details of factors affecting mobile payment adoption by SMEs found across different research in different countries are stated in table-2.1.

Table-2.1: Factor Affecting M-Payment / M-Services adoption by SMEs

S/N	References/Authors	Factors Identified	Location
01	Chingapi & Steyn (2022)	Risk, convenience, ease of use, trust in service providers, system features, device features and issues, cost of fees, company image and credibility, Bluetooth connection, customer service, and integrated systems.	South Africa
02	Khan et al. (2021)	Trialability, complexity, relative advantage, compatibility, and observability significantly influence mobile payment adoption. Complexity and observability were essential factors for Pakistani SMEs. But, on the other hand, for Chinese SMEs, critical mass was a significantly important factor.	China and Pakistan
03	Tengeh & Talom (2020)	Accessibility, safety, convenience that entice SMEs adopting MMS	Cameroon

S/N	References/Authors	Factors Identified	Location
04	Kirui et al. (2020)	Group membership, gender, credit access, education, mobile phone ownership, radio ownership, registration of business, number of business units, and the total number of employees determined utilization of mobile money services	Kenya
05	Najib & Fahma (2020)	The intention to use digital the payment was determined by the perceived ease of usage, perceived usefulness, attitude towards digital payment, and trust.	Indonesia
06	Uwamariya & Loebbecke (2019)	Technological and financial standard, resources, infrastructure, regulatory body, collaboration, distribution network, and critical mass	Rwanda & Kenya
07	Masocha & Dzomonda (2018)	Benefits of mobile money such as versatility, cost-saving, time consumption, and user-friendliness and challenges are thought to be necessary to accept mobile money services.	Zimbabwe
08	John et al. (2018)	Financial and operational risks have a substantial negative impact on MMS usage.	Tanzania
09	A. N. Khan & Ali (2018)	External pressure and relative advantages are the most important antecedents	China
10	Wang et al. (2016)	Compatibility, firm size, technology competence, and critical mass facilitate, while complexity deters mobile services adoption.	Taiwan

Source: *Authors' Research*

2.3 Definition of SME

In Bangladesh, there is no consensus among organizations in defining SMEs. Different institutions, for their ease, tried to define SMEs in Bangladesh. Bangladesh Bank (2010), the central bank of Bangladesh, refers SMEs to 'the firm/business which is not a public limited company and complies the following criteria.

Serial No.	**Sector**		**Fixed Asset other than Loan & Building**	**Employed Manpower (Not above)**
1	Small Enterprise	*Service*	50,000-50,00,000	25
		Business	50,000-50,00,000	25
		Industrial	50,000-1,50,00,000	50
2	Medium Enterprise	*Service*	50,00,000-10,00,00,000	50
		Business	50,00,000-10,00,00,000	50
		Industrial	1,50,00,000-20,00,00,000	150

However, National Industrial Policy (Ministry of Industry, 2016) classified the SMEs in the following ways.

SI	**Type of Industry**		**The amount of investment (Replacement cost and value of fixed assets, excluding land and factory buildings)**	**Number of employed workers**
1.	**Cottage Industry**		Below 10 lakh	number of workers not exceed 15
2.	**Micro Industry**		10 lakh to 75 lakh	16 to 30
3.	**Small Industry**	Manufacturing	75 lakh to 15 crore	31 to 120
		Service	10 lakh to 2 crore	16 to 50

4.	**Medium Industry**	Manufacturing	15 crore to 50 crore	121 to 300
		Service	2 crore to 30 crore	51 to 120
		Service	More than 30 crore	More than 120

2.4 Hypotheses

Although Venkatesh, Morris, et al., (2003)'s original UTAUT model integrates four determinants: performance expectancy, efforts expectancy, and social influence and facilitation conditions. Later, Venkatesh et al., (2016) suggested that researchers should augment the UTAUT model with new endogenous and exogenous variables to enhance its explanatory power. For much research in M-payment adoption, scholars have extended the UTAUT with various factors (Al-Saedi et al., 2020). Thus, four more constructs have been added to the original four determinants for this study. The arguments for using the constructs for this study and relevant hypotheses are given below.

- **Performance expectancy (PE)** is the extent to which a person believes that using the system will help them attain gains in job performance. The higher the performance expectancy, the more the users will be intended to use the m-payment systems (Alalwan et al., 2017; Hongxia et al., 2011; Yu, 2012). Hence, it could be hypothesized that

  H_1: Performance expectancy influences behavioral intention to adopt mobile payment by SMEs.

- **Effort expectancy (EE)** is the degree of ease associated with using the system. It is one of the fundamental reasons to adopt mobile payment systems found in previous studies (Alalwan et al., 2017; Chong, 2013; Jadil et al., 2021). Thus, it could be hypothesized that

  H_2: Effort expectancy influences behavioral intention to adopt mobile payment by SMEs.

- **Social influence (SI)** refers to how individuals accept others' beliefs that they should use the new system. SI is found to affect the behavioral intention positively to adopt the M-payment technology(Hongxia et al., 2011; Leong et al., 2013; Wei-Han Tan et al., 2010; Zuiderwijk et al., 2015). Thus, it could be hypothesized that

  H_3: Social influence behavioral intention to adopt mobile payment by SMEs.

- **Facilitating condition (FC)** is the extent to which a person believes that an organizational and technological infrastructure exists to support the system's use.

Facilitating condition directly influences the adoption of mobile financial services (Alalwan et al., 2017; Mohamad & Kassim, 2019). Thus, it could be hypothesized that

H_4: Facilitating conditions influence behavioral intention to adopt mobile payment by SMEs.

- ***Cost Influences*** the acceptance or rejection of new technology and innovations and is a critical factor in adopting new technology (Venkatesh et al., 2012). Several previous studies (Al-Saedi et al., 2020; Mohamad & Kassim, 2019; Twum et al., 2021; Yu, 2012) have shown direct cost influences in mobile payment adoption. Thus, this study articulates that

  H_5: Cost influences behavioral intention to adopt mobile payment by SMEs.

- **Security** refers to the users' perception of feeling secure with the mobile transaction. People are usually very cautious in the case of financial transactions and get even more suspicious when dealing with financial transactions through unknown technology. Hence, different studies (Khalilzadeh et al., 2017; Rahi & Abd. Ghani, 2018) have found that perceived security plays a direct role in adopting new technology. Thus, this study hypothesized that

  H_6: Security influences behavioral intention to adopt mobile payment by SMEs.

- **Voluntariness of use** refers to the degree to which the user feels that new technology is voluntary, not compulsory. Although in the primary UTAUT model, the voluntariness of service has been shown as a moderating factor, this study assumed its influence to be direct, as found in the study of Zuiderwijk et al., (2015).

  H_7: Voluntariness of use influences SMEs' behavioral intention to adopt mobile payment.

- **Cultural influence** refers to the extent to which the national culture influences the adoption of technology. People are culture-bound and share a common mindset and anxiety level in technology utilization (Yoo & Huang, 2011). Other studies (Bandyopadhyay et al., 2007; Jadil et al., 2021; I. U. Khan et al., 2021)found the culture influencing mobile payment adoption. Hence, this study hypothesized that

  H_8: *Cultural influence behavioral intention to adopt mobile payment by SMEs.*

For simplicity, this study muted the effect of the control variables such as age, gender, and experience and the influence of behavioral intention on actual uses. The extended UTAUT

model for this study has been given in figure 3-1, and the items for measuring the constructs are shown in appendix A.

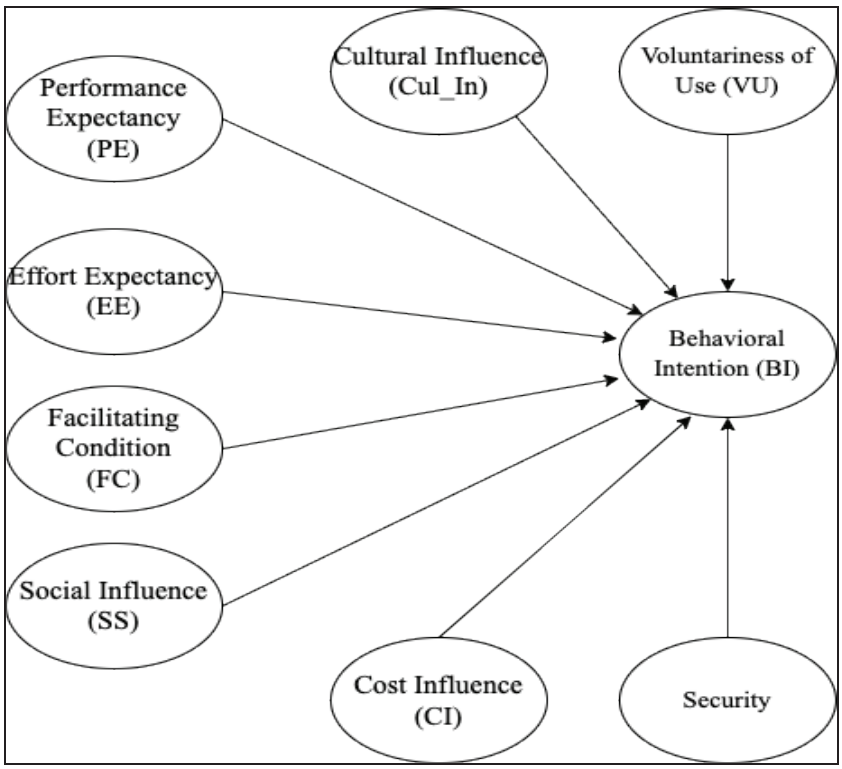

Figure 2-1: *Conceptual research model of SMEs' M-Payment adoption, Modified UTAUT*

3. Methodology

3.1 Data Collection

As a rule of thumb, for multivariate analysis, a minimum of 5 to 10 times a total number of variables is considered sufficient for estimation (Hair et al., 2006; Hensley, 1999; Hinkin, 1998; Nunnally, 1978; Roscoe, 1975). The minimum sample size required for this study has been determined by the guidelines suggested by Marcoulides & Saunders (2006) for the structural equation model. The maximum number of arrows pointing at a latent variable in the structural equation model determines the minimum sample size. In this study, eight arrows pointed towards the latent variable behavioral intention and thus a minimum of 84 samples.

According to Bangladesh Economic Census 2013, Bangladesh government has classified industries in 17 sectors. For the credible result, of the 8, 66, 424 SMEs, 200 SMEs were

surveyed in eight sectors through stratified sampling. Twenty-five samples were conveniently chosen at Dhaka city from each of the eight strata of SME: (i) Jewelry; (ii) Leather; (iii) Plastic, (iv) Library, (v) Stationary, (vi) Fashion, (vii) Electronics and (viii) Retail.

A structured questionnaire was developed, based on the measurement items on a five-point Likert scale, for collection. The respondents were surveyed physically during business hours. They were ensured of their anonymity and encouraged to react honestly as much as possible to counteract the social desirability bias (Leeuw et al., 2008). About 252 SMEs were approached, but 220 were responded resulting in a response rate of 87.30%. After critical evaluation of the responses and maintaining a balance stratum, 200 samples were finalized.

3.4 Data Analysis

The partial least squares path modeling to structural equation modeling (PLS-SEM) has been chosen to estimate the complex cause-effect relationship with latent variables. There are four distinct approaches to SEM (Wong, 2013): (a) Covariance-based SEM (b) Partial Least Squares (c) component-based SEM known as Generalized Structured Component Analysis (GSCA) and Nonlinear Universal Structural Relational Modeling (NEUSREL).

This study used PLS-SEM because it is heavily used in behavioral sciences, marketing, organization, MIS and business strategy, marketing, organization, management information system, and business strategy (Bass et al., 2003; Chin et al., 2003; Henseler, J., Ringle, C. M., & Sinkovics, 2009; Hulland, 1999; Sosik et al., 2009). Moreover, the PLS-SEM, being a prediction-based approach systematically produce less biased estimates from a small number of samples (Sarstedt et al., 2016). However, in a cross-sectional study common method bias is always a matter of caution for researchers. For this study, Harman's (1976) one-factor test and VIF (Kock, 2015) will be used to check the issue of the common method bias. Microsoft Excel, SPSS, and SmartPLS 3 software have been used to calculate and analyze the collected data.

4. Findings & Discussion

4.1 Measurement Model

The measurement models in the PLS-SEM model assess the reliability and validity of the constructs. The measurement model is assessed through Outer Loadings, Indicator Reliability, Composite Reliability, Cronbach's Alpha, Average Variance Extracted (AVE),

Cross Loadings, Fornell-Larcker Criterion, and HTMT Ratio. To see the summary of the Measurement Model, observe in the following Table 4-1.

Table 4-1: Measurement Model

Latent Variables	Indicators	Convergent Validity		Internal Consistency Reliability		Discriminant Validity	Collinearity Statistics
		Loading	AVE	Composite Reliability	Cronbach's Alpha	HTMT Confidence Interval	VIF
		> 0.70	> 0.50	> 0.60	> 0.60	Doesn't Include 1 (< 0.85)	< 5
Behavioral Intention (BI)	BI-1	0.882	0.830	0.936	0.898	YES	-
	BI-2	0.938					
	BI-3	0.912					
Cost	C-1	0.895	0.711	0.880	0.792	YES	1.239
	C-2	0.888					
	C-3	0.738					
Cultural Influence (CI)	CI-1	0.819	0.736	0.933	0.909	YES	2.002
	CI-2	0.913					
	CI-3	0.908					
	CI-4	0.881					
	CI-5	0.757					
Effort Expectancy (EE)	EE-1	0.701	0.672	0.890	0.836	YES	2.185
	EE-2	0.772					
	EE-3	0.870					
	EE-4	0.920					
Facilitating Condition (FC)	FC-1	0.821	0.661	0.886	0.829	YES	1.520
	FC-2	0.921					
	FC-3	0.764					
	FC-4	0.734					
Performance Expectancy (PE)	PE-1	0.883	0.673	0.891	0.836	YES	2.279
	PE-2	0.847					
	PE-3	0.829					
	PE-4	0.711					
Security	S-1	0.969	0.821	0.932	0.890	YES	1.091
	S-2	0.963					
	S-3	0.773					
Social Influence (SI)	SI-1	0.797	0.734	0.916	0.882	YES	2.503
	SI-2	0.797					
	SI-3	0.897					

Latent Variables	Indicators	Convergent Validity		Internal Consistency Reliability		Discriminant Validity	Collinearity Statistics
		Loading	AVE	Composite Reliability	Cronbach's Alpha	HTMT Confidence Interval	VIF
		> 0.70	> 0.50	> 0.60	> 0.60	Doesn't Include 1 (< 0.85)	< 5
	SI-4	0.927					
Voluntariness of Use (VU)	VU-1	0.898	0.716	0.882	0.812	YES	1.855
	VU-2	0.903					
	VU-3	0.726					

Wong, (2013) refers to item reliability as its reliability to develop the construct. Items are unreliable for a construct unless the outer loading value is 0.70 or higher. Indicator reliability is assessed by squaring the item loading value, and the acceptable value for indicator reliability is higher than 0.50 (Hair Jr et al., 2017). The internal reliability can be evaluated considering Cronbach's alpha and composite reliability. Hilton (2004) has suggested that Cronbach's alpha and composite reliability for 0.90 and above value will indicate excellent reliability; values between 0.70 – 0.90 will indicate high reliability, values between 0.50 – 0.70 will indicate moderate reliability, and values less than 0.50 will indicate low reliability. Table 4-1 shows the constructs have Cronbach's alpha and composite reliability values of more than the threshold value, ensuring that constructs have adequate reliability.

The validity is weighed through convergent validity and discriminant validity. The Average Variance Extracted (AVE) is a measurement technique of convergent validity. According to (Fornell & Larcker, (1981), the minimum threshold for AVE to satisfy the convergent validity is 0.50. Discriminant validity checks that the constructs are significantly different from each other. The HTMT ratio is the conservative approach to assessing discriminant validity. The HTMT values below 0.90 confirm discriminant validity between two constructs (Henseler et al., 2015).

Table 4-1 shows Average Variance Extracted (AVE), Table 4-2 HTMT Ratio. These two tables show that the AVE value ranges from 0.661 to 0.830, and the HTMT ratio between every two constructs in the model is well below 0.90. Thus, all the constructs satisfy the measurement model's convergent and discriminant validity criteria.

Table 4-2: Heterotrait-Monotrait Ratio (HTMT)

	BI	**Cost**	**CI**	**EE**	**FC**	**PE**	**Security**	**SI**	**VU**
Behavioral Intention (BI)									
Cost	0.474								

	BI	Cost	CI	EE	FC	PE	Security	SI	VU
Cultural Influence (CI)	0.677	0.432							
Effort Expectancy (EE)	0.763	0.345	0.567						
Facilitating Condition (FC)	0.588	0.368	0.473	0.574					
Performance Expectancy (PE)	0.834	0.375	0.594	0.764	0.491				
Security	0.171	0.168	0.108	0.142	0.091	0.248			
Social Influence (SI)	0.793	0.327	0.642	0.719	0.573	0.739	0.234		
Voluntariness of Use (VU)	0.658	0.390	0.672	0.434	0.315	0.585	0.129	0.619	

4.2 Structural model

The structural model is usually used to examine the degree and magnitude of the relationships between endogenous and exogenous variables. In the structural model, collinearity (VIF), estimated path coefficients (β), t-statistics, standard errors, R^2 values, the f^2 effect size, and the predictive relevance Q^2 effect size are used to examine the hypothesized relationships. Table 4-3 and 4-4 shows structural model output and path coefficient.

VIF is the degree to which the standard error has been increased due to the presence of collinearity. A VIF value of 5 and higher indicates a potential collinearity problem (Hair et al., 2012), and a VIF value higher than 3.3 indicates common method bias (Kock, 2015). Table 4-3 shows all VIF values for exogenous (i.e., predictor) constructs (represented by the rows) are clearly below the threshold of 3.3. Moreover, Harman's Single-factor test indicates that the first factor only capture 38.03% (less than 50% threshold value) of the variances and thus free of CMB(Tehseen et al., 2017). Consequently, collinearity / common method biasness among the predictor constructs is not a critical issue in the structural model.

The model's explanation power, R^2 value, ranges from 0 to 1. R^2 values of 0.75, 0.50, or 0.25 for latent dependent variables can be described as substantial, moderate, or weak predictive accuracy (Hair et al., 2012). The R^2 value (*Table 4-3*) of the endogenous latent variables has been observed, and the result shows that the R^2 values of Behavioral Intention (0.728) to be considered to have moderate explanation power following the rule of thumb mentioned by (Ketchen, 2013). In other words, this empirical model can explain 0.728 or 73% variances of the Behavioral Intention of Mobile Payment System in SMEs. It has outperformed the original UTAUT model's R^2 of 69% (Venkatesh et al., 2003).

Table 4-3: Structural Model

	Collinearity Statistics (VIF)	***Effect Size (f Square)***	**Q^2 (=1-SSE/SSO)**	**R Square**
Behavioral Intention (BI)			0.558858	0.728
Cost	1.239	0.027		
Cultural Influence (CI)	2.002	0.009		
Effort Expectancy (EE)	2.185	0.052		
Facilitating Condition (FC)	1.520	0.022		
Performance Expectancy (PE)	2.279	0.109		
Security	1.091	0.001		
Social Influence (SI)	2.503	0.100		
Voluntariness of Use (VU)	1.855	0.047		

f^2 measures the change in the R^2 value when an exogenous construct is omitted from the model to estimate whether the omitted construct has a significant effect on the endogenous constructs. f^2 values of 0.02, 0.15, and 0.35 represent small, medium, and large effects, respectively, while values of less than 0.02 indicate that there is no effect (Hair Jr et al., 2017). Table 4-3 shows Cost, Effort Expectancy, Facilitating Condition, Performance Expectancy, Social Influence, and Voluntariness of Use have a small effect, whereas Cultural Influence and Security do not affect the Behavioral Intention's R^2.

Q^2 value (Geisser, 1974; Stover & Stone, 1974) values of more than zero indicate that An exogenous construct has a predictive relevance for a particular endogenous construct (Hair Jr et al., 2017)**.** Table 4-3 shows the blindfolding results report for SME Mobile Payment System. As can be seen, the Q^2 values of the endogenous constructs Behavioral Intention (0.56) are considerably above zero. The result provides explicit support for the model's predictive relevance regarding the endogenous latent variables.

Model Fit indices allow judging how well a hypothesized model structure fits the empirical data, which helps detect model misspecifications. Henseler et al., (2014) introduce the SRMR as a goodness of fit measure for PLS-SEM that can be used to avoid model misspecification and suggest a value less than 0.10 or 0.08 (more conservative) are considered a good fit. Our model's SRMR value was found to be 0.07, which is less than the threshold value of 0.10. This indicates that our model has an acceptable level of model fit.

4.2.1 Path Coefficient

PLS-SEM uses a bootstrapping method to assess path coefficients' significance and relevance between exogenous and endogenous constructs. A t-value of more than 1.96 and a p-value of

less than 0.05 represent the path coefficient's statistical significance at a 95% confidence level.

Table 4-2 states the path coefficient of a structural model for adoption of mobile payment systems by the SMEs in Bangladesh. The study found that Cost (β = -0.096, t = 2.111, and p = 0.035), Effort Expectancy (β = 0.175, t = 2. 728, and p=0.007), Performance Expectancy (β = 0.260, t = 4.128, and p=0.000), Social Influence (β =0.261, t = 4.584, and p=0.000) and Voluntariness of Use (β = -0.154, t = 3.658, and p=0.000) have significant effect on the Behavioral Intention to adopt Mobile Payment System. Cultural Influence, Facilitating Condition and Security did not find to have any statistically significant influence on Behavioral Intention Mobile Payment System.

Table 4-4: Path Coefficient of Structural Model

Hypothesis	Relationship	β	T Stat.	P Values	Accepted
H_1	PE -> BI	0.260	4.128	0.000	**YES**
H_2	EE -> BI	0.175	2.728	0.007	**YES**
H_3	SI -> BI	0.261	4.584	0.000	**YES**
H_4	FC -> BI	0.095	1.780	0.076	NO
H_5	Cost -> BI	-0.096	2.111	0.035	**YES**
H_6	Security -> BI	-0.018	0.475	0.635	NO
H_7	VU -> BI	-0.154	3.658	0.000	**YES**
H_8	CI -> BI	-0.072	1.330	0.184	NO
BI: Behavioral Intention, CI: Cultural Influence, EE: Effort Expectancy, FC: Facilitating Condition, PE: Performance Expectancy, SI: Social Influence, VU: Voluntariness of Use					

4.3 Discussion

This study used an extended UTAUT model and eight independent variables to estimate the SMEs' behavioral intention to use m-payment systems. The independent latent variables are cultural influence, facilitating condition, security, cost, effort expectancy, performance expectancy, social influence, and voluntariness of use.

Out of eight endogenous variables, cost, effort expectancy, performance expectancy, social influence, and voluntariness of use have been statistically significant in influencing the behavioral intention to use mobile payment systems. Cost and voluntariness of use affect negatively. The three most important factors to SMEs are social influence, performance

expectancy, and effort expectancy in terms of relative weightage. These findings support the previous results of (Chingapi & Steyn, 2022; I. U. Khan et al., 2021; Tengeh & Gahapa Talom, 2020; Tengeh & Talom, 2020).

Contrary to the previous findings (Alalwan et al., 2017; Mohamad & Kassim, 2019), social influence was the most significant factor in SMEs adopting mobile financial services. This is because social bonding and saving face are strong in Bangladeshi society. Therefore, people and businesses are motivated and feel compelled to use things others use in the same group or guild to be on the bandwagon.

This social influence is enhanced by utilities the SMEs believe in deriving from the mobile payment systems and the ease of use in mobile payment systems. It is observed that social-commerce business owners prefer mobile payment systems to bank transfers or cash on delivery. Mobile payment systems have given users unprecedented convenience in performing financial transactions while keeping a bank in their pocket. It is transparent, real-time, and requires less movement. Supporting previous studies (Alalwan et al., 2017; Al-Saedi et al., 2020; Mohamad & Kassim, 2019), performance expectancy followed by effort expectancy found to be vital factors influencing mobile payment system adoption by SMEs.

However, mobile financial systems adoption of SMEs is found negatively affected by cost and voluntariness. The merchants of mobile payment systems in China enjoy zero-fee performing mobile transactions, whereas a card transaction will cost 2% of the transaction amount. 90% of the Chinese citizen extensively use Ali Pay and WeChat for their daily transactions that reach up to $41 trillion annually (Klein, 2020). On the contrary, the merchant in Bangladesh must pay a fee of 1.5% on each transaction. This high transaction cost motivates the Bangladeshi SMEs to perform transaction cash as the adoption, and use is voluntary. This finding is supported by the results of (Al-Saedi et al., 2020; Chingapi & Steyn, 2022; Mohamad & Kassim, 2019).

Contrary to previous studies' findings (Mohamad & Kassim, 2019; Mujahed et al., 2021), culture, facilitating conditions, and security do not affect SMEs' behavioral intention to use the m-payment system. It has been more than a decade since the introduction of mobile payment systems; by this time, Bangladeshi citizens are culturally accustomed to mobile payment systems. Moreover, the Bangladesh government and its regulatory bodies have established both hard and soft infrastructure to support and develop mobile payment systems. As a result, the mobile payment system and transactions are more secured, and people trust this channel in transacting money, paying bills and utilities, topping up mobile, etc. Consequently, these three factors may have become irrelevant to the SMEs for adopting mobile payment systems for merchant use.

5. Conclusion and Implication

SME (Small and Medium Enterprise) is the economic backbone of a country. Financial inclusion of the SME sector would help it channel resources in the mainstream economy and uplift the financial transparency of economic activities. One of the ways to financially include the SME sector is mobile payment systems. Although it has been a decade since the mobile payment system was launched in Bangladesh, merchant transaction is still less than 5% of the total mobile financial transactions. It is clear that SMEs are not involved in mobile transactions for some reason. This study has unearthed the reasons through identifying the determinants of mobile payment uses by SMEs.

For data analysis, this study used a modified UTAUT model that includes four latent variables from the original UTAUT model and four latent variables by the authors' research. The independent latent variables are cultural influence, facilitating condition, security, cost, effort expectancy, performance expectancy, social influence, and voluntariness of use.

Out of these independent variables, three original UTAUT constructs: effort expectancy, performance expectancy, social influence, have been found significant. Among the authors' additional four constructs, cost and voluntariness of use have been found statistically significant and negatively influencing the behavioral intention to use mobile payment systems.

The findings of this study will be helpful for the decision-makers who set the rules and regulations on SMEs and the SME owners in three areas. Firstly, the policymakers may put a ceiling over the fee of mobile money transactions like China. Zero-fee transactions up to a specific limit may boost motivation and push a social revolution in society for mobile payment system uses. Secondly, the government may mandate using a mobile money payment system for some services. By dint of this mandatory effort, the negative effect of voluntariness of use of mobile payment system will cross out. Lastly, the government must maintain the facilitating conditions, and fintech companies must continue offering mobile banking services. Although facilitating conditions and security were insignificant in motivating SMEs, the absence of these factors will deter them from using mobile payment systems.

The theoretical implication of this study is numerous. Firstly, this study fills a knowledge gap by identifying the factors affecting mobile payment use by SMEs through a systematic cluster approach. Secondly, his study also proves the relevance of the UTAT model and its constructs till today. Thirdly, the cost and voluntariness of use are found to be a relevant addition to the

existing UTAUT model in studying mobile payment systems adoption. Finally, the addition of these variables has increased the explanation power of the UTAUT model.

Like other research endeavors, this research is not free of limitations. Adding more clusters of SMEs and increasing sample size would have increased the study's strength. Moreover, the outcome of this study cannot be generalized without a cross-cultural study. Context, environment, users' tastes, and preferences constantly change, and technology evolves. So do the variables that determine the uses of a specific technology. For example, this study proves that facilitating conditions no longer influence users to adopt a mobile payment system. Researchers in their future study can validate the relevance of the findings of this study in cross-culture and cross-country contexts by adding or removing new variables and more samples to the model.

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Appendix-A: Summary of Measurement Items

Construct	Measurement Items
Performance Expectancy (PE)	PE-1: I would find mobile payments useful in my job.
	PE-2: Using mobile payments enables me to accomplish tasks more quickly.
	PE-3: Using mobile payments increases my productivity.
	PE-4: If I use mobile payments, I will increase my chances of getting a raise.
Effort Expectancy (EE)	EE-1: My interaction with mobile payments would be clear & understandable.
	EE-2: It would be easy for me to become skillful at using the mobile payments system.
	EE-3: I would find mobile payment easy to use.
	EE-4: Learning to operate a mobile payment system is easy for me.
Social Influence (SS)	SS-1: People who influence my behavior think I should use a mobile payment system.
	SS-2: People vital to me think I should use a mobile payment system.
	SS-3: The owner intends to use mobile payment systems.
	SS-4: The organization has support to use the mobile payment system.
Facilitating	FC-1: I have the resource necessary to use the mobile payment system.

Construct	Measurement Items
Condition (FC)	FC-2: I know necessary to use a mobile payment system.
	FC-3: The system is not compatible with other payment systems
	FC-4: A specific person is available for assistance with system difficulties.
Cultural Influence (Cul_In)	Cul-1: I have no trust in the mobile payment system.
	Cul-2: I can't operate the module used in the mobile payment system.
	Cul-3: I do not know the mobile payment system.
	Cul-4: I am reluctant to use a mobile payment system.
	Cul-5: Lack of customer intention on a mobile payment system.
Cost Influence (CI)	CI-1: Mobile Payment Systems is costly
	CI-2: The cost of cash withdrawal is very high.
	CI-3: Customer's unwillingness to pay extra transaction charges.
Voluntariness of Use (VU)	VU-1: Mobile payment system use is voluntary.
	VU-2: There is no pressure to use a mobile payment system from management.
	VU-3: Although it might be helpful, using a mobile payment system is certainly not compulsory.
Security	S1: M-payment system keeps payment secure
	S2: M-payment provides accurate transaction
	S3: M-payment is relatively free from faults
Behavioral Intention (BI)	BI-1: I intend to use mobile payments in the next 12 months.
	BI-2: I predict I will use mobile payments in 12 months.
	BI-3: I plan to use mobile payments in the next 12 months