

Continuance Usage Intention of Mobile Financial Services in Bangladesh during the COVID-19 Pandemic and Beyond: An Empirical Study

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ABSTRACT

Research on users' behavioural intention and continuation usage intention to adopt Mobile Financial Services (MFSs) is scarce, despite the rapid increase in their usage in developing countries. This study seeks to examine the predicting characteristics and intention of Bangladeshi customers to continue using MFSs for online purchasing during the COVID-19 pandemic and beyond. A theoretical framework was presented and examined. A structured questionnaire survey was used to gather the primary data. The data was gathered using convenience, non-probability sampling technique. A comprehensive analysis was conducted on a sample size of 413 participants using SmartPLS4.0. The study findings indicate that consumers' decisions to continue using MFSs are influenced by ease of use, perceived usefulness, and fear of COVID-19. The research findings indicate that perceived online security, perceived social influences, and perceived lifestyle compatibility do not have a substantial impact. The study investigates the psychological and ecological aspects peculiar to epidemics to elucidate the reasons behind consumers' expectations of continued usage of MFSs for online purchases. Online businesses must exercise caution when deploying MFSs as consumers' usage patterns can undergo unforeseen changes. The theoretical and managerial implications of the study have been incorporated. The study limitations and potential areas for future research were also evaluated.

Keywords: Behavioural Intention, Continuance Usage Intention, COVID-19 Fear, Mobile Financial Services (MFSs), Online Shopping

1. INTRODUCTION

Due to its strong contagiousness, COVID-19 has altered consumer behaviour patterns. This problem significantly impacts daily life, businesses, foreign trade, and movements (Sumi & Ahmed, 2022). Instead of visiting the bank, users use mobile banking to meet daily needs. In several developing countries, the COVID-19 outbreak has contributed to an increase in the use of digital banking (Bazarbash et al., 2020). The pandemic caused by COVID-19 has caused disruptions in the purchasing patterns of consumers and retailers (Zulauf et al., 2021), which has resulted in challenges for a variety of businesses (Belarmino et al., 2021). Researchers are interested in novel financial services brought by technology (Ryu, 2018). Mobile commerce apps including mobile shopping, mobile payment, and smart traveling have been popular worldwide (Shang & Wu, 2017). These Financial Technology (Fintech) companies are adding mobile remittance and payment platforms to grow. Fintech services provide users ease and efficiency.

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Retailers are making financial investments in this industry in order to take advantage of the opportunities for profit (Madan & Yadav, 2018). The proliferation of mobile applications has led to enhance security measures in the purchasing process. Consequently, buyers are curious about the potential advantages that Fintech might provide them. Thus, understanding why customers utilise MFSs for online buying is crucial. This Fintech has garnered attention, but users need to be more explicit (Ryu, 2018). For financially disadvantaged people, Fintech service has revolutionised the delivery of banking services (Al Amin et al., 2022). In Bangladesh, mobile banking has remarkably changed those with limited financial resources served by banks, and its advantages have also reached rural areas (Al Amin et al., 2022).

The global shift towards online shopping presents a new potential for e-commerce enterprises. As digital transformation drives e-retail growth (Dannenberg et al., 2020), Bangladesh is no exception. Bangladesh is one of the fastest-growing economies in South Asia. In Bangladesh, e-commerce began in the late 1990s, but due to infrastructural issues, lack of trust, and lack of cyber law, individuals were originally hesitant to shop online (Hossin et al., 2018). Mobile banking services for online buying have increased during the COVID-19 pandemic, benefiting consumers and businesses. Online sales in Bangladesh increased by 80% and the online food and commodities market grew by 300% during the COVID-19 pandemic (Hasan, 2020). In Bangladesh, a country with 170 million people, 13 MFSs providers have 198 million subscribers, many of whom have several accounts. The primary MFSs providers are bKash, Nagad, Rocket, and SureCash, with 39.9%, 18.1%, and 11.7% market shares. Clients use MFSs for transactions and bill payments (Babu, 2023). The Financial Access Survey by the International Monetary Fund found that mobile money usage surged significantly in low-and middle-income nations during the COVID-19 epidemic (Bazarbash et al., 2020). Mobile banking has also evolved in Bangladesh amid a pandemic (Rahman, 2020). In September 2020, mobile banking subscribers rose 1.1 percent (4.10 million). Thus, understanding consumers' mobile banking services application usage during the COVID-19 outbreak is crucial. Transactions in the MFSs industry rose 30.34% in the fiscal year 2022 (Business Inspection, 2023). MFSs and online banking are used by 25% of Bangladeshi adults to pay bills. MFSs is registered on 178.6 million mobile accounts but only 71.4 million are active users (Bangladesh Bank, 2023).

This perspective, combined with COVID anxiety or dread from the perceived risk of infection when shopping, has led people to choose these services even in the early stages of COVID-19 restriction relaxing (Francioni et al., 2022). Himel et al. (2021) examine the attitude and intention of users towards utilising MFSs in the specific setting of Bangladesh. The authors discovered that customers' attitudes regarding MFSs adoption are positively influenced by perceived usefulness, perceived ease of use, and perceived trust. Also, in the Bangladeshi context during the COVID-19 epidemic, Al Amin et al. (2022) carried out a study to investigate the antecedents of customers' intention to continue using Mobile Banking Services Applications (MBSAs). The findings indicated that users' intention to continue using the system was influenced by subjective norms, perceived ease of use, social distance, attitudes, cyberchondria, and institutional support. In addition, Al Amin et al. (2022) conducted a study that specifically examines online shopping and identifies the factors that influence the acceptability of mobile grocery shopping applications and their impact on the intention to use them during COVID-19 outbreaks. The results indicated that subjective norms, ease of use, and perceived usefulness determined shopping attitudes. On the other hand, social isolation, fear of COVID-19, subjective norms, attitudes, and usefulness all predict behavioural intention.

Based on these presumptions, the current study examines how different antecedents affect online shoppers' inclinations to use MFSs. This study examined how COVID-19 fear may affect online buying and mobile banking services. This study developed and tested a conceptual model and

added one dimension of COVID-19 fear in the context of MFSs usage for online shopping, to close the knowledge gap and help practitioners adapt to the emerging situation. The study discusses three antecedents. The first group of antecedents relates to technological sophistication and online security, which refer to perceived ease of use, perceived usefulness, and perceived online insecurity, respectively, since MFSs play a major role in pandemic online shopping. The second group of antecedents is consumers' perceived lifestyle compatibility and perceived social influences to use MFSs. These are lifestyle compatibility and social factors. The pandemic transformed consumers' lifestyles, making mobile payments for shopping acceptable. Finally, fear of COVID-19 and the belief that physical transactions are unsafe to make up the pandemic-only third category of predictors. More specifically, the study looks for the following questions-

RQ1: Do perceived ease of use, perceived usefulness, and perceived online security influence users' continuance intention towards using MFSs during the COVID-19 pandemic and beyond?

RQ2: Do users' perceived lifestyle compatibility, and perceived social influences motivate consumers' continuance intention towards using MFSs during the COVID-19 pandemic and beyond?

RQ3: Does COVID-19 fear lead to influence consumers' continuous intention towards using MFSs during the COVID-19 pandemic and beyond?

2. LITERATURE REVIEW

2.1 Mobile Financial Services (MFSs), Online Shopping, and COVID-19 Pandemic

Mobile financial services (MFSs), known as mobile-based banking services, let users conduct financial transactions online (Sharma et al., 2020). The existing literature focuses on the various elements of mobile banking applications based on several well-established theories and models, such as the Technology Acceptance Model (TAM) Davis (1989), Hassan and Wood (2020), Ho et al. (2020); United Theory of Acceptance and Use of Technology 2 (UTAUT2) Shavneet et al., (2020); Theory of Planned Behaviour (TPB) (Kim & Hwang, 2020; McBride et al., 2020). TAM is one of these theories that stands out the most regarding mobile banking adoption. Perceived risk, trust, and social influence were added to the TAM (Hassan & Wood, 2020; Ho et al., 2020).

Hew (2017) bibliometric analysis showed academics' growing interest in mobile technologies and suggested future research. Mobile payment intention has numerous preconditions and motives, according to research. If social distance requirements are maintained, digital payment methods will be needed because handling cash can spread viruses (Sharma et al., 2020). Compatibility, perceived technological security, performance expectations, innovativeness, and social influence affect mobile payment adoption and the desire to recommend the technology (Gao et al., 2018; Kalinic et al., 2019; Oliveria et al., 2016). According to research by Cao et al. (2016), found that perceived trust predicts mobile payment system use better than perceived intention to use, enjoyment, behavioural control, usefulness, and subjective norms. More research is needed to discover the factors, especially during the COVID-19 pandemic that may limit or help MFSs in online buying. Managing the COVID-19 pandemic without prophylactic vaccines or drugs requires social distance rules and healthy habits. Customers may use contactless payments to shop for essentials while staying safe (WHO, 2020).

Consumers' intention to use MFSs for online shopping during a pandemic, notably in Bangladesh, was not highlighted. Thus, studying how technological, psychological, and situational factors affect MFSs consumers' online purchasing intentions is crucial. The current study incorporates

and experimentally tests a conceptual model that focuses on perceived online security and COVID-19 fear to address the gaps in consumers' continued use of MFSs for online buying during a pandemic and the beyond.

2.2 Perceived Ease of Use

Davis (1989) defines perceived ease of use as 'the degree to which a person believes that adopting a given system would be free from attempts'. Empirical study links perceived ease of use with behavioural intention. Phonthanukitithaworn et al. (2016) found no direct effect of perceived ease of use on Thai users' m-payment adoption intentions. Zhang et al. (2018) revealed that perceived ease of use drove mobile banking technology adoption. According to studies in India (Chawla & Joshi, 2019) and Bangladesh (Shetu et al., 2022), perceived ease of use strongly influences mobile wallet client intentions. During the COVID-19 pandemic, the online food delivery system's perceived ease of use positively correlated with users' behavioural intention to use (Al Amin et al., 2021), supporting the prior conclusion (Kasilingam, 2020). That's why the researchers come up with these hypotheses:

H1a: Users' perceived ease of use is significant positive influence with their behavioural intention to use MFSs for online shopping during COVID-19.

H1b: There is a significant positive influence between users' perceived ease of use and continuance usage intention to use MFSs for online shopping during COVID-19.

H1c: Users' behavioural intention to use MFSs for online shopping during COVID-19 mediates the relationship between perceived ease of use and continuance usage intention.

2.3 Perceived Usefulness

Technology adoption has shown that perceived usefulness strongly influences mobile banking attitudes and intentions (Mohammadi, 2015). Studies have shown that perceived usefulness affects behavioural intention to adopt and use new technology (Davis, 1989; Venkatesh et al., 2012). Mobile banking users' behavioural intention was significantly affected by usefulness (Alalwan et al., 2016; Phonthanukitithaworn et al., 2016). The findings show that perceived usefulness greatly influences user intentions to use mobile wallets (Chawla & Joshi, 2019; Shetu et al., 2022). The most important factor influencing customers' inclination to use online meal delivery systems during COVID-19 is perceived usefulness.

Hence the following hypotheses are proposed by the researchers:

H2a: Perceived usefulness positively and significantly impacts users' behavioural intention to use MFSs for online shopping during COVID-19.

H2b: There is a significant positive influence between users' perceived usefulness and continuance usage intention to use MFSs for online shopping during COVID-19.

H2c: Users' behavioural intention to use MFSs for online shopping during COVID-19 mediates the relationship between perceived usefulness and continuance usage intention.

2.4 Perceived Lifestyle Compatibility

Compatibility is how well people think, act, and live with innovation (Hernandez & Jose', 2007). Mobile banking adoption is heavily influenced by compatibility (Chen, 2013; Shaikh & Karjaluoto, 2015). Muñoz-Leiva et al. (2017) introduced social image. They said people seek guidance from others out of respect, honor, status, reputation, credibility, social connection, etc. due to innovation uncertainty. Users prefer organisations with comparable ideals and technology. In

developing countries, users' perceived compatibility strongly determines digital wallet usage (Chawla & Joshi, 2019; Shetu et al., 2022). The researchers postulated the following hypotheses:

H3a: Users' perceived lifestyle compatibility has a significant positive influence with the behavioural intention to use MFSs for online shopping during COVID-19.

H3b: There is a significant positive influence between users' perceived lifestyle compatibility and continuance usage intention to use MFSs for online shopping during COVID-19.

H3c: Users' behavioural intention to use MFSs for online shopping during COVID-19 mediates the relationship between perceived lifestyle compatibility and continuance usage intention.

2.5 Perceived Social Influences

Venkatesh et al. (2012) defined perceived social influences as 'the degree to which consumers believe that significant individuals such as family and friends believe they should use a specific technology'. The intent to use technology like mobile wallets has been frequently assessed using this construct (Amoroso & Magnier-Watanabe, 2012; Yang et al., 2012). Dwivedi et al. (2019) found that social impact affects behavioural intentions without moderating constructs. Numerous mobile payment studies, including Bangladesh (Shetu et al., 2022), Qatar (Musa et al., 2015), and Portugal (Oliveira et al., 2016), have shown that social influence strongly affects behavioural intentions. The following hypotheses have been proposed in light of these factors:

H4a: Perceived social influences significantly and positively influence users' behavioural intention to use MFSs for online shopping during COVID-19.

H4b: There is a significant positive influence between users' perceived social influences and continuance usage intention to use MFSs for online shopping during COVID-19.

H4c: Users' behavioural intention to use MFSs for online shopping during COVID-19 mediates the relationship between perceived social influences and continuance usage intention.

2.6 Perceived Online Security

Malaquias and Hwang (2016) found that consumers often share personal information despite privacy concerns. In India, Thakur and Srivastava (2013) found that security and privacy issues hindered mobile commerce adoption. The study found that perceived internet security greatly affects customer intentions to use mobile wallets and mobile banking in developing nations. These factors have led to the following speculations:

H5a: Perceived online security significantly influences users' behavioural intention to use MFSs for online shopping during COVID-19.

H5b: There is a significant positive influence between users' perceived online security and continuance usage intention to use MFSs for online shopping during COVID-19.

H5c: Users' behavioural intention to use MFSs for online shopping during COVID-19 mediates the relationship between perceived online security and continuance usage intention.

2.7 COVID-19 Fear

Considering these assumptions, and the fact that consumers' acceptance and experience with a product or service can lead to higher adoption (Chen & Yang, 2021), customers' fear of COVID-19 and perception of the risk of dining out during the pandemic may increase their inclination to use online food delivery systems. People who believe COVID-19 is threatening their health may view mobile payments as a way to reduce social connections (Sreelakshmi & Sangeetha, 2020). Mobile

payments make it easier to avoid cash and reduce the risk of COVID-19. Health information technologies and smartphone apps for chronic illness management are substantially influenced by perceptions of health risks (Dou et al., 2017). The following speculations have been postulated in light of these factors:

H6a: COVID-19 fear has a significant positive influence on users' behavioural intention to use MFSs for online shopping during the COVID-19 pandemic.

H6b: There is a significant positive influence between users' COVID-19 fear and continuance usage intention to use MFSs for online shopping during COVID-19.

H6c: Users' behavioural intention to use MFSs for online shopping during COVID-19 mediates the relationship between COVID-19 fear and continuance usage intention.

2.8 Behavioural Intention to Use and Continuance Usage Intention

Studies on mobile payment systems show that many factors affect consumers' inclination to utilise them (Kalinic et al., 2019). The study found a positive impact on consumers' behavioural intention to utilise mobile payment services in India (Patil et al., 2020) and Bangladesh (Shetu et al., 2022). Continuance intention is a positive post-use behaviour that involves continuing to use or buy a brand, product, or service after embracing it (Kumar & Shah, 2021). Research has focused on this variable, particularly its antecedents in sharing services (Eugene Cheng-Xi et al., 2018), mobile and social apps/services (Qing & Haiying, 2021), internet banking (Rahi & Abd. Ghani, 2019), e-government services (Puthur et al., 2020), financial services (Zhou et al., 2018), online shopping (Luo & Ye, 2019), and e-learning platforms (Daneji et al., 2019). During the COVID-19 pandemic, several studies investigated the continuous intention antecedents. The impact of technological ease, particularly mobile apps and services, on customers' behaviours and intentions has been extensively studied in several industries.

The hypothesis is proposed as follows:

H7: Users' behavioural intention to use has a significant positive influence on continuance intention to use MFSs on online shopping during COVID-19.

The literature review and the suggested constructs served as the foundation for the conceptual framework shown in Figure 1.

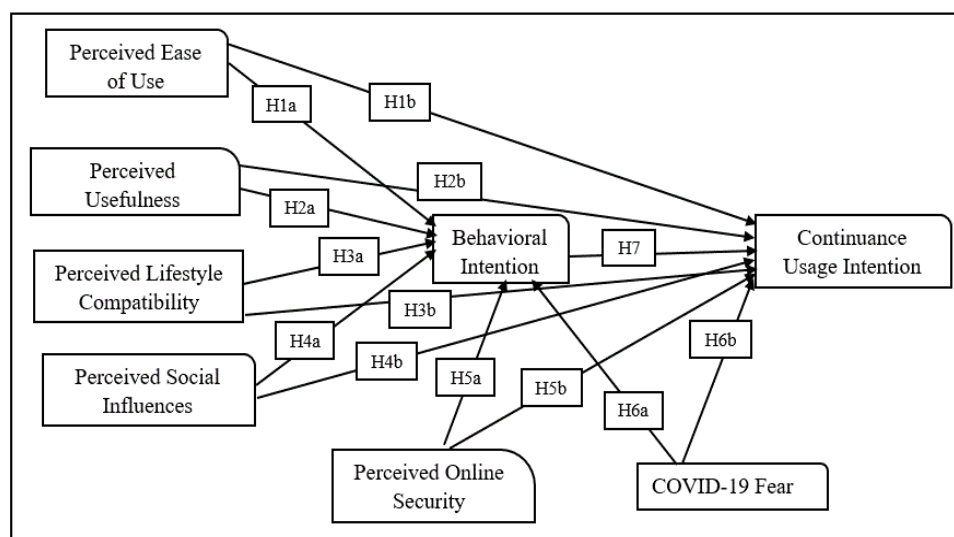


Figure 1. A Proposed Research Framework

3. METHODOLOGY

3.1 Measures

In Table 1, the 35 components were adapted from MFSs study on COVID-19 online commerce. This study uses a 5-point Likert scale to measure dependent, and independent factors from strongly disagree (1) to strongly agree (5). Davis (1989) 5-item and 4-item scales were used to assess perceived ease of use and usefulness. Perceived lifestyle compatibility was measured using Moore and Benbasat (1991) 4-item scale. Venkatesh et al. (2012) 3-item scale for perceived social effects was also used. Jin et al. (2018) 4-item scale was used to measure internet security, and Jian et al.'s (2020) 4-item scale was used to assess COVID-19 fear. The 4-item behavioural intention measure was modified from Venkatesh et al. (2012), while the 3-item scale for continuous usage intention was derived from Bhattacharjee et al. (2008) and Santosa et al. (2021).

3.2 Data Collection

The study specifically examines Generation Y and Generation Z, who are the younger demographic groups that predominantly utilise mobile banking services. This cross-sectional empirical study collected data from each respondent once (Malhotra, 2014). The study evaluated COVID-19-related online shoppers who used mobile banking. Two filtering questions were whether respondents used mobile money during the COVID-19 pandemic and within the past six months. Participants then completed the survey. The researchers collected primary data for analysis using structured questionnaires. The questionnaire was in English to reach the study participants. Researchers distributed consent forms and surveys to gauge participants' interest. This questionnaire was conducted without compensation. Since the population and sampling frame were unknown, respondents were selected using subjective judgment and non-probability convenience sampling (Saunders et al., 2019). The study also aimed for a broad and representative sample (Al Amin et al., 2022). Online surveys were chosen for their speed, accuracy, and cost-effectiveness (Fricker, 2008). This online study targeted MFSs customers who shopped online. The researchers shared the survey link via Facebook and Instagram with friends (Chuah et al., 2022), and to further reach the target audience, the surveys were sent via email, Google Classrooms, as well as Facebook and Instagram in October–November 2022 (Balakrishnan & Shuib, 2021). It included demographic questions and measurement items, which were modified from previous research and presented in English. Of the 469 responses received, 56 were rejected due to issues with the survey forms, leaving 413 valid responses, resulting in a 68% response rate (Sekaran, 2003). This response rate was deemed sufficient for the study. Table 1 presents the demographics of the respondents. All questions were answered, and no values were missing in the online survey. To address potential common method bias, researchers examined the data using Kock's (2015) recommendation, which states that VIF values below 3.3 are the cutoff for detecting bias. The maximum VIF found was 5.0. However, based on Henseler et al. (2015), Table 2 shows that the recent VIF investigation found no collinearity or common method bias (CMB), aligning with previous findings.

Table 1 Demographic Profile of the Respondents

Demographic Attributes	Category	Frequency	Percentage (%)
Gender	Male	213	51.8%
	Female	200	48.2%
Age	18-23 years	150	36.32%
	24-30 years	180	43.58%
	31-36 years	50	12.11%
	Above 36 years	33	7.99%

Demographic Attributes	Category	Frequency	Percentage (%)
Frequency of Online Shopping in a Month	0-5 times	352	85.4%
	5-10 times	43	10.4%
	More than 10 times	18	4.2%
Income	0-20,000 tk	202	48.8%
	20,000-40,000 tk	133	32.3%
	40,000- 60,000 tk	48	11.6%
	More than 60,000 tk	30	7.3%
	bKash	320	97%
	Nagad	116	35.2%
Frequently Used MFSs [Users' can choose multiple payment options]	Upay	12	3.6%
	Tap	22	6.7%
	Rocket	82	24.8%
	CellFin	11	3.3%
	NexusPay	36	10.9%
	Gpay	9	2.7%
	Others	14	4.2%

4. RESULTS AND DISCUSSIONS

4.1 Measurement Model Assessment

The outer measurement model evaluation was guided by Hair et al. (2021). Composite Reliability (CR) was assessed. Convergent validity was evaluated using Average Variance Extracted (AVE) and cross-loading, whereas discriminant validity was analysed through the Fornell-Larcker criterion and the Heterotrait-Monotrait ratio (HTMT). Following Hair et al.'s (2021) recommendation, CR should exceed 0.7, indicating that at least 70% of the model's variance is explained to ensure construct dependability. Hair et al. (2021) stated that Cronbach's Alpha (α) and rho_A values should fall within the 0–1 range, with values closer to 1.0 indicating internal consistency. Convergent validity was tested using Average Variance Extracted (AVE) and cross-loading. The AVE for each construct must exceed 0.5, indicating that the construct explains more than 50% of the model's variance (Hair et al., 2021). Table 2 shows that all constructs in the research model met the standards for CR and AVE.

Table 2 Construct Reliability (CR) and the Results of the Outer Model

Constructs	Measurement items	Loadings	A	rhoA	CR	AVE	R ²
Perceived Ease of Use (PEOU)	PEOU3	0.819	0.708	0.708	0.837	0.632	
	PEOU4	0.782					
	PEOU5	0.782					
Perceived Usefulness (PU)	PU1	0.863	0.810	0.811	0.887	0.724	
	PU2	0.828					
	PU3	0.861					
Perceived Lifestyle Compatibility (PLC)	PLC1	0.837	0.805	0.806	0.885	0.719	
	PLC2	0.871					
	PLC3	0.835					
Perceived Social Influences (PSI)	PSI1	0.749	0.775	0.789	0.869	0.690	
	PSI2	0.840					
	PSI3	0.897					
Perceived Online Security (POS)	POS1	0.740	0.847	0.852	0.898	0.689	
	POS2	0.885					
	POS3	0.813					
	POS4	0.874					

Constructs	Measurement items	Loadings	A	rhoA	CR	AVE	R ²
COVID-19 Fear (COF)	COF1	0.827	0.796	0.797	0.880	0.710	
	COF3	0.840					
	COF4	0.860					
Behavioural Intention to Use (BIU)	BIU1	0.861	0.860	0.863	0.905	0.705	0.570
	BIU2	0.808					
	BIU3	0.829					
	BIU4	0.859					
Continuance Usage Intention (CUI)	CUI1	0.909	0.849	0.850	0.909	0.769	0.694
	CUI2	0.852					
	CUI3	0.868					

Table 2 indicates the item factor loadings, construct reliability, and convergent validity. Discriminant validity of the measurement model was assessed using the Fornell and Larcker criterion (see Table 3) and HTMT of correlations (see Table 4). According to Hair et al. (2021), in the Fornell and Larcker criterion, the diagonal value is the squared root of the AVE, while the other cells show correlation. It is recommended that the diagonal values be higher than the off-diagonal values.

Table 3 Discriminant Validity based on Fornell and Larcker Criterion Model

Constructs	BIU	COF	CUI	PEOU	PLC	POS	PSI	PU
BIU	0.840							
COF	0.662	0.843						
CUI	0.779	0.705	0.877					
PEOU	0.533	0.484	0.572	0.795				
PLC	0.583	0.557	0.573	0.526	0.848			
POS	0.624	0.756	0.628	0.509	0.553	0.830		
PSI	0.580	0.654	0.600	0.473	0.609	0.772	0.831	
PU	0.541	0.388	0.460	0.509	0.606	0.393	0.435	0.851

Table 4 shows that the HTMT correlation ratio must be less than 0.9 to be valid (Gold et al., 2001). The results showed no multicollinearity (Hair et al., 2017; Henseler et al., 2015).

Table 4 Heterotrait-Monotrait Ratio (HTMT)

Constructs	BIU	COF	CUI	PEOU	PLC	POS	PSI	PU
BIU								
COF	0.801							
CUI	0.711	0.858						
PEOU	0.680	0.644	0.737					
PLC	0.697	0.696	0.690	0.693				
POS	0.730	0.723	0.741	0.656	0.668			
PSI	0.706	0.830	0.731	0.634	0.763	0.853		
PU	0.644	0.487	0.555	0.672	0.749	0.473	0.549	

4.2 Structural Model Assessment

Squared multiple correlations (R^2) by path coefficient significance level determine a structural model's explanatory capacity (Henseler et al., 2015). Bootstrapping using 5000 resamples was used to determine the research model's path coefficient from t-values and p-values (Hair et al., (2021).

Table 5 displays the hypotheses' results after SmartPLS4.0 was used to assess the theoretical model's statistical significance through PLS-SEM. According to the analysis, Hypotheses H1a and H1b were accepted, with perceived ease of use significantly influenced behavioural intention to

use and continuance usage intention ($\beta = 0.117$, t -statistics = 2.141, $p = 0.033$; and $\beta = 0.155$, t -statistics = 2.889, $p = 0.004$). Perceived usefulness significantly impacted behavioural intention to use and continuance usage intention, supporting H2a ($\beta = 0.218$, t -statistics = 4.047, $p = 0.000$) but rejected the hypothesis H2b ($\beta = -0.039$, t -statistics = 1.029, $p = 0.304$).

Hypotheses H3a and H3b were inconsistent with the data. The behavioural intention to use and continuance usage intention for perceived lifestyle compatibility were not statistically significant, refuting the assumptions H3a and H3b ($\beta = 0.101$, t -statistics = 1.546, $p = 0.123$; and $\beta = 0.053$, t -statistics = 1.197, $p = 0.232$) respectively. Besides, both H4a and H4b showed that the hypotheses were insignificant. Perceived social influences analysis revealed no significant differences in behavioural intention to use and continuance usage intention output values ($\beta = 0.047$, t -statistics = 0.706, $p = 0.481$ and $\beta = 0.080$, t -statistics = 1.393, $p = 0.164$, respectively), rejecting the hypotheses.

H5a and H5b showed the hypotheses were not significant. Behavioural intention to use and continuance usage intention regarding perceived online security were not statistically significant ($\beta = 0.136$, t -statistics = 1.922, $p = 0.055$; and $\beta = -0.028$, t -statistics = 0.431, $p = 0.667$). In contrast, H6a and H6b were significant. COVID-19 fear confirmed that behavioural intention to use ($\beta = 0.331$, t -statistics = 5.676, $p = 0.000$) and continuance usage intention ($\beta = 0.266$, t -statistics = 4.576, $p = 0.000$) output values verified the assumptions. H7 confirmed the hypothesis behavioural intention to use significantly affects continuance usage intention ($\beta = 0.482$, t -statistics = 9.423, $p = 0.000$).

Figure 2 shows the path analysis of the proposed model. Effect sizes (f^2) were also evaluated. The significant independent variables had f^2 -values of 0.02, 0.15, and 0.35, indicating minor, medium, and large magnitudes (Cohen, 1988). The magnitude of the effect f -square controls the representative impact of numerous variables in the study model (Henseler et al., 2015). The effect size strength in this model ranged from 0.001 to 0.326, as shown in Table 5. In Table 5, R^2 is 0.570, indicating that the independent constructs (PEOU, PU, PLC, PSI, POS, and COF) affect behavioural intention to use by 57.0%. BIU, PEOU, PU, PLC, PSI, POS, and COF collectively explain 69.4% of the variance in continuance usage intention.

Table 5 Hypotheses Testing and Path-coefficients Results

Hypotheses	Structural Paths	Path Coefficients (β)	t-Values	p-Values	F-Square	Effect Size	Decision
H1a	PEOU -> BIU	0.117	2.141	0.033	0.019	Small	Accepted
H1b	PEOU -> CUI	0.155	2.889	0.004	0.046	Small	Accepted
H2a	PU -> BIU	0.218	4.047	0.000	0.064	Small	Accepted
H2b	PU -> CUI	-0.039	1.029	0.304	0.003	Small	Rejected
H3a	PLC -> BIU	0.101	1.546	0.123	0.011	Small	Rejected
H3b	PLC -> CUI	0.053	1.197	0.232	0.004	Small	Rejected
H4a	PSI -> BIU	0.047	0.706	0.481	0.002	Small	Rejected
H4b	PSI -> CUI	0.080	1.393	0.164	0.007	Small	Rejected
H5a	POS -> BIU	0.136	1.922	0.055	0.012	Small	Rejected
H5b	POS -> CUI	-0.028	0.431	0.667	0.001	Small	Rejected
H6a	COF -> BIU	0.331	5.676	0.000	0.100	Small	Accepted
H6b	COF -> CUI	0.266	4.576	0.000	0.083	Small	Accepted
H7	BIU -> CUI	0.482	9.423	0.000	0.326	Medium	Accepted

NB: Coefficient of determination (R^2) for BIU=0.570 and CUI=0.694.

Blindfolding-based Cross-Validity Redundancy (Q^2) for BIU= 0.390, and CUI= 0.522

Table 5 also demonstrates blindfolding-based cross-validity redundancy (Q^2) which justifies the predictive power of PLS-SEM model. The Q^2 value for the endogenous constructs exceeds Hair et al.'s (2017) threshold value ($Q^2 > 0$).

4.3 Testing of Mediation Effects

Table 6 shows this study's mediation of users' behavioural intention of usage. The outcomes are in the next section. The behavioural intention of usage mediates the associations between perceived ease of use, perceived usefulness, and COVID-19 fear. These supported hypotheses H1c, H2c, and H6c. The mediation testing is indirect effects rejected the hypotheses H3c, H4c, and H5c.

Table 6 Results of the Mediation Analysis

Hypotheses	Indirect Path	Path Coefficients (β)	t-Values	p-Values	Decision
H1c	PEOU -> BIU -> CUI	0.056	2.053	0.041	Accepted
H2c	PU -> BIU -> CUI	0.105	3.516	0.000	Accepted
H3c	PLC -> BIU -> CUI	0.049	1.517	0.130	Rejected
H4c	PSI -> BIU -> CUI	0.023	0.715	0.475	Rejected
H5c	POS -> BIU -> CUI	0.066	1.798	0.073	Rejected
H6c	COF -> BIU -> CUI	0.159	4.893	0.000	Accepted

Note: $p < 0.05$, $p < 0.001$

Theoretical models underpinned the hypotheses, though three construct hypotheses were rejected. In hypotheses Hypotheses H1a, H1b, and H1c demonstrated that perceived ease of use positively and significantly influenced both behavioural intention to use and continuance usage intention of MFSs for online shopping (Chawla & Joshi, 2019; Shetu et al., 2022). Hypothesis H2a indicated that perceived usefulness strongly affected behavioural intention to use. However, hypothesis H2b was rejected, showing that perceived usefulness did not significantly impact users' continuance usage intention of MFSs during online shopping. Previous studies on online shopping and MFSs for transactions during the pandemic confirm that perceived usefulness has a positive and influential impact on users' behavioural intention to use these services (Al Amin et al., 2022; Al Amin et al., 2022; Himel et al., 2021).

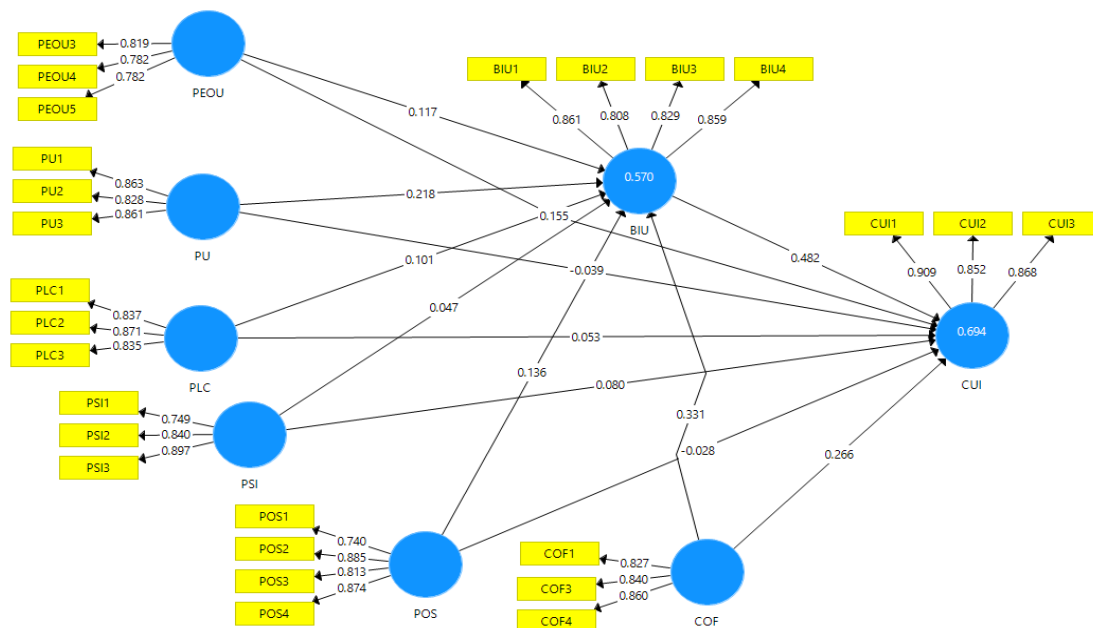


Figure 2. Path Analysis of the Proposed Model

Hypotheses H3a, H3b, and H3c found that behavioural intention to use did not significantly affect perceived lifestyle compatibility, whereas continuous usage intention rejected them. The study contradicts prior studies (Chawla & Joshi, 2019; Muñoz-Leiva et al., 2017; Shetu et al., 2022). In hypotheses H4a, H4b, and H4c, perceived social influences did not affect MFSs users' behavioural intention to use and continuance usage intention. These findings did not align with previous research from Bangladesh (Shetu et al., 2022), but the present study confirmed them. Perceived online security did not affect MFSs users' behavioural intention to use and continuance usage intention in hypotheses H5a, H5b, and H5c. The findings refuted previous studies (Chawla & Joshi, 2019; Patel & Patel, 2018; Zhang et al., 2018).

The results indicate that the hypotheses related to perceived lifestyle compatibility, perceived social influences, and perceived online security did not provide support for the stated assumptions and were therefore rejected. However, the assessment items employed in the study were derived from existing literature. The study specifically examined the perspective of a developing nation, namely Bangladesh. The researchers reached a consensus that, although the measurement items were modified, several constructs were incompatible with the examined data. Possible factors contributing to this variation include differences in study settings, sample size, and the populations being studied. Furthermore, the fact that this research was conducted after the COVID-19 pandemic may have contributed to the reason why the results of the analysis disagreed with the earlier findings. In Bangladesh's socioeconomic environment, several studies on MFSs were conducted during the COVID-19 pandemic, however, following the pandemic, the hypotheses were found to be unsubstantiated. Situational factors could contribute significantly to the rejection of these hypotheses. Recent work by Sarstedt et al. (2024) demonstrated that even with rigorous adherence to cutting-edge methodological norms, research findings can differ when evaluating identical data. In addition, the results also suggested that this variation might be observed by analysing the influence of researchers' analytical choices when employing various methods of structural equation modeling (SEM).

On the other hand, hypotheses H6a, H6b, and H6c found that COVID-19 fear strongly affected online MFSs buyers' behavioural intention to use and continuance usage intention. Al Amin et al. (2021)'s study on Bangladeshi consumers' behavioural intention to shop online for food during COVID-19 pandemic is relevant to these findings. Hypothesis H7 found that COVID-19 increased online purchases, behavioural intention to use, and continuance usage intention of MFSs during the pandemic. This supported previous research on MFSs utilisation (Alt et al., 2021; Bhatt, 2022; Mew & Milan, 2021; Shetu et al., 2022; Shim et al., 2001; Thomas-Francois & Somogyi, 2022).

5. CONCLUSION

The study aimed to investigate the factors that influence whether Bangladeshi users will continue to utilise MFS applications for online shopping purposes during emergency circumstances, such as the COVID-19 pandemic. The findings confirmed that perceived ease of use, perceived usefulness, and COVID-19 fear are highly associated with users' behavioural intention to use and continuance usage intention of utilising MFSs.

The study has several theoretical implications. Firstly, it proposes a model for predicting behavioural intention to use MFSs based on an enhanced version of TAM. This model includes constructs such as perceived social influences, perceived online security, perceived lifestyle compatibility, and COVID-19 fear, taking into account both psychological and situational factors. The study is supported by mixed theoretical foundations. It shows that users' perceptions of these factors are likely to lead to negative behavioural intention, which in turn leads to a lower degree of MFSs continuance usage intention. Secondly, the incorporation of new constructs into the

original TAM model demonstrated sufficient explanatory power and predictive relevance in explaining the behavioural intention and continuance usage intention of Bangladeshi MFSs users. Third, the study provides additional insights into the mediating effect of behavioural intention to use MFSs in the negative relationship between perceived lifestyle compatibility, perceived social influences, and perceived online security and MFSs continuance usage intention. This contrasts with previous studies that used the TAM model, which primarily focused on the mediating role of attitude in the relationship between perceived ease of use, and perceived usefulness. Consequently, this study integrates TAM with mixed constructs, contributing to the existing knowledge on technology continuance usage intention.

This study utilised the advanced statistical software SmartPLS4.0 to forecast and assess a predictive model. The PLS technique was applied due to the non-normal distribution of the acquired data. Prior research on MFS adoption predominantly concentrated on the quantitative examination of the causal connections. Nevertheless, this study utilised a combination of quantitative and qualitative methods to gain a deeper understanding of the results acquired from the analysis of the path model. In Bangladesh, MFSs have been extensively used for over a decade, with users becoming familiar with the range of services offered. However, the utilisation of MFSs experienced exponential growth during the COVID-19 pandemic, especially after the government imposed a nationwide lockdown and health safety measures. Individuals rely heavily on MFSs for various activities, including online shopping and banking. This study offers a comprehensive strategy to understand how MFS users continue to use MFSs post-pandemic. By employing a mixed-theoretical model, the authors identified previous unexplored variables related to the behavioural intention to continue using MFSs.

The study's findings indicate that the perceived ease of use, perceived usefulness, and fear of COVID-19 strongly influence the acceptance and continued use of MFSs. The primary reason for the widespread use of MFS technology is its user-friendly nature, which has made it the preferred choice for many users. Advertisements and campaigns, both on TV commercials and social media platforms, assist customers in comprehending their consumption capacity across various levels. The findings indicate that a higher level of usability fosters trust in MFS providers and leads to rapid service growth. Furthermore, the adoption of MFS technology enables practitioners to expand their services on a wide scale, offering options such as bill payments (electricity, gas, internet, university fees, etc.), money transfers, deposits, loans, and more. In addition, users can deposit funds into both debit cards and bank accounts. However, the adoption of the MFSs also presents significant health hazards. People's reliance on MFSs compels them to maintain the provision of these services to ensure seamless everyday activities, which in turn encourages further adoption of online activities and buying habits. E-commerce sites are benefiting from the integration of MFSs for online shopping, resulting in mutually advantageous collaborations. The introduction of cashback offers, discounts, and connected marketing aims to attract the increasing interest of MFS customers during online buying.

In addition, the significance of behavioural intention and continuance usage intention is emphasised by the findings on perceived lifestyle compatibility, perceived social influences, and perceived online security. However, these findings contradict previous studies. Therefore, marketers should enhance consumers' behavioural intention by improving the perceived lifestyle compatibility, perceived social influences, and perceived online security, while maximising utility and enjoyment and minimising hazards. To enhance perceived lifestyle compatibility, marketers might provide supplementary usage advantages, loyalty points, discounts, and bonuses alongside the normal MFS services. Furthermore, to enhance the perceived social influences, marketers should broaden their operations to cater to customers' profound emotional and social demands,

while also providing superior products and services through convenient online and offline activities. On the contrary, consumer trust is a crucial factor in determining the ongoing usage of MFSs. Because of fraudulent incidents occurring in online purchases, customers may hesitate to use their MFS provider's number. Ensuring website security and implementing two-step login password protection can increase consumers' confidence in using MFSs for online purchases. The reliability and security of MFSs are essential for continued usage, even when encountering usage difficulties. A rigorous online safety policy can also be implemented to ensure the exponential expansion of MFSs in Bangladesh.

This study is based on responses from Dhaka, Bangladesh, a developing nation, after the COVID-19 outbreak. Since the study relies on self-reported survey data from a single location, its generalisability may be limited. Replicating the study across multiple locations could help overcome this limitation. To enable global comparisons in this field, responses from various nations with different cultural backgrounds could be examined. Future longitudinal studies may provide further insight. While this study focuses on consumers, future research could incorporate cultural, psychological, and environmental factors that may influence consumers' usage. Additionally, further research could explore how these factors impacted users' usage intentions during and after the pandemic.

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