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Attitude towards Using Mobile Financial Services: A Study on University Students in Bangladesh

Abstract

Mobile financial services (MFS) are steadily increasing in developing countries, especially among young users. However, limited research addresses the perspectives and intentions of young individuals toward MFS adoption. This study investigates the attitudes and intentions of Bangladeshi university students to MFS usage. Data was obtained from 317 individuals of university students and analyzed using descriptive statistics, reliability tests, and exploratory factor analyses (EFA). A structured questionnaire was used for data collection via Cochran's sampling techniques. The study used a deductive approach to prove its validity, applying the technology acceptance model 2. The study revealed five key factors: knowledge adequacy, transaction indicators, current and potential usage, satisfactory impact, and individual usefulness. Findings revealed a positive perception of MFS, its usefulness, and ease of use, which promoted MFS acceptance among students. Finally, a substantial association was found between students' positive perceptions of MFS and its usefulness and usability.

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1. Introduction

Mobile commerce (m-commerce) has become more popular due to the widespread availability of smartphones and the internet (Kumar, Nim and Sharma, 2019). Mobile financial service (MFS) is a significant indicator of mobile commerce. It facilitates transactions such as money transfers, deposits, and bill payments through mobile devices or internet platforms (Al-Saedi *et al.*, 2020). According to (Chen, 2008), this approach has improved client-agent transactions' accessibility, reliability, simplicity, and security. Nowadays, considerable focus is found in academic and business research focusing on the perspectives and behaviors of MFS/m-banking clients (Saleh and Mashhour, 2014). MFS marketers may perceive acquiring and retaining customers as simpler than before in contemporary scenarios (Slade, 2015).

The internet infrastructure allows wide adoption of MFS in technologically advanced nations, including Singapore, India, China, Taiwan, and the US (Sampaio, Ladeira and Santini, 2017). Bangladesh Bank reported that in recent years, 194.125 million clients enrolled with numerous (MFS) providers such as Bkash, Nagad, Rocket, Mcash, and Ucash

(Bangladesh Bank, 2023). Currently, the usage of the features of MFS in Bangladesh is relatively poor compared to the frequency in other developing countries (Digital Finance Forum BD, 2021). Bangladesh is comparatively less advanced in smartphone use than its neighboring countries in the current technological landscape (The Daily Star, 2021).

According to MFS service providers in Bangladesh, there is a significant increase in MFS subscribers. However, inactive users remain high due to low user trust, network issues, fraud fears, lack of interoperability, and low digital literacy (Rashid, 2020). Following the study of (Rahman, Alam and Taghizadeh, 2020), the client views and use intentions remain unclear to marketers. The findings of the study (Khan, Rana and Hosen, 2021) focused on using mobile banking applications in Bangladesh. Focusing on the gap in prior studies the main contribution of this article is to examine how technology influences students' behavioral adaptation to MFS.

This study used the Technology Acceptance Model 2 (TAM 2) to comprehend the university-level students' attitudes (Venkatesh and Davis, 2000).The TAM 2 model demonstrates that future use intention (FUI) has conceptual and statistical influences on the findings of this study factor current and predicted usage of MFS. As stated in the research conducted by (Khan, Rana and Hosen, 2022), the study found that users' beliefs, ethics, and efficacy positively influenced customer behavior. Based on the study of (Amin, H., Hamid, M.R.A., Tanakinjal, G.H., Lada, 2006), the undergraduates' mobile banking adoption emphasizes Islamic banking.

The current study addresses their limitations, considering all university levels and a broader mobile banking channel. Moreover, the current study also contributes to the limitations of the (Kumar, Lall and Mane, 2017) study as it examines factors impacting Indian management students' mobile banking intention, acceptance of technology, social influence, and trust propensity, offering a model for banks and contributing to industry understanding. Similarly, (Cobla and Osei, 2017) study also suggested that Sub-Saharan Africa challenges beliefs on mobile money and banking complementarity, while the current study contradicts some prior MFS beliefs and supports the TAM 2 model.

Therefore, this study has been conducted to answer the following research questions: a) what are the young people's perceptions regarding MFS use? b) Which element influences young users to adopt MFS? c) What is the individual's attitude toward using MFS? The following sections are organized systematically: The literature was reviewed initially to provide a conceptual framework for undertaking exploratory factor analysis. The subsequent paragraphs concisely describe the study's research design, findings, and implications. In addition, the study concludes with an evaluation of its limitations and recommendations for future research.

2. Literature Review

In the era of globalization, telecommunications services offer innovative financial solutions, such as exclusive mobile financial services connecting customers directly with banks (Islam Mohammad and Majedul dan Hossain, 2014). The current study

was developed using the TAM 2 model, incorporating university-level students' adoption of mobile financial services (MFS) and their attitudes and views towards MFS. A recent study of (Rana *et al.*, 2017) found that customers prefer e-banking for its flexibility, convenience, accessibility, speed, and efficiency, yet acknowledge limitations due to an exclusive focus on internet banking. This study is distinct from others since it shows how university students use MFS and find good adaptations, whereas another study (Colquitt and Zapata-Phelan, 2007) excluded the niche marketing group preferences. Correspondingly, this study seems to support all research questionnaires conceptually and methodologically. When MFS was launched in Bangladesh, many obstacles slowed consumer adoption due to inadequate knowledge (Vota, 2017). According to (Yesmin, Paul and Uddin, 2019), consumers, agents, and distributors have faced thefts and security issues, resulting in a decline in their trust in the system. Similarly, this study shows how university students use MFS to overcome obstacles. According to (Arifin, Amin and Khan, 2020), users' satisfaction with mobile financial services depends on value, convenience, and decreased risk, which has consequences for the present study's (TAM 2) model and users' attitudes.

Subsequently, (Arifin, Amin and Khan, 2020) found that user risk perception impedes mobile financial services (MFS) adoption, with varying causation across economic categories, rural or urban locations, and low MFS use, indicating mediated moderating effects leading to relationship invalidity. In contrast, the current study findings depicted users' attitudes as significantly influencing potential usefulness. Besides, (Parvin, 2018) examined the impact of mobile financial services on customer satisfaction in Bangladesh, mainly focusing on Dutch Bangla Bank Limited, revealing through survey findings that the market is growing steadily, with customers generally satisfied but varying in specific service aspects, unlike their paper has some limitations which may not take the aggregate level managerial decision. This study meets the quality criteria of the technology acceptance model 2 (TAM 2), including the construct PEOU and PU.

Previously, another study by (Teo *et al.*, 2012) entailed (TAM 2) to analyze mobile banking adoption in Malaysia, investigating the impact of demographics and preferences on mobile banking attitudes, revealing insights crucial for decision-making in various sectors. Apart from this, (Soman, 2003) suggested that payment mechanisms can impact the distribution of income and consumption, finding that varying payment system flexibility and transparency positively affect payment simplicity and consumption adversely. In contrast, the finding is inconsistent with the current study involving university students purchasing goods via Online. This study suggested the prior literature gap and adopted that perceived usefulness (PU) and other (TAM 2) constructs significantly influence university students' perceptions of using Mobile Financial Services (MFS) and new features, indicating that students positively perceive and adopt technology based on PU. Following the research limitations of the cluster of consumers (Ghazali *et al.*, 2018) this study emphasized the (TAM 2) constructs, including PU (Perceived Usefulness), PEOU (Perceived ease of use), AU (Attitude of Using), and FUI

(Future Usage Intention), as a logical linkage with five factors that shaped the students' psychometric perception towards MFS. Based on the study of (Mohammadi, 2015) positive perceptions among Iranian customers regarding the effectiveness and usefulness of the mobile banking system. Their findings align with (Islam *et al.*, 2011), indicating that technology users in developing countries, such as Bangladesh, prioritize convenience. Additionally, their study highlights the predictive role of perceived usefulness (PU) in shaping user attitudes and adoption of mobile commerce. Notably, during the COVID-19 pandemic, MFS providers in Bangladesh demonstrated increased PU and a positive outlook, especially when contactless payments and social distance purchase behavior became crucial for safety (Kabir, 2020).

3. Research Gap and Rational of the Study

The prior literature currently lacks empirical research examining the behavioral factors of university students. In this study the researchers used the TAM 2 model to validate their observations in analyzing the behavioral characteristics of the students. The researchers conducted this study based on NESTLE's targeted marketing approach for coffee in Japan, which motivates them (Utsumi, Hirofumi; Zappa, 2022). Nestlé focused on Japan's tea-centric culture by using emotional marketing strategies to introduce coffee-infused candy to school-age children. Hence, Nestlé had tremendous success using focused group marketing research, significantly transforming Japan's coffee culture. In this study, the researchers also focused on a specific demographic: university-level students. These students typically use various applications and websites, such as Netflix, academia. edu, and foreign university admission application fees, to access entertainment and educational content. However, the current mobile financial services (MFS) providers lack a direct dollar payment mechanism for accessing paid version content. Thus, the research findings recommend that MFS providers develop additional features, such as enabling direct dollar payments through MFS apps, to ensure long-term sustainability. This research is justified, as the findings indicate a demand for a focused group marketing approach.

4. Theoretical Framework

TAM 2 model is widely used for proving consumer acceptance behavior (Venkatesh and Davis, 2000). TAM 2 theory contributes to identifying an individual behavior reflection to adopt new technology, a multivariate construct including PU (Perceived Usefulness), PEOU (Perceived ease of use), attitude, and behavioral intention. The Technology Acceptance Model 2 suggests that the perceived usefulness and ease of use of modern technology might predict its acceptance amongst young people. This study is based on the four constructs of TAM 2. To simplify the findings and hypotheses, the researchers excluded exogenous and moderating variables such as voluntariness, experience, subjective norm, image, job relevance, output quality, and result demonstrability. Therefore, this study model is depicted in Figure 1. The research indicates that niche customers' intentions to use mobile banking are influenced by their perceptions of the simplicity of use, potential usefulness, convenience of access, and attitude toward use.

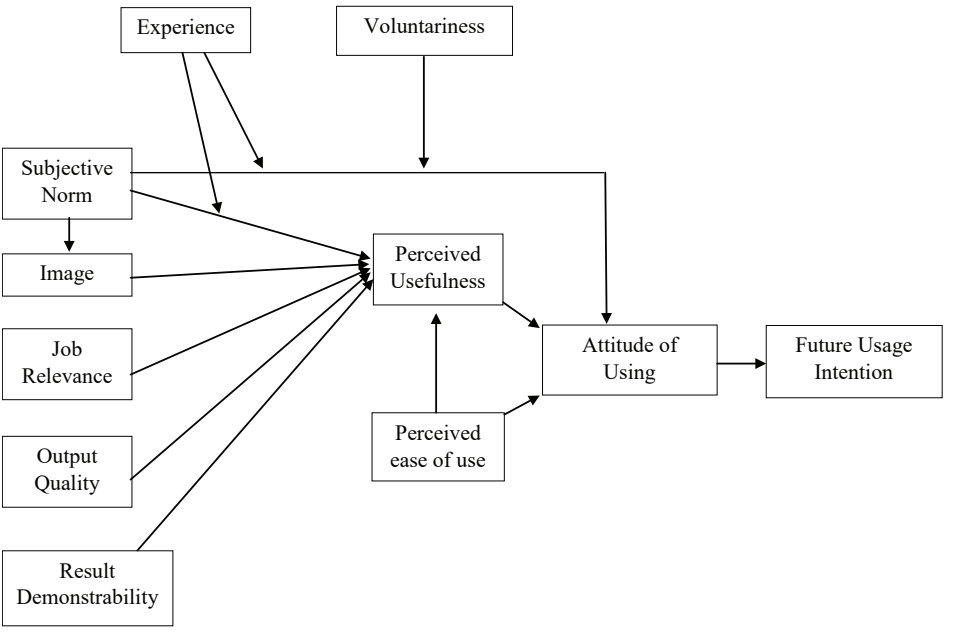

Figure 1: The Original Technology Acceptance Model 2 (Venkatesh and Davis, 2000).

In this study, the latent variable PU (Perceived Usefulness) items obtained from the study of (Chawla and Joshi, 2019) to assess the theoretical model.

Table 1: Perceived usefulness (PU) construct

Construct	Variables	Statements
Perceived Usefulness (PU)	PU 1	MFS enables me to compute transactions more quickly and cost-effective.
	PU 2	MFS improves the quality of work by saving time and space constraints.
	PU 3	MFS improves my productivity in making money. (by getting several benefits like cash back offers / discount offers)
	PU 4	MFS is more flexible in conducting banking transactions 24 hours per day.
	PU 5	Mobile financial services offer the convenience of contactless payments.
	PU 6	MFS allows me to access my transaction information quickly and easily

Based on the study conducted by (Davis, Bagozzi and Warshaw, 1989), consumers intend to receive immediate and effective technological services that align with the

TAM 2 model and support the current findings of the study. Following the findings of (Segars and Grover, 1993), PEOU helps students understand, adapt, and use new technology. (Popy and Bappy, 2022) identified that ease of learning increases user confidence in the experience, which boosts innovation positivity. Prior study has shown that customers' perceptions of technology or system simplicity affect their attitudes toward them. Mobile commerce includes m-commerce, mobile banking, cellular and contactless m-payment, and internet banking (Indarsin and Ali, 2017). This study identified the construct's perceived ease of use (PEOU), which affected its usefulness. Therefore, the researchers defined four survey questions as described by the study of (Chawla and Joshi, 2019).

Table 2: Perceived ease of use (PEOU) construct

Construct	Variables	Statements
Perceived ease of use (PEOU)	PEOU 1	I learn quickly mobile financial services.
	PEOU 2	The interface process of MFS is clear and easy.
	PEOU 3	I prefer mobile wallet payments for the ease system.
	PEOU 4	I do not require lots of effort to use MFS.

AU is the conceptual framework's third construct. Consumers believed and considered Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) (Hu *et al.*, 1999). Students adopting Mobile Financial Services (MFS) depend on PU and PEOU. According to the study of (Hu *et al.*, 1999), students who get benefits may prefer mobile banking to do everyday financial transactions; therefore, the survey questions are in the following in Table 3.

Table 3: Attitude of using (AU) construct

Construct	Variables	Statements
Attitude of Using (AU)	AU 1	I prefer to use mobile financial services (MFS).
	AU 2	I intend to use MFS.
	AU 3	I want to use MFS to aid my money transactions.

According to (Ajzen, 1991) TPB, TRA, and TAM theories, attitude strongly influences consumer behaviour. This study defines attitude influence on the students' psychology to use MFS technology positively. Another analysis (Chawla and Joshi, 2019) found that positive attitudes may increase mobile wallet use. (Foroughi, Iranmanesh and Hyun, 2019) found that attitude helps develop mobile

banking persistence. (Lin, 2011) found that attitudes positively affect usage intention. This conceptual framework ends with (TAM 2) model dependent construct future usage and intention. As per the longevity of the MFS transaction, the chance of students making MFS usage a habit, a hypothetical diversified community of MFS holders, and their recommendation of using services based on ease of use support the research goals (Chen and Barnes, 2007).

Table 4: Future usage intention (FUI) construct

Construct	Variables	Statements
Future Usage Intention (FUI)	FUI 1	I want to continue to use mobile banking services for transactions.
	FUI 2	I intend to continue with mobile banking services to learn more about MFS's features.
	FUI 3	I intend to use mobile banking services extensively.
	FUI 4	I intend to encourage others to use mobile financial services.

5. Research Objectives and hypothesis

Broad Objectives: The main research goal of this study is to examine the attitudes of university-level students in Bangladesh towards Mobile Financial Services (MFS).

Specific objectives: There are three specific objectives they are a) what are the young people's perceptions regarding MFS use? b) Which element influences young users to adopt MFS? c) What is the individual's attitude toward using MFS?

Hypothesis:

H1: Perceived usefulness significantly affects students' attitudes and knowledge.

H2: The attitudes of adolescent consumers toward MFS are influenced by their perceived ease of use.

H3: The satisfactory impact factor is influenced by students' perceptions of MFS.

6. Methodology:

6.1 Research design

The study is quantitative in nature. The researchers used a survey questionnaire to collect quantitative data from participants. University students with comparable demographics provided quantitative data. The conceptual framework is based on the Technology Acceptance Model (TAM 2). Likert scales were used in the survey. The questionnaires include four components based on TAM 2.

6.2 Measurement

The researchers developed measuring tools based on past studies. The perceived usefulness (PU) and perceived ease of use (PEOU) constructs were generated by (Venkatesh and Davis, 2000) and (Chawla and Joshi, 2019), respectively. Three observed variables were adopted based on the study of (Hu *et al.*, 1999) under the construct of attitude of using (AU). Four questions were established to justify the reliability of FUI. One item under

FUI (Future Usage Intention) showed students adding mobile financial services (MFS) transactions, while others revealed feasibility, quick development, and desire to recommend MFS. Recommendations were derived from the research conducted by (Hayduk and Littvay, 2012); the observer used the most reliable indicators in this study. Therefore, the observers employed 17 valid and reliable 5-point Likert scale questions to support the inferences.

6.3 Sampling and Data Collection

Researchers conducted the research by distributing a self-administered questionnaire to Dhaka city graduate and undergraduate students through Google Forms. According to the report of (Bangladesh Bank, 2023), the total number of users of MFS in Bangladesh is (*N = 215041746)*. In this study, researchers intended to use a continuous dataset and employ a five-point Lickert scale, assuming a significance level of alpha (*0.05)*. According to the studied by (Krejcie and Morgan, 1970) to estimate the variance of dichotomous (proportional) variables such as gender, researchers should use (*0.50)* as an estimate of the population proportion; however, in this study, as Bangladesh is an emerging technology-adaptable country in South Asia, researchers assume an estimated population proportion success (*P)* is =(*0.70)* as almost every university students use Smartphone. In addition, researchers set the acceptable error level at 0.05. Therefore, the researchers considered the sample using the study's sampling technique (Cochran G. Willian, 1977).

$$n_0 = \frac{Z^2 pq}{e^2}$$

Hence, *Z* is the value of the level of significance for each tail =*1.96*

Population proportion success factor (*P)* = *0.70*

Population proportion failure factor (*q)* = *(1 - 0.70)*

= *0.30*

Acceptable error level *(e)* = *0.05*

Therefore, Cochran's sample size recommendation is n_0 = *323*

Total number of MFS users in Bangladesh is (N = 215041746) (Bangladesh Bank, 2023).

Hence, the researcher calculated the required sample size using the following formula.

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

n = 323

Following this (Randall *et al.*, 2011), a subject-to-item ratio 10:1 is required. Several researchers explained the sample requirement using factor analysis in different ways. One hundred (100) samples are adequately stable to establish the factor analysis and correspond closely to population factors suggested by (MacCallum *et al.*, 1999). Subsequently, the recommendation of the study of (Hatcher, Grant and Schofield, 1994) the total number of respondents should be more than five times the number of variables or one hundred (100). (Hutcheson and Sofroniou, 1999) recommend at least 150 - 300 cases toward one hundred fifty (150). Considering all those opinions, 400 questionnaires were distributed among university-level students. Among 400 respondents, only 317 replied and were used for analysis purposes.

7. Results and analysis

7.1 Demographic profile

Table 5 reveals that 53.9% of respondents are male and 46.1% female. Demographic statistics showed that 46.4% were 23–27, 37.9% were 18–22, 10.4% were 28–32, and 5.3% were over 30.Table 5 also reveals that 73.8% of the students hold bachelor's degrees, 21.5% are pursuing master's degrees, 3.5% are pursuing PhDs (Doctorate), and 1.2% are Postdoctoral (Postdoc) students.

Table 5: Demographic response of the respondents

Demographic		n=317	Percentage (%)
Gender	Male	171	53.9
	Female	146	46.1
Total		**317**	**100**
Age	18-22	120	37.9
	23-27	147	46.4
	28-32	33	10.4
	33-37	17	5.3
Total		**317**	**100**
Education level	Bachelor's	234	73.8
	Master's	68	21.5
	PhD (Doctorate)	11	3.5
	Postdoctoral (Postdoc)	4	1.2
Total		**317**	**100**

Table 6: Basic responses regarding MFS of the respondents

Which MFS provider first comes up with an individual mind?		
MFS	**n=317**	**Percentage (%)**
Bkash	267	84.2
Nagad	28	8.8
Rocket	18	5.7
Others	4	1.3
Total	**317**	**100**
Which MFS do you use for daily transactions?		
Bkash	218	68.8
Nagad	52	16.4
Rocket	29	9.1
Upay	12	3.8
Surecash	6	1.9
Total	**317**	**100**

How many MFS apps have you been using?		
Zero	10	3.2
One	132	41.6
Two	79	24.9
Three	50	15.8
More than four	46	14.50
Total	**317**	**100**

In Table 6, it is evident that bKash emerges as the predominant initial Mobile Financial Services (MFS) provider, capturing 84.2% of students' initial recall. Nagad follows at 8.8%, Rocket at 5.7%, and other providers collectively at 1.3%. The ranking of initial MFS providers continues with bKash leading at 68.8%, followed by Nagad, Rocket, Upay, and Surecash at 16.4%, 9.1%, 3.8%, and 1.9%, respectively. Notably, 41.6% of young students prefer a single MFS app, while 24.9%, 15.8%, and 13.6% use two, three, or more than four MFS applications. However, a small percentage, only 3.2%, do not use any MFS apps.

7.2 Data Analysis

Principal Component Analysis (PCA) was performed using a survey questionnaire (Kim and W.Mueller, 1978). Principal Component Analysis (PCA) yields component structures or simplifies data (Abdi and Williams, 2010). Principal Component Analysis (PCA) or Factor Analysis (FA) simplifies connection patterns and reduces the number of variables to a manageable set. Factor analysis determines the latent variable layout and estimates scores to evaluate latent components. However, principal component analysis determines how to divide variables into a few subgroups. PCA is better at data reduction than factor analysis (FA) for identifying common factors among observable variables. The picture depicts a set of variables, "common" elements, and a different aspect for each variable. This research suggests observing *X1, X2,...,Xn. F1, F2,...,*and *Fn* are believed to be shared across these variables, but *U1* and *U2* are unique to each variable. Regression equations may represent variables as linear functions of components.

$$X_n = a_{n1}F_1 + a_{n2}F_2 + a_{n3}F_3 + \ldots\ldots + a_{nm}F_m + a_nU_n$$

The coefficient a11 shows how variable X1 affects F1 per unit increase. According to (Kim and W.Mueller, 1978) and (Kaiser and Cerny, 1979), factor analysis finds the coefficients (a11, a12, and a_{nm}) that most closely correspond to the observed variables. The summation of the squares of variable X1's loadings, given by a11 + a12 +... + a_{nm}, indicates the amount of variable X1's Variance explained by shared components in the presence of correlated coefficients (uncorrelated factors). The commonality of each variable increases a factor analysis solution's effectiveness. Varimax rotation is used in Principle Component Analysis. The principal component analysis is a statistical method that identifies components that reflect common and unique variations in a dataset. Multiple latent variables are often analyzed using the Varimax approach. This method uses a rotating mechanism to simplify

components by amplifying high loadings and decreasing low loadings. This strategy also requires zero correlation. The goal is to maximize individual factor variance to rebalance the variation accounted for via the extracted components.

7.3 Reliability of Survey Questionnaires

Reliability indicates a measuring instrument's accuracy or precision (Norland-Tilburg, 1990). Surveys and forms with multiple Likert questions use it most. Cronbach's alpha is employed to assess internal consistency. The alpha coefficient, between 0 and 1, describes the reliability of the dichotomous data variables. As the score increases, calculated scale reliability increases. The literature occasionally uses lower reliability coefficients than 0.7 (Nunnally, 1978). Table 7 illustrates the projected worth that is relevant to previous research. Cronbach's alpha measures the internal consistency and dependability of data. The study's 17 items have a Cronbach's alpha coefficient of 0.813, above the minimum threshold of 0.70. Therefore,reliable data is sufficient for the study.

Table 7: The reliability statistics table value

Cronbach's Alpha	N of Items
.813	**17**

The sample's Cronbach's alpha value of 0.813 indicates internal consistency. Item total statistics assessed respondents' dependability. The statement shows the scale's Cronbach's alpha after removing an item. The research demonstrated that Cronbach's alpha did not decline without inquiry. The researchers removed three variables due to the depicted value of lower Cronbach's alpha after omitting from analysis another three variables, such as mobile wallets require minimal effort, intention to continue using mobile financial services (MFS) for transactions, and students' belief of MFS derived extensively increased Cronbach's alpha. Therefore, the three variables omitted from this study may have multicollinearity issues. Finally, the researchers retained 17 variables as they depicted sufficient Cronbach's alpha.

7.4 Factor Analysis

Measure of Sampling Adequacy (MSA) Test

The Kaiser-Meyer-Olkin sampling adequacy test evaluates data for factor analysis. Table 8 illustrates the KMO score of 0.797, indicating adequate varied intercorrelations. Kaiser-Meyer-Olkin and Bartlett's sphericity adequacy tests imply that the sample size is sufficient for factor analysis.

Table 8: Sampling Adequacy KMO and Bartlett's Test

KMO and Bartlett's Test		**Results**
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.797
	Approx. Chi-Square	1757.646
Bartlett's Test of Sphericity df		136
	Sig.	.000

In this study, the efficacy of the reduction method was evaluated using principal

component analysis (PCA). A large number of coefficients exceeded 0.30 in the R-matrix's preliminary analysis. The Kaiser-Mayer-Olkin (KMO) index of 0.797 shows that the given research data were adequate for factor analysis. A sufficient KMO threshold value is 0.60, as suggested by (Kaiser, 1981). In addition, Bartlett's Test of Sphericity was statistically significant (1757.646, p<.001) (Bartlett, 1954). The research revealed five factors with Eigenvalues greater than one that explains 26.629%, 14.383%, 8.912%, 6.953%, and 6.480% of the variation. As seen in Figure 2, the Scree plot illustrates five components. The study's conclusions indicate that the data was adequate. The correlation matrix's deviation from an identity matrix and inter-item correlations' suitability for component analysis are assessed. Following a substantial examination of this study, the matrix formed by the correlation of two variables is not an identity matrix.

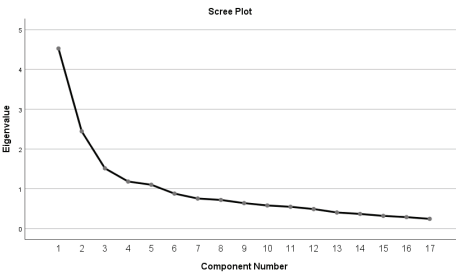

Figure 2: The Scree Plot depicts five factors

7.5 Total Variance Explained

Table 9 presents a clear delineation of five factors, each of which exhibits an eigenvalue exceeding the threshold of 1. The total variance explained section is employed to identify the various common factors among a large number of variables. To analyze the rotation method, the factors considered were those with eigenvalues that exceeded 1. The variance was accounted for by the five factors in the following proportions: 26.629%, 14.383%, 8.912%, 6.953%, and 6.480%.

Table 9: Total Variance Explained

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	4.527	26.629	26.629	4.527	26.629	26.629	3.737	21.982	21.982
2	2.445	14.383	41.012	2.445	14.383	41.012	2.082	12.247	34.229
3	1.515	8.912	49.924	1.515	8.912	49.924	1.957	11.512	45.741
4	1.182	6.953	56.877	1.182	6.953	56.877	1.518	8.928	54.669
5	1.102	6.480	63.357	1.102	6.480	63.357	1.477	8.688	63.357
6	0.879	5.170	68.527						
7	0.755	4.442	72.969						
8	0.719	4.229	77.199						
9	0.639	3.759	80.958						

10	0.581	3.416	84.373
11	0.547	3.218	87.591
12	0.490	2.881	90.472
13	0.404	2.375	92.847
14	0.367	2.161	95.008
15	0.318	1.872	96.880
16	0.287	1.686	98.565
17	0.244	1.435	100.000

Source: Output from the result of analysis (output derived using SPSS).

7.6 Principal Component Analysis (PCA)

Principle component analysis may help reduce corresponding observed variables to a smaller set of important independent composite variables. PCA implies that all variance is revealed, and all commonalities are 1. Commonality refers to a latent factor's variance share. After extraction, commonalities show how much variability each component variable accounts for. The proportion of variation in a variable accounted for by all components might indicate an indicator's dependability following the study (Garson, 2008). According to (MacCallum *et al.*, 1999), commonalities should be 0.6 or higher. All commonalities exceed 0.6 except variables 1, 3, 11, and 16. The total variance is the fraction of total variability across all variables for each component, with the starting element consistently contributing the most. The fraction of variation accounted for by a factor across all variables is its eigenvalue. This statement refers to linear factor eigenvalues before and after extraction. Extraction sums of squared loadings determine which elements to keep. Table 9 shows that just five of the 17 variables are acceptable or generated. The first component contributed 26.629% of the variation, whereas the succeeding factors contributed 14.383%, 8.912%, 6.953%, and 6.480%. The scientific literature identifies variance distribution after varimax rotation and rotating sums of squared loadings. After extraction, Factor 1 has a 21.982% variance, whereas the other factors have 12.242%, 11.512%, 8.928%, and 8.688%. From (Bryant and Yarnold, 1995), the Scree Plot illustrates the relationship between eigenvalue magnitude and factor quantity. Kaiser's criteria apply when the number of variables is fewer than 30 and the extracted commonalities exceed 0.7. In such cases, maintain only components with eigenvalues greater than 1. The curve determines the best number of elements to keep. After the fifth and sixth components, the curve narrows, as seen above. Eigenvalues are less than one for the sixth factor. After eigenvalue and variance analysis, the researchers chose five components to keep. The rotated component matrix reduces the number of elements with high loading on the variable. This table exhibits rotation on factor loadings, illustrating each variable's significance for each factor and its relationship with the factor. The factor loading exceeded the threshold of 0.3. Variables that exhibit correlation coefficients greater than 0.3 demonstrate a moderate level of correlation. The output is simplified by excluding low correlations, which are likely insignificant.

The rotated factors and loadings are also presented in the rotated component matrix. Table 10 indicates that MFS improves productivity, simplifies deals, improves efficiency, speeds up money transfers, offers contactless payment options, boosts performance, and is easy to understand, which affects students' attitudes and knowledge and is related to the TAM 2 construct perceived usefulness (Venkatesh and Davis, 2000).The transaction indicator was correlated with two parameters: the simplicity of mobile wallets and the transfer and receiving of money. These parameters had a substantial impact on the attitude of adolescent customers. Furthermore, these two parameters were also associated with the perceived ease of use, which is a construct of the TAM 2 model (Venkatesh and Davis, 2000). Current and potential use factors include MFS viability, cognitive desire to use MFS, and the likelihood of using MFS; these three variables reveal that the TAM model constructs future MFS usage and intention (Venkatesh and Davis, 2000). The satisfactory impact factor included the positive experience of using MFS and the desire to recommend it to others, which was measured by the student's attitude toward using MFS (Venkatesh and Davis, 2000). The last factor, individual usefulness factors, includes MFS benefit financial activities that substantially impact perceived usefulness via perceived ease of use (Venkatesh and Davis, 2000).

7.7 Findings of Factor Analysis

Factor loadings reveal how factors affect the relevant factor. According to (Sürücü, Yikilmaz and Maslakci, 2022), factor loadings must be examined. In a study conducted by (Kline, 2014), the direction of the relationship, as indicated by the factor loading signs, has no impact on interpreting the ideal number of factors to keep. The number of factors to save depends on factor loadings (Costello and Osborne, 2005). According to the research, some experts propose a minimum loading of 0.60, while others prefer 0.50 (Preacher and MacCallum, 2002). This scenario is possibly explained by the component that accounts for around 50% of that item's volatility (Guadagnoli and Velicer, 1988). This study has different item counts for each element. The research uses Varimax rotation and factor analysis to evaluate the loading of selected measures into anticipated structures. The study has 17 variables with eigenvalues greater than one multivariate data's eigenvalues segment variability. A principal component analysis of a correlation matrix's summation value reveals the number of variables. A correlation matrix's summation value indicates the total number of variables in the principal component analysis. 4.527, 2.445, 1.515, 1.182, and 1.102 are the five factors' eigenvalues. This study's factor analysis explains 63.357% of the cumulative variation. According to this finding, the five extracted factors explain approximately 63% of the variables' variability. Factor 1 is the adequacy of knowledge; factor 2 is an indicator of the transaction; factor 3 is current and potential usage; factor 4 is satisfactory impact; and factor 5 is individual usefulness. Therefore, mobile banking adoption is influenced by the following factors.

Table 10 : Rotated Component Matrix

Factor	Item	Component				
		1	2	3	4	5
Knowledge Adequacy Factor	V-1	0.591				
	V-2	0.632				
	V-3	0.643				
	V-4	0.765				
	V-5	0.76				
	V-6	0.781				
	V-7	0.787				
Transaction Indicator Factor	V-8		0.777			
	V-9		0.841			
	V-10		0.684			
Current and Potential Usage Factor	V-11			0.505		
	V-14			0.716		
	V-15			0.685		
	V-16			0.601		
Satisfactory Impact Factor	V-12				0.738	
	V-17				0.831	
Individual Usefulness Factors	V-13					0.775

Note. Extraction Method: Principal Component Analysis Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 8 iterations.

The adequacy of knowledge regarding mobile banking involves benefits such as increased individual productivity, facilitated dealing activities, improved individual efficiency, expedited transactions, contactless payment options, enhanced performance, and learning about mobile financial services. The current research analyses the possible factors of Knowledge Adequacy for users who have thoroughly or partly examined the domains of Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). The transaction indicator in mobile financial services (MFS) implies that mobile banking speeds ordinary financial transactions, mobile wallets do not take much time, and cash transfers and receipts need minimal effort. Perceived ease of use (PEOU) also encompasses this concept. Current and future use variables affect mobile banking usage. Mobile financial services (MFS) provide continuous banking services, making it an appealing choice for those using this platform. AU and FUI also increase the chance of MFS use. Mobile Financial Services (MFS) are pleasant to use, and younger people promote their usage among friends. Niche mobile users adopt mobile banking when they view it as providing competitive benefits, simplicity of use, low risk, and cheap cost. When choosing mobile banking, students consider the essential criteria. Table 10 delineates that knowledge adequateness is more important

than transaction indicators, current and potential usage, satisfactory impact, and individual usefulness. Perceived risk, simplicity of use, accessibility, cost, and relative advantages affect mobile banking systems found in the study of (Elhajjar and Ouaida, 2020) and (Giovanis *et al.*, 2019), respectively. Facilitator aspects such as PU (perceived usefulness), ease of use, the attitude of using, future use, and intention influence MFS students' perspectives. Perceived Usefulness (PU) positively affects Bangladeshi students' adoption of Mobile Financial Services (MFS). The Technology Acceptance Model 2 (TAM 2) examined Bangladeshi university students' views on mobile financial services (MFS) and its possible effects; however, outside the region of Bangladesh, other researchers' findings have a few contradiction with the current study, perhaps the psychological issues of consumers such as test and preference (Singh and Srivastava, 2018). Although specific substantial findings contradict (Rahmiati and Yuannita, 2019), the current study corresponds with (Raza, Umer and Shah, 2017) and (Letchumanan and Muniandy, 2013). The current study supported the author's belief that students see MFS as a valuable tool for managing financial services and enhancing economic activity. Therefore, students are likely to use it. MFS platforms in Bangladesh have partnered with banks, retail stores, restaurants, and e-commerce companies to speed up consumer transactions. Furthermore, the software records transactions involving digital currency. These records include crucial transaction details, such as payer and recipient names and transaction dates, and provide consumers with 24/7 access to their records. In this study, perceived ease of use (PEOU) of Mobile Financial Services (MFS) positively affects young customers' cognitive factors. The findings are contradictory to those of (Rahmawaty, 2013) and (Wang and Tseng, 2011) but harmonious with those (Singh and Srivastava, 2018) and (Popy and Bappy, 2020) findings. The study also found that students' MFS opinions strongly influenced their likelihood of using it. Thus, MFS app developers must simplify the app's usability to improve user experience. Similarly, this may encourage more students to use MFS, taking advantage of its ease and efficiency. This research brings insight into Bangladeshi youth's forecasted acceptance, intention, and attitude towards mobile financial services (MFS). To enhance the extensive growth of MFS in Bangladesh, marketers should prioritize expanding user experience and efficiently addressing customer complaints that could lead to a market gap. Thus, marketers may initiate new research and development endeavors and launch innovative MFS products.

8. Management implications

People of Bangladesh have largely used mobile financial services (MFS) for over a decade. The study examined why Bangladeshi university students use MFS so often. This study entails the link between the extensive growth of MFS and young adolescents' acceptance of MFS. According to the latest (Rahman, 2022) census report, 25% of the population falls within the 15-29 age range, amounting to a youth population of 45.9 million (4 crore and 59 lakh). Therefore, based on the managerial aspect, they should prioritize the perceived ease of using mobile financial services (MFS) technologies as these services are valuable and trustworthy to the students' minds. Nestle had difficulties when it first started advertising

coffee in Japan; however, it figured out the solution when focused on a cluster of age groups (Utsumi, Hirofumi; Zappa, 2022). Similar to their findings, our study found that a broader range of individuals can quickly learn to use technology, so the management pyramid should concentrate on excelling adolescents. This study implies that technology's convenience influences customers' future choices. User feedback shows that a technology's simplicity of use and capacity to learn in daily life increase its frequency of use. Thus, user-friendly technology is needed to promote the adoption of Perceived Usefulness (PU) and Mobile Financial Services (MFS). MFS providers and the government must also improve service for young consumers. MFS suppliers must fulfill their value propositions to improve customer use and intention. Latent financial barriers could hinder mobile financial service adoption by adolescents. Young users may face challenges using new technologies due to the access of cookies and sensitive smartphone files. Lastly, the managerial team must work with the government immediately to overcome the obstacles and maintain customer equity.

9. Conclusion

The development of MFSs encouraged the students during the COVID-19 pandemic as the social distance purchase and selling behavior grew in individual minds. Therefore, this study can identify the growth of Online businesses and MFS's continuous existence and support. The literature on MFS identified an individual's development phase as one of the development part ways. The findings of this study indicate that knowledge adequacy, transaction indicator, current and potential usage, satisfactory impact, and individual usefulness are five factors affecting mobile banking adoption in Bangladesh. Consequently, these five factors acknowledge the (TAM 2) model key constructs and align with the attitudes of university-level students in Bangladesh towards Mobile Financial Services (MFS). This study contributed theoretically, methodologically, and practically to the managerial aspect. The authors believe their model will help practitioners understand Bangladeshi youth users' attitudes and MFS future usage intention, enabling them to run successful marketing campaigns, establish products, and conduct applied marketing research for the MFS industry.

10. Limitations and Future research directions

This study has some drawbacks. While Cochran's sampling techniques indicated that 323 samples were required, the researcher ultimately extracted only 317 samples. Similarly, the entire country's university students were not considered in the current study analysis due to the limitations of time and funds. Further research might include the cross-cultural study of university-level students in South Asia or other regions. This study neglects to consider the exogenous variables, such as perceived pleasure, knowledge, and system efficiency, that might improve the model's predictive power. Apart from this, no control variables are allowed in this study. Future research should examine latent diversity and causal relationships within a framework that predicts MFS adoption to remove this constraint using multivariate analysis. Confirmatory-tetrad analysis may also ascertain if any concepts are formative or reflective. In addition, the TAM 2 model only

considers the indirect effect of moderating factors on the outcomes of this research. Future research might be considered an abstract idea that entails interaction with real objects, perhaps resulting in more significant findings. Although the current study had limitations, it offered valuable insights into the perspectives, future use, and objectives of young users of MFS. Considering younger mobile financial services (MFS) adoption, this study is essential. This study can motivate market research on a particular cluster, such as young consumer behavior in the MFS industry. Future MFS adoption studies should include social, socio-economic, and psychological variables such as social norms, perceived risk, and trust. Finally, this study established the foundation for future comprehensive academic and market research on MFS.

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References

A. P. (2018, January–June). Customer Satisfaction Survey on Mobile Financial Services of Dutch Bangla Bank Limited. *ASA University Review, 12*(1).

Abdi, H., and Williams, L. J. (2010). Principle component analysis. *Wiley Interdiciplinary Reviews, 2*, 433-459.

Abdinoor, A., and Mbamba, U. O. (2017). Factors influencing consumers' adoption of mobile financial services in Tanzania. *Cogent Business and Management, 4*(1), 1392273.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179-211.

Al-Saedi, K., Al-Emran, M., Ramayah, T., and Abusham, E. (2020). Developing a general extended UTAUT model for M-payment adoption. *Technology in Society, 62*, 101293.

Babar, Z. M. (2017). Digital divide: concepts and reality in Bangladesh. *Journal of Business, 2*(2), 24-33.

Bangladesh Bank. (2023). *Mobile Financial Services (MFS) Statistics (including NAGAD): Agent and Account Information.*

(2021). *Bangladesh Education Statistics.* Dhaka: The Daily Star.

Bartlett, M. S. (1954). A note on the multiplying factors for various chi square approximation. *Journal of Royal Statistical Society, 16*(B), 296.

Bryant, F. B., and Yarnold, P. R. (1995). Principal-component analysis and confirmatory factor analysis. (L. G. Grimm, and P. R. Yarnold, Eds.)

Chawla, D., and Joshi, H. (2019). Consumer attitude and intention to adopt mobile wallet in India- an empirical study. *International Journal of Bank Marketing, 37*(7), 1590-1618.

Chen, L. D. (2008). A model of consumer acceptance of mobile payment. *International Journal of Mobile Communications, 6*(1), 32-52.

Chen, Y. H., and Barnes, S. (2007). Initial trust and online buyer behaviour. *Industrial*

Management and Data Systems, 107(1), 21-36.

Chi, T. (2018). Understanding Chinese consumer adoption of apparel mobile commerce: an extended TAM approach. *Journal of Retailing and Consumer Services, 44*, 274-284.

Chuan, T. C., Tan, G. W.-H., C.-M. C., and K.-T. Y. (2012). Can the demographic and subjective norms influence the adoption of mobile banking? *International Journal of Mobile Communications, 10*(6), 578-597.

Claudy, M. C., Peterson, M., and O'Driscoll, A. (2013). Understanding the attitude-behavior gap for renewable energy systems using behavioral reasoning theory. *Journal of Macromarketing, 33*(4), 273-287.

Colquitt, J., and Zapata-Phelan, C. (2007). Trends in theory building and theory testing: a five-decade study of the academy of management journal. *Academy of Management Journal, 50*, 1281-1303.

Costello, A. M., and Osborne, J. A. (2005). Best practices in exploratory factor analysis: Four recommendations forgetting the most from your analysis. *Practical Assessment, Research, and Evaluation, 10*(1), 1-9.

Cui, Y., Mou, J., Cohen, J., Liu, Y., and Kurcz, K. (2020). Understanding consumer intentions toward cross-border m-commerce usage: a psychological distance and commitment-trust perspective. *Electronic Commerce Research and Applications,, 39*, 100920.

D. S. (2003). The Effect of Payment Transparency on Consumption: Quasi-Experiments from the Field. *Marketing Letters*, 173–183.

Digital Finance Forum BD. (2021). Webinar: Interoperability of MFS in Bangladesh: Opportunity and Challenges.

Elhajjar, S., and Ouaida, F. (2019). An analysis of factors affecting mobile banking adoption. *International Journal of Bank Marketing, 38*(2), 352-367.

Elkaseh, A., Wong, K., and Fung, C. (2016). Perceived ease of use and perceived usefulness of social media for e-learning in Libyan higher education: a structural equation modeling analysis. *International Journal of Information and Education Technology, 6*(3), 192-199.

F. D., Bagozzi, R. P., and Warshaw, P. R. (1989). User acceptance of computer technolog: a comparison of two theoritical models. *Management Science, 35*(8), 982-1003.

Fishbein, M., and Ajzen, I. (1975). Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research.

Foroughi, B., Iranmanesh, M., and Hyun, S. (2019). Understanding the determinants of mobile banking continuance usage intention. *Journal of Enterprise Information Management, 32*(6), 1015-1033.

Garson, D. G. (2008). Factor Analysis: Statnotes.

Gebba, T. R., and Aboelmaged, M. (n.d.). Mobile banking adoptation: an examination of technology acceptance model and theory of planned behavior. *International Journal of Business Research and Development, 2*(1), 35-50.

Ghazali, E. M., Mutum, D. S., Chong, J. H., and Nguyen, B. (2018). Do consumers want mobile commerce? A closer look at M-shopping and technology adaptation in Malasia. *Asia Pacific Journal of Marketing and Logistics, 30*(4), 1064-1086.

Ghazali, E. M., Mutum, D. S., Chong, J. H., and Nguyen, B. (2018). Do consumers want mobile commerce? A closer look at M-shopping and technology adoption in Malaysia. *Asia Pacific Journal of Marketing and Logistics, 30*(4), 1064-1086.

Giovanis, A., Athanasopoulou, P., Assimakopoulos, C., and Sarmaniotis, C. (2019). Adoption of mobile banking services: A comparative analysis of four competing theoretical models. *International Journal of Bank Marketing, 37*(5), 1165-1189.

Guadagnoli, E., and Velicer, W. F. (1988). Relation of sample size to the stability of component patterns. *Psychological Bulletin, 103*(2), 265–275.

Gupta, K. P., and Manrai, R. (2019). Prioritizing factors affecting the adoption of mobile financial services in emerging markets-a fuzzy AHP approach. *Performance Prediction and Analytics of Fuzzy, Reliability and Queuing Models, Springer*, 55-81.

Hanafizadeh, P., Byron, W. K., and Khedmatgozar, H. R. (2014). A systematic review of internet banking adoption. *Telematics and Informatics, 31*(3), 492-510.

Hayduk, L. A., and Littvay, L. (2012). Should researchers use single indicators, best indicators, or multiple indicators in structural equation models? *BMC Medical Research Methodology, 12*(1), 1-17.

Hsu, C. L., Wang, C. F., and Lin, J.C.C, J. C. (2011). Investigating customer adoption behaviours in mobile financial services. *International Journal of Mobile Communications, 9*(5), 477.

Hu, P., Chau, P., Sheng, O., and Tam, K. (1999). Examining the technology acceptance model using physician acceptance of telemedicine technology. *Journal of Management Information Systems, 16*(2), 91-112.

Indarsin, T., and Ali, H. (2017). Attitude toward using m-commerce: the analysis of perceived usefulness perceived ease of use, and perceived trust: case study in ikens wholesale trade. *Saudi Journal of Business and Management Studies, 2*(11), 995-1007.

Islam, M. A., Khan, M. A., Ramayah, T., and Hossain, M. M. (2011). The adoptation of mobile commerce service among employed mobile phone users in Bangladesh: self-efficacy as a moderator. *International Business Research, 4*(2), 80.

Jung, J. H., Kwon, E., and Kim, D. H. (2020). Mobile payment service usage: US consumers' motivations and intentions. *Computers in Human Behavior Reports, 1*, 100008.

Kabir, F. H. (2020, Novembe 14). Covid triggers rise in mobile financial services. *The Financial Express*.

Kabir, M. R. (2013). Factors influencing the usage of mobile banking: Incident from a developing country. *World Review of Business Research, 3*(3), 96-114.

Kaiser, H. (1970). *Measure of Sampling Adequacy (MSA) of factor analytic data matrices.*

Kaiser, H. F., and Cerny, B. A. (1979). Factor Analysis of the Image Correlation Matrix. *Educational and Psychological Measurement, 39*, 711-714.

Kaur, P., A., S., N, S., G., and Almotairi, M. (2020). An innovation resistance theory pespective on mobile payment. *Journal of Retailing and Consumer Services, 55*, 102059.

Khan, M. R., Rana, S., and Hosen, M. I. (2021). Impact of trustworthiness on the usage of m-banking apps: a study on Bangladeshi consumers. *Business Perspectives and Research*, 1-17.

Khan, M. R., Rana, S., and Hosen, M. I. (2021). Impact of trustworthiness on the usage of m-banking apps: a study on Bangladeshi consumers. *Business Perspectives and Research*, 1-17.

Kim, Jae-on, and Charles, M. W. (1978). Introduction to factor analysis: what it is and how to do it. (H. Beverly , and Calif, Eds.)

Kline, P. (1994). An easy guide to factor analysis. *Psychology*.

Koh, F., Phoon, K. F., and Ha, C. D. (2018). Digital financial inclusion in South east Asia", Handbook of Block chain, Digital Finance, and Inclusion. *Academic Press, 2*, 387-403.

Koksal, M. H. (2016). The intentions of Lebanese consumers to adopt mobile banking. *International Journal of Bank Marketing, 34*(3), 327-346.

Kothari, C. R. (2004). Research Methodology: Method and Techniques. *New Age International*.

Krause, M. S. (2019). Randomness is problematic for social science research purposes. *Quality and Quantity, 53*(3), 1495-1504.

Kumar, V., Nim, N., and Sharma, A. (2019). Driving growth of Mwallets in emerging markets: a retailer's perspective. *Journal of the Academy of Marketing Science, 47*(4), 747-769.

Letchumanan, M., and Muniandy, B. (2013). Migrating to e-book: a study on perceived usefulness and ease of use. *30*(7), pp. 10-16.

Lin, H. F. (2011). An empirical investigation of mobile banking adoption: the effect of innovation attributes and knowledge-based trust. *International Journal of Information Management, 31*(3), 252-260.

MacCallum, R. C., Widaman, K. F., Zhang, S., and Hong, S. (1999). Sample size in factor analysis: Pschological Methods. 84-99.

Malik, A., Kumra, R., and Srivastava, V. (2013). Determinants of consumer acceptance of m-commerce. *South Asian Journal of Management, 20*(2), 102.

Manchanda, M., and Deb, M. (2020). On m-commerce adoption and augmented reality: a study on apparel buying using m-commerce in Indian context. *Journal of Internet Commerce, 20*(1), 1-30.

Manrai, R., and Gupta, K. P. (2020). Integrating utaut with trust and perceived benefits to explain user adoption of mobile payments. *Strategic System Assurance and Business Analytics, Springer*, 109-121.

Mohammadi, H. (2015). A study of mobile banking loyalty in Iran. *Computers in Human Behavior, 44*, 35-47.

Mohammadi, H. (2015). A study of mobile banking usage in Iran. *International Journal of Bank Marketing, 33*(6), 733–759.

Norland-Tilburg, E. V. (1990). Controlling error in evaluation instruments. *Journal of Extension, 28*(2).

Nunnaly, J. (1978). Psychometric theory.

Popy, N. N., and Bappy, T. A. (2020). Attitude toward social media reviews and restaurant visit intention: a Bangladeshi perspective. *South Asian journal of Business Studies*.

Popy, N. N., and Bappy, T. A. (2020). Attitude toward social media reviews and restaurant visit intention: a Bangladeshi perspective. *South Asian Journal of Business Studies*.

Preacher, K. J., and MacCallum, R. C. (2002). Exploratory factor analysis in behavior genetics research: Factor recovery with small sample sizes. *Behavior Genetics, 32*(2), 153–161.

Priya, R., Gandhi, A. V., and Shaikh, A. (2018). Mobile banking adoption in an emerging economy: An empirical analysis of young Indian consumers. *Benchmarking: An International Journal, 25*(2), 743-762.

Rahman, S. A., Didarul Alam, M. M., and Taghizadeh, S. K. (2019). Do mobile financial services ensure the subjective well-being of micro-entrepreneurs? An investigation applying UTAUT2 model. *Information Technology for Development, 26*(2), 1-24.

Rahmawaty. (2012). Model perilaku penerimaan internet banking di bank syari'ah: peran motivasi spiritual. *Annual International Conference on Islamic Studies*, (pp. 1784-1807).

Rahmiati, R., and Yuannita, I. I. (2019). The influence of trust, perceived usefulness, perceived ease of use, and attitude on purchase intention. *Jurnal Kajian Manajemen Bisnis, 8*(1), 27-34.

Ram, S., and Sheth, J. N. (1989). Consumer resistance to innovations: the marketing problem and its solutions. *Journal of Consumer Marketing, 6*(2), 05-14.

Rana, M. S., Hossain, M. M., Jewel, R. M., and Islam, M. R. (2017, June). Evaluating Customers Satisfaction of Electronic Banking: An Empirical Study in Bangladesh. *The Standard International Journal (The SIJ), 5*.

Rashid, M. H. (2020). Prospects of digital financial services in Bangladesh in the context of fourth industrial revolution. *Asian Journal of Social Science and Legal Studies, 2*(5), 88-95.

Raza, S. A., Umer, A., and Shah, N. (2017). New determinants of ease of use and perceived usefulness for mobile banking adoption. *International Journal of Electronic Customer*

Relationship Management, 1(1), 44-65.

Raza, S. A., Umer, A., and Shah, N. (2017). New determinants of ease of use and percived usefulness for mobile banking adoptation. *International Journal of Electronic Customer Relationship Management, 1*(1), 44-65.

Renny, Guritno, S., and Siringoringo, H. (2013). Perceived usefulness, ease of use, and attitude towards online shopping usefulness towards online airlines ticket purchase. *Social and Behavioral Sciences, 81*, 212–216.

Riquelme, H. E., and Rios, R. E. (2010). The moderating effect of gender in the adoption of mobile banking. *International Journal of Bank Marketing, 28*(5), 328-341.

Rosa, J. A., and Malter, A. J. (2003). E-(embodied) knowledge and e-commerce: how physiological factors affect online sales of experiential products. *Journal of Consumer Psychology, 13*, 63-73.

Saleh, Z., and Mashhour, A. (2014). Consumer attitude towards m-commerce: the perceived level of security and the role of trust. *Journal of Emerging Trends in Computing and Information Sciences, 5*(2), 111-117.

Sampaio, C. H., Ladeira, W. J., and Santini, F. D. (2017). Apps for mobile banking and customer satisfaction: a cross-cultural study. *International Journal of Bank Marketing, 35*(7), 1133-1153.

Schierz, P. G., Schilke, O., and Wirtz, B. W. (2010). Understanding consumer acceptance of mobile payment services: An empirical analysis. *Electronic Commerce Research and Applications, 9*(3), 209-216.

Segars, A. H., and Grover, V. (1993). Re-examining perceived ease of use and usefulness: a confirmatory factor analysis. *MIS Quarterly: Management Information Systems, 17*(4), 517-525.

Shezan, M. (2015). Consumer attitude towards MFS. *Journal of Social Science*, 17-29.

Singh, S., and Srivastava, R. K. (2018). Predicting the intention to use mobile banking in India. *International Journal of Bank Marketing, 36*(2), 357-378.

Singh, S., and Srivastava, R. K. (2018). Predicting the intention to use mobile banking in India. *International Journal of Bank Marketing, 36*(2), 357-378.

Slade, E., Williams, M., Dwivedi, Y., and Piercy, N. (2015). Exploring consumer adoption of proximity mobile payments. *Journal of Strategic Marketing, 23*(3), 209-223.

Sürücü, L., Yikilmaz, İ., and Maslakçi, A. (2022). Exploratory factor analysis (EFA) in quantitative researches and practical consideration. *Center for Open Science*.

The Daily Star. (2021). *Bangladesh behind Nepal, Pakistan in smartphone use.*

Tobbin, P. (2012). Towards a model of adoption in mobile banking by the unbanked: A qualitative study. *14*(5), 74-88.

Venkatesh, V., Morris, M. G., Davis, G. B., and Davis, F. (2003). User acceptance of information technology: toward a unified view. *MIS Quarterly, 27*(3), 425-478.

Venkatesh, V., Morris, M. G., Davis, G. B., and Davis, F. (2003). User acceptance of information technology: toward a unified view. *MIS Quarterly, 27*(3), 425-478.

Vota, W. (2017). Five Barriers to Mobile Financial Services in Bangladesh. Retrieved 12 January 2023, from https://www.ictworks.org/5-barriers-to-mobile-financial-services-in-bangladesh/#.X_3d-ugzYdV

Wang, T., and Tseng, F. N. (2011). A study of the effect on trust and attitude with online shopping. *International Journal of Digital Society (IJDS), 22*(2), 433-440.

World Bank. (2019). *The Digital Economy in Southeast Asia: Strengthening the Foundations for Future Growth.* Washington, DC: World Bank.

Yang, K. C. (2005). Exploring factors affecting the adoption of mobile commerce in Singapore. *Telematics and Informatics, 22*(3), 257-277.

Yen, Y. S., and Wu, F. S. (2016). Predicting

the adoption of mobile financial services: the impacts of perceived mobility and personal habit. *Computers in Human Behavior, 65*, 31-42.

Yesmin, S., Paul, T. A., and Mohshin Uddin, M. (2019). bKash: revolutionizing mobile financial services in Bangladesh? *Business and Management Practices in South Asia*, 125-148.

Yesmin, S., Paul, T.A, and Uddin, M. M. (n.d.). bKash: revolutionizing mobile financial services. *Business and Management Practices in South Asia*, 125-148.

Z. A., Amin, M. I., and Khan, M. S. (2020, February). Assessment of Factors Contributing to Adoption of Mobile Financial Services: A Perspective of Bangladesh. *Journal of Business Administration, 40*(2).

Zhang, T., Lu, C., and Kizildag, M. (2018). Banking "on-the-go": Examining consumers' adoption of mobile banking services. *International Journal of Quality and Service Sciences, 10*(3), 279-295.

Zhou, T. (2011). An empirical examination of initial trust in mobile banking. *Internet Research, 21*(5), 527-540.