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Adaptation of Mobile Financial Services (MFS): Scenario of Regional Bangladesh

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Abstract
Financial industry is no exception in need of digitization in changing business eco-system for functioning of various sectors. Adapting sophisticated technological solutions especially Mobile Financial Services (MFS) emerges as a viable option in a country like Bangladesh, where a significant majority lives in regional areas with limited access to traditional banking services. The fact that MFS is less widely adapted in rural areas of Bangladesh than in cities in conjunction with the population concentration. This phenomenon has led to research on the variables influencing MFS adaption among regional communities. Regression analysis was used in this study to examine and determine the factors impacting the situation, drawing attention to the theories on the Technology Acceptance Model, the Theory of Reasoned Action, and the Theory of Planned Behaviour. Perceived usefulness and trust are two of those factors that significantly influence attitude while perceived ease of use, self-efficacy and costs have no significance. Ultimately, this study advances the understandings of MFS adaption in local communities and provides insightful information to financial institutions, service providers, and regulators. It is anticipated that MFS would be crucial in transforming the transaction culture in rural areas of Bangladesh, which are now mostly centred on cash transactions.
Keywords: Mobile Financial Service, Adaptation, Attitude, Cash-less Transaction.
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1. Introduction

To cope up with ever changing business eco-system, digitization of new products or services is pivotal for the sustainability of any sector of an economy and financial sector is not an exception (Sayari, 2023). A country where majority population live in the regional areas with limited or no access to physical banking service obviously hinder the growth and sustainability of the country's financial sector (Danladi et al., 2023). This lacking can be solved by embracing new technology based services. Mobile Financial service can be an alternative especially in a country with 189.67 million mobile phone subscribers (Bangladesh Telecommunication Regulatory Commission, 2023). Being a part of formal banking system, the service allows individuals specifically unbanked one to have better management of hard earned money. Furthermore, this service is an important tool for cashless economy which is convenient, safe and allows better budgeting and track spending (Ramya et al., 2017). So, utilizing the service to complete day to day regular transactions would drive towards cashless society.

Literally, mobile banking refers to mobile phone based application that allows the user to store value and transfer funds (Donner & Tellez, 2008). In contrast, adaptation of mobile banking could interrupt because of the tradition of cash carry culture combined with not having the awareness and understanding of the benefits of mobile banking (Koenig-Lewis et al., 2010). For instance, the study of Manikandan and Chandramohan (2015) established that acceptance of transaction through mobile banking by organized and unorganized retailers can change the cash based transaction culture. They also identified that convenience, the speed of completing transaction, greater flexibility in making secure transaction, opportunity to deposit in account by local agent at any convenient time, ease of managing cash by unbanked rural people and one touch payment for e-commerce are some of many benefits of MFS.

Among others, mobile network coverage and platform used to access MFS could be another influential factors in adopting MFS. According to Islam and Hossain (2014), mobile phone providers claim to have coverage throughout most of Bangladesh, with varying degrees of quality. However, MFS customers report experiencing network outage, especially during peak hours. MFS can be accessed by using USSD channel or by using mobile application. Using USSD channel is same as dialing a phone call and do not require internet connectivity. On the other hand mobile application requires internet connectivity to access the MFS which could add additional cost of availing MFS but compensated by lower transaction cost compared with USSD channel.

With 217.71 million registered clients, twelve banks and Nagad have been offering Mobile Financial Service (MFS) in Bangladesh since its launch in 2011. The service is being delivered through a network of 1,678,207 agents (Bangladesh Bank, 2023). Previous research (Islam & Hossain, 2014; Bangladesh Bank, 2017) shows that regional Bangladesh adapted MFS less than urban regions, which highlights the necessity to investigate the variables influencing regional residents' acceptance of MFS. Because of this, the authors aimed to identify and explain the key variables that have a substantial impact on users' attitude regarding MFS adaption, as well as the

demographic mix of MFS users in terms of age, gender, income, and educational qualification. Also the study explores possible application of influencing factors of user attitude to establish MFS a true digital platform.

2. Literature Review

Mobile communication technology has enabled networked computer programs to be accessible on mobile devices (Schofield & Kubin, 2002). However, the usages of these applications by the users depend on the willingness to adopt the technology. One of the earliest models to explain the willingness to adopt technology is the Theory of Reasoned Action (TRA). The theory states that the intention to perform a specific behavior called behavioral intentions is derived from attitude (ATT) which indicates the person's internal evaluation of an object. Subjective norm, defined as an individual's perception of significantly related persons' expectation to engage in a particular behavior, is another influential component of behavioral intention (Ajzen & Fishbein, 1980). The Theory of Planned Behavior (TPB) is developed by Ajzen and Madden (1986) by including perceived behavioral control (with TRA) or the concern of users that may limit their usage. Similarly, perceived behavioral control and self-efficacy (SE) are closely related where the latter represents one's belief in having the ability to organize and perform future tasks (Bandura, 1995).

On the basis of TRA, another theory, the Technology Acceptance Model (TAM) suggests that acceptance of a technology depends on perceived usefulness (PU) and perceived ease of use (PEOU) (Davis, 1989). Perceived usefulness denotes the user's belief that technology will enhance the performance; whereas, perceived ease of use indicates the effortless usability of the technology (Davis, 1989). The main difference between TAM and other two theories namely TRA and TPB is that subjective norm is not considered in TAM but others do. Shih and Fang (2004) concluded that subjective norm can have significant impact on environment requiring force technology adaptation; however, this may have negligible effect in a voluntary environment.

A study of Suh and Ingoo (2003) concluded that trust (TR) has a pivotal role on the acceptance of e-commerce based technology. The trust develops based on sound information from networked relationship about goodwill and competencies of the service provider and through the continuous communication between the parties (Caglio & Ditillo, 2012). Further, trust is a belief that service provider will fulfill the promise in case of unforeseen circumstances (Suh & Ingoo, 2003). Meharia (2012) established that factors listed in the trust framework proposed by American Institute of Certified Public Accountants (AICPA) have significant influence on the adaptation of mobile based e-commerce applications. According to trust framework of AICPA (2023) a trustworthy MFS provider need to ensure that system is protected from unauthorized access and secured from unauthorized disclosure of information. It should ensure the availability of access to the information regarding the provided service and accessibility in its operation and maintenance. The framework (AICPA, 2023) further affirms that a complete, valid, accurate timely and authorized processing system is assured by the MFS providers. Finally, the system is compelled to safeguard privacy and confidentiality of personal information. Confidentiality is applicable for any types of vital information, whereas; privacy is only related to personal information (Resnik, 2018). Hence, besides fulfilling all the criteria of confidentiality, under privacy the application should allow users to access, review and amend personal information. Furthermore, access and disclosure of personal information to the third party can only be done with the consent of the user (AICPA, 2023).

In addition of these factors Anckar et al. (2003) identified that high initial cost (C) and high operating cost influence the adaptation of m-commerce. According to Donner and Tellez (2008) sending small amount of money through mobile banking is less costly than other mediums. But individuals prefer to use traditional banking channel to remit large sum of money as it considered being more secure and reliable. In contrast, Bangladesh Bank (2017) found that users in Bangladesh consider operating cost of MFS in marginally high.

Previous studies portrayed that education level of consumers shape the usage of e-money based payment. The demand for e-commerce based products are mainly derives from higher income, younger and more educated households (Lee et al., 2002; Karjaluoto et al., 2002). In contrast, Laforet and Li (2005) state that Chinese mobile bank users are not necessarily highly educated and young in age. Literacy rate on 2018 in rural Bangladesh was 66.1%, whereas; in urban area the rate was 81.1% (Bangladesh Bureau of Statistics, 2018). Though people with different level of education are using the MFS, the literacy rate gap in urban and rural areas indicates that the rural Bangladesh is lagging in this parameter and may supports the earlier finding of less adaptability of mobile banking in rural Bangladesh.

According to Bangladesh Bank (2023), among the MFS users of in Bangladesh, the male users (58%) are more in number than female users (42%). At the same time, employment rate of males and females in the employed population are 80.86% and 41.06% respectively (Bangladesh Bureau of Statistics, 2023). It is equally important to mention that income inequality in rural Bangladesh has been rising since the early 1990s (Osmani & Sen, 2011). Here, both the parameters namely number of user of MFS based on gender and earners based on gender show similar trend where females are lagging in both parameters in big margin.

On the other hand, Islam and Hossain (2014) reflects that customer service provided by MFS providers is also encouraged adaptation of MFS. Among the support provided by the customer service, availability of

immediate support and ease of solving wrong transaction are most influential factors in considering the usage of MFS.

Finally, the regulation requires only bank led organization can only provide MFS enhances safety of the users. However, regulator imposed limits on daily and monthly transaction (Parvez et al., 2015). This imposed restriction may discourage the adaptation of MFS. As the impact of factors discussed in literature varies between the urban to rural users of MFS, it is worthy to identify the factors that influence adaptation of MFS in rural areas of Bangladesh.

3. Methods, Results and Discussion

The research design of this study is descriptive in nature based on questionnaire survey. The survey was divided into two sections: the first reported demographic information and the second included variables of mobile financial services and their levels of agreement. A questionnaire for this study was designed including several questions that were both continuous and categorical in nature. Initially, variables considered in this study are Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Trust (TR), Self-efficacy (SE), Cost (C), Attitude (ATT) and Subjective Norm (SN) based on the previous studies. As per TRA, SN and ATT have an impact on BI. However, after careful evaluation, SN has been eliminated as the researchers consider the usage of MFS is voluntary in nature; whereas, SN has a significant influence in an environment of mandatory technology adaptation (Shih & Fang 2004). The authors did not explicitly examine the relationship between any of the factors and BI, even if they did not take SN into account for reasons. This is because it is evident that ATT has an impact on BI.

The scale for measuring consumer adaptation of mobile financial services was adopted from recent studies of Kolodinsky (2004); Islam and Hossain (2014); Trivedi (2016) and the relevant statements were kept for the current study. These statements were assessed using a 5-point Likert scale ranging from strongly agree to strongly disagree. The sampling unit consisting of people who have at least one account with a recognized MFS provider, such as BKash, Nagad, and others, and who use mobile financial services. To choose the sample and to reflect the current percentages of male and female MFS users, which are 58% and 42%, respectively, the questionnaire was initially distributed to 150 users, with 60% of the users being male and the remaining 40% being female. This survey received responses from 110 people, of whom 36% were female and 64% were male. The residents of the districts of Feni, Comilla, Noakhali, and Lokhipur were handed this questionnaire. Purposive sampling was used to conduct the survey.

Here the variables Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Trust (TR), Self-efficacy (SE), Cost (C) have been considered to justify the role as predictors and customer Attitude (ATT) as a criterion variable. Based on past literature review, the hypotheses set for analyzing the relationships were:

Hypothesis 1: There is a significant association between Perceived Ease of Use (PEOU) and Attitude (ATT) in MFS adaptation.

Hypothesis 2: There is a significant relationship between Perceived Usefulness (PU) and Attitude (ATT) in MFS adaptation.

Hypothesis 3: There is a significant relationship between Trust (TR) and Attitude (ATT) in MFS adaptation.

Hypothesis 4: There is a significant relationship between Self-efficacy (SE) and Attitude (ATT) in MFS adaptation.

Hypothesis 5: There is a significant relationship between Cost (C) and Attitude (ATT) in MFS adaptation.

3.1 Demographic Analysis

The demographic analyses shown in tables 1, 2 and 3 reflect some vital demographic details of MFS users. The study finds that majority respondents are aged in between 18 to 25 years (47.3%). 22.7% of respondents fall age range of 25 to 30 years which is second highest in terms of age (Table 1). Findings of similar studies also support proneness of young users towards technology orientated financial services (Islam & Hossain, 2014).

Table 1. Age of Respondents

Age	Frequency	Percent
< 18	6	5.5
18 to 25	52	47.3
25 to 30	25	22.7
30 to 35	8	7.3
35 to 40	8	7.3
40 to 45	3	2.7
45 to 50	5	4.5
Above 50	3	2.7
Total	110	100.0

The majority of mobile financial service users are literate, as seen by the current findings (table 2), which

also show that 91% of respondents have completed at least a Higher Secondary School Certificate. Of these, 42%, 31%, and 19% possess Higher Secondary, Bachelor, and Masters degrees respectively.

Table 2. Educational Qualification of Respondents

Academic Qualification	Frequency	Percent
Secondary	9	8.2
Higher Secondary	46	41.8
Bachelor	34	30.9
Masters	21	19.1
Total	110	100.0

Furthermore, table 3 reflects that majority of respondents (54%) earn less than Tk. 10,000 followed by the income range of Tk. 10,000 to Tk. 30,000 represents 24% respondents. This could be the case because young people aged bellow 25 years with Higher Secondary School Certificate holder made up a sizable portion of the sample.

Table 3. Income Level of Respondents

Monthly Income (Tk.)	Frequency	Percent
≤10,000	59	53.6
10,001 to 30,000	26	23.6
30,001 to 50,000	18	16.4
50,001 to 70,000	3	2.7
70,001 to 90,000	1	.9
90,001 to 110,000	2	1.8
> 110,000	1	.9
Total	110	100.0

Lee et al. (2002), depicted that younger in age, higher income and higher education are pivotal factors for adapting e-money based payment. Similarly, this study supports that younger population is the major user of MFS while people with low income earners with moderate educational qualification are also using MFS proportionately in the context of regional Bangladesh.

3.2 Reliability

Usually a questionnaire is considered reliable or trustworthy if a person's response to a statement is consistent or stable over time or at different times with calculative measures if its alpha coefficient is greater than 0.60 (Sekaran & Bougie, 2016). The results of reliability tests show that all research instruments have a Cronbach's Alpha coefficient greater than 0.60 along with overall Cronbach's Alpha coefficient of 0.771 (table 4). As a result, all variables have met the reliability or dependability requirements for conducting research.

Table 4. Cronbach's Alpha

Items	Cronbach's Alpha Values	Overall Reliability (Cronbach's Alpha Values)
PEOU	.660	.771
PU	.676	
ATT	.753	
TR	.799	
SE	.769	
C	.636	

3.3 Normality Test

Skewness and Kurtosis were used to check normality, with boundaries of ±3 and ±10, respectively. Results in table 5 indicated normal distribution, with Perceived Usefulness having the highest mean (4.14) and Perceived Ease of Use having the lowest mean (3.78).

Table 5. Descriptive Statistics

	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
PEOU	3.78	0.63	-0.30	0.23	-0.67	0.46
PU	4.14	0.59	-0.53	0.23	0.09	0.46
ATT	4.12	0.71	-1.19	0.23	2.79	0.46
TR	3.91	0.57	-0.36	0.23	0.13	0.46
SE	4.05	0.69	-1.15	0.23	2.70	0.46
C	3.82	0.78	-0.71	0.23	0.95	0.46

3.4 Multicollinearity Test

Table 6 represents the Pearson Correlation to assess the linear relationships among the factors. In concern to multicollinearity, all the values are within the acceptable boundary of ±0.9 (Hair et al. 2006) where the value of 0.426 between Trust and Self-efficacy is the highest amongst all.

Table 6. Pearson Correlation

Factors/ Variables	PEOU	PU	T	SE	C
PEOU	1.000	.238	.153	.225	.142
PU	.238	1.000	.290	.239	.261
TR	.153	.290	1.000	.426	.258
SE	.225	.239	.426	1.000	.318
C	.142	.261	.258	.318	1.000

3.5 Regression

This relationship among the variables have been studied on the basis of regression analysis. The regression coefficient and coefficient of multiple determinations (R^2) were employed to identify relative significance. Table 7 showed an R^2 of 0.374, signifying that 37.4% of the variation in Attitude could be explained by the predictors Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Trust (TR), Self-efficacy (SE), Cost (C).

Table 7. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.611[a]	.374	.344	1.719
a. Predictors: (Constant), C, PEO, TR, PU, SE				

These Hypothesis were postulated for a robust correlation between adaptation of MFS and attitude toward it in regional Bangladesh. The absence of multicollinearity issues, indicated by correlation values between ±0.9 for all variables, highlights the reliability of the dataset (Hair et al. 2006). Moreover, the ANOVA (Table 8) further demonstrates the model's efficacy, indicating a significant F value and a well-fitted representation of user attitude towards MFS. Specifically, the calculated F value of 12.410 exceeds the critical value, substantiating a considerable impact of independent variables on user attitude. Table 9 endorses the positive relationships of Perceived Usefulness and Trust, thus affirming the hypotheses associated with these dimensions.

Table 8. ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	183.428	5	36.686	12.410	.000[b]
	Residual	307.445	104	2.956		
	Total	490.873	109			
a. Dependent Variable: ATT						
b. Predictors: (Constant), C, PEO, TR, PU, SE						

Table 9. Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.078	1.461		.738	.462
PEOU	.071	.049	.126	1.460	.147
PU	.305	.085	.338	3.583	.001
TR	.098	.045	.211	2.160	.033
SE	.057	.074	.075	.774	.441
C	.054	.080	.060	.676	.501
a. Dependent Variable: ATT					

In this study, the relationships of ATT with PEOU, PU, TR, SE and C were studied by conducting regression analysis. The analysis posits that PU and TR have significant influence on ATT (Hypothesis 2 and Hypothesis 3); whereas, PEOU, SE and C have insignificant influence on ATT (Hypothesis 1, Hypothesis 4 and Hypothesis 5). Reasonably, the convenience of using MFS prevails over the cost of using it can be a logical justification for cost (C) being insignificant in affecting the attitude. Furthermore, the insignificance of PEOU and SE on ATT can be explained by the demography of the respondents. Majority of the users belong to the Gen Z of the society who are well acquainted with the technology. That's why, this generation adopted and understood the digital world so well that factor like SE and PEOU become insignificant (Trivedi, 2016).

4. Theoretical and Managerial Implications

By deepening our understanding of technology acceptance models in the context of mobile financial services, the study adds to the current body of knowledge by identifying specific factors influencing adaption in the unique regional context of Bangladesh. The study contributes to the existing body of knowledge by applying and validating theoretical frameworks such as Technology Acceptance Model (TAM), Theory of Reasoned Action (TRA) and Theory of Planned Behaviour (TPB) in the context of adaptation of mobile financial service in regional Bangladesh. The findings of this study provide insights to further development of theoretical models for different socio-economic contexts and cultural influences. Research has also emphasized how factors namely perceived usefulness and trust have a major impact on attitude. This emphasizes how important it is to incorporate robust security measures and processes to enhance trust in mobile banking platforms in line with trust theory.

On the other hand, key findings of the study are useful for financial institutions doing business in Bangladesh to customize their marketing plans related to financial services such as stressing security features and trust-building strategies in MFS apps. Managers are able to address some of the issues of technology adaption based on literacy levels by implementing focused user education programs and recruiting new users. Another effect could be educating the public about strong security measures to calm concerns about data leaks and illegal access. The results indicate the importance of user-friendly interfaces to encourage the adaption of mobile banking for all types of users. For example, financial service providers have the opportunity to allocate resources to tailor their user interfaces to suit the tastes and expectations of the local population, therefore increasing user satisfaction and adaption rates.

5. Conclusion

This study provides a brief overview of the variables influencing the adaption of mobile financial services in regional Bangladesh. It has been found that effective implementation and widespread adaptation of mobile financial services in the region depends on understanding individual socio-economic dynamics. In some cases, users hesitate to adapt mobile banking if they feel a high risk of unauthorized access or fraudulent activity in transparent communication. To fulfil the purpose, users with minimum level of literacy have been selected to ensure the full awareness about the MFS, users having self-literacy have been left out could be a limitation of this study. Additionally, inconsistent internet connectivity, limited availability of agents, and access to mobile networks directly affect users' willingness to adapt MFS. Therefore, it is suggested for future researchers to explore the impact of UX design elements on mobile banking adoption, focusing on interfaces that fit regional users' preferences and needs. Future research will also be extended to assess the acceptance of emerging technologies such as biometrics, AI and blockchain to enhance the security and efficiency of mobile banking. Imposed limits on number and amount of transaction on a daily and monthly basis by the regulatory authority just to curb the illegal activities is a major challenge for MFS to become an alternative for traditional banking channels. Lifting the regulatory bars by focusing on usefulness, trust and positive attitude of users can only establish MFS as a true alternative of traditional banking.

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