Logical Creations Education Research Institute
JOURNAL OF MANAGEMENT & EDUCATIONAL RESEARCH INNOVATION
E-ISSN: 3005-7728
Web: www.jomeri.org | Email: editor@jomeri.org
Volume-01 | Issue Number-03 | September-2023

Mobile Banking Services in Bangladesh: Security and Abuses

Mohammad Rezaul Kabir [1], Dr. M. Amzad Hossain[2]
[1]Assistant Professor, Department of Business Administration, Sylhet International University, Bangladesh.
[2]Professor, Department of Finance, University of Rajshahi, Bangladesh.
rezaul_ru@yahoo.com

DOI: 10.5281/zenodo.10449174

ABSTRACT

Security is an essential element of building customer trust. Without adequate security features, customers are not interested in these services. The existence of well-designed security features and their proper implementation reduces the abuse of these services. This study analyzed mobile banking's present security principles and their abuses. Side by side, this study showed the impact of mobile banking security problems on secure mobile banking transactions. A questionnaire survey of 400 respondents and 23 key informant interviews have been carried out in this study. Besides, descriptive and linear multiple regression models have been used in this study. It found mobile banking security problems had a negative impact on its secure transactions as well as weakening its security features. Whereas abuse of services is increasing. To reduce the security problems, coordination is needed among the government, MPSP, BTRC, and MNO.

Keywords: Banking, Security, Abuses.

Cite as: Mohammad Rezaul Kabir, & Dr.M.Amzad Hossain. (2023). Mobile Banking Services in Bangladesh: Security and Abuses. *Journal of Management & Educational Research Innovation (JOMERI), 1*(3), 50–71. https://doi.org/10.5281/zenodo.10449174

INTRODUCTION

Mobile banking security is an ongoing concern in the mobile banking ecosystem, as it involves the transmission and storage of sensitive personal and financial information**.** Mobile banking in developing nations like Bangladesh has not yet matured, so people place great importance on security and privacy. Privacy and security are major sources of dissatisfaction with mobile banking, with some chances of money loss due to fraud (Manoj V. Bramhe, 2011). Customers' access to mobile financial services is impeded by several security issues associated with their transactions. Mobile banking security measures are put in place to protect customer information and prevent unauthorized access, fraud, and theft. Even though the promise of mobile banking services for increased financial inclusion of unbanked people more broadly increases economic activity on both a microeconomic and macroeconomic level, effective MBS rollouts have not been noteworthy due to security problems. It is a common tendency that corruption and irregularity would manifest when the services increased very fast. To make mobile banking transactions more stable, it is needed to protect the user's financial information from fraudsters and cybercriminals. In this case, the regulators need to take effective measures to avert untoward incidents in mobile financial systems.

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Objective

To identify the security principles used in mobile banking systems.

To find out the abuse in mobile banking

To clarify security problems in the mobile banking system

To assess how security problems, affect mobile banking activities.

LITERATURE REVIEW

Security is a top priority in all mobile banking-related activities. Mobile financial service providers use strong security principles to protect the customers' transaction information. Afterward, abuse of these services may weaken the confidence of customers about its security features. The mobile hand set operationally, security, privacy and standardization of mobile banking services are the most important issue. Majority customers think that success of mobile banking depends on its privacy and security (Mir Abdullah Shahneaz, et al, 2016). Now customers are more conscious and informed about different types abuse occurred in mobile banking transactions'. Sharma et al reveal that mobile banking customers are more aware with security perspective like financial frauds, accounts misuse, and faces difficulty in remembering the different codes for different type of transactions (P. Sharma et al 2009).

The study on significance of exponential uses of Mobile financial services in Bangladesh. They found most of the transaction of MB are made from big cities like capital or metropolitan cities. In this research has also state that customers are satisfied about mobile banking activities but are more concerned about security issues arises from networking problem, telecommunication services and unconsciousness of agents (Priyanka Das et al 2014).

Mobile banking is very popular among customers but risk to the customers was introduced with mobile banking service providers is also rising. Different kinds of risks like operational risk, technological risk, legal risk, strategic risk etc., which have become the issue to the experts to suggest the means to mitigate them (Singh et al.2013).

It has been examined the issues surrounding mobile banking in India. The study identified simplicity, interoperability, cost effectiveness, security, data protection, ratability, speed, and cross-border payments as desirable features that should be integrated into mobile banking to make it more universally acceptable to people. The study also looked at the security issues and risks associated with mobile banking (Goyal, V et al., 2012).

Security is defined as the public's perception of a mobile banking system's ability to perform financial transactions securely and maintain the privacy of personal data (Patel & Patel, 2018). It also discovered that the most important aspect in mobile banking services is perceived security. (Svilar and Zupani 2016) Many studies have examined the effects of security on mobile banking and found that mobile banking acceptance as well as usage behavior can be affected by security. (Laforet & Li, 2005, Luarn & Lin, 2005, Wong & Mo, 2019, Dufour et al., 2017). Some study found that users of M Banking may become more worried about the security of their transactions and the protection of their personal information (Chawla and Joshi, 2018; Choudrie, Junior, McKenna, and Richter, 2018).

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Many people are concerned about mobile banking transactions as a result of cyber security vulnerabilities and their corresponding difficulties. Consumers are now wary of adopting and using M-Banking due to the risk of data breaches, leaks, theft, and harm brought on by computer hackers and cybercriminals. (Wazid, Zeadally and Das, 2019, Tarhini et al., 2016; Apau et al., 2019; Merhi et al., 2019). Consumer perceptions of the danger and safety of M-Banking apps are a key consideration when selecting whether to use the channel for mobile financial transactions. Several studies have been done to find out how people feel about the reliability, security, and risk of the mobile banking and online banking. (Obaid, 2021; Kumar & Yukita, 2021; Merhi et al., 2021; Merhi et al., 2019; Mutahar et al., 2018; Lim et al., 2019). These researches have produced a range of findings and analysis in relation to the security risks posed by m-banking.

As mobile banking usage rises, it is important to examine the security of financial transactions. This study attempts to investigate how security levels affect consumers' intentions when using mobile banking. The analysis's findings demonstrate that mobile baking's security has a positive impact on users perceived usefulness (Wandira, R., & Fauzi, A. 2022).

METHODOLOGY

Population

The populations in this study are all active users of mobile banking services scattered all over the country. According to the Bangladesh Bank payment department, there are a total of 5,737,400,000 mobile banking service active users.

Sample Area Selection

To collect the primary data through questionnaire survey, a multi-stage random sampling method has been incorporated in this study for selecting the sample area. Four districts (Dhaka, Sylhet, Kurigram, and Pirojpur) from four greater divisions (Dhaka, Chattogong, Rajshahi,Khulna) have been randomly selected. Then, at randomly four Upazilas (Keranigonj, South Surma, Ulipur, and Nojirpur) from four districts and randomly four unions (Rohiatpur, Borakandhi, Durghapur, and Mativhanga) from four upazilas were selected.

Sample Unit Selection

The questionnaire surveyed respondents first divided according to the homogeneity of each profession, like small business owners, marginal farmers, garment workers, domestic workers, tea laborers, homemakers, students, and others. The ultimate individual respondent has been selected based on a systematic random sampling method. Additionally, twenty-three key informant interviews (KII) and cases have been undertaken by judgment sampling method.

Sample Size

The sample size for a population of over a million individuals should be at least 384 on a 5% margin of error (Saunders et al. 2009, Fisher, 200). Moreover, the sample size should not be less than 300, with 500 being very good and 1000 being great (Tabachnick & Fidell). The participants in this study were mobile banking account holders who use mobile banking services. The researcher targeted a sample size of 384 to 450 participants for this study, and based on the explanation above, the sample size that was actually acquired in the current study is 400.

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Data Collection Tools

Primary data have been used in this study. Questionnaire survey, Key informant interview, case analysis and document review have been used in this study. Side by side, reviewing many mobile banking public and private documents and journal articles.

Data Analysis

The data has been analyzed using Statistical Package for Social Science (SPSS) version 22. Descriptive analyses (DA) have been carried out to better understand the overview of the sample, the data and its distribution, the missing variables, and the data outliers. Moreover, statistical tools like mean, standard deviation, t test, and multiple linear regression models have been incorporated to test the hypothesized impact of mobile banking problems on financial inclusion.

Security Principles in Mobile Banking System

Security is one of the fundamental elements of any payment solution. Mobile banking security principles should be simple but ensure the safety to build up trust and confidence of all stakeholders. However, if the procedures of security system become complex, it makes mobile banking payment services more complex compared to traditional payment services, which could greatly reduce convenience. The mobile banking association highlighted main security issues data transmission, data access, data integrity as well as limited impact of loss of mobile device that should be addressed in order to encourage the adoption of mobile banking (D Weerasinghe, et al.2010). In Bangladesh, mobile banking eco -system have ensure the security principles according to Mobile Financial Service regulation 2018. Some of the key principles of mobile banking security include user authentication, encryption, secure communication channels, fraud detection, prevention, and privacy.

User authentication is a fundamental principle of mobile banking security. Authentication assures that the transaction is carried out by a legal individual and a legitimate and official bank, rather than a fraudulent organization. In mobile banking services, mutual authentication between mobile banking service providers and users must be conducted before payment.

Encryption is another critical principle of mobile banking security. This involves encoding sensitive financial information in transit, such as account details, and personal identification information. Encryption makes it difficult for cybercriminals to intercept and read this information, ensuring that it remains secure and protected. It is essential to use robust encryption protocols.

Secure communication channels are also critical to ensure mobile banking security. Financial institutions and technology providers must use secure communication channels. Secure communication channels use encryption to protect data in transit, ensuring that users' financial information remains secure and protected. In rural and distant parts of Bangladesh, where mobile network coverage is weak and financial distribution networks are few, this has hampered the adoption of these services. The reliable mobile financial infrastructure necessary for making widespread mobile financial access and usage possible.

Some experts stated that financial infrastructure that enables efficient, affordable, and secure transactions, such as interoperable digital payment systems and distribution networks, digital identification, and robust security platforms, is critical for the expansion of MFS to a larger portion of Bangladesh's population.

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There is the need for reliable mobile telecommunications infrastructure and network coverage in order to conduct transactions safely and efficiently and there is a reliance on customers keeping their PINs and mobile phones safe and secure.

Fraud detection and prevention are also essential principles of mobile banking security. Financial institutions and technology providers use advanced fraud detection systems to identify and prevent fraudulent transactions. Additionally, financial institutions and technology providers may also use transaction monitoring systems to identify and prevent fraudulent transactions in real-time.
Whereas the abuse of mobile banking in Bangladesh being made frequently as a results users lose the money and trust and service provider losses the customers and profits. The following part have discussed the different security risk incurred from the abuse of mobile banking in Bangladesh.

Security Risk Taxonomy in Mobile Banking

The mobile banking payment system, has some degree of vulnerability criminals can exploit. World Bank research and analysis suggests the abuse of mobile banking could stem from four major risk factors: anonymity, elusiveness, rapidity, and poor oversight (PL Chatain, et al.2010). The different risk escalations from its transactions produced an imposition on the expansion of inclusive mobile financial systems. The risk generated in the mobile banking system, the most of risks were same of traditional banking system that lead to systemic, liquidity, and integrity problems. These risks pertained to all levels of the mobile banking system's participants. This part begins by identifying the security risk at the MNO level, risk at the bank level, risk at the agent level, and risk at the customer level.

Abuse of Mobile Banking in Bangladesh

The abuse of this services have created the risk in the mobile financial system as well as reduces the faith of customers. In the last some years the abuse of this services have rapidly evolving as increasing its number of transactions. It has been found that in the majority cases of abuse, the criminal utilizes a falsely registered mobile bank account and a fraudulent identity. Because the criminal has been using a bogus account, he or she opens the account under the fake name. Statistics from law enforcing agencies say that illegal money transaction is top on the crimes committed through mobile banking. Used these services for many illegal activities likely drug, human trafficking, smuggling, extortion, murder, kidnapping, hundi, embezzlement, ransom, militancy, terrorist financing and many others are abundant. In order to portray a genuine picture of mobile banking abuse, the following are some examples of fraud that has occurred in mobile banking systems in Bangladesh:

Hello Party Fraud

Organized criminal groups impersonate MNO service centers by using mobile numbers that match MNO service center numbers (e.g., 0xxx9000000 or Oxxx1123456). Victims are told they have won a set of jewelry, a lottery ticket, a piece of property, or an apartment in the capital. Criminals may use a caller tune or welcome melody that indicates a large corporation. Victims are then asked to pay a small amount of money into an MBS account to register for the program or cover the first fee. Once a victim has paid a small amount, the thieves attempt to further abuse their target. Even educated people, such as former senior government officials, teachers, and members of civil society, have become victims of criminal groups. The bulk of the thieves preyed on their victims' greed because they had barely completed secondary education. But most victims feel shy about filing a formal complaint with LEA to mask their foolishness (CID, *Bangladesh Police*, 2015).

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A government college teacher in Pirojpur district has been victimized by such a party. Once a day, he got a call from Hallo Party in the name of a call from bKash Center's promotion manager. He informed me that I had won the lottery, and within two days all procedures had to be completed for dispatching the lottery money. You send Tk 20,000 to bear the initial expenses for maintaining the procedures. By this time, he did not have enough money in his pocket. Afterward, he sent the money, borrowing from a colleague. Then he called back, but this number was closed. After sending money, he understood that he had been cheated by the criminals. [Note takes 20.11.2021]

Fraud by Agents

Our country's illiterate and low educated customers are betrayed by agent's fraud activations. Generally, city migrant workers send money via their agent's personal accounts for their families. There are some cases where other people cash out the money with the help of agents. Therefore, the actual person did not receive money, even though they did not recover it. Moreover, agents of mobile banking engage in other unlawful money transfers like hundi, narcotics, and smuggling. In 2017, Bangladesh Financial Intelligence Unit (BFIU) found 2,888 suspected Rocket, bKash, and other mobile banking agents and provided this list to CID. From that list, the crime department selected 25 people and conducted raids to make arrests. The CID detained 11 of these agents in January 2018. In addition, 16 more people were detained by the RAB and Dhaka Metro Police (DMP). Three agents of bKash were captured by Detective Branch in the capital with 850 bogus national identification cards, 300 SIM cards, and 900 pictures. According to the police, they were involved in a number of fraudulent acts, including the leakage of exam papers.

Harassment of Female by Male Agents

The greatest barrier for rural women to use MBS is the lack of female agents in the community. Since they suffered from harassing and eve-teasing by male agents, female users are afraid of them.

"*Two users claimed that their wives' phone numbers were leaked by MFS agents after transactions. Then, the agents continued to disturb their wives. The majority of agent locations are in crowded areas, making it dangerous for female users to visit. It is uncomfortable for women to enter a crowded market. They said, whenever I send money through MBS, I feel insecure with my wife to collect that money from the nearest agent. She also doesn't like to go to them because the place is very crowded and seems unsafe for her."*

In Bangladesh, rural women are very traditional-minded. Rural areas people is more concerned about the safety of female users. Some factors such as user-friendly services, number of branches and agents, rules and regulations, culture, norms, knowledge level, behavioral differences, security, speed, and mobility can ensure women's participation in MBS in Bangladesh Lubna et al.2018). The female participation in the MBS industry of Bangladesh is still small. Females must visit neighboring marketplaces to use any mobile banking services because the distributor-agent relationship structure is still quite rigid, and they may not be aware of these services (Akhtaruzzaman et al. 2017). The majority of the time, female users seek the assistance of a male relative who may exploit this as an opportunity to defraud female users. Without female user-friendly service mass women, participation in mobile financial service would be near to impossible.

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Fraud and Extortion by Genier Badsha (King of Genie)

The mobile phone users in Bangladesh has got a call from a 'Genie from the 4th sky,' who promises to deliver them a giant jar full of ancient gold money. What the call-recipient needs to do is pay Tk. 25 for the call through which the 'Genie' spoke with the victim. One out of every 100 callers will simply ignore the caller. Step by step they demanded more money from victim. It begins with deception, but it usually progresses to threats and extortion, in which the genie threatens that the victim, her son, husband, or other important family member will die instantly if she does not obey the genie's orders or if she tells anyone else about these activities before she receives the jar full of gold coins. In these cases women are falling in trap and more victimized than men. He/she one who is stuck and fears from impersonate Genie (Men as an evils) and victim pay the 'Genie, 'by selling personal property (gold, domestic animals, crops) or borrowing form relatives, even stealing.

A northern district is known for its 'Genie' business, which involves from riksha-pulers to upazila chairman, shops to MFS agents. However, when a victim is forced to report to the police, it has found that the criminals used an unregistered or fraudulently registered SIM number and a modified voice. Moreover, the criminals swap SIM and/or mobile sets after each successful operation.

Fraud Through Auto- Theft

Organized burgles stole auto-rickshaws, CNG, motorcycles from different part of Bangladesh. They called owners and promising them to return their goods if they send demanded money through mobile financial services such as bKash, Mcash, Nagad and other similar services. They return on rare occasions, but the majority of the time they don't. In this case mobile banking services blunder uses to earn illegal greedy money. Depending on the value of the stolen item, they might earn anywhere from Tk. 30,000 to Tk. 500,000.

Extortion by The Name of Top Terrorists

Terrorists used the mobile banking services for collecting illegal enforcement subscription money. Victimized received call from unknown number and callers represent themselves as top terror or their supporters and demand tolls ranging from Tk 20,000 to Tk 200,000 from businessmen, industrialists, or service providers.

Abduction/Kidnapping for Ransom

A well-coordinated gang abducts a man or a child and demands a ransom. The gang groups used mobile bank accounts to collect their ransom money. The criminals /thieves continue roaming by car or motorbike in the city or in highway and offer a home-goer employee or a city dweller a short trip (for example, 10 kilometers from Kawranbazar to Uttara), and then force the victim to phone his spouse or another member of his family to make a "tolerable" amount of money. (Tk 15,000 or 30,000) to their mobile accounts. Only releasing the victim and his phone after the ransom money has been deposited to the criminal's MBS account. This is a crime involving a single car and an MBS account number, which is almost often the personal account of a local MBS agent!

Anonymous Transaction

According to MB regulations, customers have own account to access mobile banking services. Over-the-counter transactions are not permitted under current mobile banking laws. However, from the introduction of the MBS in Bangladesh, there has been a trend of anonymous transactions, in which the sender and receiver both information is absent from the transaction trail. According to the MBS-related crime investigation criminals almost always employ anonymous transactions to disguise their identity

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(Bangladesh Bank, BFIU, 2018). He or she will be enormously encouraged if he or she knows that no one will be able to identify him or her after the crime.

Over the last five years, the number of cash-in and cash-out transactions has rapidly increased, yet there is a substantial gap with P2P transactions. The primary cause of this disparity may be traced back to the high prevalence of anonymous transactions. Although estimating the percentage of anonymous transactions is impossible, existing data and numbers show that it is quite high.

Illegal Foreign Remittance (Digital Hundi)

Bangladeshi expatriates use mobile banking services for sending money to their family. The present law permitted only inward foreign remittance not outward remittance. According to a survey conducted by the Bangladesh Bureau of Statistics in 2016, mobile banking accounts for 14.31% of inbound foreign remittances in Bangladesh (Bangladesh Bureau of Statistics 2013). The main remittance senders are Bangladeshi expatriates in Saudi Arabia, the United Arab Emirates, and Malaysia, with 16.98 percent, 11.65 percent, and 14.11 percent of those remittances flowing through MFS in Bangladesh, respectively. MBS receives the highest percentage of remittances from the Maldives, at 35.29 percent. However, the majority of inward remittances are sent through unlawful channels, such as digital hundi (Bangladesh Bank, 2016). Bangladeshi exchange houses and commercial banks operating in abroad have complained to the central banks that illegal foreign inward remittance through mobile banking entering in Bangladesh has increased as result of legal channel foreign remittance declined.

Yet outward foreign remittance through mobile banking totally forbidden by present regulation. Nevertheless, illegal fund transfer to other country through mobile banking. Bangladesh Pratidin published news 5th May, 2023 that how a mobile banking distributor illegally transfer the Tk 46 core to other country.

It is true that the abuse of this service being occurred in our country. Whereas the number of abuse of this services were not mentionable as compare with every day number of mobile banking transaction and volume of transaction. The main causes of abuse of this service are lack of awareness, lack of technological and financial literacy, illiteracy, and tendency of illegal money earning. If we are conscious about the abuse and trap then it possible to reduce most of them.

Causes of Mobile Banking Security Problems

There are many causes/factors that created the security problems in mobile banking transactions. Most of the causes are manmade for earning illegal money via mobile banking. This causes vary from country to country while some causes are same in the all country like cybercrime. In this part researcher has discussed the different form of cybercrime which attack the mobile banking transaction. Then discussed some causes of mobile banking security problems in Bangladesh has found in this study.

Cybercrime

The high penetration rate, personalized and affordable nature of mobile banking services mean more people are now connected to the service than ever before. But the cybercrime is the barriers of the evolution of mobile device-based financial products. With estimated revenue from MBS projected to reach $516 billion by 2017, MBS is the new cash cow for cybercrime (Fireeye, 2015). Now the total banking industry faces cyber security challenges (Wechuli, Franklin and Jotham, 2017). According to a recent survey, there have been over five billion downloads of mobile applications, and these applications are vulnerable to remote attacks. Additionally, between 2013 and 2015, mobile fraud

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increased by almost 173%.This has led to a lack of trust in MBS, which has slowed down the adoption of MBS, despite the obvious benefits (R. F Malaquias, and Y Hwang, 2020).

Loss, Theft and Improper Disposal of Devices

The loss of mobile phones, which might be stolen or misplaced. If information from stolen or lost phones is accessible, unauthorized individuals may check critical information such as passwords from cached memory or auto-fill settings of m-banking apps, as well as misuse mobile device. The confidentiality of sensitive information on a mobile phone might be make vulnerable if it is lost. Information stored on a mobile device might be exposed if it is lost or stolen (Jeonet al 202) Information can be leaked in a variety of ways, including theft. When a consumer disposes of a device in an insecure manner, for example, by selling the device without fully deleting its data, information can be disclosed (Hollestelle, G., 2011).

Commentators noted that mobile devices are easily lost, stolen, or destroyed, and users may not be able to recover information if it was erased or if they switched phones. The lost mobile devices that are not passcode-protected pose serious hazards to all mobile services.

One commenter stated that losing or damaging a mobile device does not imply losing money in a mobile bank account. Because the mobile bank account is operated using a different PIN code. Only account holders have access to this PIN code. As a result, if a mobile phone device is lost or damaged, it does not pose a significant risk to mobile account balances. In this instance, account users can obtain a replacement SIM card from an agent location and continue to use their mobile bank account without incurring any financial losses.

One commentator noted that when people use mobile banking services, they may become targets for fraudsters. He said that underprivileged people, such as migrants, are more likely to be victims of street crime and theft than other sectors of the community.

Lack of Knowledge and Awareness Regarding MBS

The most significant challenge of customers is inadequate knowledge and low-level awareness about MBS. Most of the users with low educational levels have insufficient knowledge about mobile financial services. Although mobile phone usage is increasing among rural people, their MBS usage is still at a very basic level. In Bangladesh, users are increasingly growing the digital lifestyle, but still, most users are not aware of MBS (Hossain MA and Haque MZ, 2014). Many rural users think MBS can only be used for cash in and cash out. They are not aware of advanced functions of MBS for example, utility bill payment, transfer money to/from a bank or international remittance, and getting a balance statement. Most mobile banking users in Bangladesh, either have very little or no education (Bhuiyan and Rahman 2013). Users with low-level education have difficulties in understanding the MBS menu because of their little reading capabilities. When utilizing a mobile phone to access accounts, consumers are more likely to be in a public place, and they may not be aware of the dangers of transferring data over public Wi-Fi, making identity theft a possibility.

One commentator said that identity theft has a greater impact on low-income customers, since they have "little money to suffer any economic loss that occurs.

Therefore, confidentiality of private information might be threatened due to a lack of user understanding. A client can be tricked into giving information that could result in the customer losing money owing to a lack of user knowledge**.**

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Medium of Language

Language used in m-banking software is also a barrier, almost all software use English as common language but illiterate and low literate people cannot understand English. MBSP should develop m-banking software in regional language and should use most commonly used phrases, name and shortcuts in software (Vijay M Kumbhar, 2011). Language acts a demographic challenge for mobile banking adoption to all level of users (Dwaipayan. Regmi 2015). In Bangladesh all mobile banking service providers provide this service in only English language which becomes a strong inefficiency and a restriction to this service. Most of the customers do not know how to write a message on mobile and also most of them are unfamiliar with the English language due to illiteracy (Alam, et al, 2013). Recently, MBS has introduced the Bengali language in the user interface but still, it's not sufficient for illiterate people to understand and use mobile financial services. Some people in the countryside think that mobile banking is only used by wealthy people since they have enough money afford it (Regmi, Dwaipayan,2015). People with having high education are more disposed to use MFS because education shaped their perception of innovations and technologies making them more willing to use MBS (Ramdhony and Munien, 2013).The 55%, 33% respondents agree and strongly agree that English language used in its transaction has created problems to understand.

Lack of Technological Knowledge

Lack of technological knowledge is one of the barriers to mobile banking adoption in Bangladesh. There is insufficient guidance in case of mobile banking and the non-adopters of mobile banking are afraid of using the technology due to complications in the system as no proper guidance is provided to them (S. P Joshi,., & M. A. S Salim,2013). Banks must put in efforts to educate their customers in mobile banking (A. P Wadhe,. & S Ghodke,.2013). The limited customer knowledge about mobile banking services has a negative impact on perceived usefulness. A considerable amount of effort is required to improve consumer's use of mobile banking services. In this context, consumer may not quickly adopt mobile banking because of a lack of understanding and knowledge about this technology (C.L., Corritore, B Kracher,& S Wiedenbeck,2003). The surveyed result revealed that the lack of technological knowledge are the problem of mobile banking adoption.

Complex Mobile Banking Operating Functions

Its operating functions has created the problems about the adoption of these services especially to the low literacy level users. Users with low-level education have difficulties in understanding the MBS menu because of their little reading capabilities. Many Bangladeshis living in remote parts have access to basic mobile financial and the majority of USSD menus of phone are in English.It makes it difficult for them to understand or use MBS properly. Low level of literacy and illiteracy people faces problem with adoption of mobile financial services. Since they could not understand the process and functions of this services as result they feel insecure and fear to do transaction with this services. The survey result revealed that 50% and 30% respondents agree and strongly agree regard that low literacy and illiteracy has made challenging adoption of this services. It has also been observed from survey that the out of 400 users the illiterate users were (82) and PSC, JSC passed users (68), (63) which comprise the highest number of users, that is 53%. Furthermore, 61 illiterate users, 21 PSC passed, 14 JSC passed, and 5 SSC passed users do not know how to operate mobile banking. They used this services with the help of relatives or agents. This finding implied that the users of this services would not feel comfortable regarding its operating functions. So it services providers should makes its functions understandable, memorable and comfortable to the all level of users.

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Some users mentioned that the MBS payment process is very complex for them and they need others to help to do that. We do not understand how to use MBS, the users claimed. Whenever we got money in the account, we went to the nearest agent for cashing out purposes. They do everything on us behalf." As rural users need other assistance to make the payment or understand basic functions, so they become dependent on others with MBS.

Table 5.1: Mobile banking operating functions

Do you know how to operate mobile banking account			
Education	No	Yes	Total
Illiterate	61	21	82
PSC	20	48	68
JSC	14	49	63
SSC	6	55	61
HSC	0	72	72
Graduate	0	27	27
Postgraduate	0	27	27
Total	101	299	400

Sources: Field Survey 2020-2021

High Transaction Cost

According to Mallat the cost of a payment transaction has a direct effect on consumer adoption and usage if the cost is passed on to customers (N Mallat 2007). Transaction costs should be low to make the total cost of the transaction competitive. An m-payment solution should compete with other modes of payments in terms of cost and convenience. The cost effect as the extent to which a person believes that using mobile banking will cost money, this has negative effect on intention to use mobile banking and its related technologies (Luarn and Lin, 2005). The low-cost charges can ease the burden to the users hence the affordability of the service. The m-payments should not be costlier than existing payment mechanism to the extent possible. The previous study also found that most of the users are dissatisfied with the high transaction charges of MBS (M. T Hasan 2020). In contrast, it has. found that most of the users believe mobile banking has a lower cost compared to traditional banking (Alam et al 2013). The study demonstrated that maximum users were unhappy due to the high transaction cost of MBS.

"Most of the respondents mentioned that it would be better to handle cash rather than using it through mobile financial services due to high charges. Users running small business thinks the high fees of MBS is a huge burden for them. Some respondents uttered, "If we have ten thousand (10,000.00) taka in our MB account, we will get one hundred seventy-five (175.00) taka less after the cash-out. So, why would we keep money in an MFS account?"

Lack of Available Funds to Agents Points

In mobile banking system, financial service providers are facing short supply of liquid money as cash-outs are more frequent than cash-ins. Because of frequent cash outs sometimes the agents cannot provide sufficient cash to fulfill the customer 's demand. Moreover, there is a cap on transaction of a particular personal account. Most of the users use MBS for cash in and cash out purposes. But, local agents have limited balance which often becomes insufficient for users. Besides sometimes agents points remained closed during the business hour which makes problems to the users as result they have to go distance agents points.

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E-ISSN: 3005-7728
Web: www.jomeri.org | Email: editor@jomeri.org
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One customer told that during festivals or in any crisis period nearest agent doesn't have enough funds for cash out. Users have to travel quite a distance to get their cash when the nearest agent is deficient in cash. It's not only time-consuming but also expensive for users.

During festivals and crisis period's rural people need to travel a long way to make a payment or cash out money (A Galada & A. D Gautam,2022). During Eid or other national celebrations, the distributor of Mobile financial service providers are not available, agent points balance fallen in shortage as result users in rural areas find it difficult to withdraw large sums of money (M. T Hasan,2020).

One of the respondents uttered, "During the covid-19 crisis my brother sent me money from another city. Due to the scarcity of cash, I could not able to get money from our nearest agent. So, I had to travel 30 minutes to cash out from MBS." There is a huge scarcity of MBS branches in rural areas. It creates inconvenience for rural users because whenever local agents can't provide any solution for them, they can't reach MBS branches.

Network Problems

The mobile banking services dependent on network facility provided MNO. The MBSP have no any control on network. Thus sometimes mobile banking transaction process delayed or hampered due to wireless signals with poor coverage, or when communication is disturbed by other signals. Furthermore, a shortage of energy for mobile devices would disrupt the current financial transactions process, leaving transaction data incomplete.

Most of the respondents stated that they faced network problems when they had done the mobile banking transaction with their own account or an agent account. In this case, they need more time to complete the mobile banking transactions, or sometimes their financial transactions remain incomplete. As a result, they felt uncertain about the incomplete transaction data.

Some agents stated that network problems frequently occurred as result needed more time to completed the mobile banking transaction. Moreover, MBSP have no control over the network communication, so this problem should be minimized with cooperation of MNO. In this case Bangladesh Bank and BTRC would play intermediary role to solve the network problems.

Lack of strong cash Vault at Agents Point

Most of the agent points of this service situated at weak premises, some agents are under the open sky. The agent is vulnerable to theft because of the nature of cash transfer (K Vincent, & T Cull, 2011). Most agents in Bangladesh keep their cash on the business premises and do not have any safeguards in place to protect it, such as safes or strong rooms, making them vulnerable to theft. Since they keep huge quantities of money in their point of sale, as well as they conduct financial services in a similar manner to cashiers. But they do not follow the same security measures as bank branches, as a result the agents may be forced to transfer all or parts of e-money inventory to the robber or other party (K Vincent, & T Cull, 2011).While agents who are also merchants may find that accepting e-money as payment for goods and services reduces the need for cash on hand and therefore the risk of robbery. The agents' and MBSP contracts do not specifically clarify who is responsible for cash security. Insurance against theft or robbery of an agent's funds is not required by law.

Agents mentioned that they have to maintain sufficient liquidity to smoothly run the cash in and cash out activities. But they have no strong, safe place to keep liquidity money with them. Due to the lack of security, they kept the money at their home when closing the business. Moreover, agents are robbed on the way from business to house. Already, some of the same incidents have occurred in different parts of Bangladesh.

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The Inefficiency of Customer Care Services

Sometimes the users face problems with their MBS which cannot be solved by agents. At that time, they need help from customer care services. The agents are not competent in dealing with customers' queries and complaints. They do not know how to provide entire services to clients (M Akhtaruzzaman,et al., 2017) . The customer care services are not available at Thana level as well as the number of customer care services were small compared to total numbers mobile bank account holders and total number and volume of mobile banking transactions. Further, there are some inefficiency of customers care services for solving the customer's problems and quires timely.

Users mentioned that contact with customer care centers is very expensive and difficult. Most of the time the connection remains busy or no customer care representative receives the calls. One user claimed that customer care behaves rudely with him as he couldn't able to express his problem clearly to them. Users took a long time to connect with a customer care agent due to a lack of agents and a bad network. Another consumer reported, "After attempting for about thirty (30) minutes, I was able to speak with a customer service agent on the phone. I spoke with him for ten (10) minutes which costs me nearly twenty (20) taka. The cost is huge for me." They are even blamed for colluding with miscreants in illegal transactions through MBS in Bangladesh. Some users mentioned that there is no clear guideline about the complaining registration process and where to do that or how much time an MBS provider needs to solve those problems. Sometimes, it takes months for rural users to get any solution for their problems of MBS.

Lack of Interoperability Among MBS Providers

Another hindrance of MBS is the lack of interoperability. Almost all the respondents mentioned that the MBS features are very limited. Users can't able to send money among different MBS and they are forced to use multiple MBS to get full efficiency of MBS. The users of this service become puzzled in using different brands MBS. Most of the users use MBS of the same provider and the low willingness of the dominant MBS creates a lack of interoperability (M. K Mujeri & S. E Azam, 2018). Many foreign countries have introduced interoperability which boosted the MBS.

I can transfer money from my DBBL bank account to any other bank account, such AB bank, said one user. However, I am unable to apply the same logic to mobile financial services. Then, why should I use it?"

Statistical Analysis

In this part, the researcher has carried out statistical analysis to find out the impact of mobile banking problems on its security features. Descriptive and inferential statistics have been analyzed on the basis of user's perceptions.

Descriptive Statistics

All variables mean value in table 5.4 above the 4 out of 5. These implied that most of the respondents admitted that mobile banking transactions faces the different types of problematic risk and abuse. All variable values are normally distributed, since their kurtosis value above 2 and skewness value below the -1.5.

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Table 5. 2: Descriptive Statistics Mobile Banking Problems in Bangladesh

Problems in Mobile Banking Services in Bangladesh											
		MBP1	MBP2	MBP3	MBP4	MBP5	MBP6	MBP7	MBP8	MBP9	MBP10
N	Valid	400	400	400	400	400	400	400	400	400	400
	Missing	0	0	0	0	0	0	0	0	0	0
strongly disagree (%)		0.05	0.038	0.04	0.03	0.033	0.023	0.033	0.035	0.013	0.02
disagree (%)		6.8	7.3	8	6.8	9.5	9.8	9	9	9.8	8.3
ither agree nor disagr		0.8	1.3	1.5	2.5	2.8	2.3	2.8	0.3	1.5	3
agree(%)		58	54.5	50.8	44.5	47	49.5	44.8	51	46.3	51
strongly agree(%)		29.5	33.3	35.8	43.3	37.5	36.3	40.3	36.3	41.3	35.8
Mean		4	4.0625	4.0625	4.1825	4.06	4.0775	4.0975	4.075	4.165	4.1025
Std. Deviation		1.01245	0.9854	1.02529	0.98316	1.03638	0.98688	1.03715	1.01832	0.95133	0.94298
Skewness		-1.563	-1.531	-1.472	-1.565	-1.342	-1.335	-1.388	-1.468	-1.371	-1.377
Kurtosis		2.255	2.248	1.823	2.262	1.289	1.406	1.411	1.772	1.481	1.793

Correlation

Two tailed Pearson correlation test has been used in this study for finding correlations among variables. It showed the relationships among the dependent and independent variables which is required for conducting the regression analysis. The multicollinerity also has been tested to find out whether there is overlapping of close variables which should be excluded. Correlation analysis helps to identify the relationship between dependent variable & each independent variable. Here the dependent variable Mobile banking problems is positively related with the independent variables. This result indicates that these variables are much closer to influence the dependent variable. All the variables have correlation value of less than 0.7. It is an indication of the fact that there is no multicollinearity problem in the variable set and all the variables have their separate influence and importance.

Table 5.3: Two tailed Pearson Correlation

Two Tailed Pearson Correlation test											
	MBS	MBP1	MBP2	MBP3	MBP4	MBP5	MBP6	MBP7	MBP8	MBP9	MBP10
MBS	1.00	0.47	0.38	0.31	0.37	0.32	0.25	0.26	0.28	0.28	0.22
MBP1	0.47	1.00	0.41	0.43	0.49	0.53	0.22	0.28	0.29	0.30	0.23
MBP2	0.38	0.41	1.00	0.46	0.50	0.34	0.20	0.24	0.18	0.20	0.16
MBP3	0.31	0.43	0.46	1.00	0.59	0.40	0.29	0.24	0.30	0.27	0.28
MBP4	0.37	0.49	0.50	0.59	1.00	0.57	0.31	0.32	0.37	0.33	0.28
MBP5	0.32	0.53	0.34	0.40	0.57	1.00	0.38	0.27	0.33	0.37	0.28
MBP6	0.25	0.22	0.20	0.29	0.31	0.38	1.00	0.66	0.60	0.54	0.58
MBP7	0.26	0.28	0.24	0.24	0.32	0.27	0.66	1.00	0.67	0.64	0.64
MBP8	0.28	0.29	0.18	0.30	0.37	0.33	0.60	0.67	1.00	0.67	0.70
MBP9	0.28	0.30	0.20	0.27	0.33	0.37	0.54	0.64	0.67	1.00	0.68
MBP10	0.22	0.23	0.16	0.28	0.28	0.28	0.58	0.64	0.70	0.68	1.00

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Hypothesis Development

They found that the causes of these services decline the user's confidence and trust and made more vulnerable of mobile banking transactions (S Singh, & S, 2013). Strong security features would not ensure the secure transaction, unless reduced the causes of mobile banking problems (S. P Joshi, & M. A. S Salim, 2013). It found that causes of problems like lack of awareness, technical and, financial knowledge of users has created problems on secure mobile banking transactions. Furthermore, these problems have made weak the mobile banking strong security features (Sylvie Laforet, and Xiaoyan Li, 2005).

Ho: The causes of mobile banking problems have not made insecure the mobile banking transactions.
H1: The cause's mobile banking problems have made insecure the mobile banking transactions.

Description of The Model Summary

Here, the Value of R = 0.542 indicates that there is a high degree of positive correlation among the causes of mobile banking problems (independent variables) & insecure mobile banking transactions (dependent variables). The value of R^2 = 0.31 means that 31% variation in the dependent variables can be explained accurately by the regression model. The value of adjusted R^2 = 0.30 suggests that addition of the other independent variables couldn't make a remarkable contribution in explaining the variation in the dependent variable.

Table 5.4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.542a	0.31	0.3	0.76222

a. Predictors: (Constant), MBP1, MBP2.MBP3, MBP4, MBP5, MBP6, MBP7, MBP8, MBP9, MBP10

ANOVA Analysis

The ANOVA table 5.7 provides us the significance value of .000. Because calculated F value (8.581) is higher than critical F value at 5% significance level. This conclusion suggests that there is a substantial link between the causes of problem and secure mobile banking transactions. So, it can be said that causes of mobile banking problems are significantly negatively impacted on mobile banking secure transactions and made weaken the mobile banking strong security features. This finding supports the acceptance of the alternative hypothesis that there is insignificant relationship between the dependent and independent variables. The acceptance of the alternative hypothesis indicates the rejection of the null hypothesis.

Table 5.5: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	29.834	11	2.712	8.581	.000b
	Residual	122.643	388	0.316		
	Total	152.477	399			

a. Dependent Variable: MBS (The mobile banking strong security features.)
b. Predictors:(Constant),MBP1,MBP2.MBP3,MBP4,MBP5,MBP6,MBP7,MBP8,MBP9,MBP10

Regression Coefficient

From the following evidences it is clear that the dependent variable mobile banking security has been impeded by the independent variables of mobile banking problems. Independent variables implied that

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beta values of MBP2 (.003), MBP3 (.007), MBP4 (.005), MBP7 (.004), MBP8 (.00), and MBP10 (.009) are more sensitive for highly threaten for mobile banking security than the other ones.

Table 5.6 : Beta Coefficient

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	2.675	0.244		10.961	0		
MBP1	0.043	0.047	0.051	0.923	0.356	0.67	1.50
MBP2	0.171	0.058	0.189	2.953	0.003	0.51	1.97
MBP3	0.1	0.056	0.106	1.793	0.074	0.59	1.68
MBP4	0.092	0.048	0.12	1.932	0.054	0.54	1.86
MBP5	0.003	0.062	0.004	0.052	0.959	0.43	2.33
MBP6	0.008	0.056	0.01	0.15	0.881	0.51	1.95
MBP7	-0.097	0.048	-0.133	-2.01	0.045	0.47	2.11
MBP8	0.197	0.055	0.268	3.604	0	0.37	2.67
MBP9	0.053	0.052	0.076	1.009	0.314	0.37	2.72
MBP10	-0.05	0.05	-0.118	-1.676	0.095	0.42	2.40

CONCLUSION AND RECOMMENDATIONS

Conclusion

Strong security principles have been applied to mobile banking transaction systems in order to develop users' confidence and trust. Some sort of problem or abuse has frequently occurred in these services. Cybercrime and network hacking are common threats now. The security of personal transaction-specific information, mobile fraud and scams, and the security of MBS devices, including loss or theft, are all concerning issues in the mobile financial system. Some people in our country are not well educated. The situation has improved recently, but there are still segments of people who are staying away from standard education. They could be communicated with Bangla text messages in lieu of English texts. Then they could understand the mobile banking service's benefits and processes far better than before. Some people don't have the knowledge to use mobile banking services. Users and agents must be instilled with adequate digital financial literacy and awareness to protect themselves against fraudulent experiences.

The mobile banking service providers, wireless network service providers, and bankers must work together to provide a secure infrastructure for mobile financial transactions over cellular networks.
The mobile banking systems require data confidentiality, anti-hacker and anti-fraud security mechanisms, scalability, and efficiency to handle millions of transactions per day. Customers should be assured that if they choose to transact through mobile banking, they will be secured in all aspects. Strong security systems and digital infrastructure should be developed to keep the customer's data confidential. Dedicated laws on data protection and privacy are also required to protect consumers' data, their collection, and their usage.

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Findings

According to Mobile Financial Service regulation 2018, Bangladesh mobile banking eco -system have ensure the security its payment systems by following the security principles namely mutual authentication, authorization, integrity, privacy, and availability.

Mobile banking system created different security risks which produced an imposition on the expansion of inclusive mobile financial systems. The systemic risks, liquidity risks, and integrity problems arises in mobile banking transaction. These risks pertained to all levels of the mobile banking system's participants by identifying the security risk at the MNO level, risk at the bank level, risk at the agent level, and risk at the customer level.

Cybercrime is the dark side of the evolution of mobile device-based financial products. The top cyber security threats are malware; eavesdropping; denial of service; physical damage/theft/loss and insider abuse which created security risks in mobile banking transaction in Bangladesh.

Consumers face liquidity risks when an agent owing money is unable to complete its payment obligations on time, thereby jeopardizing the liquidity position of the recipient of funds when the funds are due, and when their agents have inadequate e-float.

Any system failure due to information technology or mechanical failure, such as intermittent energy or national communication infrastructure breakdowns, poses an operational risk.

Money laundering, terrorism financing, and other financial hazards are all potential threats to the integrity of the mobile banking payment system.

The mobile devices are easily lost, stolen, or destroyed, and users may not be able to recover information if it was erased or if they switched phones. The lost mobile devices that are not passcode-protected pose serious hazards to all mobile services.

It has been found that in the majority cases of abuse, the criminal utilizes a falsely registered mobile bank account and a fraudulent identity. Because the criminal has been using a bogus account, he or she opens the account under the fake name. Statistics from law enforcing agencies say that illegal money transaction is top on the crimes committed through mobile banking. Transaction of money for things like, drug, human trafficking, smuggling, extortion, murder, kidnapping, hundi, embezzlement, ransom, militancy and many others are abundant through mobile banking.

Based on the analysis of mobile banking related complaints and cases in this study the key causes likely lack of awareness, technological knowledge, strong cash vault at agent point, high transaction cost, complex operating system and medium of language have been identified which contributing for the security problems of mobile banking in Bangladesh.

Suggestions

Financial institutions use fraud monitoring systems to identify and prevent fraudulent activities. These systems can detect suspicious transactions and patterns and take appropriate action to prevent any fraudulent activity.

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E-ISSN: 3005-7728
Web: www.jomeri.org | Email: editor@jomeri.org
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To monitor and control the mobile financial market, the Bangladesh Bank payment department and Bangladesh financial intelligence unit should go regularly on-site and off-site visits to the agent and MBSP activity.

Financial institutions and technology providers must remain vigilant and up-to-date with the latest security technologies and protocols to ensure that users' financial information remains secure and protected.

Users must also take responsibility for their own security by using strong passwords, keeping their mobile devices up-to-date with the latest security patches, and being vigilant for phishing attempts and other malicious activities.

Financial institutions and technology providers should use various methods to prevent phishing attacks, including education and awareness programs for users, email filtering, and multi-factor authentication.

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