Article

An investigation on the behavioral intention of existing bank clients in a developing country to use mobile banking services

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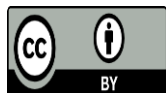
Abstract: Mobile banking has become very important in today's life as technological advancements have led bank clients to use banking services. Clients' attitudes toward mobile banking services are based on their expectations is the background of this research. So, the main objective is to observe the purposeful conduct in mind of clients to adopt mobile banking services. This study also examines the influence of six variables on financial services clients' desire to utilize mobile banking services, including perceived benefits, perceived ease of use, trust, security, perceived privacy, and technology expertise. Consequently, the goal of this study is to find out the crucial and deciding factors that may influence clients' willingness to use mobile banking features in Bangladesh as a developing country. The sample shaped for this research is 310 respondents from Bangladesh a developing country. For analytical purposes, SEM has been used to test hypotheses. The results show that in Bangladesh, factors like perceived value, security, and technological aptitude greatly determine whether a customer will utilize mobile banking. Financial institutions have proven to be successful in serving clients through mobile phones. Clients have made good use of mobile banking only to save money, cost, and labor. The research suggests that mobile banking operations must be timely and accurate, the transaction process must be short, interactivity, convenience of usage, and so on. The findings have important implications for bank regulatory authority, management, bankers, and executives who wish to increase mobile banking usage to secure their long-term profitability.

Keywords: consumer behavior; consumption; mobile banking; developing economy; technology

1. Introduction

The introduction of new technology has significantly altered how clients interact with service providers. Clients would often have to go to a physical branch to get any financial services under the retail banking industry's traditional service delivery model. The circumstances are different today (Khatun et al., 2021). Circumventing queues at the bank is just one facet of the expanding spectrum of technology-driven services considered crucial to electronic banking, with automated teller machines and mobile banking as prime example (Laukkanen, 2016). The way financial services are sold and purchased has changed as a result of the financial industry's adoption of technology (Al Khasawneh et al., 2018). The competitive environment of the financial services sector has made technology an ever more important component (Sulaiman et al., 2007). The expanded network capacity and

wireless application technologies have made it possible to install and use mobile commerce services more widely (Alshaali and Varshney, 2005).

The massive and rapid advancement of communications and information systems has boosted the utilization of innovation by both companies and individuals, which in turn has increased the use of technology as a key source of communication and providing services to the clients (Krishanan et al., 2015). Electronic devices like cell phones using by the banks in many efforts particularly banking services, marketing efforts and offering services of the banks' that entail many of the strategies which have been taken by firms and banks (Krishanan et al., 2015). One of the recent developments in sales and marketing, and service proving is the use of mobile devices (Khatun et al., 2021). It is therefore viewed as a tool of online service, which is defined as the use of interactive transmission networks to convey various services to Clients at any time that enhance service quality, quickly and timely service (Lonkani et al., 2020). As a result, a lot of companies began using digital apps to streamline their procedures and stay in continuous touch with their clients. This included banks, which began to expand the amount of digital banking they provided in line with electronic wallets. Mobile banking is a stage that serves simple and expedient entry to financial agreement information, essential monetary facts, and reports on various financial goods and services, based on consumer needs. This innovative stage for serving banking services is rapidly achieving traction in Bangladesh (Shankar and Datta, 2018). According to Bangladesh Bank, users can get mobile financial services (MFS) from 17 banks, with Bkash and Rocket for BRAC Bank and Dutch Bangla Bank being the market leader in mobile banking. Bkash of BRAC Bank and Rocket of Dutch Bangla Bank are among 17 banks that have been permitted to use MFS to provide services. According to figures from the Bangladesh Bank, the number of people using mobile banking attained a high of 53.70 million in June 2019 (Khatun et al., 2021). In Bangladesh, 27.40 million of these are calculated effective mobile banking users. Because the number of people utilizing mobile banking is increasing, banks need to devote more attention to offering high-quality mobile financial services to their consumers (Al Amin et al., 2021). It is clear average amount of people who are using cell devices in Bangladesh who use cutting-edge technology is continually increasing (Akhter et al., 2020). All banks are needed to provide their buyers with more modern technical-based monetary offerings like digital money. To taking the market and comprehend buyer attitude, financial service providers must grasp the essential components that may explain and anticipate client behavioral intention to use and accept mobile banking services. Furthermore, due to the development of this remarkable service instrument, businesses, particularly banks, will be able to quickly maintain their existing client base while also having the option of converting patrons of banks who will use their phones (Palani et al., 2012). However, from a banking managerial standpoint, not only retaining existing bank clients but also attracting new consumers is not simple. On the other hand, banks were tasked with exploring and analyzing factors that might influence bank service users' preparedness to accept mobile banking. Determining the factors that affect client's willingness to adopt mobile banking systems is the main goal of this research (Akhter et al., 2020; Gazi, 2020).

The usual way the bank processes transactions is changed by mobile banking.

Because of revolution of modern technology, the bank's clients moved in accordance with technological adaptation. When banks are closed during holidays, people move to other locations or turn to the internet to take banking services they need. Mobile banking allows them to transfer money and complete all of their tasks without having to leave the area. The more convenient digital payments allows for a shift in the nature of the banking industry based on the client's mood. Using mobile banking which is widely used by clients, banks are starting to expand their operations (Palani and Yasodha, 2012; Gazi et al., 2023).

Bangladesh is a developing country; the banking system of this country has been established on a strong basis in the last 51 years. The contribution of the banking sector to the economy of Bangladesh is undeniable. However, customers are not fully satisfied with the quality of banking services as they have not yet ensured all the amenities of modern banking system. However, the good side is that the banking sector has continued its efforts to incessantly provide technology friendly banking services. As part of that, many banks have started mobile banking services as a new dimension. In the beginning, only providing notification of deposit and withdrawal through mobile, but now the banks have made multi-dimensional in the field of mobile banking services. Current customers of Bangladeshi Banks' generally have less knowledge about technology, yet their intention to adopt mobile banking services is increasing significantly (Akhter et al., 2020; Gazi et al., 2022). And the current research on the areas of intention to adopt mobile banking services. While there are many studies in the western world on intention to adopt mobile banking services, this is a new field in the context of Bangladesh. There have been a handful of studies on the behavioral intention of customers to adopt mobile banking services in the banking sector of Bangladesh. Due to their limitations and limited number of variables and variation of variables, the present study is felt necessary and we believe that the study has a novel value.

Although there has been extensive study into the motivations of customers in the West to adopt mobile banking (Cheah et al., 2011; Sreejesh et al., 2016), no comparable studies have been conducted among Bangladesh's population. Therefore, we decided to perform a quantitative study to gauge the level of interest in mobile banking among Bangladeshi clients. So, the main goal is to observe clients' behavioral intention to utilize mobile banking services in emerging Bangladesh. This study also explores how perceived benefits, simplicity of use, trust, security, privacy, and technology knowledge affect financial services clients' propensity to usage mobile banking services. So, this research seeks to uncover key elements that may influence clients' use of mobile banking services. This study seeks to determine how clients feel about and are satisfied with mobile banking services in order to make recommendations and suggestions to bank management on how to create user-friendly mobile banking services to encourage more users to switch to e-banking channels, which benefits banks and the Bangladeshi economy.

In Bangladesh context, several studies on adopts of Internet banking services are either related private or public banking sectors, showed e-banking challenges and solutions, revealed the internet banking linkage with banking quality service performance etc. (Al Amin et al., 2021; Bhatt and Bhatt, 2016; Akhter et al., 2020). But no study was conducted to investigate the client's intention to adopt mobile

banking service toward banking sector as whole that follows or practices M-banking. Again, number of literatures has used both e-banking and online banking as a behavioral intention to adopt mobile baking in separate research model in developed country context, but none have studied on clients' behavioral intention to adopt mobile banking (M-banking) services in the developing country context. This motivates the research of the present study to fill the existing gap in the field of M-banking studies.

2. Literature review

The term mobile banking refers to the concept of having your bank on your phone via special programs provided by financial organizations such as banks or microfinance institutions. Mobile banking allows users to access and complete a variety of financial operations, allowing them to streamline their job, save time and money, minimize commuting costs, and lessen the danger of identity theft (Mujahed et al., 2020). Mobile services have become an attractive substitute for many businesses, including banking, as a result of the rapid growth of mobile phones. However, in compared to total banking transactions, the mobile banking market is still relatively tiny particularly because its adoption and usage are not thinking about the use and acceptance of mobile banking (AlSouf, 2014). The mobile banking platform offers real-time, two-way data transfer, banking, and payments for mobile, universal access to financial information and services (Mujahed et al., 2020). The financial service innovation made possible by information and communications technology is mobile banking (ICT). The two main types of mobile banking are financial-ruled models and mobile service provider led models (Bhatt and Bhatt, 2016). In the financial ruled business sketch, mere a financial buyer are permitted to use its mobile banking service and carry out various banking tasks (AlSouf, 2014). In contrast, in the mobile service provider model, clients who do not have a bank account can nevertheless conduct financial transactions through their mobile service provider (Bhatt and Bhatt, 2016). SMS financial, application-oriented, browser-based, and mobile app models are the four categories under which mobile banking services fall. Balance inquiries, mini statements, money transfers, bill payments, etc., are typical tasks that can be carried out with mobile banking (Bhatt and Bhatt, 2016). Information technology's proliferation has led to the development of more versatile and malleable gateways for payment in the banking sector; this unavoidably brings efficient banking institutions to bank clients (Boateng et al., 2016). The ability for financial institutions to bid the greatest steady and contemporary financial services to their clients has changed the way they offer services to clients (Afshan and Sharif, 2016). Modern technology has also led to the emergence of automated teller machines (ATMs), which have improved and accelerated the financial process in today's banking products (Schierz et al., 2010). ATMs ushered in the epoch of banking self-service that was nearly followed by the introduction of mobile financial services such as M-banking for commercial clients with great convenience (Susanto et al., 2013). Mobile banking has developed into one of the most sophisticated and user-responsive tools in the current banking industry by keeping up with the newest technological advancements. The operational activities of banks today have been

advanced to the next level of technical innovation thanks to this dynamic platform. The general population has increased way to their bank balances, financial transactions, and other crucial data through mobile banking at any time. Because of its simplicity of use, technological innovation, and robustness, people value mobile banking (Baptista and Oliveira, 2016). According to Afshan and Sharif (2016), mobile banking provides its goal users with much more expedient financial services ardor rather than other cost-effective systems to give monetary action by internet. Mobile banking has no time barriers or location limits due to geographical differences. The level of financial involvement among banking clients is thought to be significantly influenced by the use of mobile banking services (Abdinoor and Mbamba, 2017). The most cutting-edge type of electronic finch is mobile banking, which gives clients access to crucial and timely entry to the necessary banking services via a mobile phone or other portable electronic device while also enabling immediate communication with their banks (Al Masud et al., 2021). Initially, mobile financial services allowed clients to pay a different utility bill while also receiving important information about their bank account balance with a text messaging application on their cellphones (Laukkanen and Lauronen, 2005). Customers who use mobile banking to make transactions like money transfers, advances, withdrawals, and online payments are now given access to a wider range of financial services. Online banking includes mobile money as a special case that gives improved and additional convenience in terms of having access to financial information at any time and from any location (Hossain et al., 2021). More and more people are using smartphone banking, which means that a growing number of financial transactions can be completed offline. Mobile banking has been espoused and applied by new cohort banks and other financial institutions worldwide, making it one of the characteristics of mobile financial services that are expanding quickly (Arahita and Hatammimi, 2015). Globally, mobile banking is regarded to be among the most precious and successful financial electronic enterprise apps (Baptista and Oliveira, 2016). Mobile banking has recently received priority attention from financial officials, and work to adopt this new technology is ongoing. Financial institutions, such as banks, have shifted their branch operations direction of World Wide Web financial service offerings (e.g., the development of mobile banking operations) in reaction to the swift increase in the usage of intelligent mobile phones (Nasri and Charfeddine, 2012). Mobile banking services include checking balances, searching financial charters, transmitting treasury, paying utility notes, dealings conservatory, and guiding prefecture (Akhter et al., 2020).

This study builds a productive relationship between independent and dependent variables after developing hypotheses based on a thorough literature review i.e., behavioral intention to accept and use mobile banking. This study is organized as follows to address each different variables and their causal association to utilize a mobile banking service, research methodology, analysis, and results of the study. The next step examines the research findings and offers managerial implications for those who will provide banking services.

2.1. Hypotheses development

2.1.1. Perceived usefulness (PU)

PU is an essential concept in the technology acceptance model. It suggests that PU is the extent to which a person believes that using a particular system would improve their daily performance. Davis (1989) proposed this concept, and it has been widely used in various IT contexts to measure innovation performance for work, life, and study (Chau and Lai, 2003). In Rogers' (2003) innovation diffusion theory, PU is referred to as "relative advantage", which means the perceived superiority of innovation over its predecessor. PU significantly influences mobile banking services, which are considered an innovation in the existing payment system (Abuga and Manyange, 2015). Previous research has shown that higher PU levels can increase a customer's willingness to engage in specific behaviors, such as using mobile financial services (Raza et al., 2017; Al Khasawneh, 2015).

However, some studies examining the relationship between PU and the intention to use new technologies have shown mixed results. While some studies report significant and positive results (Pham and Ho, 2015), others do not show significant results (Li and Liu, 2014). Therefore, it is crucial to investigate the relationship between PU and the intention to use mobile banking apps, especially in developing countries where mobile banking is still emerging. The adoption of mobile banking apps is expected to provide notable customer benefits such as convenience, accessibility, and ease of use. Hence, the PU of these apps is expected to be a critical factor in determining customers' willingness to adopt them. Perceived usefulness (PU) has a greater impact on mobile banking services (Abuga and Manyange, 2015). Previous research has displayed that perceived value has a substantial influence on a client's behavior (Venkatesh et al., 2003). Several studies have displayed that a superior balance of PU can significantly raise a consumer's will to be involved in specific behaviors (Raza et al., 2017). A higher degree of perceived usefulness implies a superior balance of acceptance of mobile monetary services as mobile banking services by mobile phone users (Al Khasawneh, 2015). Perceived usefulness has been widely applied in various IT contexts. It has been used to measure innovation performance for job, life, and study, as it is a critical factor in determining the degree to which a particular system can enhance an individual's work efficiency and productivity (Chau and Lai, 2003). Davis (1989) defined perceived usefulness as the extent to which a person believes using a particular system will increase their job performance. In Rogers' (2003) innovation diffusion theory, perceived usefulness is referred to as "relative advantage," demarcated as the perceived superiority of innovation over its predecessor. In the case of mobile banking applications, perceived usefulness is an important factor to consider since it is closely related to the app's benefits to consumers. Previous studies have established the direct positive relationship between attitude and perceived usefulness (Munoz et al., 2012) and the effect of perceived usefulness on intention to use (Jeong and Yoon, 2013). However, the findings of studies examining the correlation between perceived usefulness and intention to use new technologies have been mixed, with some studies reporting substantial and positive results (Pham and Ho, 2015) and others not showing significant results (Li and Liu, 2014). Therefore, it is

crucial to investigate further the relationship between perceived usefulness and intention to use mobile banking apps, as they are still deliberating an innovation in the existing payment system. The espousal of M-banking apps is expected to provide noteworthy benefits to consumers, such as convenience, accessibility, and ease of use. Hence, the perceived usefulness of these apps is expected to be a crucial factor in determining consumers' willingness to adopt them. Consequently, the following hypothesis is put forth:

H_1: Clients' purpose to use mobile banking services is affected by the perceived usefulness (PU) of the service.

2.1.2. Perceived ease of use (PEOU)

PEOU refers to the degree to which users expect a target mechanism to be easy to use, as Davis (1989) explained. For mobile banking services, the technical characteristics of the design should be clear and user-friendly so that clients can easily learn and accept the service (Koksal, 2016). However, some elements of the mobile financial banking system may create complexity. Therefore, if the functional activities of mobile banking are perceived as basic and straightforward for usage purposes, clients' usage will be positively influenced (Agarwal and Prasad, 1998). The metric for this construct is the percentage of potential banking clients who say the service system is simple and painless (Venkatesh et al., 2003).

Research has shown that perceived ease of use is a significant factor that influences users' attitudes and intentions toward using technology. When users perceive technology as easy to use, they are more likely to have a positive attitude toward it and to adopt and continue using it. in the context of mobile applications, perceived ease of use significantly predicts users' attitudes and intentions toward using mobile social network games (Park et al., 2014) and mobile games (Ha et al., 2007). In the context of virtual communities, perceived ease of use has also been found to positively impact users' perceptions of usefulness (Hsu and Lu, 2007).

In conclusion, it is essential to design technology that is easy to use, since perceived ease of use can significantly influence users' attitudes and behaviors towards using the technology. However, it is important to note that ease of use can vary depending on the context and user characteristics. The perceived ease of use (PEU) can disclose the amount of user expectations for an easy-to-use target mechanism, according to Davis (1989). It is mentioned that the technical characteristics of mobile banking service design must be understandable and user-friendly for target clients to learn and accept the service easily (Koksal, 2016). Several elements in the mobile financial banking system's service may cause some complexities. If the functional activities of mobile banking are perceived as basic and straightforward for usage aims, clients' usage will be influenced (Agarwal and Prasad, 1998). The construct metric is the percentage of potential banking clients who say the service system is simple and painless (Venkatesh et al., 2003). Erstwhile research has established that PEOU has a necessary impact on people's willingness to use mobile banking services (Venkatesh et al., 2003; Achieng and Ingari, 2015). Perceived ease of use is a significant factor that influences users' attitudes and intentions toward using technology. Research has shown that when users perceive technology as easy to use, they are more likely to have a positive attitude toward it

and to adopt and continue using it. For example, in the context of online banking, a study by Yousafzai et al. (2005) found that perceived comfort of use was a significant prognosticator of users' attitudes towards online banking and that users who found the technology easy to use were more likely to use it in the future. Similarly, in the context of mobile applications, perceived ease of use significantly predicts users' attitudes and intentions toward using mobile social network games (Park et al., 2014) and mobile games (Ha et al., 2007). In the context of virtual communities, perceived ease of use has also been found to positively impact users' perceptions of usefulness (Hsu and Lu, 2007). Overall, these findings highlight the importance of designing technology that is easy to use, as perceived ease of use can significantly influence users' attitudes and behaviors toward using the technology. However, it is important to note that the concept of ease of use can vary depending on the context and user characteristics and should be tailored to meet the needs and preferences of specific user groups (Venkatesh and Bala, 2008). Thus, we postulate the following hypothesis:

H_2: Perceived usability influences clients' propensity to utilize mobile banking services.

2.1.3. Perceived trust (PT)

Establishing a trust mechanism is crucial because it minimizes unfavorable perceptions, skepticism, and misunderstanding among clients, hence enhancing individual adoption propensity over time (Sahoo and Pillai, 2017). Perceived trust (PT) consistently represents clients' willingness to rely on a particular act like mobile banking services (Koksal, 2016). The following three distinct features of trust are established: The ability of a certain service to complete essential work on time; the ability to deliver on its promises without lying; and the honesty in considering clients' needs in exact time (Alalwan et al., 2015). Trust is seen as a crucial concept to promote brand loyalty in the area of mobile banking (Farah et al., 2018). In a study conducted by Koksal (2016) to assess M-banking use intentions, they discovered that personal trust enhances perceptions of the security scheme of the service apps when it comes to mobile banking. These criteria are thought to be the most important predictors of consumer satisfaction. Clients' notion of trust, in particular, may promote the benefits and ideals of mobile banking by minimizing personal concerns (Alalwanet et al., 2015). Trust is a critical factor influencing users' decisions to adopt new technologies, especially in mobile banking. Research has shown that trust is a subjective disposition to believe that a specific action will occur consistent with positive assumptions (Koksal and Penez, 2015). Trust is established when users perceive a sufficient level of ability, benevolence, and integrity in a particular system (Gefen et al., 2003). Trust has an inverse association with risk and is a crucial influencer of the behavioral intention to adopt a technology (Sharma and Sharma, 2019). Increased confidence in modern technologies reduces the perceived risk associated with it, which in turn, positively influences users' behavioral intention to adopt the technology. Trust in both the banking organization and the mobile banking technology or channel is important for the widespread use of mobile banking. (Koksal and Penez, 2015). Trust in financial service providers based on their established track record or stellar image is known as institutional trust (Chiu et

al., 2016). Institutional trust is built on the history and reputation of financial service providers, which can be gained through consistent performance and reliable services. However, when introducing novel financial technology, the concept of institutional trust may not be applicable. In this case, perceptions, emotions, and irrational forces influence users' trust in the technology or channel (Kim et al., 2008). Therefore, financial service providers need to establish trust in their technology and system through various means, such as security measures, customer service, and transparency in the use of user data. Previous research has also found that prior trust is a major motivator for people to use mobile banking (Kim et al., 2008). This means that users with previous positive experiences are more apt to use mobile banking to trust and adopt the technology in the future. Therefore, financial service providers must focus on building trust and providing excellent customer experiences to encourage users to adopt new financial technology. As a result, trust plays a critical role in increasing mobile banking adoption by minimizing concerns about security and fraud-related risks for the technological founded mobile banking environment (Afshan and Sharif, 2016). Besides, one of the most important criteria in studying and assessing the progress and flourishing of mobile banking is client trust (Khasawneh, 2015). As a result, it is hypothesized:

H_3: The likelihood that clients will utilize mobile banking depends on how trustworthy they feel.

2.1.4. Perceived security (PS)

When it comes to conducting financial transactions via online or electronic channels, security is seen as a top priority. As a result, perceived security (PS) could be a significant barrier to mobile banking acceptance, as there is a risk of other dishonest parties gaining access to sensitive financial information. Any mobile banking application's security process has been demonstrated to have a beneficial influence on the personal willingness and inclination to utilize it (Changchit et al., 2017; Kalakota and Whinston, 1997; Yenisey et al., 2005; Merhi et al., 2019). This metric has been thoroughly investigated in several previous researches. In a study conducted in England, online banking usage was found to be significantly influenced favorably by perceived security (Jun and Cai, 2010). Similarly, in Lebanon, perceived security was a critical factor affecting the adoption of digital banking (Tarhini et al., 2016). Consumers must feel secure transmitting sensitive information, such as personal and financial data, over digital channels. Trust in a technology's security is critical for consumers to be confident using it. Hence, perceived security is key in influencing consumer behavior and intention to adopt technology (Sun et al., 2017). A lack of trust in a technology's security can significantly affect businesses and their customers. For example, a security breach could result in losing customers' personal and financial data, leading to reputational damage for the business and financial losses for the affected customers. Therefore, businesses must invest in security measures and regularly update them to maintain their customers' trust (Kshetri, 2018; Abdullah et al., 2023). In conclusion, perceived security is critical in influencing consumers' adoption of digital channels, such as online and mobile banking. Consumers must feel confident and secure in transmitting sensitive information over digital channels. A lack of perceived security can significantly

affect businesses and their customers. Hence, businesses should prioritize investing in strong security measures to maintain customers' trust and confidence in their services. As a result, it is hypothesized:

H$_4$: Perception of safety influences behavioral intentions to utilize mobile banking in a good way.

2.1.5. Perceived privacy (PP)

Client's willingness to use online is said to be heavily influenced by the level of secrecy they have above the online system (Sreejesh et al., 2016; Namahoot and Laohavichien, 2018). In addition, clients' propensity to set in online banking services, particularly monetary transactions are influenced based on how they view the Internet agreement's confidentiality (Zorotheos and Kafeza, 2009). Privacy has become a major ethical concern today due to the increasing reliance on electronic information. Privacy is the term used to describe the freedom to decide how personal information is collected and used with the added right to prevent unauthorized disclosure (Westin, 1967). Privacy concerns have been linked to technology adoption, with studies showing that privacy concerns hindered e-commerce use in 65% of participants (Harris, 2004). A study by Statistics Canada in 2006 found that 57% of consumers hesitated to use credit cards online, indicating the importance of privacy in online transactions. Concerns about privacy, information management, and interaction management are the three perceived requirements for privacy that were identified (Nemati, 2010). Privacy has become a significant ethical concern due to the sensitivity, value, and risks related to personal information stored electronically. Despite efforts to regulate and protect personal data, such as the Data Protection Act implemented in 1998, certain countries do not have adequate laws for regulating and protecting personal data. The 23rd session of the Universal Periodic Review Stakeholder Report indicated that Lebanon, for example, does not have laws for regulating and protecting personal data (Salisbury et al., 2001). Banks in these countries are not allowed to disclose their customers' identities or account details due to a rule known as "bank secrecy," which has been enacted in Luxembourg, Lebanon, Switzerland, and Singapore. Privacy concerns have also impacted the adoption of mobile payments. Research shows that about 65% of US poll respondents are worried about the safety of payments made via mobile devices and the possibility of hackers gaining access to their personal information (Harris, 2004). In conclusion, privacy is a crucial ethical concern that impacts technology adoption. It is important to recognize the sensitivity, value, and potential risks associated with personal information in electronic form and implement adequate measures to protect it. As a result, it is hypothesized:

H$_5$: The client's impression of privacy influences their willingness to use mobile banking.

2.1.6. Technology competency (TC)

Tippins and Sohi (2003) define technology competency (TC) as an individual's ability to use tools for managing and storing data by using ICT to handle and organize information effectively. Individuals more confident in their ability to use technology are more likely to accept and adopt technological products and services (Venkatesh and Davis, 2000). In addition, people with a greater degree of

technological competency exhibit a greater inclination to use and accept technological products and services than those with a lower confidence level in their ability to use technology (Li and Liu, 2014). Several studies have examined the connection between technology competency and the adoption of mobile banking. Yang (2010) found that individuals with a higher level of technology competency are more likely to adopt mobile banking due to their enthusiastic outlook and propensity to use technology products and services. Similarly, Zhou et al. (2010) found that technology competency positively relates to mobile banking with the purpose to use it. It has also been shown that one's level of technological competence influences their opinion of a product's usability and efficiency, key determinants of user acceptance of technology (Venkatesh and Davis, 2000). For example, those who are more tech-savvy are more apt to see mobile banking as a viable option as convenient and easy to use, positively affecting their intention to adopt the technology (Yang, 2010).

Overall, these studies suggest that technology competency plays an important role in adopting and accepting mobile banking as a convenient and easy-to-use alternative to traditional banking methods. As a result, it is hypothesized:

H_6: Clients' inclination to use mobile banking is influenced by technology competency (TC).

3. Methods and procedures

3.1. Sampling and data collection

We will go over sampling and data-gathering processes in this section. Then comes dynamic functional monitoring and reliability tests that are used to assess theories (Cheah et al., 2011). This was a quantitative and exploratory research project. It relied solely on primary data. The study has used a questionnaire to collect data random sampling strategy that is not based on chance. The survey questionnaire was issued at random to people who claimed to have a bank or mobile banking account. Whether users have any mobile bank accounts was the first question answered in the poll. If the response was no, the poll was put on hold until a replacement respondent could be found. A total of 350 people were given an online survey form to fill out. As a result, 310 replies were deemed to be legitimate, indicating a response rate of 88%. The feature of the online survey questionnaire was a pre-structured adopted manner. Emails and multiple phone calls were used to contact respondents (Kharbat and Daabes, 2021). The respondents were given access to the questionnaire from 10 June 2022, to 31 January 2023. The questionnaire took between 5 and 10 min to complete for each participant.

3.2. Measurement instruments

Items derived from available literature were used to access independent variables in this investigation. **Table 1** tabulates all of the variables. PU, PEOU, PT, PS, PP, and TC are the six independent variables employed in this research. Three to six concerns were posed by every one of these factors, all of which were tailored to the mobile banking setting. To measure the desire to use mobile banking, a total of

multiple choice questions were developed. The questionnaires for each variable in this study were adapted from previous research. All items of **Table 1** were measured on 5- a 5-point Likert scale (strongly agree-strongly disagree) ranging from strongly agree (5) agree (4) neutral (3) disagree (2) strongly disagree (1).

Table 1. Measurement of items adopted.

Constructs	Measure items		Reference
Perceived usefulness	PU1	It saves time compared to visiting a physical bank branch.	Al Ghaith (2015)
	PU2	When I go somewhere other than a bank, I typically receive superior service.	
	PU3	I can use mobile banking to conduct agreements in any condition.	
	PU4	I can conduct transactions from the convenience of my own home using mobile banking.	
Perceived ease of use	PEOU1	For me, learning how to use mobile banking is simple.	Davis (1989)
	PEOU2	I find it simple to use mobile banking to accomplish my banking goals.	
	PEOU3	My experience with mobile banking is straightforward and easy to comprehend.	
Perceived trust	PT1	Mobile banking, in my opinion, is secure.	Farah et al. (2018)
	PT2	Mobile banking, in my opinion, delivers on its promise.	
	PT3	It also protects my profile.	
Perceived security	PS1	Overall, I am not concerned about mobile banking security.	Nayak et al. (2014)
	PS2	My banks, I feel, safeguard me from illegal charges.	
	PS3	My transactions, I believe, are safe.	
Perceived privacy	PP1	I have faith that the mobile financial sector will maintain the confidentiality of my individual economic details.	Akhter et al. (2020)
	PP2	My personal banking data, I suppose, will not be disclosed via the mobile banking system.	
	PP3	Working with technology is something I enjoy doing.	
Technology competency	TC1	My ability to pick up new technology is excellent.	Akhter et al. (2020)
	TC2	I'm fascinated by new technology.	
	TC3	This technology is easier to use	
Behavioral intention	BI1	In the future, I plan to continue utilizing mobile banking.	Agarwal (1999)
	BI2	In my daily life, I will make every effort to use mobile banking.	
	BI3	I resolve to sustain to utilize mobile banking on a regular basis.	

3.3. Research model

An intentionality model for using banking apps was created using the literature search as a foundation (**Figure 1**). Mobile banking adoption in Bangladesh is influenced by the postulated constructs and assumptions listed below (Yunus, 2014).
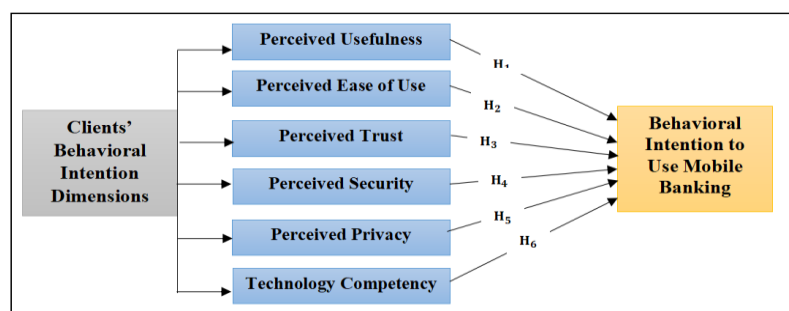

Figure 1. Research framework.

3.4. Analysis tool

Structural model and latent variable correlation were performed using the analytical program AMOS-SEM, version 24.0, to interpret the data and validate the study's hypotheses as well as the reliability and accuracy of the survey results.

4. Analysis and results

4.1. Demographic profiles of respondents

The demographic details of the poll respondents are shown in (**Table 2**) 73% of the total respondents are men, and 27% of the total are women. The age group 21–30, which accounts for 56 percent of the total, dominates the split of age groups. A total of 31% of respondents were under 20 years old. The majority of respondents (75.5) percent have a student, 16.30 percent have a job holder, and 3.2 percent have a business. The majority of respondents in this study have a basic phone (14.50 percent).

Table 2. Demographic profile of respondents.

Variables		Frequency	Percentage
Gender	Male	225	73
	Female	85	27
Age	Below 20	95	31
	21–30	174	56
	31–40	35	11
	41–60	5	1.6
	Above 60 years	1	0.4
Occupation	Student	235	75.5
	Home maker	14	5
	Business	10	3.2
	Job holder	51	16.30
Adopted item	Normal phone	45	14.50
	Smart phone	265	85.50
Monthly income	Below 10,000	169	54.50
	BDT 10,000–20,000	87	28
	BDT 21,000–30,000	43	14
	BDT 31,000–40,000	9	2.9
	BDT 40,000+	2	0.60
Mobile banking prior experience	Yes	165	54
	No	145	46

With 85.50 percent, the 3G mobile phone comes in second. The study also revealed that 46 percent of the respondents had no prior experience with mobile banking. Only 54% of them had used mobile banking services before.

4.2. Descriptive statistics

After screening for missing data and duplicated responses, we retained 310 answers for final data analysis. As shown in **Table 3**, all seven of the utilized constructions' item mean values are shown. Each construct's mean value range is presented as follows: 2.01 to 5.26, 4.01 to 4.89, 4.14 to 4.44, 2.11 to 3.09, 2.56 to 4.15, 3.03 to 3.45, and 4.11 to 4.23 with the accompanying standard deviations shown in the table. The calculated mean values show respondents generally agree with the study's prepared items. This suggests that the majority of participants express generally positive responses to the factors being measured in this research. The skewness and kurtosis were employed to check the data's normality. The normal range for skewness-kurtosis value is ± 2.58. Hence, all the items in the dataset for both samples were found to be normally distributed (i.e., < ± 2.58) (see **Table 3**). The table's skewness and kurtosis values are all within the permitted range, showing that the data were collected properly. The outcome displays the lowest and highest answer rates for each question. Cronbach's alpha values for all structures were also above the threshold of 0.7, indicating high levels of internal consistency. **Table 3** also shows the factor loading for all items was above their threshold value, which designates that the constructs have a strong internal consistency.

Table 3. Descriptive statistics (source: author calculation).

Items	$\bar{x}$	σ	Skew	Kurtosis	Min	Max	α	Loading	Overall ($\bar{x}$)	Overall (σ)
PU1	2.01	1.15	−1.01	−1.63	1.00	5.00		0.929		
PU2	2.22	1.89	−1.11	−0.26	1.00	5.00	0.961	0.947	3.11	0.2561
PU3	5.26	1.77	−1.77	−1.17	1.00	5.00		0.958		
PU4	3.45	1.82	−1.04	−1.29	2.00	5.00		0.960		
PEOU1	4.01	0.76	−1.71	−1.45	1.00	5.00		0.927		
PEOU2	4.77	1.14	−1.74	−1.22	1.00	5.00	0.963	0.966	3.29	0.2145
PEOU3	4.64	1.88	−1.13	−1.18	1.00	5.00		0.959		
PEOU4	4.89	1.19	−0.44	−1.36	1.00	5.00		0.939		
PT1	4.29	2.36	−1.88	−1.77	2.00	5.00		0.968		
PT2	4.44	1.41	−0.46	−1.43	1.00	5.00	0.962	0.948	3.55	0.3651
PT3	4.14	1.71	−0.96	−0.96	1.00	5.00		0.972		
PS1	3.09	1.86	−1.04	−0.82	1.00	5.00		0.938		
PS2	2.12	1.43	−0.13	−0.48	1.00	5.00	0.936	0.946	4.02	0.4125
PS3	2.11	0.44	−1.44	−1.25	1.00	5.00		0.935		
PP1	5.47	0.93	−0.49	−0.77	1.00	5.00		0.956		
PP2	4.15	1.90	−1.78	−1.65	2.00	5.00	0.957	0.963	4.77	0.1782
PP3	2.56	0.76	−1.59	−1.88	2.00	5.00		0.959		
TC1	3.45	1.05	−0.54	−0.78	1.00	5.00		0.907		
TC2	3.03	0.75	−1.40	−1.76	1.00	5.00	0.941	0.966	3.46	0.4265
TC3	4.01	1.68	−1.69	−1.44	1.00	5.00		0.907		
BI1	4.48	1.92	−1.78	−0.29	1.00	5.00		0.923		
BI2	4.23	1.91	−1.11	−0.79	1.00	5.00	0.950	0.979	3.22	0.3256
BI3	**4.11**	**2.91**	**−0.77**	**−0.49**	**2.00**	**5.00**		**0.956**		

4.3. Assessing measurement model

Validation of dependent and independent measures was performed using the confirmatory factor analysis approach. With a value of x^2/df = 1.327, GFI = 0.991, AGFI = 0.982, NFI = 0.987, CFI = 0.981, TLI = 0.990, SRMR = 0.025, RMSEA = 0.028, and *P*-close = 1.00, the measurement model was found to be statistically significant. The measurement model is evaluated in terms of its consistency, reliability, validity, and capacity to discriminate. Validation of the measurement model concludes the structured model and permits testing of the assumptions.

Table 4. Model fit indices.

Fit indices.	Measurement model	Cut-off point
Squared/df	1.327	≤ 3.000
GFI	0.991	≥ 0.900
AGFI	0.982	≥ 0.800
NFI	0.987	≥ 0.900
CFI	0.981	≥ 0.900
TLI	0.990	≥ 0.900
SRMR	0.025	≤ 0.100
RMSEA	0.028	≤ 0.080
P-close	1.000	≥ 0.010

All of the fit values are within the acceptable parameters. The measurement model demonstrated that the summary statistics, which reflect the probability of influencing variables, are consistent with one another (Alalwan et al., 2018) affecting the customer's intention to adopt mobile banking (see **Table 4**).

4.4. Constructs reliability and validity

Tables 5 and **6** present the results of the modeling approach. The levels' convergent validity (CR) is more than 0.70, indicating that they are internally consistent (**Table 5**).

Table 5 also shows that the apparatus has good indication accuracy because the factor loading is greater than 0.70.

To assess convergent validity, the average extracting patterns (AVE) method was employed. Since the regression model would need to explain for more than half of the variation in the indicators, the AVE is required to be greater than 0.50 (Henseler et al., 2009). Every architectural complies with these specifications, as shown in **Table 5**. The ratings for the AVE, CR, and alpha are all greater than the corresponding suggested values of 0.5, 0.7 and 0.7 (Gefen et al., 2000).

Last but not least, the square root of AVE for each construct was compared to the correlations for all constructs to assess predictive relevance (Fornell and Larcker, 1981). **Table 6** shows that the square root of AVE (in bold) is greater than the correlation between categories.

In **Table 6** we examined the variance between the variables using the AVE from each construct to show proof of construct validity among some of the constructs.

If the AVE of each concept is higher than the shared variance, it can be said that there is significant different between them (Chin, 1998). When we contrasted AVE values with associated changes (**Figure 2**), we found that the discriminant cogency of the dormant elements in our model was supported (**Table 6**).

Table 5. Factor loading and constructs reliability.

Construct	Factor	Loading	AVE	Composite reliability	Cronbach's alpha
Perceived usefulness	PU1	0.929	0.868	0.963	0.961
	PU2	0.947			
	PU3	0.958			
	PU4	0.960			
Perceived ease of use	PEOU1	0.927	0.864	0.962	0.963
	PEOU2	0.966			
	PEOU3	0.959			
	PEOU4	0.939			
Perceived trust	PT1	0.968	0.891	0.961	0.962
	PT2	0.948			
	PT3	0.972			
Perceived security	PS1	0.938	0.825	0.934	0.936
	PS2	0.946			
	PS3	0.935			
Perceived privacy	PP1	0.956	0.882	0.957	0.957
	PP2	0.963			
	PP3	0.959			
Technology competency	TC1	0.907	0.844	0.942	0.941
	TC2	0.966			
	TC3	0.907			
Behavioral Intention	BI1	0.923	0.865	0.950	0.950
	BI2	0.979			
	BI3	0.956			

Table 6. Latent variable correlation (discriminant validity).

	CR	AVE	MSV	MaxR(H)	PU	PEOU	PT	PS	PP	TC	BI
PU	0.962	0.864	0.141	0.963	0.930						
PEOU	0.963	0.868	0.141	0.964	0.376	0.932					
PT	0.957	0.882	0.073	0.958	0.241	0.262	0.939				
PS	0.961	0.891	0.102	0.961	0.275	0.319	0.270	0.944			
PP	0.950	0.865	0.066	0.957	0.226	0.236	0.257	0.229	0.930		
TC	0.942	0.844	0.076	0.950	0.229	0.273	0.237	0.275	0.213	0.918	
BI	0.934	0.825	0.100	0.937	0.295	0.317	0.225	0.313	0.232	0.212	0.908

Note: PU = Perceived usefulness, PEOU = Perceived ease of use, PT = Perceived trust, PS = Perceived security, PP = Perceived privacy, TC = Technology competency, and BI = Behavioral intension.
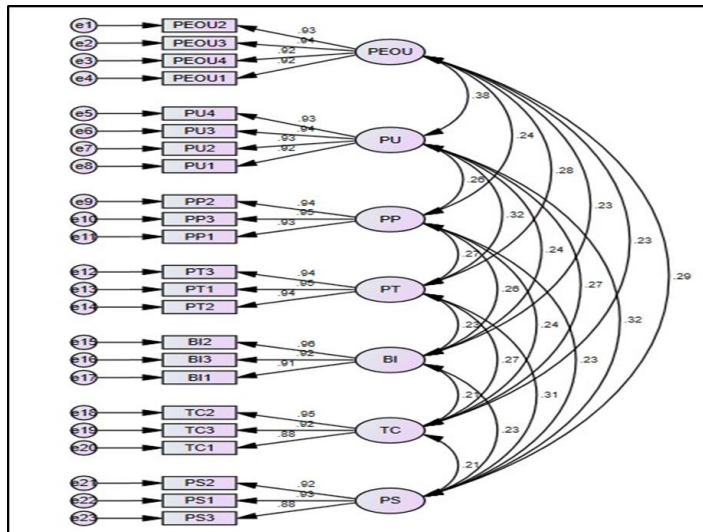
Figure 2. Measurement model.

4.5. Measuring hypotheses

The examination of regular routes served as the foundation for the analysis of the relationships between assumptions and concepts. AMOS version 24 was used to analyse all of the connections in the expected conceptual model and the path significance levels (see **Figure 3**).
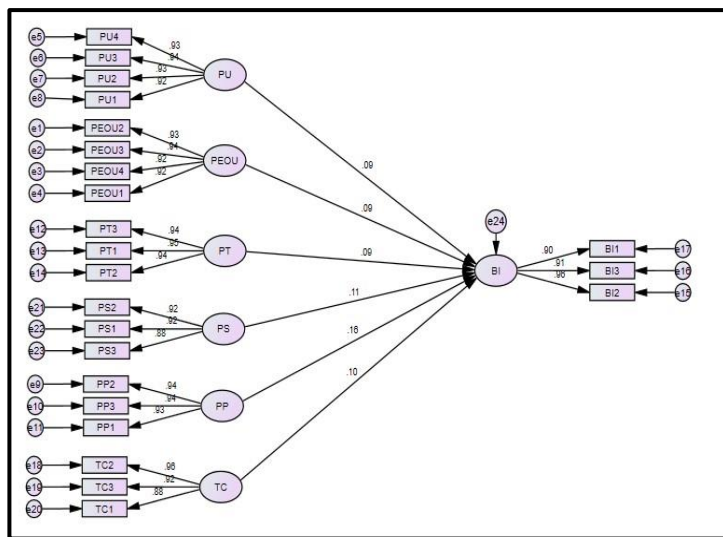

Figure 3. Structural model.

The results are summarized in **Table 7**. The structural model estimate and evaluation of the formulated hypotheses are shown in **Table 7** as a result of the AMOS-SEM study. According to the obtained *t*-values and *p*-values, whole hypotheses are received (see **Table 7**).

As can be seen in **Table 7**, a larger absolute number of *R*-square indicates a more robust relationship. The study of path coefficients reveals careful thought given to each structure's *t*-test, *p*-values, and standardized coefficients. The results of the hypothesis testing are presented in **Table 7**. However, the coefficient of all research hypotheses (H_1, H_2, H_3, H_4, H_5, H_6) were supported.

Table 7. Results of structural model.

Path	Path coefficients	R^2	*t*-value	*p*-value	Results
PU → BI	0.09	0.008	2.273	$p < 0.01$	Supported
PEOU → BI	0.09	0.008	2.262	$p < 0.01$	Supported
PT → BI	0.09	0.008	2.289	$p < 0.01$	Supported
PS → BI	0.11	0.121	4.084	$p < 0.01$	Supported
PP → BI	0.16	0.026	6.801	$p < 0.01$	Supported
TC → BI	0.10	0.010	3.887	$p < 0.01$	Supported

Note: PU = Perceived usefulness, PEOU = Perceived ease of use, PT = Perceived trust, PS = Perceived security, PP = Perceived privacy, TC = Technology competency, and BI = Behavioral intension.

5. Discussion

This study set out to investigate, quantitatively, the factors that consumers' intentions to use mobile banking services are influenced by incorporating elements from the confidence research and adapting them to the setting of mobile banking, the present study's comprehensive yet economic model considerably adds to the body of information on online client trust and internet banking. The empirical findings offered excellent support for the existing study model's explanatory capacity. The study discovered that six characteristics (perceived usefulness, perceived ease of use, perceived trust, perceived security, perceived privacy, and technology competency) direct bearing on clients' desire to switch to mobile banking. From the study finding in **Table 7** shows that, H_1 provide important insights into the factors influencing clients' willingness to adopt mobile banking. According to the results, the desire of clients or buyers to embrace mobile banking is significantly and positively impacted by perceived usefulness. The regression coefficient, denoted by the symbol *ß*, is 0.09, indicating that the desire to use mobile banking increases by 0.09 units for every one-unit increase in perceived usefulness. The *t*-value of 2.273 is statistically significant at the $p < 0.01$ level, indicating high confidence in the findings (JosephNg, 2023). This suggests that consumers are more likely to believe in mobile banking if they perceive it to be advantageous. This finding is consistent with previous research, showing that perceived usefulness is a key determinant of technology adoption. Furthermore, the results suggest that using mobile banking provides several benefits to consumers, including saving time, receiving better service, and greater convenience. These findings highlight the importance of promoting the advantages of mobile banking to potential users to encourage adoption. Overall, the Amos outcomes provide valuable insights into the factors influencing consumers' willingness to adopt mobile banking and underscore the importance of perceived usefulness in driving adoption. The H_2 in the study investigated the relationship between consumers' willingness to use mobile banking and their perceived ease of use. The results showed that these two factors are significantly and positively correlated, with a regression coefficient (*ß*) of 0.09, a *t*-value of 2.262, and a *p*-value of less than 0.01, indicating high confidence in the findings. This implies that clients who perceive mobile banking as easy to use are likelier to adopt it. In other words, the easier clients perceive it to be to use mobile banking, the more likely they are to embrace it. This finding is consistent with previous research showing that ease of use

is a critical factor in technology adoption. These results suggest that mobile banking service providers should make their platforms as user-friendly as possible to encourage wider adoption. By simplifying the user interface and enhancing the ease of use of their mobile banking applications, service providers can attract more clients and gain a competitive advantage in the market. The study's findings provide valuable insights for businesses looking to improve mobile banking services and increase user adoption. The H_3 in the study explored the relationship between consumers' perceived trust in mobile banking and their willingness to use it. The results showed that these two factors are significantly and positively correlated, with a regression coefficient (β) of 0.09, a *t*-value of 2.289, and a *p*-value of less than 0.01, indicating a high degree of confidence in the findings. This implies that consumers who perceive mobile banking as trustworthy are more likely to adopt it. In other words, perceived trust value of adopting mobile banking, the higher the likelihood of consumers embracing it. This finding confirms H_3 and is consistent with previous research highlighting the importance of trust in technology adoption. The study's findings have significant implications for mobile banking service providers. The results suggest that providers must work to enhance users' trust in their services to increase adoption rates. This can be achieved through various measures, such as providing transparent and clear communication about security protocols and data protection policies. Providing users with a reliable and robust customer support system can also help build trust and encourage greater adoption of mobile banking services. Overall, the results of this study provide valuable insights into the factors that influence consumers' willingness to adopt mobile banking and highlight the critical role of perceived trust in the adoption process. By addressing consumers' trust concerns, mobile banking service providers can increase their user base and gain a competitive advantage in the market. The study investigated the relationship between perceived security in mobile banking and consumers' behavioral intention to use it, supporting the H_4 hypothesis. The results indicated that consumers who perceive mobile banking as secure are more likely to adopt it, with a regression coefficient (β) of 0.11, a *t*-value of 4.08, and a *p*-value of less than 0.01. This finding emphasizes the importance of security in technology adoption and has significant implications for mobile banking service providers. Providers must prioritize security measures to increase users' confidence in their services and encourage greater adoption rates, such as implementing two-factor authentication and encryption protocols. By addressing these concerns, providers can increase their user base and gain a competitive advantage in the market. The study revealed that perceived privacy and technology competency have a significant positive impact on clients' intention to use mobile banking, supporting H_5 and H_6. Perceived privacy has a strong and positive relationship with behavioral intention ($\beta = 0.16$, $t = 6.801$, $p < 0.01$), indicating that clients who perceive mobile banking as privacy-protective are more likely to adopt it. Technology competency also has a positive relationship with behavioral intention ($\beta = 0.10$, $t = 3.887$, $p < 0.01$), suggesting that clients who perceive themselves as competent in using technology are more likely to adopt mobile banking. To increase their user base and gain a competitive advantage, mobile banking service providers must prioritize building trust and confidence in their privacy and security measures while providing user-friendly interfaces and

easy-to-use features to enhance users' technology competency. **Table 7** shows that the perceived utility, perceived ease of use, perceived trust, perceived privacy, perceived security and technology competency of mobile banking may be used to explain the differences in customer intention to adopt mobile banking.

6. Conclusion

In order to keep and please clients, banks must update their services as mobile banking has grown to be a crucial element that consumers now use successfully. The use of mobile banking to transmit money, cash, credit, debit, and other items enhances our understanding of consumers' behavioral intentions to utilize mobile technology. To summarize, numerous monetary organization have meanwhile inaugurated and accomplished mobile banking services in order to enlarge their shopper basis and supply more specialized monetary resolutions in order to stay competitiveness in the craft; however, the enhancement and progress of mobile banking has been closely linked to customer acceptance. Since a result, the study is critical for Bangladesh's banking business, as it allows for exceptional and insightful practical contributions. Examining the variables that affect consumers' behavioral intents to utilize mobile banking in Bangladesh is the study's aim. Out of a total of 6 variables, three perceived utility, security, and technology competency were found to be the most important in predicting clients' behavioral intention to utilize mobile banking services in Bangladesh. Despite the fact that trust, privacy and perceived ease of use not to play a large preface in meaning act purpose, mobile banking work serves will consider its parts to make their works more competitive in the market. Significantly, recognizing and taking into account the change that may influence buyer' willingness to take up mobile banking will undoubtedly aid monetary organization develop organizational goals that will rapid buyers willingness to take up and strain its extra special mobile banking service more effectively.

6.1. Implication of the study

First, we'll discuss the study's implications in this part. The limitations and future investigations were discussed before the paper's conclusion. According to this study, three traits can be used to predict whether or not clients in Bangladesh will utilization and embrace mobile banking. Since perceived usefulness influences behavioral intent to utilize and accept mobile banking, evaluating perceived usefulness has become more important. In contrast to traditional financial services, it guarantees that their services for mobile banking are more adaptive, user-friendly, and sometimes even simple. Mobile banking providers in Bangladesh are being urged to improve their security systems. In order to offer the highest level of protection to clients and entice them to use the product, mobile banking applications must be thoughtfully designed. Furthermore, when establishing a service, mobile banking providers should keep in mind that mobile banking should be user-friendly in terms of technology. As a result, service providers should customize their various marketing and promotional techniques to help consumers learn how to use the services they supply, because technological competency varies from person to person. Consumers who are not technically savvy should be given special attention.

Furthermore, banks and non-banking institutions should work together to develop stable safety factors for their mobile banking services so that it gains higher client acceptability.

6.2. Limitations and future studies

Numerous problems with this study need to be fixed. Future studies and advancements should consider these limitations. For starters, this study's empirical evidence was gathered from Bangladesh's developing economy, hence the findings may not be generalizable and inapplicable to other nationalities. Because of mobile technology acceptance and usage vary greatly among countries, with different adoption levels and attitudes. As a result, researchers may wish to increase geographical boundaries to acquire better generalizations in future studies, more studies on multi-nationalities. Second, the construct measurements are all inside this investigation were gathered concurrently. Accordingly with increased experience and advancement of mobile technology, people's opinions and motives to utilize mobile banking may alter over time as a continuous process. It is therefore recommended that a long-term study be carried out to examine the adoption of mobile banking at different phases of the decision-making procedure.

Author contributions: Conceptualization, MAIG, AAM and HH; methodology, MAIG and AAM; software, MAIG and AAM; validation, MAIG, AAM and ARbSS; formal analysis, MAIG and AAM; investigation, ARbSS and HH; resources, HH and AAM; data curation, MAIG and ARbSS; writing—MAIG and AAM; writing—review and editing, MAIG, AAM, ARbSS and HH; visualization, ARbSS; supervision, AAM; project administration, MAIG; funding acquisition, MAIG and HH. All authors have read and agreed to the published version of the manuscript.

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