

Students towards a Cashless Society through Mobile Banking: Evidence from an Emerging Country

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ABSTRACT

This study has been carried out to examine key factors influencing students' engagement in a cashless society through mobile banking apps in Bangladesh. To attain the objectives of the research, this study implements an extended Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) framework integrating two additional constructs: perceived risk and trust. The study analyzed data from 274 valid responses from private university students in Bangladesh. The proposed framework was analyzed via Structural Equation Modeling (SEM) with SmartPLS. The outcomes reflect that facilitating conditions, hedonic motivation, performance expectancy, price value, and trust are major enablers of students' behavioral intentions towards mobile banking apps. Perceived risk was found to be a significant inhibitor of their intention to use mobile banking. The findings further revealed that effort expectancy, habit, and social influence did not significantly predict students' behavioral intention to use mobile banking apps. A moderate explanatory power has been projected by the model, which explains 52.8% of the variance in behavioral intention. Findings of the research provide practical insights for banks, fintech service providers, and policymakers in designing strategies to promote mobile banking usage and expedite the shift towards a cashless society in emerging countries.

KEYWORDS: Mobile Banking, Cashless Society, Banking Services, Students, Emerging Economy

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1. Introduction

The evolution of digital financial services has contributed to a new era of a cashless society (Abdullah et al., 2020). Moreover, the advent of digital payment has enabled individuals to experience cashless technologies (Rais et al., 2022). University students represent an important user group who are more prone to use digital or cashless technologies. They provide an important population for examining digital technology adoption such as mobile banking for performing banking activities. Moreover, existing evidence indicates that digital payment systems such as mobile banking are more prevalent among students of higher education institutions (Rais et al., 2022).

Mobile banking has become an essential part of the banking sector, allowing for easier and more efficient handling of daily transactions. It has greatly changed the way customers perform their day-to-day financial operations (Riley et al., 2025). In the pre-mobile banking era, clients used to physically access the branches of banks to carry out their transactions and had to wait and get an assurance of their transaction to go through with the bank staff (Spevak et al., 2025). Over the years, information technology has significantly revolutionized the banking sector through increased efficiency in operations and delivery of service (Munira, 2025). Extensive access to the internet by the general population has also increased the usage of digital technologies (Samala et al., 2024). The banking sector has been responding to this digital transformation and, therefore, is open to technological innovations. Smartphone-based apps, also known as mobile banking apps, are one of these innovations that streamline banking operations and offer customer-driven services. The term mobile banking is used broadly to describe financial solutions that are accessed by mobile devices (through SMS, USSD, and browser-based interfaces) (Shaikh et al., 2023).

App-based banking refers to the utilization of specific apps on smartphones created by the financial institution that, in most cases, provide a more advanced, user-friendly experience due to the availability of more services and more user-friendly interfaces (Palamidovska- Sterjadovska et al., 2024; Shahid et al., 2022).

Thus, the use of apps in banking has become an essential aspect of current banking services. As a result, consumers can now check their accounts, transfer money, pay bills, and apply for loans at any time and from any location thanks to the use of banking apps. These applications are gradually becoming perceived as reliable and safe due to their implementation of the latest security measures like encryption of user data, biometric authentication, and two-factor authentication to keep the information of users safe and secure their transactions (Saprikis et al., 2022).

An earlier survey by University Grants Commission (UGC) indicated that approximately 86.62% of Bangladeshi students in higher education use smartphones (Ahmed, 2020). As a result, they tend to use various app-based services, including those promoted by banking institutions. Bangladesh Bank has been continuously designing and applying policies to encourage the institutionalization of student banking. Accordingly, banks in Bangladesh are increasingly seeking to attract the students by offering student-friendly features. An external estimate reported by Bangladesh bank suggests widespread use of mobile banking apps for a convenient banking experience among university students (Bangladesh Bank, 2023). This

implies that a substantial number of students gravitate towards mobile banking apps for their banking transactions due to their accessibility, convenience, and real-time capabilities.

Previous studies in Bangladesh have investigated mobile banking from general perspective (Haque et al., 2024, Al amin et al., 2019), undergraduates' adoption of Fintech (Sultana et al., 2023), SME entrepreneurs' cashless technology adoption (Sultana et al., 2025), and satisfaction of mobile banking from young users' perspective (Jahan & Shahria, 2022).

However, private university students' engagement toward cashless society through mobile banking app in an emerging economy like Bangladesh is still unexplored. Furthermore, prior studies regarding the effect of trust and perceived risk remain inconsistent across different contexts, suggesting the need for further research. Based on the identified gap, the study focuses on identifying the enablers and inhibitors that influence mobile banking use intention among private university students in Bangladesh by examining established UTAUT2 determinants together with trust and perceived risk.

The subsequent section of the paper is structured with a review of existing studies and reasoning for the presented hypothesis, followed by research methodology, results, and discussions. Finally, the paper concludes with the key implications and limitations with potential future research prospects.

2. Literature Review

Principal outcomes of prior studies that provided the direction of this research by emphasizing significant issues and notable gaps in knowledge, are presented in Table 1.

Table 1: Significant findings from existing literature

S/N	Author (Year)	Purpose	Significant Findings
1	Belousova and Chichkanov (2015)	Identify the impact of proposed aspects on consumers' intention in using mobile banking in Russia.	Perceived usefulness has a significant impact on this case. However, perceived efforts and perceived financial costs had significant negative relationships.
2	Munoz-Leiva et al. (2017)	To investigate the elements that influence user's recognition of mobile banking apps.	It was found that perceived ease of use significantly affects perceived usefulness and attitude. Trust exerts a positive impact on perceived ease of use. Perceived risk has a statistically insignificant negative influence on the use of such apps.
3	Tarhini et al. (2016)	To investigate the elements that can encourage or hinder Lebanon's adoption and usage of online banking.	According to the study on task-technology fit, perceived credibility, social influence, and performance expectancy had substantial effects.

S/N	Author (Year)	Purpose	Significant Findings
4	Ahmed et al. (2017)	To evaluate the important factors that dictate the perception and user inclination to embrace mobile banking in Bangladesh.	The findings explored that social influence was the powerful factor driving mobile banking adoption in Bangladesh, in succession by task characteristics, facilitating conditions, performance expectancy, task-technology fit, and technological attributes.
5	Islam et. al. (2019)	To find out the key attributes influencing customers' adoption to operate mobile banking in Bangladesh, using the UTAUT framework.	The empirical analysis revealed that effort expectancy, social influence, and facilitating conditions had a significant impact on Bangladeshis readiness to use mobile banking. However, performance expectancy did not have a meaningful influence.
6	Savić and Pešterac (2019)	To find out the impact of some key variables on the users of mobile banking services.	Performance expectancy is the strongest influence on mobile banking usage intention.
7	Rashid et al. (2021)	To investigate the variables affecting Bangladeshi consumers' intentions to g accept online banking services.	The study identified that although facilitating conditions limited users' adoption of internet banking in Bangladesh, variables such as performance expectancy, effort expectancy, social influence as well as trust significantly promoted their desire to use these services.
8	Akter et al. (2021)	To explore strong predictors that drive the utilization of internet banking in Bangladesh by expanding the UTAUT2 model to include two other constructs, perceived technological security and trust.	The uptake of internet banking is shaped by multiple determinants, including price value, hedonic motivation, trust, social influence, performance expectancy, effort expectancy, perceived technological security, as well as facilitating conditions.
9	Ivanova and Noh (2022)	To investigate mobile banking acceptance in Mongolia by applying the extended UTAUT model, which incorporates perceived trust, security, and risks.	Users' intents to use mobile banking are significantly influenced by their performance expectations, while actual usage behavior remains unaffected by perceived risk. Perceived security positively influences perceived trust, which is crucial for mobile banking usage.
10	Samartha et al. (2022)	To inspect the major elements that encourage the usage of mobile apps in India.	Authors found that effort expectancy significantly influences mobile banking application usage in India. Social influence and trust also play crucial roles in adoption.
11	Saprikis et al. (2022)	To assess the significant attributes that drive the acceptance of mobile banking apps, contrasting users with non-users.	Performance expectancy influences intention across both groups, while social influence plays a stronger role.

S/N	Author (Year)	Purpose	Significant Findings
12	Konteos et al. (2022)	To analyze the major determinants shaping mobile application adoption among retail banking customers.	The study identified innovativeness as significant for mobile banking adoption.
13	Dendrinis and Spais (2023)	To examine users' attitudes and behaviors towards mobile banking.	The research highlights that users' performance expectations influence their inclination to use such apps, with Gen X users having more faith in them than Gen Z.
14	Rofi'i et al. (2023)	To assess the elements that contribute to users' willingness to use banking apps.	Authors identified that performance expectancy, social influence, service and information quality had substantial effects, whereas effort expectancy, facilitating conditions, and system quality showed insignificant impact.
15	Emon et al. (2023)	To identify factors that affect customers' approach towards mobile banking application usage.	Perceived usefulness, ease of use, trust and security have significant impact on customers.
16	Bashir et al. (2023)	The study focuses on identifying factors influencing consumer behavior.	Performance expectancy, social influence, effort expectancy, hedonic motivation, price value, facilitating conditions affect actual use behavior and users' behavioral intention.
17	Wati et al. (2024)	To explore the attributes that impact mobile banking acceptance of customers in Indonesia.	Authors identified that performance expectancy, effort expectancy and social influence positively impact consumers' behavioral intention of mobile banking usage.
18	Mukarromah and Setyono (2024)	To study factors explaining customers' intentions in adopting banking apps.	In accordance with the research findings, performance expectancy does not affect users' behavioral intentions. While effort expectancy has a negative impact, price value, habit, and security positively influences users' behavioral intention.
19	Mensah and Khan (2024)	To observe the parameters determining the acceptance of banking apps in China.	The study identified three primary determinants shaping Chinese users' intentions to embrace banking app services such as performance expectancy, facilitating conditions as well as effort expectancy.
20	Apau et al. (2025)	To explore acceptance of banking apps through the UTAUT2 model.	Authors found that mobile banking apps were positively impacted by hedonic motivation, price value, performance expectancy, effort expectancy, social influence, facilitating conditions and habit.

Literature from 2015 to 2025 indicates that mobile banking adoption has been examined in relation to performance expectancy, effort expectancy, facilitating conditions, social influence, hedonic motivation,

price, and habit of users. In previous studies, trust has been found as a positive influencer whereas perceived risk was found to be a barrier which reduced the user's intention. The studies extensively utilized Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT) frameworks for predicting user's adoption or acceptance of mobile banking apps.

Despite extensive research on mobile banking, the findings remain inconsistent across different contexts, particularly regarding performance expectancy and effort expectancy. Moreover, recent empirical evidence from Bangladesh is limited. Previous studies focused on general customers untapping a technologically adept group, specifically students. Besides, the combined influence of trust and perceived risk has not been sufficiently examined in an integrated framework. Therefore, further investigation is needed to advance as well as authenticate the extended UTAUT2 model to understand private university students' behavioral intention to use mobile banking apps which paves the way for a cashless society in an emerging country like Bangladesh.

3. Theoretical foundation and hypothesis development

Unified Theory of Acceptance and Use of Technology (UTAUT) theoretical framework developed by Venkatesh et al. (2003) which has been widely used to find out technology adoption was further extended with three major constructs such as hedonic motivation, price value, and habit. The new framework UTAUT2 developed by Venkatesh et al. (2012) has been used globally to understand consumer behavior. The study used this UTAUT2 model incorporating two constructs reflecting an extended UTAUT2 model to discover the factors that encourage or discourage university students from using mobile banking apps in Bangladesh.

The construct trust as conceptualized by Gefen et al. (2003) has been recognized as a major factor influencing users' acceptance of technological revolutions. Inclusion of perceived risk is supported by its recognized importance in the technology adoption context, as evidenced in prior studies by Chao (2019), Tiwari (2020), and Featherman and Pavlou (2003). Table 2 outlines the rationale for the inclusion of each construct in the extended model, accompanied by a brief justification for the corresponding hypotheses based on prior research.

Table 2: Constructs and hypotheses

S/N	Constructs	Definitions and Developed Hypotheses	Results of previous studies
1	Effort Expectancy	Measures how straightforward it is to use the system (Venkatesh et al., 2003). H1: Students' behavioral intention to use mobile banking apps is positively influenced by effort expectancy.	Samartha et al. (2022), Islam et al. (2019), Rashid et al. (2021), and Mensah and Khan (2024) have found significant influence of effort expectancy on mobile banking. Rofi'i et al. (2023), Mukarromah and Setyono (2024), Tarhini et al. (2016), and Savić and Pešterac (2019) have not found any significant influence.
2	Facilitating Conditions	Facilitation conditions mean availability of technical infrastructure	Islam et al. (2019) Tarhini et al. (2016), Ahmed et al. (2017), Mensah and Khan (2024), and Savić and Pešterac

S/N	Constructs	Definitions and Developed Hypotheses	Results of previous studies
		to make it easy to use the system (Venkatesh et al., 2003). H2: Students' behavioral intention to use mobile banking apps is positively influenced by facilitating conditions.	(2019) found significant impact of facilitating conditions on banking apps usage in Bangladesh, Lebanon, China, and Serbia. Rofi'i et al. (2023) found a negative influence of this construct.
3	Habit	Habit refers to the level to which people prefer to behave in a certain way automatically (Venkatesh et al., 2003). H3: Habit positively influences students' behavioral intentions to use mobile banking apps.	Mukarromah and Setyono (2024), and Apau et al. (2025) identified that habit significantly influences users' behavioral intentions.
4	Hedonic Motivation	The excitement obtained from using a new technology (Venkatesh et al., 2012). H4: Students' behavioral intention to use mobile banking apps is positively influenced by hedonic motivation.	Apau et al. (2025), Bashir et al. (2023), found significant impact of hedonic motivation on mobile banking users. Akter et al. (2021) identified that hedonic motivation contributes to shaping the uptake of internet banking.
5	Performance Expectancy	Referring to a person's belief that using the system will help them improve their job performance (Venkatesh et al., 2003). H5: Students' behavioral intention to use mobile banking apps is positively influenced by performance expectancy.	Studies by Ivanova and Noh (2022), Saprikis et al. (2022), and Mensah and Khan (2024) found that PE influences mobile banking services. However, Mukarromah and Setyono (2024) and Islam et al. (2019) did not find the factor influencing users' behavioral intention both in Indonesia and Bangladesh.
6	Perceived Risk	Perceived risk implies the perception of an individual incurring potential negative consequences that might occur due to trying something new. H6: Students' behavioral intention to use mobile banking apps is negatively influenced by perceived risk.	Apau et al. (2025) found that perceived risk decreased mobile banking adoption intention among customers. Ivanova and Noh (2022), Belousova and Chichkanov (2015), and Munoz- Leiva et al. (2017) showed that customers' behavioral intentions are not much impacted by perceived risk.
7	Price Value	Price value is the exchange that customers make between the application's perceived benefits and the cost of using them (Venkatesh et al., 2012). H7: Price value positively influences students' behavioral intentions to use mobile banking apps.	Mukarromah and Setyono (2024), Apau et al. (2025), Bashir et al. (2023), etc. found that customers' behavioral intentions when using mobile banking are positively impacted by pricing value.

S/N	Constructs	Definitions and Developed Hypotheses	Results of previous studies
8	Social Influence	A person's belief that important individuals can shape their behavior (Venkatesh et al., 2003). H8: Students' behavioral intention to use mobile banking apps is positively influenced by social influence.	Samartha et al. (2022), Saprikis et al. (2022), Tarhini et al. (2016), and Savić and Pešterac (2019) found social influence to have a strong effect on usage of mobile banking. Belousova and Chichkanov (2015) found an insignificant impact of this construct.
9	Trust	Trust refers to the idea that the trustee would cooperate to meet the trustor's expectations without taking advantage of its weaknesses (Pavlou and Fygenson, 2006). H9: Students' behavioral intention to use mobile banking apps is positively influenced by trust.	Akter et al. (2021), Rashid et al. (2021), Apau et al. (2025), Ivanova and Noh (2022), and Samartha et al. (2022) found that trust has significant influence on users.

This study excludes the control variables from the original UTAUT2 model. The conceptual model of this study has been depicted in Figure 1.

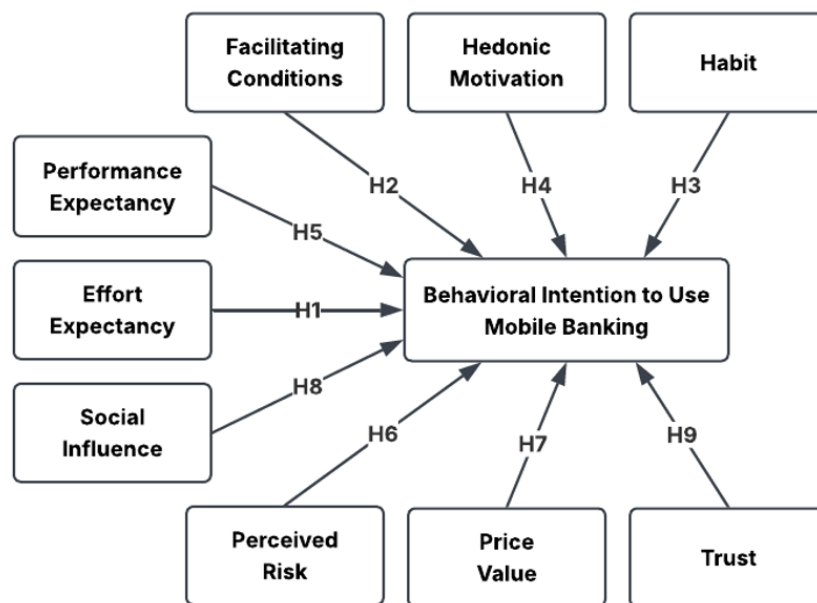


Figure 1: Research model

4. Methodology

4.1 Data Collection

Data was collected using primary and secondary sources. Secondary sources have been used to identify constructs, develop the literature review, and find the gap in our study. Primary data were collected using a structured questionnaire (refer to Appendix A) with a five-point Likert scale adapted from literature. The

measurement items were based on previously validated scales used to examine technology adoption by Venkatesh et al. (2003), Featherman and Pavlou (2003), Gefen et al. (2003), Chao (2019), and Tiwari (2020). A pre-testing was conducted by carefully distributing the questionnaire to the private university students pursuing undergraduate and graduate degrees and who use mobile banking apps prior to the final data collection to ensure readability and comprehensibility of the items. Following minor revisions, questionnaires were shared using Google Forms with the students at private universities, and responses were collected from January to March 2026.

4.2 Sample

The study focused on students from private universities as they use mobile banking services from banks and digital payment platforms for transactions which makes them an appropriate population for understanding cashless behaviour. To determine the minimum required sample size for the nine predictor variables in the model, the study employed G*Power, based on a medium effect size ($f^2 = 0.15$), an alpha level 0.05, and a statistical power of 0.80 (Faul et al., 2007). The analysis showed that a minimum of 114 respondents were required for the significant effect based on these parameters with nine predictors.

The study applied a non-probability convenience sampling approach to collect the data from private university students pursuing undergraduate and graduate degrees. Following data collection, the dataset was initially screened using descriptive statistics in SPSS to examine minimum and maximum values. Missing data were assessed through frequency analysis, and no missing responses were identified. The data were subsequently screened for engagement of the participants. Responses from non-engaged participants were found and eliminated to guarantee the quality of the data. Responses with a standard deviation less than 0.25 were excluded from further analysis in accordance with Collier's (2020) recommendations. After data screening and cleaning, 274 valid responses remained for subsequent analysis.

4.3 Data Analysis

SPSS was employed for demographic analysis and data cleaning. SmartPLS (Ringle et al., 2015) was used for model estimation as PLS-SEM is a robust approach to measure relationships between complex latent variables (Hair et al., 2022).

Table 3 shows the demographics of the respondents, with 55.11% being men and 44.89% being women. Gender distribution is quite even, with a slight male preponderance. The age distribution of the respondents indicates that 34.67% respondents belong to 18-23 age group. 32.85% respondents were from the 24-29 age group, 24.82% were from the 30-35 age group and the rest 7.66% belonged to the 36-41 age group. Therefore, the sample represents a diverse range of age groups comprised of students pursuing undergraduate and graduate degrees from private universities. Most respondents which are 50.36%, reported using banking apps 2-4 times each month, indicating moderate usage. Approximately, 30.29% users reported using the app more than seven times in a month, indicating a rising reliance on mobile banking services. In addition, 9.49% of the respondents shared that they use mobile banking apps once a month.

Additionally, 40.88% of users shared that they use banking apps for utility services, for example, bill payment, mobile top-ups, government fees, connecting with mobile financial services, etc. The distribution indicates that there is a rising demand of mobile banking for utility-related services. 37.96% users primarily use mobile banking apps for sending or receiving money, indicating reliance on mobile apps for financial transactions. The remaining 21.17% of respondents use the apps for account management services, for example, checking balances, viewing statements, and tracking transactions.

Table 3: Demographic and Mobile Banking Usage Profile

Demographic Items	Categories	Frequency	Percentage
Gender	Female	123	44.89%
	Male	151	55.11%
Age	18-23	95	34.67%
	24-29	90	32.85%
	30-35	68	24.82%
	36-41	21	7.66%
Frequency of use	Once a month	26	9.49%
	2-4 times	138	50.36%
	5-7 times	27	9.85%
	More than 7 times in a month	83	30.29%
Purpose	Fund Transfer	104	37.96%
	Account Management	58	21.17%
	Use Utilities	112	40.88%

5. Results

Prior to analysis, the dataset was examined for common method bias and multicollinearity among the constructs which is essential for getting precise results. Harman's single-factor test revealed that the first factor accounted for 30.61% of the total variance which is below the threshold of 50% (Podsakoff et al., 2003). The VIF values (Table 9) of all the constructs were less than the threshold value 5 (Hair et al., 2022) indicating that the model did not suffer from collinearity issues. These findings reflect that common method bias and collinearity were unlikely to pose significant concerns for our structural model.

The measurement model was assessed to evaluate the relationships between the latent constructs and their indicators following the established PLS-SEM guidelines (Hair et al., 2022). The validity and reliability of the items included in the study are confirmed by the measurement model. The findings are displayed in Table 4, which presents factor loadings, Cronbach's alpha, composite reliability, and average variance extracted (AVE).

Factor loadings with a minimal threshold of 0.5 are considered acceptable with a target of exceeding 0.7 (Hair et al., 2022). The factor loading in the study ranged from 0.648 to 0.908. Although a few indicators had loadings slightly below 0.70, they remained above 0.60 and were retained based on their theoretical relevance and overall measurement properties of the respective constructs. The Cronbach's alpha values for most constructs exceeded 0.70 which indicates satisfactory consistency. However, effort expectancy, facilitating conditions, and social influence had Cronbach's alpha values of 0.646, 0.654 and 0.640, respectively. According to Hinton (2004), Cronbach's alpha values between 0.50 and 0.70 can be interpreted as moderate reliability. Therefore, these three constructs demonstrated moderate reliability. The composite reliability values for most constructs were above the threshold of 0.70 (Hair et al., 2022). However, effort expectancy, facilitating conditions, and social influence had composite reliability values of 0.661, 0.668 and 0.649 respectively which were below the threshold of 0.70. These values were retained since they demonstrated acceptable indicator loadings and AVE values above 0.50.

The measurement items of the study were adopted from previously validated scales from relevant literature. Hence, the items were retained to preserve the established measurement approach of the constructs and ensure comparability with previous studies. Furthermore, the AVE for each construct exceeded the threshold value of 0.5 (Hair et al., 2022).

Table 4: Measurement Model

Constructs	Items	Loadings	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Behavioural Intention (BI)	BI1 <- BI	0.809	0.800	0.809	0.713
	BI2 <- BI	0.859			
	BI3 <- BI	0.864			
Effort Expectancy (EE)	EE1 <- EE	0.690	0.646	0.661	0.584
	EE2 <- EE	0.801			
	EE3 <- EE	0.797			
Facilitating Conditions (FC)	FC1 <- FC	0.825	0.654	0.668	0.592
	FC2 <- FC	0.779			
	FC3 <- FC	0.698			
Habit (HB)	HB1 <- HB	0.805	0.725	0.762	0.624
	HB2 <- HB	0.752			
	HB3 <- HB	0.812			
Hedonic	HM1 <- HM	0.823	0.801	0.823	0.711

Constructs	Items	Loadings	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Motivation (HM)	HM2 <- HM	0.841			
	HM3 <- HM	0.864			
Performance Expectancy (PE)	PE1 <- PE	0.810	0.702	0.711	0.624
	PE2 <- PE	0.762			
	PE3 <- PE	0.798			
Perceived Risk (PR)	PR1 <- PR	0.891	0.888	0.941	0.812
	PR2 <- PR	0.908			
	PR3 <- PR	0.905			
Price Value (PV)	PV1 <- PV	0.648	0.770	0.851	0.683
	PV2 <- PV	0.902			
	PV3 <- PV	0.904			
Social Influence (SI)	SI1 <- SI	0.714	0.640	0.649	0.579
	SI2 <- SI	0.791			
	SI3 <- SI	0.776			
Trust (TR)	TR1 <- TR	0.870	0.853	0.856	0.773
	TR2 <- TR	0.889			
	TR3 <- TR	0.878			

The study used the Heterotrait-Monotrait Ratio and the Fornell-Larcker Criterion to determine whether the constructs were empirically distinct from each other. Table 5 depicts the Heterotrait-Monotrait Ratio, which shows that all values were smaller than 0.90 (Henseler et al., 2015), showing discriminant validity between the constructs.

Table 5: Heterotrait-Monotrait Ratio

	BI	EE	FC	HB	HM	PE	PR	PV	SI	TR
BI										
EE	0.681									
FC	0.798	0.870								
HB	0.525	0.509	0.668							
HM	0.560	0.527	0.667	0.736						
PE	0.673	0.805	0.665	0.329	0.350					
PR	0.057	0.094	0.131	0.458	0.311	0.075				
PV	0.607	0.484	0.599	0.733	0.504	0.422	0.339			
SI	0.614	0.736	0.816	0.647	0.520	0.646	0.138	0.598		
TR	0.632	0.699	0.654	0.523	0.450	0.549	0.045	0.565	0.687	

The Fornell and Larcker (1981) Criterion, which requires that all diagonal values be greater than the corresponding row and column values, has been applied in Table 6 and indicates that the model satisfies the discriminant validity requirements.

Table 6: Fornell–Larcker Criterion

	BI	EE	FC	HB	HM	PE	PR	PV	SI	TR
BI	0.845									
EE	0.495	0.764								
FC	0.581	0.565	0.769							
HB	0.450	0.357	0.482	0.790						
HM	0.469	0.389	0.484	0.541	0.843					
PE	0.514	0.536	0.463	0.253	0.284	0.790				
PR	-0.024	-0.028	0.083	0.326	0.257	-0.029	0.901			
PV	0.505	0.375	0.437	0.534	0.402	0.340	0.238	0.827		
SI	0.448	0.486	0.531	0.442	0.384	0.448	0.095	0.423	0.761	
TR	0.528	0.520	0.494	0.426	0.388	0.425	0.020	0.492	0.515	0.879

Various fit indices were used to assess the suitability of the model, and they are reported in Table 8. The SRMR of 0.075 is lower than the recommended (Hair et al., 2022) and thus, a good model fit. The model yielded an NFI of 0.654 which is below the satisfactory threshold of 0.90 (Hair et al., 2022) which should be interpreted cautiously.

Table 8: Model Fit

	Saturated model	Estimated model
SRMR	0.075	0.075
NFI	0.654	0.654

To test the developed hypotheses for the study, a bootstrapping technique was used with 5,000 bootstrap samples according to the instructions of Hair et al. (2014). As all hypotheses were directional, one-tailed significance testing was employed. The output is shown in Table 9 which demonstrates meaningful explanatory and predictive properties of the structural model. The model explained 52.8% variance in behavioural intention ($R^2 = 0.528$) indicating moderate explanatory power (Hair et al., 2014). Except for effort expectancy, habit, social influence and trust, all other constructs had effect sizes (f^2) of at least 0.02, indicating small effects (Cohen, 1988) emphasizing that each construct contributes modestly to explain students' intention to use mobile banking apps. The Q^2 value of 0.355 is above 0, demonstrating predictive importance for endogenous latent variables (Geisser, 1974). Although the NFI is below the traditional 0.90 threshold, goodness-of-fit metrics are evaluated secondary to predictive capabilities in PLS-SEM (Hair et al., 2022) Hence, the model remains robust when evaluated alongside its R^2 (0.528) and Q^2 (0.355).

Table 9: Structural Model

Hypothesized Relationships	Path Coeff. (beta)	Std. Dev. (SD)	T stats	P values	VIF	R ²	f ²	Q ²	Decision
H1: EE -> BI	0.025	0.068	0.370	0.356	1.905	0.528	0.001	0.355	Not supported
H2: FC -> BI	0.216	0.075	2.898	0.002	1.973		0.05		Supported
H3: HB -> BI	0.094	0.062	1.503	0.066	1.919		0.01		Not supported
H4: HM -> BI	0.160	0.057	2.816	0.002	1.637		0.033		Supported
H5: PE -> BI	0.210	0.067	3.124	0.001	1.576		0.059		Supported
H6: PR -> BI	-0.154	0.062	2.501	0.006	1.216		0.041		Supported
H7: PV -> BI	0.192	0.058	3.292	0.001	1.687		0.046		Supported
H8: SI -> BI	-0.010	0.065	0.146	0.442	1.737		0		Not supported
H9: TR -> BI	0.130	0.072	1.817	0.035	1.802		0.02		Supported

Note: EE= Effort Expectancy, FC= Facilitating Conditions, HB=Habit, HM=Hedonic Motivation, PE=Performance Expectancy, PR=Perceived Risk, PV=Price Value, SI=Social Influence, TR=Trust

The structural model results in Table 9 shows that facilitating conditions ($\beta = 0.216$, $t = 2.898$, and $p = 0.002$), hedonic motivation ($\beta = 0.160$, $t = 2.816$, and $p = 0.002$), performance expectancy ($\beta = 0.210$, $t = 3.124$ and $p = 0.001$) and price value ($\beta = 0.192$, $t = 3.292$, and $p = 0.001$), trust ($\beta = 0.130$, $t = 1.817$, and $p = 0.035$) have a positive significant effect, and perceived risk ($\beta = -0.154$, $t = 2.501$, and $p = 0.006$) has a significant negative effect on students' behavioural intention to use mobile banking apps in Bangladesh. Hence, hypotheses H2, H4, H5, H6, H7 and H9 are supported.

On the other hand, effort expectancy ($\beta = 0.025$, $t = 0.370$, and $p = 0.356$), habit ($\beta = 0.094$, $t = 1.503$, and $p = 0.066$), social influence ($\beta = -0.010$, $t = 0.146$, and $p = 0.442$) don't have significant influence on students' behavioural intention to use mobile banking apps. Therefore, hypotheses H1, H3 and H8 are not supported. Figure 2 depicts the model's path coefficient and p values for each path.

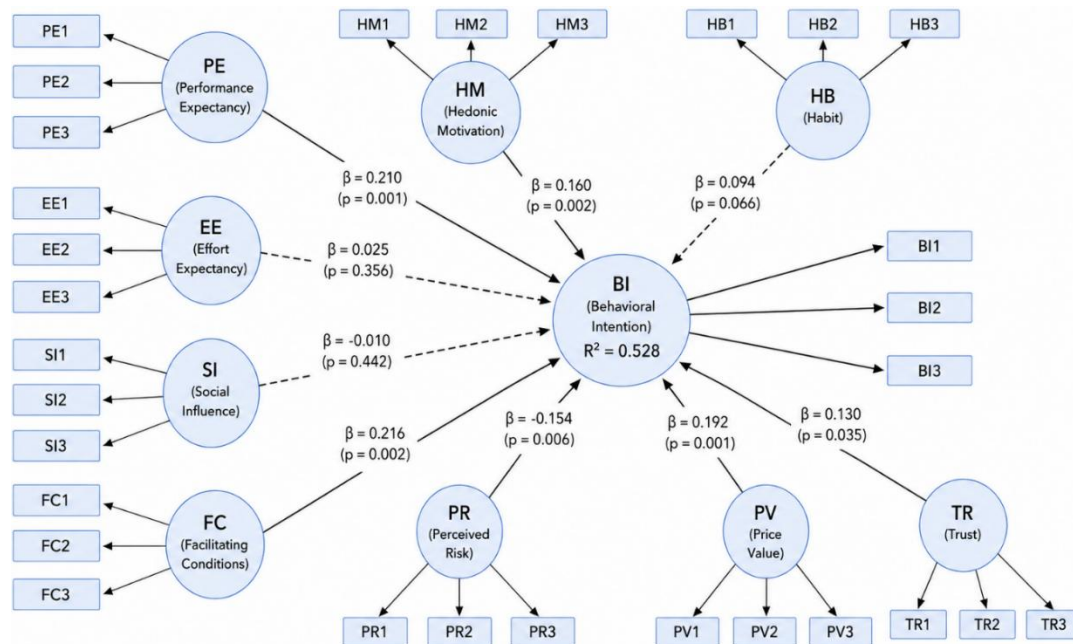


Figure 2: Research model with path co-efficient and p values

Note: Solid arrow- Supported hypothesis, Dashed arrows- Unsupported hypothesis

6. Discussion

This study examines important determinants in estimating behavioural intentions of private university students in using mobile banking apps in Bangladesh through an extended Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) model that incorporates perceived risk and trust alongside the model's original seven constructs. The results demonstrate that the extended framework explained 52.8% of the variance in behavioural intention ($R^2 = 0.528$) and exhibited acceptable predictive relevance ($Q^2 = 0.355$), confirming that the extended UTAUT2 model works well in explaining digital financial behaviour among private university students in an emerging market (Venkatesh et al., 2012; Williams et al., 2015).

Five constructs exerted a significant positive influence on behavioural intention: facilitating conditions ($\beta = 0.216$, $t = 2.898$, and $p = 0.002$), hedonic motivation ($\beta = 0.160$, $t = 2.816$, and $p = 0.002$), performance expectancy ($\beta = 0.210$, $t = 3.124$ and $p = 0.001$) and price value ($\beta = 0.192$, $t = 3.292$, and $p = 0.001$), trust ($\beta = 0.130$, $t = 1.817$, and $p = 0.035$) have a positive significant effect. Facilitating conditions emerged as the strongest predictor as it had the largest positive path coefficient ($\beta = 0.216$), closely followed by performance expectancy ($\beta = 0.210$). The result diverges from earlier UTAUT2 studies, where performance expectancy or social influence were usually the strongest factors (Tarhini et al., 2016; Savić & Pešterac, 2019).

This result makes sense for an emerging market like Bangladesh, where network reliability, transaction speed, and device compatibility are not guaranteed. In this setting, good technical and

institutional support is a basic requirement for use, not just a helpful extra (Islam et al., 2019; Ahmed et al., 2017). For students operating within Bangladesh's still-developing digital payment infrastructure, confidence in the stability of the underlying system appears to matter more than any single feature of the app itself. Performance expectancy and price value, in turn, indicate that students continue to evaluate mobile banking instrumentally, in terms of the speed, convenience, and cost-effectiveness it offers relative to traditional banking channels, while the significant hedonic motivation result shows that enjoyment also plays a role for this generation, who are accustomed to engaging with enjoyable digital experiences (Apau et al., 2025; Bashir et al., 2023; Trinh et al., 2020). Trust emerged as a significant factor which aligns with earlier research studies of Akter et al. (2021), Rashid et al. (2021), Apau et al. (2025), Ivanova and Noh (2022), and Samartha et al. (2022).

Perceived risk, the study's first contextual extension, exerted a significant negative effect on behavioural intention ($\beta = -0.154$, $t = 2.501$, and $p = 0.006$), reaffirming that concerns about data privacy, fraud, and financial loss continue to discourage usage even among digitally proficient users (Featherman & Pavlou, 2003; Apau et al., 2025). This shows that perceived risk in mobile banking is not about technical skill. It is more about confidence in the overall security system, including encryption, fraud recovery, and regulatory oversight.

In contrast, effort expectancy ($\beta = 0.025$, $t = 0.37$, and $p = 0.356$), habit ($\beta = 0.094$, $t = 1.503$, and $p = 0.066$), social influence ($\beta = -0.010$, $t = 0.146$, and $p = 0.442$) did not exert a statistically significant influence on behavioural intention; hypotheses H1, H3 and H8 are therefore not supported. These results should not be seen only as a weakness of the model. Instead, they deserve a closer explanation specific to this group of students.

The non-significant result for effort expectancy can be explained as a basic expectation rather than a real decision factor. Ease of use mattered more for groups with less digital experience (Mukarromah & Setyono, 2024). When users perceive competing applications as similarly easy to use, differences in effort expectancy may reflect limited explanatory power for behavioural intention. This interpretation should be considered cautiously as the present study did not examine the effects of age groups.

The non-significant result for social influence may be explained by how common mobile banking already is among this university students. Mobile banking apps are already being used by around 80% of the university students in Bangladesh (Bangladesh Bank, 2023). When a behaviour becomes this common within a group, social influence may simply have less power to explain remaining differences in intention. This pattern has also been seen in other studies of widely adopted technologies (Belousova & Chichkanov, 2015).

The non-significant result for habit may be explained by the type of decision measured here, which is intention rather than long-term, repeated use. It is also possible that the effects normally linked to habit are already captured within performance expectancy and hedonic motivation, rather than

acting as a separate factor (Limayem et al., 2007). A longer study period, or a sample with more established usage history, may be needed to separate habitual use from other factors.

Together, these findings give a more refined understanding of UTAUT2, rather than simply confirming it, in a digitally experienced emerging market. They suggest that as a population becomes more familiar with technology and mobile financial services, factors related to effort and social influence become less important, while factors related to value, outcomes, and infrastructure become more important. This pattern offers more than a simple confirmation that UTAUT2 works in Bangladesh. It identifies which parts of the model depend on context and which parts may stay consistent across different settings.

Finally, this study measured behavioural intention, not actual transaction behaviour. The findings should therefore be seen as a sign of students' willingness to adopt mobile banking, not as direct proof of an ongoing shift toward a cashless society. The original UTAUT model itself treats intention and actual use as separate ideas (Venkatesh et al., 2003). Turning these intentions into a measurable shift toward a cashless society will require additional infrastructure, regulation, and behavioural change that this study was not designed to measure.

7. Implications

7.1 Theoretical Implication

This study extends the UTAUT2 model beyond a simple validation exercise in a new geographic setting. By adding perceived risk and trust, and testing the extended model on private university students, the results show that not all UTAUT2 factors carry equal importance in the context of mobile banking adoption. Specifically, effort and social related factors, which are central to the original UTAUT model and carried into UTAUT2 (Venkatesh et al., 2003, 2012), become less important once ease of use becomes a basic expectation and most peers already use the technology. At the same time, infrastructure, enjoyment, and value-related factors become more important. The extended UTAUT2 model of the study yielded significant effects for both perceived risk and trust which adds substantial academic and practical value to the study of mobile banking adoption in Bangladesh.

7.2 Practical Implication

The pattern of significant and non-significant results has direct implications for how mobile banking services are designed and promoted to student users. Since facilitating conditions were the strongest predictor of intention, banks and fintech providers should focus on infrastructure reliability, network performance, app stability, and responsive customer support, rather than only minor interface updates, when trying to engage student users. The significant results for performance expectancy and price value suggest that clearly communicating practical benefits, such as faster transfers, shorter waiting times, and real-time confirmation, along with competitive and transparent fees, will appeal more to this group than general feature advertising. The significant result for hedonic motivation shows that adding enjoyable elements, such as simple design,

gamified saving features, or personalized financial tips, can further support continued use without replacing the more practical reasons for adoption. The significant result for trust shows that higher trust motivates students to adopt mobile banking for their daily transactions. At the same time, the significant negative effect of perceived risk shows that providers cannot treat security as a secondary issue. Clear, user-facing assurances, such as fraud-protection guarantees, two-factor authentication, and easy ways to report suspicious activity, are likely to do more to turn intention into actual use than additional convenience features alone.

7.3 Policy and Regulatory Implications

The findings carry implications that extend beyond individual banks and fintech providers to the broader policy environment governing Bangladesh's digital financial sector. The dominance of facilitating conditions as a driver of student intention suggests that Bangladesh Bank and telecommunications regulators have a direct role to play in ensuring the network reliability, interoperability, and uptime standards that underpin everyday mobile banking use, areas that fall outside the direct control of individual service providers. The significant inhibiting effect of perceived risk similarly points to a regulatory, rather than purely commercial, response: standardized encryption and data-protection requirements, mandatory fraud-reporting and dispute-resolution mechanisms, and public information campaigns on safe digital banking practices would address the underlying security concerns this study identifies as a barrier to adoption. The significant role of price value offers a concrete, low-cost policy lever: regulators or participating banks could consider preferential or zero-tariff transaction windows for routine, low-value student transactions such as tuition and academic fee payments, directly targeting the price sensitivity documented among the student segments. More broadly, these findings provide empirical support for Bangladesh's "Smart Bangladesh 2041" digital economy vision. Universities and educational institutions also have a role to play in this ecosystem; embedding basic digital financial literacy and cybersecurity awareness into student orientation or co-curricular programming could complement the infrastructural and regulatory measures above, particularly for students from lower-income or rural backgrounds for whom unfamiliarity with digital risk-mitigation features may otherwise widen, rather than narrow, the country's financial inclusion gap. Finally, situating these findings alongside other emerging-market mobile payment ecosystems, such as India's Unified Payments Interface (UPI) or Kenya's M-Pesa, both of which achieved rapid uptake through strong regulatory backing, interoperable infrastructure, and low transaction costs rather than feature differentiation, would allow Bangladeshi policymakers to draw on comparable international experience and would strengthen this study's relevance to an international, cross-country policy audience.

8. Limitations and Future Research

Several limitations of this study should be noted, both to explain its findings and to guide future research. The findings cannot be generalized to all Bangladeshi university students, including those at public universities. Future studies should use probability-based sampling, or a more diverse range of institutions, to improve the generalizability of results. Although age was collected and reported descriptively, age differences were not examined through control variable or multi-group

analysis. The broad age distribution of the respondents suggests that the results may vary across age groups. Further research should examine such differences using control variable or multi-group analysis.

Future research might determine whether the patterns found in this study, particularly the non-significant results for effort expectancy, social influence, habit apply more broadly or are specific to this study's sample. This study used a single, cross-sectional self-reported survey that measured behavioral intention rather than actual usage behavior. The gap between intending to use mobile banking and reducing cash transactions was not tested in this study. Future research that aims to draw conclusions about Bangladesh's shift toward a cashless society should combine intention-based surveys, like the one used here, with actual transaction data. A longitudinal study design would also help track whether stated intentions lead to long-term use, and whether habit becomes more important once students have used mobile banking for a longer period. Future studies might test whether trust works as a mediator between perceived risk and behavioral intention, or as a moderator of relationships such as performance expectancy or facilitating conditions, instead of assuming a direct effect, as this study did.

Given the limited scope of this study, future research would benefit from comparing results across countries, particularly with other emerging-market mobile payment systems such as India's UPI or Kenya's M-Pesa. This would help determine whether the importance of infrastructure, value, and risk-related factors found in this study applies to other regulatory and market conditions, or whether it is specific to Bangladesh's current stage of digital financial development. Adding qualitative or mixed method approaches in future studies would also help explain, rather than only report, why factors such as effort expectancy and social influence appear less important for this digitally experienced group, a question that this quantitative model alone cannot fully answer.

9. Conclusion

This paper examines the factors influencing the adoption of mobile banking apps among university students in Bangladesh, using the extended UTAUT2 model. Mobile banking provides numerous possibilities through which students can perform financial transactions more effectively and conveniently, facilitating financial inclusion and digital transformation, which leads to building a cashless society. As such, once mobile banking is more readily embraced by students, the digital financial ecosystem in Bangladesh will gain in terms of increased interaction with university students who are widely engaging with digital financial services. Non-probability convenience sampling was used to gather the responses of the students at private universities in Bangladesh. 274 valid responses were retained after data cleaning, which met the statistical criteria of structural equation modelling.

The results reveal that performance expectancy, facilitating conditions, hedonic motivation, perceived risk, price value and trust have a significant effect on the behavioral intentions of students

to use mobile banking apps. Performance expectancy has a significant impact on the willingness of people to adopt, and hedonic motivation and perceived price value also emphasize the importance of enjoyment and the perceived benefits in contributing to behavioral intention of usage significantly. Facilitating conditions identify the significance of resources and infrastructure in contributing to adoption, trust reflects the reliance on the system without worrying and perceived risk acts as a barrier to behavioral intention, a signal of security and privacy issues. Importantly, in contrast to the initial theoretical expectations, the empirical findings demonstrate that effort expectancy, social influence and habit are not statistically significant determinants in this context, indicating that perceived ease of use, peer influence, habitual behavior do not directly influence students' behavioral intention. This evidence reflects the actual rejected hypotheses in the structural model and avoids a static, assumption-driven narrative interpretation.

Moreover, the results indicate that the functional and value considerations are more effective factors behind the adoption of mobile banking as compared to social or habitual considerations. This suggests that students consider mobile banking apps in relation to their usefulness, affordability, and security, instead of external influence. The findings indicate that the main determinants of the adoption tendency are the facilitating conditions, the hedonic motivation, the performance expectancy, the price value and trust whereas the perceived risk plays the role of an adoption deterrent. The future work needs to be extended into other areas to incorporate other variables, which include cultural perceptions, financial literacy levels, and regulatory body impact to intensify the general explanatory strength of the model used to explain the prevalence of mobile banking.

In conclusion, to make sure that mobile banking applications are used inclusively by students, banks and fintech companies, they must center their attention on digital literacy, heightened awareness of users, robust security standards, and general inclusion policies. The latter ought to aim at resolving the interests of university students and establish confidence in the digital financial infrastructures of Bangladesh, moving toward a cashless society.

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Conflicts of Interest

The authors declare no conflict of interest.

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Appendix A

Constructs	Measurement Items	References
Performance Expectancy (PE)	PE1: I find mobile banking applications are useful in getting banking services.	Venkatesh et al. (2003)
	PE2: Mobile banking application increases my productivity in using banking services.	
	PE3: Using mobile banking application would improve the outcome of my banking services.	
Effort Expectancy (EE)	EE1: My work with mobile banking applications is clear.	Venkatesh et al. (2003)
	EE2: I can easily become skilled at using mobile banking application.	
	EE3: I find mobile banking applications are easy in getting banking services.	
Facilitating Conditions (FC)	FC1: I have the resources required to use mobile banking application.	Venkatesh et al. (2003)
	FC2: Mobile banking application fits with the other technologies I usually use.	
	FC3: I can ask for aid from others when I'm having trouble with mobile banking application.	
Social Influence (SI)	SI1: Those who impact my financial decisions recommend using mobile banking application.	Venkatesh et al. (2003)
	SI2: The use of mobile banking applications is a trend with my social and professional network.	
	SI3: My bank supports the use of mobile banking application.	
Hedonic Motivation (HM)	HM1: Mobile banking applications are fun.	Venkatesh et al. (2012)
	HM2: Mobile banking applications are enjoyable.	
	HM3: Mobile banking applications are entertaining.	
Habit (HB)	HB1: I must use mobile banking application for getting services from banks.	Venkatesh et al. (2012)
	HB2: I am addicted to using mobile banking applications to get services from banks.	
	HB3: Using mobile banking applications has become a habit for me.	
Perceived Risk (PR)	PR1: I think using mobile banking applications can put my privacy at risk.	Chao (2019)
	PR2: Using mobile banking application can expose me to overall risk.	
	PR3: Using mobile banking applications in getting banking services can lead to potential fraud.	Tiwari (2020), Featherman and Pavlou (2003)
Price Value (PV)	PV1: Using mobile banking application is reasonably priced.	Venkatesh et al. (2012)
	PV2: Using mobile banking applications is good value for money.	
	PV3: At the current price, using mobile banking application provides good value.	
Trust (TR)	TR1: From my experience, I know mobile banking applications are trustworthy.	Gefen et al. (2003)
	TR2: I know mobile banking applications provide good banking service.	
	TR3: Mobile banking applications can provide authentic banking services.	
Behavioral Intention (BI)	BI1: I intend to use mobile banking application in the future.	Venkatesh et al. (2003)
	BI2: I will always use mobile banking applications in my daily life.	
	BI3: I plan to use mobile banking applications on a regular basis.	