Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 59, no. 2, 2025, p.539-550
DOI 10.30892/gtg.59203-1435

ADOPTION OF TECHNOLOGY: CRITICAL FACTORS INFLUENCING CONSUMERS' INTENTIONS TO USE MOBILE BANKING IN SRI LANKA

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Citation: Umakanth, N., Shukri, S., Tham, J., & Khatibi, A. (2025). Adoption of technology: Critical factors influencing consumers' intentions to use mobile banking in Sri Lanka. *Geojournal of Tourism and Geosites*, 59(2), 539–550. https://doi.org/10.30892/gtg.59203-1435

Abstract: Mobile banking plays a crucial role in modern retail banking, particularly in developing countries like Sri Lanka, where financial inclusion remains a key challenge. Despite its potential to enhance convenience, accessibility, and efficiency, adoption rates have been relatively slow due to various influencing factors. This study seeks to examine the critical factors shaping consumers' behavioral intentions toward mobile banking in Sri Lanka within an evolving Financial and technological land scape. A cross-sectional Survey design as employed, gathering data from a diverse sample of bank customers to assess key determinants. The study investigates the effects of social influence, IT innovativeness, performance expectancy, effect expectancy, environmental benefits, and privacy concerns on mobile banking adoption. Structural equation modeling (SEM) was used to analyze the relationships between these factors and to test the proposed conceptual Framework. The findings indicate that social influence, IT innovativeness, and attitudes significantly and positively impact consumers' behavioral intentions toward mobile banking. However, performance expectancy, effect expectancy, environmental benefits, and privacy concerns do not exhibit significant direct effects. Notably, attitudes play a mediating role, fully mediating the impact of performance expectancy and partially mediating the influence of environmental benefits. The proposed model explains 70.32% of the variance in behavioral intentions, demonstrating a strong predictive ability and theoretical contribution. These insights provide valuable implications for financial institutions, policymakers, and technology developers seeking to improve mobile banking adoption. By addressing key drivers and barriers, targeted strategies can be developed to enhance user acceptance, trust, and engagement, ultimately fostering greater financial inclusion and digital transformation in Sri Lanka.

Keywords: mobile banking, UTAUT, consumers adoption, consumers' intentions, banks

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INTRODUCTION

M-banking has emerged as the best and most appealing network for retail bankers, particularly in developing countries. Financial services are more difficult to obtain than in advanced countries (Thusi & Maduku, 2020). The number of mobile devices is growing at an exponential rate, and mobile phones are gaining market share globally (Hayes et al., 2020). Because of advancements in information technology, improvements in internet infrastructure, and the widespread use of mobile phones, many businesses, including banks are beginning to investigate the possibility of selling their goods and services via mobile devices (Shankar et al., 2020).

Accordingly, Banks focus on M-banking practices as the competitive advantage for their market growth. M-banking is a new way to conduct all transactions and provide services using a mobile device such as a cell phone or personal digital assistant. This way of thinking represents a significant paradigm shift in financial services (Giovanis et al., 2019). Mobile banking stands out as the alternative that is the most adaptable, efficient, and cost-effective when compared to the other available choices for the provision of financial services (Rahi et al., 2021).

A key concern for financial institutions is the growing dependence of customers on mobile banking applications to acquire banking services (Jebarajakirthy & Shankar, 2021). As a result, the banking industry has implemented mobile banking to make it easier for customers to complete financial transactions using their mobile devices (Elhajjar & Ouaida, 2019). The increased level of competition in the banking industry has increased the amount of pressure on financial institutions to provide new, more technologically advanced delivery channels (Çelik & Özköse, 2023). One

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example is mobile banking, which most people consider to be the most modern way to conduct online banking (Malaquias & Hwang, 2019). M-banking is a channel through which customers can contact banks using portable electronic devices such as mobile phones to complete banking-related transactions whenever and wherever they want at a lower cost in both time and money (Khattak et al., 2023).

Mobile banking removes the physical constraints of traditional banking, allowing customers to conduct transactions whenever and wherever they want (Hassan & Wood, 2020). Despite the numerous advantages of mobile banking, it is not widely used by retail customers, particularly in developing countries (Shankar et al., 2020). Despite this, mobile banking is still in its infancy in terms of widespread adoption. The concept merits further investigation, particularly in developing countries that have been slow to adopt technological advances (Tsindeliani et al., 2021).

The research on consumers' adoption of M-banking mainly focused on advanced countries. Scholars revealed that the introduction of m-banking has revolutionized the banking industry, providing consumers with the convenience and flexibility to carry out transactions from anywhere at any time (Juma et al., 2022) Despite the potential benefits, the adoption of m- banking among consumers in emerging countries has been relatively low (Finkelstein et al., 2022). Studies revealed that factors such as lack of trust, security concerns, and limited technological infrastructure are some of the barriers hindering the widespread adoption of m-banking in emerging markets (Garg et al., 2023).

The low adoption of m-banking in emerging countries presents a significant gap in the literature, especially as these markets represent a massive potential for growth and development (Dissanayake et al., 2023). Understanding consumers' adoption behavior towards m-banking in emerging countries is crucial in identifying the factors that drive or inhibit the adoption process (Dissanayake et al., 2023). Thus, this study aims to investigate the consumers' adoption of m-banking in emerging countrylike Sri Lanka. The findings of this study provide valuable insights for banks and policymakers to enhance the adoption of m-banking in emerging markets (Finkelstein-Shapiro et al., 2022).

REVIEW OF LITERATURE

1. Underpinning Theory

Several theories have shed light on consumer adoption and use of new technologies such as Theory of Planned Behavior (TPB), Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT) and the UTAUT2 (Elhajjar & Ouaida, 2019).

UTAUT2 is considered as a thorough framework that elucidates the elements that impact people's willingness and utilization of technology (Finkelstein-Shapiro et al., 2022). It expands on the UTAUT1 framework by adding four new components: performance expectancy, effort expectancy, social influence, and facilitating conditions. Performance expectancy determines the extent to which users believe that using the technology will improve their work performance (Kitsios et al., 2021). Effort expectancy measures the perceived simplicity of using the technology. Social influence quantifies the impact of social networks on an individual's utilization of the technology (Balyuk & Davydenko, 2023).

Facilitating conditions assesses the availability of resources and assistance in using the technology (Thusi & Maduku, 2020). UTAUT2 model is a widely accepted model that aims to understand and explain individual's intentions to adopt and use technology Despite this, it has faced criticism for failing to incorporate certain key factors such as privacy concerns, personal innovativeness in IT and environmental benefits, that are known to impact technology adoption (Giovanis et al., 2019). For instance, privacy concerns are becoming increasingly important in the digital age, as individuals become more aware of data breaches and potential privacy violations (Zhu & Jin, 2023). Similarly, personal innovativeness in IT refers to an individual's willingness and ability to try new and innovative technologies (Finkelstein-Shapiro et al., 2022).

Some people are naturally more inclined towards innovation and may be more likely to adopt new technologies earlier than others (Ullah et al., 2022). Lastly, environmental benefits associated with IT refer to the positive impact that technology can have on the environment, such as reducing carbon emissions through sustainable technology (Koroleva & Kudryavtseva, 2020). These key factors can affect individuals' intentions and willingness to adopt new technology. Despite this, UTAUT2 does not explicitly account for them (Chouykaew et al., 2024).

To bridge this gap, this study incorporates the variables such as privacy concerns, personal innovativeness in IT (Ashraf & Varela-Neira, 2022), and environmental benefits associated with IT into the comprehensive framework of M-Banking adoption. Several key theories have illuminated the factors influencing consumer adoption and use of new technologies, including the Theory of Planned Behavior (TPB), Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), and UTAUT2 (Elhajjar & Ouaida, 2019).

Among these, UTAUT2 stands out as a robust framework that elucidates the elements impacting individuals' willingness to adopt and utilize technology (Raza et al., 2017). It expands on the original UTAUT framework by incorporating four additional components: performance expectancy, effort expectancy, social influence, and facilitating conditions.

- Performance expectancy reflects users' belief that using the technology will enhance their performance.
- Effort expectancy assesses the perceived ease of using the technology.
- Social influence gauges the effect of social networks on technology use.
- Facilitating conditions evaluate the availability of resources and support for using the technology (Thusi & Maduku, 2020). Despite its widespread acceptance, the UTAUT2 model has faced criticism for neglecting several critical factors that can influence technology adoption, including privacy concerns, personal innovativeness in IT, and environmental benefits (Giovanis et al., 2019).

1. Privacy concerns have gained prominence in the digital era, where individuals are increasingly aware of data breaches and privacy violations.

2. Personal innovativeness in IT refers to an individual's propensity to embrace new technologies, with some users being naturally more inclined to adopt innovations earlier than others (Mullan et al., 2017).
3. Environmental benefits associated with technology, such as reducing carbon emissions through sustainable practices, also play a role in influencing adoption decisions (Venkatesh et al., 2003).

Based on the above facts, we have formulated the following hypotheses.

General Objective

To investigate the factors influencing the behavioral intents to adopt M - banking in the Sri Lankan context.

Specific Objectives

1. To examine the influence of Performance Expectancy (PE), Effort Expectancy (EE), and Social Influences (SI) on the behavioral intents to adopt M - banking in the Sri Lankan context.
2. To examine the influence of Privacy Concerns (PC), Personal Innovativeness (PI), and Eco-Benefits (EB) on the behavioral intents to adopt M - banking in the Sri Lankan context.
3. To examine the influence of Attitude (ATT) towards M - banking on the behavioral intents to adopt M - banking in the Sri Lankan context
4. To examine the mediating effect of attitude toward M - banking on the relationship between various factors (Performance Expectancy, Effort Expectancy, Social Influence, Personal innovativeness, Privacy Concerns, and Eco-Benefits) and the behavioral intents to adopt M - banking in the Sri Lankan context

Research Questions

1. Do Performance Expectancy (PE), Effort Expectancy (EE), and Social Influences (SI) influence the behavioral intents to adopt M - banking in the Sri Lankan context?
2. Do Privacy Concerns (PC), Personal Innovativeness (PI), and Eco-Benefits (EB) influence the behavioral intents to adopt M - banking in the Sri Lankan context?
3. Does attitude towards M - banking (ATT) influence the behavioral intents to adopt M - banking in the Sri Lankan context?
4. Does attitude toward M - banking mediate the relationship between various factors (performance expectancy, effort expectancy, social influence, environmental benefits, personal innovativeness, and privacy concerns) and behavioral intents to adopt M - banking in the Sri Lankan context?

Based on the above facts, have formulated the following hypotheses.

H1. Performance expectancy positively influences the behavioural intention to adopt mobile banking.
H2. Effort expectancy positively influences the behavioural intention to adopt mobile banking.
H3. Social influence positively influences the behavioural intention to adopt mobile banking.
H4. Environmental behaviour positively influences the behavioural intention to adopt mobile banking.
H5. Privacy concerns negatively influence the behavioural intention to adopt mobile banking.
H6. Personal innovativeness in IT positively influences the behavioural intention to adopt mobile banking.
H7. Attitude positively influences the behavioural intention to adopt mobile banking.
H8. Attitude towards using mobile banking mediates the association between a) performance expectancy, b) effort expectancy, c) social influence, d) privacy concern, e) personal innovativeness in IT, f) eco-friendliness; and behavioural intention towards mobile banking.

METHODS OF STUDY

Research design

This study employed a casual research approach within a conclusive research design to systematically and effectively address the research questions. The focus of the study is on the factors that influence mobile banking adoption, requiring quantitative data to determine causal relationships between variables. Therefore, a cross-sectional survey strategy was deemed most suitable for this study, as it allows for the collection of data from a diverse sample at a single point in time, facilitating the analysis of relationships among the variables of interest.

1. Context of the Study

The study's context is centered on **banking consumers in Sri Lanka who hold accounts with licensed commercial banks.** To ensure that data was collected from customers who were familiar with their bank's mobile banking services, the researcher asked three screening questions. "Do you have a mobile phone? , "Have a bank account?" and "If yes, "Do you have any awareness related to Mobile Banking?". To enhance comprehension, an outline of various mobile banking activities provided by banks was added, along with examples for each activity. Only respondents who met our screening criteria were considered to proceed with the rest of the survey. Questions were posed regarding customers' educational level, employment position, and employment status to confirm their usage of technology, particularly related to mobile phones. To verify the usability of the technology, respondents were inquired about their educational backgrounds. The educational background section was divided into four categories: G.C.E. (O/L) and below, G.C.E. (A/L),Graduate, and Postgraduate or higher. In this survey, the distribution of respondents based on their educational backgrounds is as follows: 36% Graduates, 25% G.C.E. (A/L), 19% Post Graduates, and 20% below GCE O/L.

2. Sample and survey design

The sample for this study consisted of banking consumers who held accounts with licensed commercial banks in Sri Lanka. To ensure that data was collected from customers who were familiar with their bank's mobile banking services, the researcher asked three screening questions.

"Do you have a mobile phone? "Have a bank account?" and "If yes, "Do you have any awareness related to Mobile Banking?". To enhance comprehension, an outline of various mobile banking activities provided by banks was added, along with examples for each activity. Only respondents who met our screening criteria were considered to proceed with the rest of the survey. Questions were posed regarding customers' educational level, employment position, and employment status to confirm their usage of technology, particularly related to mobile phones. To verify the usability of the technology, respondents were inquired about their educational backgrounds. The educational background section was divided into four categories: G.C.E. (O/L) and below, G.C.E. (A/L), Graduate, and Postgraduate or higher. In this survey, the distribution of respondents based on their educational backgrounds is as follows: 36% Graduates, 25% G.C.E. (A/L), 19% Post Graduates, and 20% below GCE O/L. The distribution is presented in Table 1.

Table1. Summary of Personal Demographic Profile in the Study (n = 345)

Description	Frequency	Percentage
Gender		
Male	189	54.8
Female	156	45.2
Civil Status		
Married	149	43.2
Unmarried	196	56.8
Age		
18-30	210	60.9
31-45	99	28.7
46-60	35	10.1
Above 60	1	0.3
Family Size		
1-3	102	29.6
4-6	219	63.5
Seven and above	24	7.0
Educational Level		
GCE (O/L)	2	0.6
GCE (A/L)	106	30.7
Graduate	137	39.7
Post Graduate OR Higher	100	29
Employment Status		
Studying	116	19.7
Unemployment	14	4.1
Government sector	91	26.4
Semi-government Sector	47	13.6
Private Sector	68	33.6
Self-employed	9	2.6
Employment Position		
Executive Level	40	11.6
Managerial Level	27	7.8
Administrative Level	98	28.4
Clerical Level	19	5.5
Office Assistant	15	4.3
Academic	107	31.0
Professional	21	6.1
Nil	18	5.2
Monthly Income		
Below 50,000	177	51.3
50,000 - 80,000	77	22.3
80,001 - 110,000	36	10.4
110,001 - 140,000	13	3.8
140,001 - 170,000	13	3.8
170,001 - 200,000	11	3.2
Above 200,000	18	5.2

In the selection of respondents in Sri Lanka, a comprehensive process was employed. The survey encompassed all nine provinces of the country, with smaller sampling areas identified within each province based on administration districts. To ensure a representative sample, a thorough population analysis was conducted, considering factors such as population size, as well as age and gender distribution within each final sampling area. The creation of a representative respondent group was achieved through convenience sampling, strategically addressing population, age, gender, and

familiarity factors. The methods of contact involved various approaches, including direct interaction through personal contacts of the researchers, approaching targeted respondents at bank branches, utilizing the assistance of bank staff for direct contact, and engaging with respondents at their workplaces, which included bank customers, university students, teachers, and other public and private employees in Sri Lanka. By employing these methods, a convenience sample of Sri Lankan individuals with bank accounts was successfully reached for the survey.

3. Development of survey measures and instruments

The survey instrument used in this study included items sourced from validated scales, while also considering their relevance to the specific context of the study. To assess the suitability of the instrument, a panel of specialists, including three academics specializing in Business Technology Management disciplines and two senior professionals with extensive experience in mobile banking operations, was formed. This evaluation process helped ensure the quality and appropriateness of the research instrument. The study utilized a structured questionnaire comprising pre-defined closed questions based on documented measures. The survey instrument was organized into two main sections. Section one provides information about the survey to the respondents. It includes a question regarding their consent to participate in the survey. Additionally, it aims to collect information regarding the personal demographic characteristics of the respondents. Section Two is designed to gather information about consumers' behavioral intentions. It focuses on understanding their intentions and preferences related to certain behaviors or actions.

The survey was designed using a closed-ended questionnaire that employed a five-point Likert scale, ranging from strongly disagree to strongly agree. The Likert scale is a widely used psychometric measuring tool in survey research, allowing respondents to indicate their level of agreement with specific statements. It was chosen for the survey questions as it facilitates the measurement of constructs such as satisfaction, which is a psychometric variable, as well as other perceptual measures in the model. Likert scales, along with other attitudinal scales, provide insights into people's attitudes, preferences, and subjective reactions, thus aiding in the design of systems and understanding emotional and preferential responses. The measurement items for each dimension along with relevant literature sources were documented in appendix.

Criteria for Selecting Respondents: Participants were selected based on specific criteria to ensure familiarity with mobile banking services. The criteria included: Total Number of Respondents: 345

1. Age: Respondents had to be 18 years or older.
2. Ownership: Each respondent needed to possess a mobile phone.
3. Bank Account: Respondents were required to have an active account with a licensed commercial bank in Sri Lanka.
4. Awareness: Participants must have a basic understanding of mobile banking services.

4. Pilot Study

To ensure the internal consistency of the study's measures, a pilot test was conducted with bank customers. This involved using statistical techniques such as Cronbach's alpha and item-total correlation analysis to assess the reliability of measurement scales. The midpoint was excluded from the Likert scale based on previous considerations. The pilot test involved 38 bank customers and aimed to evaluate the consistency and coherence of the measurement scales. Cronbach's alpha, which measures how closely related a set of items are, was used to estimate the reliability of the scale. A Cronbach's alpha value above 0.70 is generally considered acceptable for research purposes, and in this study, the coefficient for the constructs exceeded 0.8, indicating acceptable internal consistency.

Researchers also made modifications to certain words in the survey based on feedback from the pilot study participants to ensure ease of response. The survey was conducted in Tamil and English, with respondents given the option to choose their preferred language. To ensure consistency between the two languages, bilingual researchers used a translation and back-translation method.

DATA ANALYSIS

1. Analysis approach

In this study, the researchers used the partial least squares (PLS) technique, which is a variance-based structural equation modelling (SEM) method, to test the hypotheses. PLS was chosen because it is suitable for analyzing complex associations and predicting variance in key target dimensions. The researchers used the Smart PLS 4.0 tool to conduct the PLS-SEM analysis, which consisted of the measurement model and the structural model. The measurement model assessed the reliability and validity of the indicators and constructs, while the structural model examined the relationships between the constructs and tested the hypothesized paths. The researchers used this approach to comprehensively analyze the associations and explain the variance in the dimensions of interest.

2. Common method bias

To address common method bias (CMB), both statistical and procedural solutions were implemented. One statistical solution was Harman's single-factor test, which checks whether a single factor explains most of the variation in the measured variables, indicating potential bias. The researchers conducted this test and found that no single component emerged, suggesting that CMB is not a concern. In addition to statistical measures, procedural safeguards were implemented, such as assuring respondents of confidentiality and anonymity, emphasizing the importance of genuine responses, and allowing participants to discontinue the survey if desired. By considering both statistical and procedural measures, the researchers addressed the potential issue of CMB.

3. Assessment of the measurement model

The conceptual model used in this study consists of reflective measurement models, and the criteria for evaluating these models are summarized in Table 2. The researchers ensured that all the requirements for model evaluation were met, indicating strong reliability and convergent validity of the model. Table 2 shows that each independent variable's factor loading, Cronbach's alpha, and composite reliability values were above 0.7. These values indicate that the measurement indicators effectively capture and assess each construct (Hair et al., 2013).

Table 2. Summary of the measurement model

Construct	Statements	Factor Loading
Performance Expectancy (PE) α= .920, CR =.925, AVE =.758	Using mobile banking services can save time for me.	0.883
	Mobile banking allows me to conduct transactions at my convenience.	0.884
	Using mobile banking enables me to accomplish tasks more quickly.	0.824
	I believe that using mobile banking will improve my performance	0.859
	I think mobile banking helps me to carry the banking-related tasks effectively	0.902
Effort Expectancy (EE) α= .946, CR = .947, AVE = .823	I would find the mobile banking system easy to use	0.922
	It would be easy for me to become skillful at using mobile banking	0.912
	Registering a mobile banking service is easy for me	0.921
	Learning to operate the mobile banking system is easy for me	0.893
	My interaction with the system would be clear and understandable	0.886
Social Influence (SI) α=.877, CR=.883, AVE=.669	Many people in my life believe I should use mobile banking	0.779
	People who are important to me think that I should use the mobile banking system	0.818
	The bank's staff members have been helpful in the use of the mobile banking system.	0.828
	In general, the bank has supported using the mobile banking system.	0.838
	Mobile banking enables me to maintain a professional image	0.824
Environmental Benefits (EB) α=.937, CR=.937, AVE=.798	The usage of mobile banking reduces consumers' travels	0.913
	The usage of mobile banking is considered the environmentally sensitive practice	0.893
	The usage of mobile banking reduces paper works	0.916
	The usage of mobile banking reduces the energy consumption of bank	0.886
	Overall, usage of mobile banking minimizes the Co_2 emission levels	0.858
Privacy Concern (PC), α=.891, CR=.914, AVE=.639	Disclosure of my personal information to banks irritates me	0.795
	I am concerned that others may continuously track my current location	0.851
	Banks are gathering an excessive amount of data about me	0.856
	Banks may not keep my private information in a secure way	0.766
	My data can be misused by banks employees	0.720
	I believe that the most critical issue affecting mobile banking is privacy	0.799
Personnel Innovativeness in IT (PI) α=.932, CR=.945, AVE = .788	I am always interested in new technology	0.914
	I frequently look for new information technology	0.930
	If I heard about new information technology, I would try it out.	0.921
	Among my peers, I am the first to adopt new information technology.	0.757
	I am always accepting of new information technologies	0.906
Attitude toward using mobile banking (AT) α=.946, CR=.948, AVE=.824	Using mobile banking is pleasant	0.911
	Mobile banking is desirable	0.882
	Using mobile banking is an advisable move	0.912
	Mobile banking is advantageous for me	0.923
	Mobile banking is an excellent fit for my personality.	0.909
Behavioural Intention (BI) α= .956, CR=.956, AVE=.850	I plan to utilize mobile banking services in the future	0.925
	I believe my interest in mobile banking will increase in the future	0.911
	I plan to continue to use mobile banking frequently	0.936
	I will say good things about mobile banking that works	0.932
	I am likely to make full use of all mobile banking features	0.906

Notes: α=Cronbach's Alpha, CR=Construct Reliability, AVE=Average Variance Extracted

Table 3. Fornell–Larcker criterion analysis for checking discriminant validity

	AT	BI	EB	EE	PC	PE	PI	SI
AT	0.908[a]							
BI	0.810	0.922[a]						
EB	0.780	0.706	0.893[a]					
EE	0.760	0.714	0.826	0.907[a]				
PC	0.233	0.234	0.244	0.262	0.799[a]			
PE	0.731	0.674	0.734	0.773	0.182	0.871[a]		
PI	0.762	0.710	0.691	0.675	0.346	0.636	0.888[a]	
SI	0.674	0.666	0.650	0.677	0.204	0.675	0.608	0.818[a]

Notes 1: [a] Diagonal value indicates the square root of AVE of an individual latent construct.

Notes2: AT: Attitude toward using mobile banking, BI: Behavioural Intention, EB: Environmental Benefits, EE: Effort Expectancy, PC: Privacy Concern, PE: Performance Expectancy, PI: Personnel Innovativeness in IT, SI: Social Influence

A factor loading above 0.7 suggests the indicator strongly relates to its corresponding construct. Moreover, Cronbach's alpha and composite reliability values above 0.7 indicate good internal consistency and reliability of the measurement scales. By meeting these criteria, the researchers ensured that the measurement model had strong reliability and convergent validity, providing confidence in the assessment of the constructs in the study.

The average variance extracted (AVE) for each construct in the study ranges from 0.607 to 0.728, surpassing the minimum requirement of 0.5 (Götz et al., 2010). This indicates that each latent construct shares a larger proportion of variance (50% or more) with its indicators compared to the indicators of other latent variables.

The findings support the internal consistency and convergent validity of the measurement model as a whole (Hair et al., 2013). AVE is a measure of the amount of variance captured by a construct about the measurement error. A higher AVE value indicates that the construct accounts for a substantial portion of the variance observed in its indicators, thereby demonstrating convergent validity. By meeting the AVE requirements and demonstrating internal consistency and convergent validity, the researchers have strengthened the validity of the measurement model. These results indicate that the study's constructs are reliable and effectively capture the underlying concepts they represent.

The measures' discriminant validity was assessed following the approach suggested by Fornell & Larcker, 1981). Examination of Table 3 indicated that the square root of the Average Variance Extracted (AVE) for each construct (located on the upper diagonal) exceeded the corresponding off-diagonal correlation coefficients. This observation suggests that the scales demonstrated discriminant validity, as per the criteria outlined by Fornell & Larcker, 1981).

Furthermore, as indicated in the results shown in Table 4, all heterotrait–monotrait (HTMT) values fell below the more stringent threshold of 0.85/0.9 as recommended by (Henseler et al., 2015). Consequently, it can be inferred that there is adequate discriminant validity among the constructs, in line with the criteria proposed by Hair et al., 2013. In other words, the indicators of each construct are not significantly linked with those of the other constructs in the model.

Table 4. Results of HTMT analysis

	AT	BI	EB	EE	PC	PE	PI	SI
AT								
BI	0.851							
EB	0.827	0.745						
EE	0.802	0.749	0.877					
PC	0.232	0.232	0.242	0.260				
PE	0.778	0.713	0.785	0.824	0.174			
PI	0.802	0.746	0.729	0.708	0.366	0.676		
SI	0.731	0.720	0.708	0.736	0.222	0.741	0.665	

Notes: AT: Attitude toward using mobile banking, BI: Behavioural Intention, EB: Environmental Benefits, EE: Effort Expectancy, PC: Privacy Concern, PE: Performance Expectancy, PI: Personnel Innovativeness in IT, SI: Social Influence

4. Assessment of structural model and hypothesis testing

In this section, the formulated hypotheses were examined through both direct and indirect effect testing. For assessing the statistical significance of the path coefficients, we employed bootstrapping with 2,000 resamples to derive standard errors and t-statistics. The Variance Inflation Factor (VIF) values for the suggested model were below the established threshold of 5.0, signifying the absence of multicollinearity in the model. The results of the proposed model are detailed in Table 5.

Table 5. Results of the Structural Model

Hypothesis	Path	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics	P values	Decision
H1	PE→BI	0.033	0.033	0.061	0.543	0.587	Not Support
H2	EE→ BI	0.109	0.113	0.076	1.43	0.153	Not support
H3	SI→ BI	0.144	0.145	0.058	2.481	0.013	Support
H4	EB→ BI	0.026	0.033	0.072	0.363	0.716	Not Support
H5	PC→ BI	0.002	0.001	0.029	0.062	0.951	Not support
H6	PI→ BI	0.15	0.151	0.056	2.681	0.007	Support
H7	AT→BI	0.471	0.458	0.089	5.296	0.000	Support
Mediation effect							
H8a	PE→AT→BI	0.088	0.085	0.04	2.184	0.029	Full Mediation
H8b	EE→AT→BI	0.073	0.069	0.039	1.861	0.063	No Mediation
H8c	SI→AT→BI	0.054	0.051	0.028	1.965	0.049	Partial Mediation
H8d	EB→AT→ BI	0.129	0.126	0.043	2.978	0.003	Full Mediation
H8e	PC→AT→ BI	-0.016	-0.014	0.013	1.226	0.22	No Mediation
H8f	PI→AT→BI	0.171	0.166	0.051	3.328	0.001	Partial Mediation

Notes: AT: Attitude toward using mobile banking, BI: Behavioural Intention, EB: Environmental Benefits, EE: Effort Expectancy, PC: Privacy Concern, PE: Performance Expectancy, PI: Personnel Innovativeness in IT, SI: Social Influence

As per the result of Table 5, social influence (β=0.144, t=2.481, p=0.013), Personnel Innovativeness in IT (β=0.15, t=2.681, p=0.007) and attitude toward using mobile banking (β=0.15, t=2.681, p=0.007) have a significant and positive

impact on behavioural intention. Thus, H3, H6 and H7 were supported. However, behavioural intention was not statistically and significantly influenced by performance expectancy (β=0.033, t=543, p=0.587), effect expectancy (β=0.19, t=1.43, p=0.153), environmental benefits (β=0.026, t=0.363, p=0.716) and privacy concern (β=0.002, t=0.62, p=0.951). Therefore, H1, H2, H4 and H5 were not supported. Besides, the researcher(s) test the mediation effect of attitude in between dependent and independent variables of the study. The findings revealed that, apart from effort expectancy and privacy concern, all other variables, such as performance expectancy, social influence, environmental benefits, and personnel innovations in IT were mediated by attitudes towards using mobile banking.

Further, Table 5 and Figure 1 gives an outline of the mediation's effects. In conformity with the findings of Table 5, attitudes towards using mobile banking fully mediates the effect of performance expectancy (direct-effect = 0.033ns; indirect-effect = 0.088**) and environmental benefits (direct-effect = 0.026 ns; indirect-effect = 0.129**) on behavioural intention. Other findings revealed that attitudes towards using mobile banking partially mediated the relationships between social influence (direct-effect 0.144**; indirect-effect 0.054**), Personnel Innovativeness in IT (direct-effect 0.15**; indirect-effect 0.171**) and behavioural intention. Nevertheless, attitudes towards using mobile banking did not mediate the relationship between.

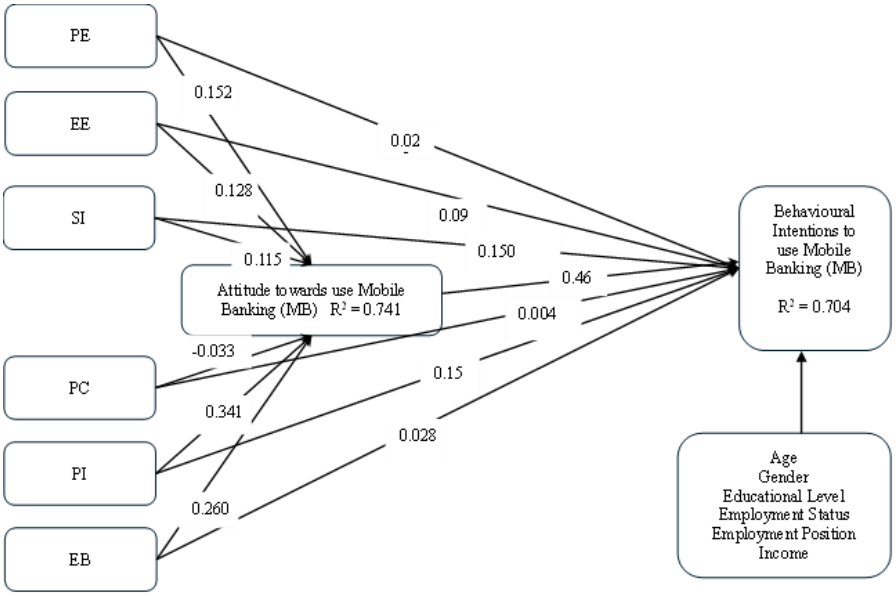

Figure 1. Conceptual framework of the study

Table 5 and figure 1 gives, Effort expectancy (direct-effect 0.109^{ns}; indirect-effect 0.073^{ns}), privacy concerns (direct-effect 0.002^{ns}; indirect-effect -0.014^{ns}) and behavioral intention. Besides, the study's proposed model demonstrates that 70.32% (R^2 = 0.7032) of the variance in behavioral intention can be accounted for. This suggests that the proposed model possesses sufficient explanatory capability in relation to behavioral intention.

DISCUSSION

The findings of this study provide valuable insights into the factors influencing the behavioral intention to adopt mobile applications in the context of banking services.

Contrary to expectations, performance expectancy, effort expectancy, environmental benefit, and privacy concern were identified as having no significant influence on the behavioral intention to adopt mobile applications. This may suggest that the perceived performance benefits associated with mobile applications were not effectively communicated or understood by participants, which aligns with findings from (Venkatesh et al., 2012 ; Gharaibeh, 2024), who noted that clear communication of benefits is crucial for user adoption.

First, it is possible that the perceived performance benefits expected from adopting mobile applications were not clearly communicated or understood by the participants, leading to an absence of a significant impact on their behavioral intentions. Similarly, if the effort required for adoption was not perceived as a significant barrier, or if participants did not anticipate substantial environmental benefits or privacy concerns associated with mobile application usage, these factors may not have played a crucial role in shaping their intentions.

However, the study revealed that social influence, personal innovativeness, and attitudes toward using mobile banking emerged as significant predictors of behavioral intention. Previous studies also explored that social influence, personal innovativeness and attitudes towards using mobile banking influence on behavioral intention to adopt mobile applications (Elhajjar & Ouaida, 2019; Giovanis et al., 2019; Thusi & Maduku, 2020).

Furthermore, if participants did not perceive the effort required for adoption as a significant barrier, or if they did not anticipate substantial environmental benefits or privacy concerns, these factors may have had little impact on shaping their intentions. This is consistent with research by Wang et al. (2019), which found that users often overlook these factors if they believe the technology aligns well with their needs.

Conversely, the study identified social influence, personal innovativeness, and attitudes toward using mobile banking as significant predictors of behavioral intention. This corroborates previous studies, such as those by Elhajjar & Ouaida (2019), Giovanis et al. (2019), and Thusi & Maduku (2020), which similarly highlighted the importance of these factors in shaping user adoption of mobile applications.

Particularly noteworthy is the mediating role of attitudes toward using mobile banking in the relationship between performance expectancy and behavioral intention to adopt mobile applications, as well as environmental benefits and behavioral intention. These results suggest that individuals' perceptions of mobile banking, their personal innovativeness, and the influence of social factors play crucial roles in shaping their behavioral intentions towards adopting mobile applications in the banking sector. The study underscores the need for financial institutions to consider these nuanced factors when designing strategies to promote the adoption of mobile applications among their clientele.

Performance Expectancy and Effort Expectancy: The lack of significant influence from performance expectancy may indicate that participants did not perceive substantial improvements in their banking efficiency through mobile applications. Previous research, such as that by Wang et al., 2019, supports this notion, suggesting that users often overlook performance benefits if they believe the technology aligns well with their needs or if the communication of these benefits is inadequate. Similarly, effort expectancy, which refers to the perceived ease of use, may not have been a deterrent if participants felt that the learning curve associated with mobile applications was manageable.

This is consistent with findings from Davis (1989), who emphasized that perceived ease of use significantly affects technology adoption, albeit this study's results suggest that it may not have been a primary concern for our respondents. Environmental Benefits and Privacy Concerns: The findings regarding environmental benefits and privacy concerns mirror the observations in the literature that suggest these factors may be less influential in the decision-making process for mobile banking adoption. For instance, Giovanis et al. (2019) found that while users are increasingly aware of environmental issues, this awareness does not always translate into action unless users perceive a direct benefit to themselves. Moreover, if participants did not view privacy risks as significant, this could explain the lack of impact on their behavioral intentions. As highlighted by Thusi & Maduku (2020), users often prioritize convenience and efficiency over privacy when adopting new technologies.

Significant Predictors of Behavioral Intention: In contrast, social influence, personal innovativeness, and attitudes toward using mobile banking emerged as significant predictors of behavioral intention. This finding is consistent with previous studies (Elhajjar & Ouaida, 2019; Giovanis et al., 2019; Thusi & Maduku, 2020), which underscore the importance of social factors and individual traits in technology adoption. Social influence reflects the degree to which individuals perceive that important others believe they should use a technology, which has been shown to significantly impact adoption decisions. The significance of personal innovativeness suggests that individuals who are more open to trying new technologies are more likely to adopt mobile banking applications.

Mediating Role of Attitudes: Particularly noteworthy is the mediating role of attitudes toward using mobile banking in the relationship between performance expectancy and behavioral intention, as well as between environmental benefits and behavioral intention. This mediating effect highlights the complex interplay between users' perceptions and their actual intentions. It indicates that individuals who hold a positive attitude towards mobile banking are more likely to be influenced by their perceptions of performance benefits and environmental impacts.

This finding is corroborated by prior research, suggesting that attitudes serve as a crucial intermediary that shapes how users interpret various factors influencing their adoption decisions. Implications for Financial Institutions: The study underscores the necessity for financial institutions to consider these nuanced factors when designing strategies to promote mobile application adoption. Institutions should focus on enhancing communication regarding the performance benefits of mobile applications and leverage social influence to foster positive attitudes. Strategies could include targeted marketing campaigns that highlight the advantages of mobile banking in real-world scenarios, engaging influencers or community leaders to advocate for mobile banking, and providing educational resources that demystify the technology and its benefits.

Theoretical Implications

The extension of the Unified Theory of Acceptance and Use of Technology (UTAUT) in this research signifies a fundamental acknowledgment that the original UTAUT framework might not comprehensively encompass all the pertinent factors influencing technology adoption, particularly in the nuanced context of mobile banking. This extension reflects a proactive effort to refine and broaden the theoretical underpinnings, recognizing that the landscape of technology acceptance is dynamic and context-dependent. By introducing variables such as privacy concern, environmental benefits, and personal innovativeness, the research endeavors to augment the predictive power of the UTAUT model.

This augmentation implies a more nuanced and encompassing understanding of the factors shaping user acceptance and utilization of mobile banking technologies. The inclusion of these additional variables is anticipated to refine the model's ability to explain and predict user behavior in the evolving realm of mobile banking. The incorporation of privacy concern and environmental benefits into the extended UTAUT framework emphasizes a commitment to achieving a holistic understanding of adoption factors (Al-Baltah et al., 2024). This recognition underscores the multifaceted nature of technology adoption, asserting that users' apprehensions about privacy and their cognizance of the environmental implications of technology can wield substantial influence over their decisions to embrace mobile banking (Al-Baltah et al., 2024). The emphasis on the emerging country context not only highlights the geographical diversity in technology adoption but also underscores the significance of cultural and contextual factors.

This emphasis suggests an understanding that the dynamics of mobile banking adoption can vary significantly across different regions and economic settings, necessitating a more nuanced and context-specific approach. The explicit mention of filling the research gap in mobile banking adoption in emerging countries signals a notable contribution to the academic literature. Beyond extending the UTAUT framework, the study addresses a critical void in empirical evidence and theoretical development within the specified context, enriching the scholarly discourse on technology adoption in regions experiencing rapid technological evolution (Çelik & Özköse, 2023).

Practical Implications

Mobile banking providers should tailor their marketing strategies to highlight the positive aspects of mobile banking, emphasizing attributes like convenience, speed, and efficiency. By focusing on enhancing users' perceptions of performance expectancy, these providers can positively influence individuals' behavioral intentions to adopt mobile applications. Creating compelling marketing campaigns that showcase the practical benefits and features of mobile banking can help attract and retain users. Emphasizing the seamless and time-saving nature of mobile transactions, for example, may address potential concerns and encourage wider adoption.

Recognizing the significance of personal innovativeness, mobile banking providers should consider implementing educational programs and user training sessions. These initiatives can serve to familiarize potential users with the innovative features and advantages of mobile banking applications. By reducing barriers to entry through education, providers can enhance users' comfort and confidence in utilizing mobile banking services. Offering user-friendly tutorials, webinars, or interactive guides can empower individuals to make informed decisions about adopting mobile banking, thereby contributing to increased usage and acceptance of these technologies.

Given the mediating role of environmental benefits in shaping attitudes and behavioral intentions, mobile banking providers should incorporate environmental messaging into their communication strategies (Ashraf & Varela-Neira, 2022). Highlighting the eco-friendly advantages of using mobile applications, such as promoting paperless transactions and reducing carbon footprints, can resonate with environmentally conscious users. Integrating sustainability into the marketing narrative can not only contribute to positive attitudes but also foster a sense of social responsibility among users, potentially influencing their behavioral intentions to adopt mobile banking services with a positive environmental impact.

Limitation and Future Research Direction

This study focuses on quantitative approach to explore the factors influencing mobile banking adoption. A qualitative exploration of consumers' perspectives on the perceived barriers to mobile banking adoption could also provide richer insights. In-depth interviews or focus group discussions may uncover hidden factors that quantitative surveys might not capture, contributing to a more comprehensive understanding of the challenges faced by consumers. This study provides valuable insights into the specific context of Sri Lanka. Thus, caution should be exercised when generalizing the findings to other regions or countries with different socio-economic and cultural backgrounds. Replication studies in diverse contexts would enhance the external validity of the research. The rapid evolution of mobile banking technology may render some findings obsolete over time. Longitudinal research design to align with technological advancements are necessary to ensure the relevance of the study's insights in a rapidly changing landscape. The study relies on self-reported data, which may introduce common method bias and social desirability bias. Future research could incorporate objective measures or combine self-reported data with behavioral observations to more accurately assess consumers' intentions and behaviors.

CONCLUSIONS

The findings of this study provide valuable insights into the factors influencing the behavioral intention to adopt mobile applications in the context of banking services. Contrary to expectations, performance expectancy, effort expectancy, environmental benefit, and privacy concern were identified as having no significant influence on the behavioral intention to adopt mobile applications. This suggests that the perceived performance benefits associated with mobile applications may not have been effectively communicated or understood by participants, aligning with findings from Venkatesh et al. (2022), who noted that clear communication of benefits is crucial for user adoption in digital platforms.

The lack of impact from effort expectancy, environmental benefits, and privacy concerns resonates with the findings of which indicated that when users feel comfortable with technology, perceived barriers diminish (Nguyen et al., 2024). Conversely, social influence, personal innovativeness, and attitudes toward using mobile banking emerged as significant predictors of behavioral intention. This is supported by Shin et al. (2022), who found that social factors and individual traits are crucial in technology adoption, reinforcing the results of previous studies by Elhajjar & Ouaida (2019) and Giovanis et al., (2019). The mediating role of attitudes towards using mobile banking in the relationship between performance expectancy and behavioral intention, as well as environmental benefits, highlights the complex dynamics at play. Research by Kumar et al., (2023) emphasizes the importance of user attitudes in shaping adoption behavior, further supporting the findings of this study. Practically, mobile banking providers are encouraged to tailor their strategies by highlighting the convenience and efficiency of mobile applications (Kumar et al., 2023).

Educational initiatives aimed at enhancing personal innovativeness can empower users and reduce barriers to adoption (Shin et al., 2022). Additionally, integrating environmental messaging into marketing campaigns may resonate with users who are increasingly aware of sustainability issues (Elhajjar & Ouaida, 2019). While this study offers valuable insights, it also acknowledges certain limitations, such as the reliance on a quantitative approach and the need for further exploration through qualitative methods. Future research should consider longitudinal designs to keep pace with technological

advancements and replicate the study across diverse contexts to enhance its external validity (Giovanis et al., 2019).In summary, this research contributes to the understanding of mobile banking adoption, providing both theoretical and practical implications that can inform future studies and strategies in the evolving landscape of digital finance.

Author Contributions: Conceptualization, N.U, S.S and J.T; methodology, N.U, S.S and J.T; software, N.U; validation, N.U, S.S and J.T; formal analysis, N.U, S.S and J.T; investigation, N.U, S.S and J.T; data curation, N.U; writing - original draft preparation, N.U; writing - review and editing, N.U, S.S and J.T; visualization, N.U, S.S and J.T.; supervision, S.S and J.T. and A.K; project administration, N.U, S.S and J.T. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study may be obtained on request from the corresponding author.

Acknowledgments: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The authors declare no conflict of interest.

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Article history: Received: 21.11.2024 Revised: 28.02.2025 Accepted: 31.03.2025 Available online: 07.05.2025