Chapter 25
Investigating the Factors Driving Consumers' Intention to Use Mobile Banking Applications: An Integrated Acceptance Model

Karolina Olma, Paulina Rutecka, and Artur Strzelecki

Abstract Investigating the variables that influence customers' decision to use mobile banking applications is the goal of this study. The interaction between numerous criteria and consumers' intention to use mobile banking applications is explained by an integrated acceptance model. The study concentrates on perceived usefulness, perceived availability, system and service quality, attitude, satisfaction, perceived security, and intention to use as the primary influences on customers' adoption and usage of mobile banking applications. Data is collected through a survey of 203 mobile banking app users and analyzed using structural equation modeling. The findings show that the satisfaction has the strongest effect on intention to use toward mobile banking applications, followed by attitude. Perceived security has the strongest effect on attitude and on service and system quality. Perceived availability significantly impacts attitude followed by service and system quality. The study's findings can be used by companies who provide mobile banking applications to enhance their services and increase acceptance and usage among consumers.

25.1 Introduction

It has been proven that the number of consumers using their mobile devices for service completion increases [1]. Because of this, "it is apparent that there is a connection between consumers' Internet literacy and their use of mobile apps", as well as their perception and intention to use them [2]. Many companies rely on mobile apps to support their company and build a worldwide platform for their customers, in part because "the popularity of mobile apps and current technologies is constantly growing and changing the behavior of consumers and service providers" [3, 4]. For many years, the growing involvement of banks in the development of the mobile application market has also been visible.

K. Olma · P. Rutecka · A. Strzelecki (✉)
Department of Informatics, University of Economics in Katowice, Katowice, Poland
e-mail: artur.strzelecki@ue.katowice.pl

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Customers realize the advantages of utilizing banking apps more and more, especially on mobile devices [5]. Consequently, they are evolving into tools that help consumers with banking, budgeting, payments, and shopping [6]. The main reasons why mobile banking is not used include concerns about security and privacy, unseen benefits of its use, personal preferences and consumer traits, and the technology's inherent qualities [7]. Additionally, m-banking utilizes portable technologies which are faced with several limitations such small keyboards, small displays, slow data transmission, and others. One of the major problems is the restricted quantity of data that can fit on a compact gadget [8, 9]. Thus, m-banking is competing for widespread acceptance among customers, associated with adapting to perform transactions on a small device [10].

This study aims to better understand the elements that influence consumers' decisions to utilize mobile banking applications. The objective of this study is to create a comprehensive acceptance model that explains the connection between many variables and customers' intention to use mobile banking applications. The study concentrates on perceived availability, perceived usefulness, perceived security, attitude, perceived satisfaction, perceived system and service quality, and intention to use as the primary elements influencing customers' adoption and use of mobile banking applications. The study also seeks to offer insights on how developers of mobile banking applications may enhance their offerings to boost users' acceptability and usage.

25.2 Theoretical Background

The number of users of mobile devices around the world is constantly growing, and with it the demand for mobile services [1, 11, 12]. At present, every pocket-sized device that allows you to connect to the Internet is a small computer that performs many different activities. For several years, statistics have shown that mobile devices account for over 50% of website traffic. The importance of mobile devices as online shopping tools is growing [13]. Social media and mobile games drive micropayments made directly from a mobile device [14]. With the development of technology, there is also an increase in security. Solutions such as multi-stage authorization, biometric authorization, or behavioral biometrics are introduced to the applications. The demand for the use of payments via a mobile device is combined with greater opportunities in terms of security. Banks have been working on solutions in the field of usability and security of mobile applications for years. As a result, the number of users of mobile banking applications is constantly increasing. However, it is difficult to say what contributes to the acceptance of banking application technology. Rapid intergenerational changes mean that the profile of consumers changes every few years, due to the entry of a generation growing up with technologies different than its predecessors. This changes the conditions of acceptance of technology.

Customers of financial institutions can undertake a variety of financial activities through mobile banking, which is the use of specific mobile applications provided

by a bank on mobile devices [15]. To be precise, the authors assume that mobile applications are "software applications intended for end-users, de-signed for the operating system of a mobile device, and significantly expanding the capabilities of the device" [16]. Mobile banking applications allow you to make a transaction [17], check your account balance [12, 18], open a new account, activate or block an ATM card, or order additional banking products. The applications of selected banks also allow you to pay for selected external services, such as public transport tickets or motorways [19], and also provide the possibility of immediate currency exchange at an online currency exchange office. Some banks combine the mobile banking application with m-wallet [20], i.e., an application for storing currencies and making payments with them in a manner similar to bank card payments (similar to external m-wallet applications such as Apple Pay or Google Pay). It is especially useful to use m-wallet in banking applications when multiple currencies are used. Such solutions were introduced, among others, by Revolut and other online exchange offices. The increase in interest in m-wallet was also associated with the growing popularity of cryptocurrencies [21].

Poland is considered one of the most modern banking markets in Europe and even in the world [11]. According to the data of the "Digital Banking Maturity 2022" report [12] published by Deloitte in 2022, covering 41 countries from 5 continents, "Poland took 6th place in the ranking of digitization leaders" [11]. On the other hand, GDP per capita in PPS (purchasing power standard) calculated for Poland is low as compared to other European Union countries [13]. Poland is still classified as a developing country according to the World Economic Outlook report [25].

However, modern banking solutions are readily accepted in Poland, as evidenced by, among others, BLIK success [24]. It may seem surprising how willingly Poles use modern technologies, especially in the banking sector, which requires high trust [12, 26], while at the same time, according to Eurostat report "How many citizens had basic digital skills in 2021?" Poland ranks at the very end among countries where citizens have at least basic digital skills (only Bulgaria and Romania are lower in the rank than Poland) [27]. These two extremes make the case of Poland particularly interesting for the study of mobile banking adoption, the more so that the previous studies of mobile banking adoption indicate that, in particular in developing countries, its level is not satisfactory, and is even considered very low [12, 28].

This study presents a novel approach by focusing on the acceptance and usage of mobile banking applications among users. While previous research has broadly addressed mobile banking, this work dives into the specific elements that determine customer adoption and use of these applications. The design, features, and usability of these apps play a key role in users' willingness to engage with mobile banking services. By honing in on these applications, our study provides a detailed understanding of user perceptions and the influencing factors of their adoption. Additionally, we propose a comprehensive model to guide future research and aid mobile banking service providers in refining their offerings.

Recognizing how individuals accept and utilize new technologies is vital for those involved in their design, development, and marketing. To facilitate this understanding, various theoretical models of technology acceptance have been proposed.

These frameworks seek to elucidate the factors that sway a person's decision to embrace and use new technology. Applying these theories can shed light on how users interact with technology, thereby helping to promote its acceptance and use.

25.2.1 Attitude (ATT)

Fishbein and Ajzen [14] created the "Theory of Reasoned Action" (TRA) to understand how individuals make decisions about their behavior. According to TRA, an individual's behavior is driven by their intention to perform the behavior, which in turn is influenced by their attitude toward the behavior and the perceived social norm. The person's attitude is shaped by their beliefs about the likely outcomes of their actions. For example, if an individual perceives certain technology as beneficial and values those benefits, they are likely to have a positive attitude toward using that technology [15]. The "Theory of Planned Behavior" (TPB) was authored by Ajzen in [16] as an extension of TRA by incorporating the concept of perceived behavioral control. Perceived behavioral control is the judgment a person makes about their ability to engage in a specific behavior. Three things, in accordance with TPB, affect a person's intention to engage in a behavior: "attitude toward the behavior, subjective norm, and perceived behavioral control" [17]. A person's attitude toward a behavior is their assessment of its effects, whereas "a subjective norm is the perceived social pressure to engage in or refrain from engaging in the behavior" [18]. In both theories, attitude is considered as a key determinant of behavior intentions, as it reflects the individual's assessment of the behavior's prospective results. A study by Ho et al. [19] confirms that consumer intention to adopt mobile banking was positively influenced by perceived behavioral control. Also Hai [20] confirmed that attitude toward mobile banking positively impacts consumers adoption intention.

25.2.2 Perceived Usefulness (PU) and Intention to Use (ITU)

The "Technology Acceptance Model" (TAM), introduced by Davis [21], is a widely utilized framework for understanding the determinants of people's decisions to adopt and use novel technologies. This model has found applicability across various technologies, including computers, mobile phones, and e-learning systems. TAM underscores two central elements influencing technology acceptance: "perceived usefulness" and "perceived ease of use." The former represents an individual's belief that a particular technology will enable them to meet their goals. The latter refers to the belief that the technology is straightforward and user-friendly. The theory postulates that if a person views the technology as both beneficial and easy-to-use, they are likely to adopt and use it. Furthermore, TAM suggests that both perceived usefulness and ease of use directly affect an individual's intention to use the technology, which then, in turn, affects its actual usage. Over the years, TAM has undergone significant

testing and refinement and has proven valuable in predicting technology acceptance and usage across different contexts [22, 23]. The intention to use in TAM refers to a person's readiness or desire to employ a particular technology. When someone uses a certain technology, they believe that it will help them complete their duties or goals more quickly or effectively. This is known as perceived usefulness.

In context of mobile banking, in Brazil, Malaquias and Silva [24] recognized that perceived ease of use, perceived usefulness and trust are related to the use of mobile banking. Also Watat and Madina [25] found that perceived usefulness and ease of use significantly predict attitudes toward mobile banking adoption.

25.2.3 Service and System Quality (SSQ)

In DeLone and McLean's [26] "Information Systems Success Model", two important factors that affect an information system's overall success are service quality and system quality. The level to which an information system satisfies the needs and expectations of its users is referred to as service quality. It includes aspects like the system's dependability, reactivity, and usability. High service quality is essential to increasing user happiness and system acceptability. The effectiveness and efficiency of an information system in attaining its intended goal is referred to as system quality. It includes aspects of the system's correctness, thoroughness, and flexibility. The user's view of the system's performance depends heavily on the system's high quality. Together, service quality and system quality are considered to be important user's determinants of satisfaction, acceptance and ultimately success of an information system. High service quality and system quality help to ensure that the system effectively meets the expectations and needs of its users, and is perceived to be performing well [27].

M-banking services are convenient for bank customers, as they eliminate the need for traveling bank departments or ATMs [28]. This brings advantages such as time optimization, instant connection to the bank, express information, and high interactivity [29]. M-banking channel improves the quality of services, and reduces service costs, what appeals to both clients and banks [30]. Almajali et al. [31] confirmed that service and information quality are positively related to an individual's intention to use of mobile banking. This is in line with the results of studies on the acceptance of other technologies such as e-learning [32] or mobile shopping [33].

25.2.4 Satisfaction (SAT)

In Expectancy-Disconfirmation Theory (EDT) developed in a series of two papers authored by Oliver in 1977 and 1980 [34, 35], satisfaction is the emotional response that an individual has after using a product or service. It is the extent to which the good or service lives up to the standards that the user had before utilizing it. The degree to

which a person's impressions of the performance of the good or service meet their expectations is what EDT defines as satisfaction. A person will feel satisfied if the good or service meets or surpasses their expectations. People will become dissatisfied if the good or service doesn't live up to their expectations. Satisfaction can also be influenced by the level of importance that the individual places on different aspects of the product or service. If an individual values a particular feature of the product or service, they may be more satisfied if that feature is present and working well.

Consumer satisfaction is influenced, among others, by the quality of service, quality of information and trust [36, 37]. Customers experience different emotions while using the app. If the application does not work properly or there are failures in it, this may discourage its further use [38]. Many banks have made investments in the mobile banking tactics available, such as enhancing banking apps and increasing user satisfaction [5]. According to the study by Geebren et al., satisfaction is a recognized factor in the adoption of mobile banking systems [37].

25.2.5 Perceived Security (PS)

Perceived security was recently explored by Hartono et al. [39]. It refers to the degree to which people think it is safe to send sensitive information over the Internet. The subjective likelihood that personal information won't be viewed, stored, or altered by unauthorized parties, as well as the individual's understanding of security when submitting personal or financial information is just a few of the variables that may have an impact on this perception. The degree of security that users feel while using mobile apps, the degree to which a user believes that using a specific application will not expose their private information to unauthorized parties, and the customer's subjective assessment of the system's security can also be considered as aspects of perceived security [40]. In the end, perceived security refers to how customers judge the level of security versus risks that could result in financial suffering through data destruction, disclosure, modification, denial of service, fraud, waste, and misuse [41].

The core information security principles are confidentiality, integrity, and availability [42]. Particularly in the case of financial instruments, consumers need be assured that their data is private, that no one can modify it inappropriately, and that the banking applications are available whenever they need them. Therefore, they must be resistant to failures [38] and provide reliable information [31]. Sometimes, however, to ensure security, it is necessary to find a golden mean between security and convenience and ease of use of the application. So there is a group of consumers who do not want to use banking applications due to lack of trust [43]. There are also those for whom extensive security systems make the application difficult to use [44].

25.2.6 Perceived Availability (PA)

The degree to which customers believe that mobile banking services are available to them when they need them and are functional, accessible, and convenient is known as "perceived availability" in mobile banking applications [45]. It refers to how simple it is for consumers to access mobile banking services from their mobile devices, including the app's availability in the app store, the simplicity of downloading and installing the app, and the capability of accessing the services through a mobile web browser. Additionally, it refers to how well the mobile banking services can fulfill the expectations of users and carry out operations like monitoring account balance, making transfers, paying bills, and receiving notifications of account activity. The availability of the mobile banking services during normal operation hours, as well as during times of high demand or system maintenance, and the reliability of the services to remain available and accessible to users and the speed at which the mobile banking services are able to perform transactions and provide information to the users [46].

25.2.7 Conceptual Model and Hypotheses Development

In line with the arguments outlined above, we suggest following hypotheses (Fig. 25.1):

H1. "Perceived availability has positive influence on attitude."
H2. "Perceived security has positive influence on attitude."
H3. "Perceived usefulness has positive influence on attitude."
H4. "System and service quality has positive influence on attitude."

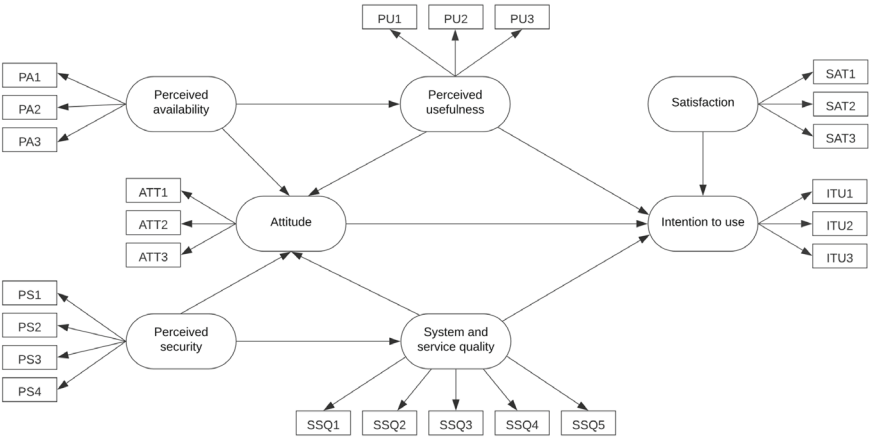

Fig. 25.1 Conceptual acceptance model for mobile banking applications

H5. "Perceived availability has positive effect on perceived usefulness."
H6. "Perceived security has significant effect on service and system quality."
H7. "Perceived usefulness has significant influence on intention to use."
H8. "System and service quality has significant influence on intention to use."
H9. "Attitude has significant influence on intention to use."
H10. "Satisfaction has significant influence on intention to use."

Model research proposition was based on seven variables discussed previously, elements of a widely used measure of technology acceptance. In addition, we adopted a scale based on our literature survey to measure the seven dimensions of the mobile banking applications acceptance (Table 25.1).

The survey was distributed from December 2021 to March 2022 among users of mobile banking apps. A 7-point Likert scale was used. The survey has been conducted in Google Forms. The survey was conducted among users of mobile banking apps through the Messenger app and through Facebook groups. The survey was closed when the last of 203 responses were collected. The Faculty Research Ethics Committee at the University of Economics in Katowice, Poland, accepted the study after it was carried out in compliance with the Declaration of Helsinki: approve number: 136082, and date: October 4, 2021. Informed consent of each participant was collected in the beginning of the survey. The statement was following: "By taking part in this study, you are agreeing to allow us to collect data about mobile banking applications. This data will be used to help us better understand mobile banking app acceptance and will be kept strictly confidential. You are always free to leave the study by contacting us."

Most of the surveyed individuals were women, at 75.9%, with a total of 154. Men, at 24.1%, made up 49 of the surveyed individuals. The largest group age of survey participants was in the range of 18–24, followed closely by those in the range of 25–34. The fewest participants were under the age of 18 and 55 and older. Most of the surveyed individuals had higher education. The fewest number of participants had vocational basic education or primary education. Among the surveyed individuals, the largest group were students or pupils at 57.6%. The greatest number of surveyed individuals worked full-time at 34.5%. The least number of surveyed individuals was unemployed.

25.3 Results

The software used to create the SEM model was SmartPLS4 v. 4.0.8.7 [47]. The software is based on calculating PLS-SEM algorithms [48]. The default configuration settings were used to calculate the results. When a loading is above 0.70, it means that the variable being measured explains more than half of the variance, which indicates that the indicator is reliable to a satisfactory degree [48]. The recorded item SSQ2 of "System and service quality" was removed due to low loading.

Table 25.1 Developed scale for acceptance of mobile banking (m-banking) applications (apps)

Variable		Item
Perceived usefulness [21]	PU1	I think that the services offered by m-banking apps are helpful in my work
	PU2	My productivity at work goes up when I use mobile banking
	PU3	Utilizing the mobile banking app improves the efficiency of my work
Perceived availability [45]	PA1	M-banking gives me access to data and information at any time and anywhere
	PA2	I have access to m-banking whenever I want using any Internet-capable device
	PA3	I feel at ease using mobile banking because I have complete control over it and can do whatever I want with it
System and service quality [26]	SSQ1	I've never had any limitations when utilizing mobile banking
	SSQ2	I haven't encountered any problems while using mobile banking
	SSQ3	Devices with the possibility of using mobile banking meet my needs
	SSQ4	Devices with mobile banking apps offer more services
	SSQ5	Devices with the banking application installed properly satisfy my needs
Perceived security [39]	PS1	I am sure that the data kept in mobile banking is protected
	PS2	I think that no one may access my data or information saved in mobile banking without my consent
	PS3	I am confident that the information or data I provide in the mobile banking application won't be changed or tampered with
Attitude [14, 16]	ATT1	I have a favorable opinion on how the mobile banking app processes data
	ATT2	I think that using a mobile banking app is a wise choice
	ATT3	I think that having access to a mobile banking app is preferable to other mobile device services
Satisfaction [34, 35]	SAT1	Overall, I'm happy with the mobile banking app
	SAT2	The mobile banking application that I'm using right now meets my expectations
	SAT3	I believe that using mobile banking is a good solution and would recommend it to other users

(continued)

Table 25.1 (continued)

Variable		Item
Intention to use [21]	ITU1	It is very likely that I'll keep using the mobile banking app
	ITU2	I want to use the mobile banking app as often as I can
	ITU3	I will continue using the mobile banking app if I have access to it

First, we evaluate the internal consistency reliability of variables. One method for doing this when using PLS-SEM is to calculate composite reliability ρ_c. A higher value of ρ_c indicates a higher level of reliability. In exploratory research, values between 0.60 and 0.70 are considered fair, while values from 0.70 to 0.95 are considered satisfactory to good. Cronbach's alpha measures internal consistency reliability. It has similar threshold, however typically produces lower values than ρ_c. When estimating reflective measurement models with PLS-SEM, Cronbach's alpha has typically the lower value, while ρ_c has the higher value for internal consistency reliability. Additionally, the reliability coefficient ρ_A may also be calculated, which usually is between Cronbach's alpha and ρ_c [49] (Table 25.2).

In evaluating reflective measurement models, convergent validity, which refers to how well a construct's indicators all measure the same concept by explaining the variance in the items, needs to be assess. This is determined by the average variance extracted (AVE), which is calculated by taking the mean of the squared loadings for each indicator related to a variable [50].

To verify the discriminant validity of reflectively measured variables, it is necessary to investigate their ability to be distinguished from other constructs both in terms of correlations with them and how specifically the indicators describe a single construct. This analysis can be conducted through the use of heterotrait–monotrait ratio (HTMT) in PLS-SEM. A threshold of 0.85 for the HTMT should be considered [51] (Table 25.3).

We received the results for path coefficients listed in Table 25.4. Six tested hypotheses are significant at 5% error level. The values of f^2 for hypotheses H3, H7, and H8 are not above the 0.15 criterion, thus they are reasonably low. Paths for hypotheses H2, H6, and H10 show the highest significance. Our final results are in Fig. 25.2.

25.4 Discussion

In this research, we have examined integrated model of mobile banking applications acceptance. Through the thorough literature review, we have identified key variables that may have impact on intention to use banking apps. From 10 stated hypotheses, we confirmed 6. Perceived security occurred to be the most important external factor in

Table 25.2 Assessment of measurement models using PLS-SEM

Variable	Indicators	Convergent validity			Internal consistency reliability		
		Loading	Reliability	Cronbach's alpha	ρ_A (rho_A)	Composite reliability ρ_c	AVE
		> 0.70	> 0.50	0.70–0.95	> 0.70	> 0.70	> 0.50
Attitude	ATT1	0.750	0.563	0.752	0.784	0.808	0.585
	ATT2	0.830	0.689				
	ATT3	0.709	0.503				
Intention to use	ITU1	0.877	0.769	0.828	0.831	0.898	0.746
	ITU2	0.803	0.645				
	ITU3	0.908	0.824				
Perceived availability	PA1	0.796	0.634	0.713	0.797	0.834	0.629
	PA2	0.689	0.475				
	PA3	0.882	0.778				
Perceived usefulness	PU1	0.901	0.812	0.898	0.958	0.935	0.827
	PU2	0.932	0.869				
	PU3	0.895	0.801				
Perceived security	PS1	0.892	0.796	0.835	0.836	0.901	0.752
	PS2	0.861	0.741				
	PS3	0.847	0.717				
Satisfaction	SAT1	0.903	0.815	0.881	0.885	0.926	0.807
	SAT2	0.892	0.796				
	SAT3	0.900	0.810				
System and service quality	SSQ1	0.693	0.480	0.707	0.718	0.820	0.533
	SSQ3	0.784	0.614				
	SSQ4	0.658	0.433				
	SSQ5	0.778	0.605				

Table 25.3 Heterotrait–monotrait ratio (HTMT) values

	ATT	ITU	PA	PU	PS	SAT	SSQ
Attitude (ATT)							
Intention to use (ITU)	0.823						
Perceived availability (PA)	0.667	0.834					
Perceived usability (PU)	0.287	0.122	0.144				
Perceived security (PS)	0.948	0.462	0.337	0.216			
Satisfaction (SAT)	0.821	0.852	0.788	0.133	0.544		
System and service quality (SSQ)	0.877	0.778	0.715	0.225	0.657	0.878	

Table 25.4 Results of the significance tests and the path coefficient of the structural model

Hypothesis	Path	Coefficient	T-statistics	Effect size	Significant ($p < 0.05$)?
H1	PA → ATT	0.258	3.994	0.129	Yes
H2	PS → ATT	0.526	9.490	0.552	Yes
H3	PU → ATT	0.030	0.772	0.002	No
H4	SSQ → ATT	0.201	3.090	0.063	Yes
H5	PA → PU	0.130	1.575	0.017	No
H6	PS → SSQ	0.506	8.151	0.344	Yes
H7	PU → ITU	− 0.017	0.428	0.001	No
H8	SSQ → ITU	0.103	1.490	0.012	No
H9	ATT → ITU	0.252	3.561	0.077	Yes
H10	SAT → ITU	0.494	6.366	0.238	Yes

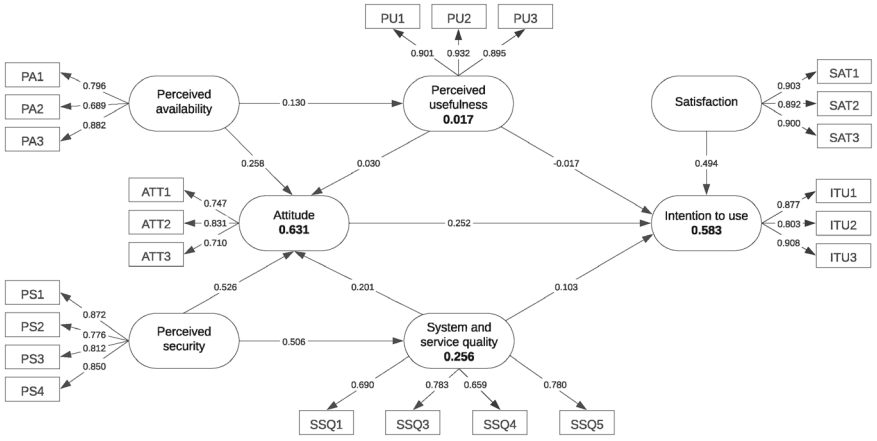

Fig. 25.2 Integrated acceptance model for mobile banking applications–final results

this model. It has large significant impact on both attitude (H2) and service and system quality (H6). Perceived security seems to be quite important for mobile banking app users as these applications provide access to financial data and operations. Singh and Srivasta [52] also discovered that the model of intention to use mobile banking takes into account perceived security. Merhi et al. [53] have the same results as perceived security is important for mobile banking.

Perceived usefulness occurred to be not significant in the model. Despite its proper reliability measures, perceived usefulness does not significantly impact other variables like attitude and intention to use, and also is not affected by perceived availability. All three hypotheses related to perceived usefulness (H3, H5, and H7) are not confirmed. Mobile banking apps are not considered by sample group as being

useful. Possible explanation is that if users are not aware of the full range of advantages that a technology provides, they may not perceive it as useful. This can be particularly true for new technologies, where users are possibly unaware of all the potential advantages. Similar result for mobile banking acceptance has Akturan and Tezcan [54]. They also did not confirmed effect of perceived usefulness on intention, however they did confirm impact of it on attitude. Same confirmation was found by Ho et al. [19]. The lack of link between intention to use and perceived usefulness is also in study by Muñoz-Leiva et al. [55], but they did confirmed its influence on attitude. Perceived availability has also a significant impact on attitude (H1), as users would like to have mobile banking app always accessible, functional and available to them when they need it. Similar results were confirmed by Ewe et al. [45].

System and service quality has significant impact on attitude (H4) but is not relevant for intention to use (H8). The app's quality is essential for mobile users, and it influences their attitude. On the other hand, it does not influence whether they intent to use it. In other words, when user decides to use banking app, quality of it is not important. Mobile banking app use is strongly defined by the bank, where the user has bank account, thus decision to start using the app always finishes with the app, created by user's bank. De Leon et al. [56] also confirmed that system and service quality is important variable in mobile banking acceptance. Same results was tested and confirmed by Trabelsi-Zoghlami et al. [57].

Attitude significantly impacted the intention to use banking app. Ho et al. [19] also confirmed the same significant impact of attitude. Attitude has been confirmed as well as significant in the study of Muñoz-Leiva et al. [55] significantly impacted intention to use mobile banking app. Similar results is also confirmed by Petrović et al. [58].

The primary contribution of the research is the proposition of an integrated acceptance model that explains the association between different variables and consumers' intention to use mobile banking apps. This model can be used as a reference for future research and for mobile banking applications providers to improve their services. Another contribution is identification of key factors influencing mobile banking acceptance. Through theory and literature review, we identified key variables such as perceived availability, system and service quality, perceived security, attitude, perceived usefulness, satisfaction, and intention to use that impacts consumers' acceptance and usage of banking apps. This information can be used by banks with apps to improve their services and increase acceptance and usage among consumers.

Banks should prioritize user-centered design principles to develop mobile banking apps that are intuitive, easy-to-use, and meet their customers' needs. Continual investment in the latest technology and relevant features will enhance the app's performance and functionality, leading to better service quality and improved perceived usability. In terms of compatibility, it is essential for banks to ensure their mobile banking apps work smoothly with popular devices, such as smartphones, tablets, and smartwatches. Availability, even during peak usage times, is key to enhancing perceived reliability. This can be achieved by hosting the app on a robust and dependable server infrastructure.

Security should be a primary concern. Robust measures like two-factor authentication, encryption, and biometric authentication can help protect customers' personal and financial data. Banks could also educate their customers on using these security features and steps to take if they suspect a security breach. Regular customer surveys can help banks understand their customers' attitudes toward mobile banking applications. Customer feedback can be invaluable in identifying areas that need improvement and aligning services with customer expectations.

Enhancing user satisfaction could be accomplished by offering a comprehensive range of services, ensuring an enjoyable user experience, and creating an easy-to-use app interface. Banks could also incentivize usage of mobile banking apps through rewards and special offers. Furthermore, measuring and evaluating the app's usefulness from the customer's perspective will allow for effective corrective actions, improved strategies, and optimized operational activities. Finally, effective advertising campaigns can highlight the benefits of mobile banking and raise user awareness about the convenience of these apps. Regular assessments of app acceptance can inform necessary changes and marketing strategies to increase adoption and usage. Banks should also stay updated on new technologies and trends in mobile banking to identify potential innovation opportunities and maintain a competitive edge.

25.5 Conclusion

The results show that the suggested variables have an effect on the overall intention to use mobile banking applications. The satisfaction and attitude are therefore the two main aspects that directly affect the intention to use and users relation with mobile banking applications. This is particularly important for application creators, service providers to take into account and to prioritize when creating applications. Perceived availability has a significant impact on the attitude of users, and service and system quality also has a direct positive impact on the attitude toward the application acceptance. The results of this analysis can serve to more easily and effectively identify and understand the current needs of mobile banking application users. Research has shown that perceived security is also key elements in the hierarchy of importance of mobile banking app features for users.

While our study provides valuable insights, it is important to acknowledge its limitations when interpreting the results. First, the sample size and data collection methods used may not represent all online banking users, limiting the generalizability of the findings. Thus, the results might not be applicable to different populations or contexts. Secondly, our study focuses on a specific set of variables that influence the acceptance and use of banking applications, potentially overlooking other significant factors. The research also relies on self-reported data, which could be subject to biases and inaccuracies in participants' reporting of their attitudes and behaviors. We didn't take into account the specific cultural contexts of the users, which might affect their perception and use of mobile banking apps. The regional focus of the study might limit its applicability to other regions with distinct mobile banking infrastructures and

usage habits. The research didn't consider regulatory environments and policies that could influence mobile banking usage and acceptance. Our study didn't explore the impact of mobile banking apps on customers' financial behavior and inclusion, or how mobile banking might be affecting individual and community financial well-being. Additionally, we didn't measure the effect of mobile banking on financial services like credit scoring, loan provisions, and insurance, which leaves out potential impacts on the broader banking industry and services provided to clients.

There are several possibilities for next research that can build upon the results of our study. One avenue would be investigating other variables that may impact the acceptance and usage of these mobile applications, like personal characteristics and socio-economic factors. This would deliver a better-nuanced comprehension of how mobile banking is being used and perceived by different groups of people. Another important avenue for future research would be to consider the long-term effects of mobile banking on financial inclusion and financial behavior. This would contribute a more extensive understanding of how mobile banking is affecting the financial well-being of individuals and communities over time.

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