Convenience and risk factors affecting mobile banking adoption behavior: The mediating role of trust

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ARTICLE INFO

ABSTRACT

In this digital age, major financial institutions have given mobile banking a huge amount of publicity and are promoting it aggressively. Previous research has revealed, however, that mobile banking use among young adults is still in its early stages and has yet to gain widespread acceptance. These youths do not have a strong knowledge of mobile banking and are apprehensive about its security. Therefore, this paper aims to investigate the factors that affect mobile banking usage intention. We administered a survey to 363 university students and analyzed the collected data using statistical software. The research results show that perceived convenience and perceived risks have a significant impact on intention of mobile banking. In addition, customer trust plays a mediator in this linkage. The results of this study provide a scientific basis for the further development of mobile banking. Besides, the expansion of mobile banking business should strengthen technological innovation, enrich the range of functions of mobile banking, reduce the risks, and improve user experience. Banks and mobile operators should strengthen cooperation to build a safe mobile banking operating system platform, improve service quality, and provide customers with better financial business support.

1. Introduction

In recent years, mobile banking has been developing rapidly all over the world, with the gradually increasing number of users and transactions, which has been an important extension of the service form of commercial banks and represented the future development of financial services. Under the dramatic development of mobile banking has been a new and significant service delivery mode for commercial

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banks. With the support of new information technologies and platforms, users can enjoy business functions that could only be handled at the counter or on the website or APP software of commercial Banks. However, different kinds of users have different attitudes towards new things, and various factors jointly determine people's usage intention and related behavior. In other words, mobile banking applied by commercial banks in Malaysia is different on acceptance degree and functional expectation for different users. At present, many scholars in the world have carried out studies in this field from different angles, meanwhile we can easily find that the study of user behavior is a prerequisite for the improvement of mobile banking.

With the rapid development of information technology, mobile phones are not only traditional voice communication tools, but also can integrate music, games, videos, and networks, and gradually integrate into people's learning, life, and work. Facing the fierce competition in the industry, major banks have strengthened financial innovation, seized the opportunities of technological development, and used mobile phones as a medium to bring consumers more efficient and convenient payment methods-mobile banking. Mobile banking first appeared in 1999, when Citibank, the United States, and French companies jointly launched mobile banking (Shaikh and Karjaluoto, 2015). Users can learn about bank card account balances and transaction payments in the form of short messages through their mobile phones, or they can download personalized menus that meet their needs on their mobile phones and directly handle banking business. Now mobile banking has achieved great success in most of developed countries. The customer behavior of mobile banking has also received more and more attention from academia. In the past 10 years, the development potential of mobile banking has received more and more attention from different financial institution. According to the data released by Bank Negara Malaysia, as of December 2019, the number of Malaysian mobile banking transactions has exceeded 200 million RM. The growth of the value of mobile phone transactions of individual banks is the highest in history. In just a few years, the number of mobile banking users has increased dramatically. In addition, according to its Financial Stability and Payment Systems Report (Bank Negara Malaysia, 2018) released last year, this growth was supported by a 2.2 million increase in mobile banking service subscribers in 2018 to 6.6 million, from 2017's 4.4 million.

As a typical mobile financial service, mobile banking has huge development potential: it brings convenience for customers to process financial services anytime, anywhere, saves operating costs for banks, and increases data traffic for mobile operators (Baptista and Oliveira, 2015). Mobile banking has made important contributions to the bank's gaining a favorable position in the fierce market competition. With the rapid development of the mobile phone network and the advent of the mobile phone era, for people who are increasingly seeking convenience and speed, the mobile banking era is coming (Malaquias and Hwang, 2016). The market prospects for mobile banking are broad, but so far it has not been fully circulated. Banks are themselves risk-management organizations, and it is even more difficult and complicated to implement security and highly sensitive banking services in a mobile network environment. Chang (2016) shows that most customers are repulsive about providing personal information on the website, mainly because of a lack of trust on the internet. Many customers still feel insecure about e-commerce. They doubt whether network virtual operations can meet their needs like the real world. At the same time, they are very worried about the security and reliability of e-commerce technology. Due to fraud and risks in e-commerce, some consumers do not trust e-commerce, so trust has become a key factor affecting the development of e-commerce (Rana and Baria, 2015). Therefore, in order to prevent the decline of their own reputation, financial institutions can use measures to reduce consumers' perceived risks, including the protection of user privacy and the improvement of transaction rules. The purpose of this research is to explore the influencing factors of mobile banking intention and the mediation role of customer trust in it which will help banks and other institutions understand the psychological mechanism of students in the process of using mobile banking, so as to adopt appropriate marketing strategies.

2.   Literature review

2.1   *Opportunities and challenges face by mobile banking*

The Technology Acceptance Model (TAM), according to Davis et al. (1989), extends to the relationship of attitude, behavior and intention on the basis of Theory of Reasoned Action (Fishbein and Ajzen, 1975). Perceived usefulness and perceived ease of use as two important factors that affect the intention to use are the core ideas of the technology acceptance model. The model only focuses on the attitude of individuals when explaining the tendency to use a particular technology or service.

The proposal and application of the technology acceptance model has a specific scope, which is mainly proposed for the acceptance of information technology. In the research accepted by the information technology, the model has the following two assumptions: first, when enterprises and individual users truly agree that a certain technology is beneficial to them, they are willing to adopt it; second, because users have their own main jobs, Therefore, the use of this technology does not consume energy and consumes too much time and energy of the user. The two aspects also explain the usefulness of perception and ease of use. In the follow-up research, for the sake of model simplification, scholars have gradually diminished the intermediary role of attitude. The intention to use technology is directly affected by the factors of perceived usefulness and perceived ease of use.

Since its introduction, the Technology Acceptance Model has been widely used by scholars in various fields, especially in the fields of financial services and mobile operator value-added services. By appropriately expanding and revising the Technology Acceptance Model, the user's adoption process of new technology can be well discovered and explained. This method has been verified through relevant research, and it also indirectly reflects different technical environment has good stability and adaptability (Scherer, Siddiq and Tondeur, 2019).

In this study, based on the Technology Acceptance Model, this article puts forward the variable of perceived risk. At the same time, this study uses customer trust as a mediation variable to conduct in-depth research. Therefore, in order to provide a basis for the design of the scale of perceived risk and customer trust, the following article The literature on risk perception and customer trust will be reviewed.

With the penetration of Internet connections, especially among mobile online users, many banks have established rich businesses on mobile platforms. Through the provision of mobile financial services, it will bring added value and differentiation to financial institutions in a fiercely competitive market environment to facilitate consumers' use of services and tools for increasing the potential of online financial product sales (Akturan and Tezcan, 2012).

Security is one of the most important challenges facing online banking marketers. With online banking, cyber criminals only need to determine certain personal information to break into a person's account and steal their money. It can be done anonymously and involves far fewer personal dangers than in the past. According to Chiu, Bool and Chiu (2017), in fact, in the UK, about 130 million pounds were stolen from online banking accounts through fraud in 2015. Therefore, security remains a major issue for online banking and its customers. Marketing professionals in the online banking industry need to concentrate on demonstrating and explaining the security of online banking to overcome this challenge. According to Abdel Aziz, El Badrawy and Hussien (2014), since mobile banking relies heavily on its online platform, this means that if the system crashes or there is an error in the code, they may cause significant losses. A single technical problem that caused the bank to fail for a day may cost the bank millions of dollars. According to Odumeru (2013), this may also cause serious damage to bank customers who may not be able to make payments or conduct transactions during the site shutdown. Therefore, it is crucial that the bank's online platform runs smoothly, as is the mobile application. The loss of funds or data caused by the crash can be very worrying for bank customers (Hwang et al, 2013). Therefore, marketers should give priority to alleviating this concern by stating that if technical problems occur, account funds will not be lost.

Also, there are opportunities for mobile banking, according to Behl, Singh and Venkatesh (2016), mobile banking could produce more output more profits. There is no specific time when someone can want to deposit or withdraw from their bank accounts, let alone buying something online. Through digital banking,

banks can offer round the clock services to their customers, maximizing profits (Skinner, 2014). It is without any doubt that everyone is going the digital way. That's why it's easier for our grandfathers to wait in line in the bank than it is for a university student. Since the upcoming generations will be more digitized, digital banking is predicted to be the peoples' favorite in the future. In addition, according to De Leon (2019), more customers with time bank services. It is without any doubt that everyone is going the digital way. That's why it's easier for our grandfathers to wait in line in the bank than it is for a university student. Since the upcoming generations will be more digitized, digital banking is predicted to be the peoples' favorite in the future. According to Oerther and Manjrekar (2014), More loans means more interests and banks like it when people borrow loans. That is why many financial institutions are competing to give out low-interest rates because, in the end, they will still make profits. Digital banking will make it easier for customers to access loans online, and this will increase the number of borrowers.

2.2   Young consumers and technology adoption

According to Poh and Abdullah (2019), the consumption characteristics of university students are similar to those of the young working class. In the high-end consumption categories such as personal computers, laptops, and mobile phones, the ratio of university students to the working class of the same age is very similar, and university students also have a consumption ratio that is more similar to the young working class. Due to the influence of the social environment, the expectation of the future, and the psychological comparison, the above-mentioned consumption characteristics have appeared in the group of university students. With the support of financial institutions, university students' consumption awareness and behaviors are also closer to the public.

In Muniady et al. (2014), university student focus on learning and consumption. University students pay more attention to improving their comprehensive quality, especially in the face of changes in the external environment in terms of employment pressure and social pressure. In addition to learning their professional knowledge, they will also increase their knowledge and knowledge through various social training channels. ability. Such as small language training, computer training, driving license training, etc.

According to Aziz and Wahid (2018), University students have a diversified consumption structure. The consumption pattern of university students is no longer limited to the former school model. A large number of students are integrated into social consumption. Cosmetics, clothing, tourism, dinners, transportation, study classes, employment training classes, etc., are becoming more diversified. Moreover, contemporary university students have obvious brand preferences, which reflect their unique personality characteristics in many aspects such as consumption trends, values, and lifestyles.

According to Auerbach et al. (2018), university campuses are different from high schools in that they are loosely managed. They have their own preferences and insights when buying items. Many businesses, such as mobile communications, have observed the consumer psychology of university students, set a third of the market share on campus, and have designed a variety of packages suitable for university students.

In the research of Ellis et al. (2019), because university students are financially restricted by family income, most of them have a certain amount of planning for their expenditures. During the consumption process, they will pay close attention to the cost-effectiveness of the products while choosing novel and fashionable products. University students have limited life experience and are immature in thoughts. They have a strong emotional color in the consumption process and are easily implied to cause impulsive consumption (Gabriel and Lang, 2006). However, due to the limitation of economic ability, they retain the rational side.

2.3   Perceived convenience

Wang et al. (2014a) –using Technology Acceptance Model, pointed out that mobile banking should increase awareness of performance on safety, and think over traditional forms of service. He concluded that the users' intention, perceived usefulness, perceived ease of use would contribute to their behavior, and their decisions had a decisive influence. Lin et al. (2015) used the Technology Acceptance Model to study

mobile phone users in Taiwan bank and found that perceived usefulness and perceived ease of use and a significant correlation between customer usage and behavior. In the study, they also found that in addition to the above two factors, the financial service's trust, economic cost and the user's ability also were related to users' behavior. The research pointed out that mobile banking needs to follow these factors, to adjust and perfect the functions and services form. A study conducted by Cho and Sagyno (2015) found that consumers' ease of use of online websites has a significant impact on consumer behavior and consumer willingness to purchase. This research is supported by very little research, Gabriel and Lang (2006) emphasized that the important factors that attract consumers through the use of Internet products are the ease of online site navigation and the quick checkout process. Consumers will try to find the easiest way to navigate on the site, such as easy-to-access and easy-to-understand simple programs, in order to compare products, prices and desired products when they buy online, and think this will free them from any payment via online Question (Juniwati, 2014). In this research, perceived usefulness and ease of use will be explained as perceived convenience.

The perceived convenience factor refers to the perceived usefulness and perceived ease of use. Many scholars such as Wang et al. (2014a) have listed perceived usefulness as the most basic factor in technology adoption; scholars such as Lin et al. (2015) have shown that perceived ease of use has a significant correlation with users' attitudes through research.

H1:   Perceived convenience positively affects intention of use.

2.4   Perceived risks

One of the key elements of usage behavior is risk, which is defined as an attribute of alternative decisions that reflect the differences in its possible outcomes (Gefen et al., 2003). As suggested by Dholakia (2015), in all usage decisions, especially when the outcome is uncertain, perceived risk is involved in some way. In online shopping, compared with traditional purchases, consumers who prefer Internet transactions are consumers with lower risk avoidance (Juan, 2014). Therefore, whenever consumers take turns to choose, postpone or cancel a purchase, it shows that they are aware of the existence of risks (Hong and Cha, 2013).

Internet users are riskier than those who shop in stores. This is due to the following three reasons: (i) they cannot inspect the product before receiving it; (ii) they worry about after-sales service; and (iii) they may not Fully understand the language used in electronic sales (Hong and Cho, 2016). In online purchases, consumers cannot evaluate the quality of services because it is impossible to make further clarifications with service personnel and electronic buyers cannot personally inspect the products. As a result, it has been found that perceived risk can seriously affect online customers' purchasing decisions (Antony et al., 2016). When this is not possible due to product characteristics (ie the intangibility of financial products), online consumers will try to collect as much information as possible before buying, and they will also conduct customer-to-customer (C2C) communication, especially in terms of price and quality of service (Kauppinen-Räisänen et al., 2017). In addition, e-commerce itself has intangible quality, which makes users not sure that the selected product can meet their needs and expectations (Weathers et al., 2017). Therefore, when the product information provided is limited and users have insufficient confidence in their brand evaluation, the perceived product risk will be greater (Bhatnagar and Ghose, 2014). The key product element that determines user decision-making is service quality (Sanchez et al., 2015). Financial risk involves "the possibility of incurring financial losses due to any hidden costs, maintenance costs or replacement costs caused by lack of warranty and product failures" (Kiang et al., 2016).

In using internet services, the basic risk is related to privacy issues (Pantano et al, 2018), that is, the degree to which customers feel safe in using the online environment (Taylor and Strutton, 2015). Users cannot directly interact with sellers, navigation is difficult (Forsythe et al., 2006), time spent searching for information, and uncertainty in after-sales service guarantees compared to traditional shopping methods (Hong et al., 2017). Especially in products characterized by intangible assets (such as in the financial services industry), the perceived risk will increase greatly (Laroche et al., 2018), so people believe that the purchase risk of services is higher than that of goods (Mitchell and Greatorex, 2017). The product

information provided is very important to minimize the perceived purchase risk. Therefore, when a relatively high product risk is involved, potential buyers tend to collect and consider more information about the trustworthiness of the supply (Wang et al., 2013). In addition, the level of consumer trust in online platforms and their security helps establish psychological beliefs in electronic suppliers, which ultimately determines the possibility of sales (Hong and Cho, 2016). Risk and quality issues are also related to the website provider itself (Ahn et al., 2014). Website providers need to increase their customers' trust in the quality of the services they provide, in an effort to reduce the perceived risks, because this is an important prerequisite for users' intentions. Therefore, network providers need to develop a mechanism to ensure customer privacy and ensure the transfer of funds and provide high-quality services (Van Noort et al., 2017).

Perceived risk is very important for the online service (Doolin et al., 2015). As pointed out by Bhatnagar Ghose (2014), online services will amplify the perceived risks, increase the impact of dealing with the positive and negative aspects of Internet services, and seriously affect the user's final decision. Woodwall (2013) identified risk as the determinant of perceived value and determined use intention (Comegys et al., 2016).

H2:   Perceived risks positively affect intention of use.

2.5   Consumer trust

With the rise of relationship marketing research, scholars' research on trust has also broadened. Many scholars believe that customer trust is the cornerstone of a service company's successful establishment of customer relationships. Therefore, when studying the relationship between customer satisfaction and loyalty, customer trust is usually included in the theoretical framework of relationship marketing (Wang et al, 2014b).

It is believed that trust is whether the trustee is confident in the realization of the need of the trusted person (Beatty et al, 2011). When the consumer is confident that the trusted person will realize the need, it is trust. Bozic (2017) pointed out that trust is a judgment of goodwill, honesty and reliability of trading partners, meanwhile having confidence in the exchange partner and having the will to rely on the exchange partner is trust. Oliveira et al (2017) defined trust as relying on the willingness of trusted trading partners and pointed out that trust expectation comes from fulfillment ability, credibility and intention. Nuttavuthisit and Thøgersen (2017) believe that the two most important concepts in relationship marketing are a sense of belonging and trust, and trust is based on the common understanding of both parties and believes that the other party's behavior is honest and reliable. According to Lin et al (2014), trust is the experience of the overall brand, it is not an emotional structure, but a cognitive structure.

According to Oliveira et al (2017), the confidence in the other party's language, behavior and decisions, and the willingness to take action for this is called trust, which can be divided into two dimensions: cognitive trust and emotional trust. After studying trust from the perspective of e-commerce, according to Al Hogail (2018), the results show that trust concept, trust belief, system-based trust and trust intention constitute trust in e-commerce. In Hong and Cha (2013), they pointed out that some of the quality characteristics of the trusted party that the trusted party perceives as beneficial to the trusted party are trust beliefs; and consumers' general reliance on websites is trust intention. Trust belief mainly includes three dimensions: ability, integrity and goodwill. In Hegner, Beldad and Kraesgenberg (2016), result is consistent with the results on the cause of trust and has been widely used and empirically tested in subsequent studies.

The aspects of trust have been studied in many different fields of economics, management, technology, social and institutional environment, consumer behavior and psychology (Liu et al., 2018). Trust is built on the user's expectations, that is, the seller will not have an opportunistic attitude and take advantage of this situation, but will act in a reliable, ethical and socially appropriate way, despite the user's vulnerability and dependence. But it will still fulfill its promise (Gefen et al., 2003). Therefore, users' perceptions of trustworthiness may determine the final purchase decision between buyers and sellers. Trust is more important for online than offline services, because consumers face more risks in e-commerce because they

cannot visit physical stores and check the services they are interested in (Oghazi et al, 2018). It plays a vital role in determining e-commerce. At the same time, lack of trust is the biggest obstacle to using network services (Urban et al., 2019). After examining the correlation between trust and willingness to use, Komiak and Bembasat (2016) concluded that cognitive trust (based on rational expectations of online service providers' attributes and paying attention to consumers' beliefs) has an effect on emotional trust (involving consumers' attitudes and attitudes). As a result, the key role of trust in determining consumers' willingness to use will be affected by product and online service satisfaction (Wu, 2013). Therefore, if service providers want users to use their services, they need to exceed the threshold of trustworthy behavior (Bente et al., 2016).

In the use of mobile banking, users cannot visually see the flow of funds. The uncertainty and risks of the network may also cause great worries to customers. The establishment of customer trust can well eliminate these worries. Bozic (2017) and others believe that the results of trust include behavioral intentions, and behavioral intentions include attitudes, purchase intentions, and long-term relationships. When customers trust mobile banking, they will have confidence in mobile banking, believing that mobile banking can well meet their business needs, which will effectively encourage customers to use mobile banking for a long time. Oliveira et al (2017) conducted a cross-cultural study on customer trust, and the results confirmed that customer trust affects usage intention through use attitude. From the consumer's cognitive psychology, if there is a barrier to using mobile banking, the customer will It is easy to have distrust of mobile banking, which affects their intention to use mobile banking, and is unwilling to adopt mobile banking.

H3:   Customer trust mediates the relationship between perceived convenience and intention of use.
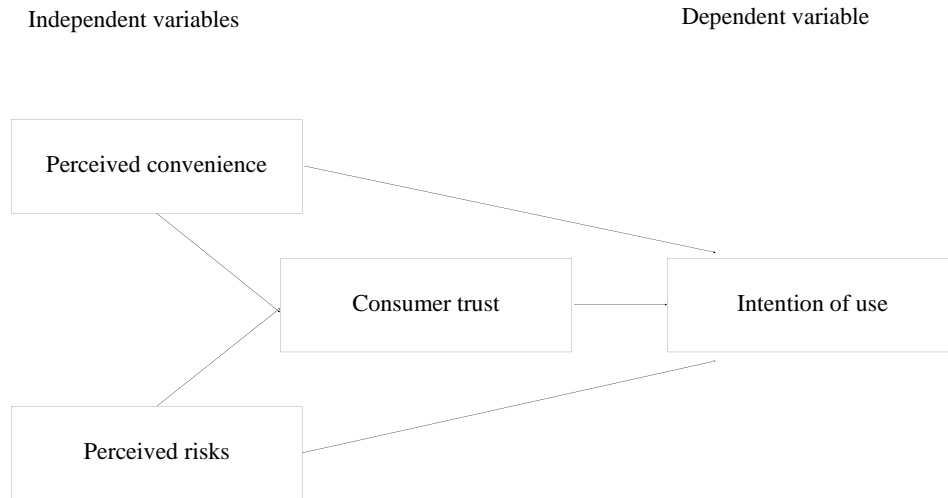H4:   Customer trust mediates the relationship between perceived risks and intention of use.

2.6   Intention of use

User behavior is one of the most studied researchers in the marketing field. By using qualitative and quantitative methodological research methods to establish behavior, various theories or models of behavior can be used (Solomon, Russell-Bennett and Previte, 2012). As a result, most of these theories and models have been adopted by various research disciplines such as economics, psychology, and sociology. Engel, Kottat and Blackwell (2018) are models commonly used and adopted by scholars. For example, theories and models, such as Rational Action Theory, Planned Behavior Theory, Technology Acceptance model, Motivation model, etc.

In Internet services, the importance of trust in user decision-making has aroused great interest among retailers because it is considered the most important factor affecting usage behavior (Park et al., 2012). It is important to understand the user's intention to use, because the user's final usage behavior can be predicted from the user's intention (Bai et al., 2018). The user decides whether to use it based on the available information (Liu et al., 2008). In addition, when risks are involved, users' trust in information sources and the suggestions and comments provided will affect their final use decisions (Wang and Chang, 2013), because reducing performance and financial risks will lead to reduced risks. Increase the possibility of potential use (Suwelack et al., 2013). In addition, the quality and quantity of information provided will also have a positive impact on consumers' willingness to use it (Park and Lee 2017). Currently, e-service providers not only focus on persuading users to use supplier websites that sell their products but are also committed to motivating users to continue using these channels (Chiu et al., 2017). Therefore, it is important to further study online users' views on the products and network providers offered, and to link them with trust factors that influence online usage intentions.

2.7 Conceptual framework

Independent variables   Dependent variable

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┌──────────────────────┐
│ Perceived convenience │
└──────────────────────┘
                ┌──────────────────┐        ┌──────────────────┐
                │  Consumer trust  │        │  Intention of use │
                └──────────────────┘        └──────────────────┘
┌──────────────────────┐
│   Perceived risks     │
└──────────────────────┘
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3. Methodology

3.1 Data collection procedure

In this study, the questionnaire was used because it enabled respondents to answer questions quickly and honestly about Malaysian university students using mobile banking. This type of response is needed to extract this type of information. Similarly, the use of questionnaires can eliminate prejudice caused by differences in the words used by individual respondents. The availability of resources, the convenience of time and price, and the convenience of automatic information input make questionnaires the best choice for quantitative information evaluation.

This research develops an online questionnaire in Google Form and sends the questionnaire link to respondents via email or WhatsApp. Due to the limited time, using online surveys will greatly reduce settings. It is easy and convenient for interviewees to complete the survey online, so the interviewee only needs to click the provided link and then direct them to the survey.

3.2 Questionnaire development

This article collects the data of this research through a questionnaire. The questionnaire includes 23 questions, covering the personal information of the respondents and questions related to the use of mobile banking. The questionnaire mainly consists of three parts: the first part expresses gratitude to the survey participants, explains the meaning of the questionnaire and how to fill in the form. The second part of the questionnaire is the main text, which is the Likert scale. All items are designed using Likert five-level scale scoring methods, and the survey respondents are required to indicate their attitudes, respectively: strongly disagree, disagree, neutral, agree, strongly agree. The third part is the basic personal information of the survey object. Therefore, in this study, an online questionnaire will be used. Finally, the research will be summarized from the data.

3.3   Sampling frame and techniques

According to the sample size of Krejcie and Morgan (1970), a given population of 1 million will require 384 participants to reflect the different parts of the Malaysian university student population. This number is large enough to produce important analysis and results. The sampling type used is a convenient sampling method. The target sample for this study will be Malaysian university students. Sampling is used to ensure that certain attributes of Malaysian university students are adequately described according to different demographic data categories. However, final data processing is 363 after sorted due to time constraint.

3.4   Data processing sample methodology

This study will use quantitative research methods, because it is necessary to find out the factors that affect Malaysian university students' use of mobile banking. The data collected is in quantitative form and evaluated using analytical and statistical methods. Quantitative data usually contains original information and published information. Conduct quantitative research and collect data through online surveys of Malaysian university students. Survey research can use a range of techniques of information collection, the most prevalent being questionnaires (Check and Schutt, 2012). This article establishes assumptions to determine the relationship and importance of these variables. For further data analysis and hypothesis testing, the Social Science Statistical Package (SPSS) will be used as the main analysis tool to test reliability, descriptive analysis, and mediation effects. SPSS software enables researchers to easily and correctly convert initial data into practical information and examines the demographics and hypothesis testing of the participants in this study.

3.5   Pilot test

A pilot study is conducted to test the feasibility of techniques, methods, questionnaires, and interviews and how they work together in specific situations; it shows ethical and practical issues that may hinder basic research (Doody & Doody, 2015). The rule of thumb is a number that depends on limited main research information, such as the required power or relative effect size value. The stepped rule is based on the NCT method of Whitehead et al. (2016). Therefore, a sample size of 10% will be collected based on the 384-sample size of Krejcie & Morgan (1970), so 40 respondents are required to perform the pilot test.

3.6   Reliability test

There are many spatial or indecisive features that affect the overall quality of the instrument and the data acquired, therefore, reliability tests are used to evaluate the accuracy of the data collected for the proposed research model (Sekaran & Bougie, 2016). The reliability of a method refers to the applicability and consistency of the method without bias and error in measuring ideas (Sekaran & Bougie, 2016). Cronbach's alpha is one of the most common reliability tests used today. Cronbach's alpha value determines the internal consistency or median correlation of items in the research tool to assess its reliability (Cronbach, 1951). According to the rule of thumb, Cronbach's alpha corresponds to 0.90 and higher, indicating that it has excellent reliability; 0.70 to 0.90 shows high reliability; 0.50 to 0.70 shows medium reliability; 0.50 and below, indicating its low reliability. Generally, the predictor variables can be correlated up to 0.8 before causing multicollinearity problems (Hair et al., 2014).

3.7   Descriptive analysis

Descriptive analysis is used for quantitative analysis of data collection. Then use the frequency distribution to summarize the value of each variable. In this study, frequency analysis was used to analyze the demographic characteristics of respondents. By determining the mean, median, and standard deviation

of all respondents, researchers can determine the level of education and the percentage of male and female respondents.

4.   Findings

4.1   Reliability test

In this study, internal consistency was determined before the test was used for research and inspection purposes to test reliability. Cronbach's alpha value was 0.90 and higher, indicating that it has excellent reliability; 0.70 to 0.90, indicating that it has high reliability; 0.50 to 0.70, indicating that it has medium reliability; 0.50 and below, indicating that it has low reliability. Generally, the predictor variables can be correlated up to 0.8 before causing multicollinearity problems (Hair et al., 2014). Cronbach's alpha value is shown in Table 1, and the four variables are all above 0.87, which means that it has high reliability. Therefore, the reliability is reliable and suitable for this research.

Table 1: Reliability test

Variables	Cronbach's Alpha	N of Items
Perceived Convenience	0.907	5
Perceived Risks	0.907	5
Consumer Trust	0.891	4
Intention of Use	0.874	4

4.2   Validity test

Validity refers to the degree to which measurement tools or methods can accurately study the object. The higher the validity, the more the measurement data can reflect the characteristics of the indicators set by the researcher. Validity is mainly divided into content validity and structure validity. The former mainly examines whether the deduction from concept to index is logical, and the latter mainly examines whether the structure between indexes meets the design goals. In order to ensure the validity, this study draws on the existing research results to the greatest extent to ensure that the questionnaire has high content validity.

In this section, the construct validity is mainly tested, and confirmatory factor analysis is used. The specific process is to first use SPSS 23.0 to perform KMO and Bartlett sphere test on the questionnaire survey data to determine that the relevant data of the questionnaire meets the basic conditions of factor analysis. The results show that the KMO value is 0.987 and the Sig value of Bartlett sphere test is 0.00. The chi-square test is significant, indicating that the sample data is suitable for factor analysis.

Table 2: Socio-demographic profile

		Frequency	Percentage
Gender	Male	190	52.30%
	Female	173	47.70%
Age	18-24	363	100.00%
Education level	University junior college	48	13.20%
	University undergraduate	268	73.80%
	Master	44	12.10%
	Phd	3	0.80%

Ethnic	Malay	96	26.45%
	Chinese	160	44.01%
	India	92	25.30%
	Other	15	4.10%
Monthly mobile phone bill	under RM50	110	30.30%
	RM50-100	128	35.26%
	RM100-200	73	20.11%
	over RM200	52	14.33%

It can be seen from Table 2 that the proportion of male in this survey is about 52.3%, and the proportion of female is about 47.7%. The gender distribution is relatively balanced. The age group is mainly from 18 to 24 years old, accounting for 100% of all samples, basically in line with the user group structure of mobile banking. The subjects of the survey have a relatively high academic level, with a bachelor's degree or above, accounting for 86.8% of all surveyed subjects. The ethnic distribution covers the three major ethnics in Malaysia, and the sample is highly representative. For 85.7% of the survey respondents, their monthly mobile phone bills are concentrated below RM200. All the research subjects have ideal conditions for using mobile banking.

It shows that the survey sample is multi-ethnic university students who are current customers or important potential customers of mobile banking. Studying the influence factors of these people's intention to use mobile banking provides important guidance for improving mobile banking products and services.

4.3   Hypothesis testing

In this section, SPSS 23.0 is used to test the hypotheses of the previous research, and the Linear Regression Model is used to analyze the relationship between various variables. First carry out the correlation test to determine whether there is a significant linear correlation between the variables, and then use the regression analysis method to find the causal relationship between the variables. Among them, F test is used to determine whether the entire regression equation has statistical significance, and t test is used to determine the significance of each coefficient in the regression equation.

4.3.1   Correlation between variables

Since the Pearson correlation coefficient is mainly used to measure the correlation coefficient between the variables at a fixed distance, this study uses the Likert five-point scale to collect data, which can be considered equidistant. Therefore, the Pearson correlation coefficient, the most commonly used Method for testing. Analyze the correlation between the variables used in this article, use SPSS 23.0 to process the statistical data, and the results are shown in Table 3. It can be seen that the mutual influence between any two factors is very obvious.

Table 3: Variables correlation

	Convenience	Risks	Consumer Trust	Intention
Convenience				
Risks	0.919**			
Consumer Trust	0.914**	0.916**		
Intention	0.894**	0.893**	0.887**	

Note: ** indicates a significant correlation at the 0.05 level

4.3.2 The relationship between perceived convenience, perceived risks and intention of use

It can be seen from Table 4 that the survey results show that there is a significant positive correlation between perceived convenience and perceived risks and intention of use at the level of 0.05. Therefore, regression analysis can be used to further explore these two variables and intention of use. The following uses intention as the dependent variable and the above-mentioned perceived convenience and perceived risks as independent variables to do a multiple linear regression analysis. The results are shown in Tables 4, 5, and 6.

Table 4: Regression summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.911[a]	0.83	0.829	0.40419

a.   Predictors: (Constant), Convenience, Risks
b.   Dependent Variable: Intention

Table 4 shows the fit of the regression model and the estimated standard error. It shows that the multivariate correlation coefficient between the two predictor variables is 0.911, and the total variation explained by the regression equation is 83.0%, indicating that the model fits the data well.

Table 5: ANOVA analysis

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	243.664	2	121.832	745.761	.000[b]
	Residual	49.99	306	0.163		
	Total	293.655	308			

a.   Predictors: (Constant), Convenience, Risks
b.   Dependent Variable: Intention

Use the F test method (analysis of variance) to test the significance of the regression equation. The results are shown in Table 5. It shows that the significance level of the regression equation is P=0<0.05. The hypothesis that the overall model is not significant is rejected. The model is valid.

Table 6: Regression coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	0.391	0.093		4.213	0		
	Convenience	0.45	0.057	0.467	7.864	0	0.158	6.33
	Risks	0.446	0.057	0.464	7.812	0	0.157	6.34

a. Dependent Variable: Intention

Table 6 shows the regression coefficient, the standard error of the regression coefficient, the standardized regression coefficient, and the t-test and significance test results of each regression coefficient. It can be seen from the table that the significance level of perceived convenience p=0<0.05, and the significance

level of perceived risks p=0<0.05, indicating that these two variables have a significant linear correlation with the intention of use. Among them, the standardized regression coefficients of perceived convenience and perceived risks are 0.45 and 0.446, respectively. At the same time, the Tolerance in the collinearity diagnosis was 0.158 and 0.157 respectively, all of which were greater than 0.1. So the model is acceptable.

In summary, in the previous assumptions, H1 and H2 are supported.

4.3.3   Consumer trust mediation effect analysis

In order to test the mediating role of customer trust, this paper will adopt the Sobel Test, the specific method is as follows:
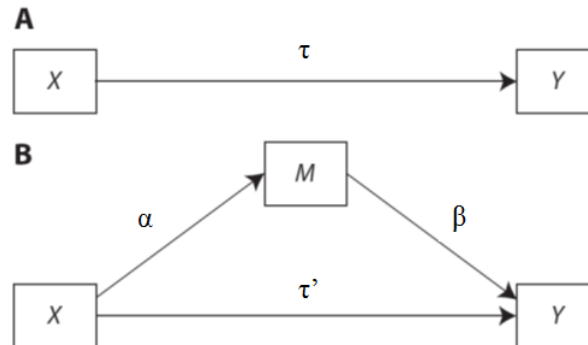

Figure 2: Sobel test method

When evaluating a mediation effect three different regression models are examined:

Model 1: $Y_O = \gamma_1 + \tau X_I + \varepsilon_1$
Model 2: $X_M = \gamma_2 + \alpha X_I + \varepsilon_2$
Model 3: $Y_O = \gamma_3 + \tau' X_I + \beta X_M + \varepsilon_3$

In these models Y_O is the dependent variable, X_I is the independent variable and X_M is the mediator. γ_1, γ_2, and γ_3 represent the intercepts for each model, while ε_1, ε_2, and ε_3 represent the error term for each equation. τ denotes the relationship between the independent variable and the dependent variable in model 1, while τ' denotes that same relationship in model 3 after controlling for the effect of the mediator. The terms αX_I and βX_M represent the relationship between the independent variable and the mediator, and the mediator and the dependent variable after controlling for the independent variable, respectively.

From these models, the mediation effect is calculated as $(\tau - \tau')$. This represents the change in the magnitude of the effect that the independent variable has on the dependent variable after controlling for the mediator. From examination of these equations it can be determined that $(\alpha\beta) = (\tau - \tau')$. The α term represents the magnitude of the relationship between the independent variable and the mediator. The β term represents the magnitude of the relationship between the mediator and dependent variable after controlling for the effect of the independent variable. Therefore $(\alpha\beta)$ represents the product of these two terms. In essence this is the amount of variance in the dependent variable that is accounted for by the independent variable through the mechanism of the mediator. This is the indirect effect, and the $(\alpha\beta)$ term has been termed the product of coefficients.

Table 7: Perceived convenience mediation model test

	Consumer trust		Intention of use (without mediator)		Intention of use (with mediator)	
	t	p	t	p	t	p
Constant	3.1287	0.0019	5.6318	0.0016	4.7281	0.0016
Convenience	42.8478	0.0003	38.0875	0.0019	9.4865	0.0012
Consumer trust					7.8877	0.0013
R^2	0.8357		0.8007		0.8301	
F	1835.9337		1450.6587		879.4351	
	Effect (β)	SE	LLCI	ULCI	Percent	
Mediation Effect (CR)	0.3731	0.0528	0.2703	0.4775	43.18%	

Note: All variables in the model are brought into the regression equation using standardized variables. SE, LLCI and ULCI refer to the standard error and 95% confidence interval of the indirect effect estimated by the deviation-corrected percentile Bootstrap method, respectively

First, Model 4 (Model 4 is a simple intermediary model) in the SPSS Process V3.3 compiled by Hayes (2013) is used to test the intermediary effect of consumer trust in the relationship between perceived convenience and use intention. The results (see Table 7) show that perceived convenience has a significant predictive effect on intention of use ($R2=0.807$, t = 38.0875, p<0.01), and when mediator is placed, perceived convenience directly affects intention of use. The predictive effect is still significant ($R2=0.8301$, t=9.4865, p<0.01). Perceived convenience has a significant positive predictive effect on consumer trust ($R2=0.8301$, t = 42.8478, p<0.01), and consumer trust also has a significant positive predictive effect on consumer trust ($R2=0.8301$, t = 7.8877, p <0.01). The upper and lower limits of the confidence interval do not contain 0 (see table 7 LLCI ULCI), indicating that perceived convenience cannot only directly predict intention of use, and can predict intention of use through the mediation effect of consumer trust. The direct effect (β=0.491) and the mediation effect (β=0.373) account for 56.82% and 43.18% of the total effect (β=0.863), respectively. In summary, in the previous assumptions, H3 is supported.

Table 8: Perceived risks mediation model test

	Consumer Trust		Intention of use (without mediator)		Intention of use (with mediator)	
	t	p	t	p	t	p
Constant	3.474	0.0006	5.548	0.0012	5.0113	0.0011
Perceived Risks	43.5311	0.0004	34.5431	0.0004	9.0754	0.0004
Consumer Trust					7.885	0.0003
R2	0.84		0.7954		0.8272	
F	1894.9568		1193.223		861.4698	
	Effect (β)	SE	LLCI	ULCI	Percent	
Mediation Effect (CR)	0.3793	0.0519	0.2767	0.4798	44.33%	

Note: All variables in the model are brought into the regression equation using standardized variables. SE, LLCI and ULCI refer to the standard error and 95% confidence interval of the indirect effect estimated by the deviation-corrected percentile Bootstrap method, respectively

Similarly, test the mediating effect of consumer trust in the relationship between perceived risks and intention of use. The results (see Table 8) show that perceived risks have a significant predictive effect on intention of use (R^2=0.7954, t =34.5431, p<0.01), and when a mediator is included, the direct predictive effect of perceived risks on use intention It is still significant (R^2=0.8272, t = 9.0754, p<0.01). Perceived risk has a significant positive predictive effect on consumer trust (R^2=0.84, t = 43.5311, p<0.01), and consumer trust also has a significant positive predictive effect on consumer trust (R^2=0.8272, t = 7.885, p< 0.01). The upper and lower limits of the confidence interval do not contain 0 (see table 9 LLCI ULCI), indicating that perceived convenience cannot only directly predict intention of use, and can predict intention of use through the mediation effect of consumer trust. The direct effect (β=0.476) and the mediating effect (β=0.379) account for 55.67% and 44.33% of the total effect (β=0.856), respectively. In summary, in the previous assumptions, H4 is supported.

5.   Discussion and conclusion

5.1   Discussion on findings

The results of regression analysis with use intention as the dependent variable and convenience and perceived risks as independent variables show that convenience, perceived risks and intention of use have a significant positive correlation, and they all have a strong influence (Van Noort et al., 2017). This may be related to the user's low awareness of mobile banking. Consumers must first perceive that mobile banking is useful to them and believe that operating mobile banking is risk-free before they take a positive attitude towards this technology (Gefen et al., 2003). Moreover, consumers value the security of mobile banking very much and are not willing to take risks. And with the improvement of education level, people's knowledge level and personal ability are also improving, and there are no obstacles to the normal use of mobile banking (Juan, 2014). On the other hand, it may also be because many of the samples selected in this survey are university students, and their knowledge level and risk perception ability are relatively high in the entire society (Hong and Cho, 2016).

Through research, this article draws the following conclusions:

For university students, perceived convenience is considered from the perspective of new technology adoption to consider their impact on mobile banking usage behavior. Technical convenience has a significant positive effect on users' intention to use mobile banking. In the influence relationship between technological convenience, there are both direct influence and indirect influence through customer trust. At the same time, since the indicator of perceived convenience is derived from the Technology Acceptance Model, this conclusion also shows that the Technology Acceptance Model is still applicable to the user behavior research of Malaysian mobile banking among university students (Muniady et al., 2014).

Perceived risks have a significant positive effect on the intention of use mobile banking. At the same time, the impact of perceived risks on intention of use mobile banking has the same impact as that of perceived convenience. Similar to convenience, the impact of perceived risks on the intention to use mobile banking has both a direct impact and an indirect impact through customer trust (Bente et al., 2016)

5.2   Implications for theory

This research proves that in the context of mobile banking use, customer trust has a partial mediating effect on the correlation between perceived convenience, perceived risks and intention of use (Weathers et al., 2017). That is, when users perceive convenience of mobile banking, they will trust mobile banking and have a positive attitude toward mobile banking (Beatty et al, 2011). However, even if users do not trust mobile banking, when users believe that using mobile banking will bring them risks, they will also distrust mobile banking and have a negative attitude towards using mobile banking (Gefen et al., 2003).

With the rapid development of mobile phone networks, mobile phones are becoming more and more popular among people. Major banks have seized this opportunity to jointly promote mobile banking so that users can operate banking business anytime and anywhere, thereby improving the efficiency of their

customers' work and life. This will improve the bank's own competitiveness (Urban et al., 2019). The purpose of this research is to explore the influencing factors of mobile banking use intention and the mediation role of customer trust in it and help banks and other institutions understand the psychological mechanism of university students in the process of using mobile banking, so as to adopt appropriate marketing strategies.

5.3   Implications for practice

The results of this research show that the convenience of mobile banking has the most direct and significant influence on the intention to use mobile banking. When university students contact mobile banking, the first thing they feel is the business functions of mobile banking, whether it has a wide range of functions and whether it can meet their business needs. If it can meet business needs, is it easy to operate mobile banking, and can it be convenient and fast enough to help you save time and energy without having to wait in long lines at the counter for business. This is a question considered by university students, but also a question considered by banks (Rehman and Shaikh, 2020). Therefore, when banks promote mobile banking, they should first start with the product itself, continue to upgrade products, and enrich mobile banking functions, so that mobile banking not only has basic financial functions such as simple account inquiry, transfer and remittance, transaction payment, etc., but also can handle investment and wealth management services such as stocks, gold, funds, and treasury bonds, that is, all services that can be handled at the bank counter except cash withdrawal are included in mobile banking (Engdahl & Lidskog, 2014).

In order to ensure the safe use of electronic banking, the Malaysian government has continuously regulated the mobile banking market. At present, in order to ensure timely and accurate data dissemination among banks, without interference from other factors, and to prevent the risk of information being stolen or destroyed, Bank of Malaysia mainly adopts internationally recognized encrypted transmission methods for information transmission and processing (Oerther, Manjrekar and Oerther, 2014). At the same time, in order to ensure the safety of funds in bank accounts, banks have stricter requirements on the upper limit of each transaction (De Leon, 2019).

However, in terms of the use of mobile banking users in Malaysia, the development of mobile banking is still in its infancy, and banks still need to continue their efforts to improve security protection policies and measures. For mobile banking, database, data storage, network, etc. are basic equipment, and errors in any link will cause huge losses to users (Bai et al., 2018). Therefore, banks should be cautious in these technical links, and constantly update and improve the mobile banking system platform and network architecture to meet the needs of business development and platform safe operation. At the same time, strengthen cooperation with mobile operators, propose more effective solutions, develop more reliable business systems, and make consumers more willing to use (Wang and Chang, 2013).

6.   Recommendations

6.1   Improve account management functions

Among the many functions of mobile banking, the most frequently used by users is the account query function of mobile banking, which accounts for 74.2% of the total number of users, and transfers and remittances rank second with 55.5% (Raza, Shah and Ali, 2019). These two are important manifestations of the convenience of mobile banking, and the preferential policies for mobile banking transfers and remittances that are successively launched by major commercial banks are the key points of banking competition.

Account management is the basic function of mobile banking. At present, the account management function generally covers the main content of bank counter services, but some are not included. For example, physical account opening, and cancellation can only be handled at the counter. The amount of funds transfer and remittance or purchase of investment products can only be reserved or cancelled through online banking. The reason why these functions are not currently designed in mobile banking is mainly

because they worry that the provision of these services will become criminal tools for criminals. For such functions, commercial banks should ensure the realization of the functions through process control. For example, when opening a bank card account, university students can use online application, fill in application materials, video identity authentication and other forms to check. Account cancellation can be confirmed by phone according to the contact information left when opening the account, so that the risks of these functions are controlled from the process. If these functions are perfected, mobile banking can actually become the basic platform for commercial bank customer services, and the effectiveness and convenience of services will be greatly enhanced.

6.2   Strengthen the coverage of offline payment

At present, the core function of mobile banking mainly revolves around the bank's counter business, which cannot meet the needs of users for instant payment. With the increasing requirements of users for card-less payment, offline payment has become a basic function and an important development direction for mobile financial service terminals. As far as the current situation is concerned, the offline payment function of mobile banking has lagged behind third-party payment companies that scan QR codes such as mobile apps in terms of R&D level and market layout. At present, all financial institutions are still in the stage of innovation and experimentation. Whoever can realize the expectations of users to the greatest extent can seize the market opportunity. For example, as "QuickPass" increases the intensity and scope of promotion, it is believed that in the near future, the card-less contactless transaction method will be generally accepted and used by people.

6.3   Improve living service functions

Mobile banking payment service is a practical function closely related to the daily life of the general public. Most banks can only pay part of the living expenses, and some banks do not even have one. From the perspective of serving customers, the business departments of banking institutions should add water, electricity, and other services to the scope of their services as much as possible to avoid losing customers. In terms of online shopping, the common problems are the popularity of cooperative platforms or self-owned platforms is too low, the abundance of products is not enough, and the price of most products has no advantage. Most shopping malls have very low traffic, indicating that their transactions are not active, and the number of users is very limited. This requires commercial banks to actively change their business methods and development thinking, actively seek cooperation opportunities with new market entities such as internet e-commerce, make full use of market resources, and strive to improve customer experience.

6.4   Biometric technology

Security is currently the most worrying and dissatisfied issue for mobile banking users. It can be found from the statistics that many users give up trying or using it because of the risks of mobile banking. The security functions of mobile banking mainly include two aspects, namely login security and payment security. In common, the login password and payment password of mobile banking are separate. When entering the personal account for inquiries and management, users need to enter the login password; when property transfer is involved, they usually need to enter another payment password for secondary confirmation. When the amount of funds spent is large, the verification code sent by SMS becomes This is the last technological barrier commonly adopted by banks. In individual cases that have occurred, criminals can obtain these two independent passwords through illegal means such as phishing and placing Trojan horses, and then can even obtain verification codes by intercepting mobile phone text messages, and then transfer account funds in small amounts from different places. Even if the user promptly reports the crime after discovery, it is very difficult for the police to catch the criminal. At the same time, the possibility of recovering the stolen money is even slimmer, damaging consumer confidence in mobile banking. Although

this is a case, the high-tech crime has a high technical content and a complicated situation, which brings a lot of insecurity and psychological panic to ordinary users.

Science and technology make the future, and development is the only way to solve problems. Compared with online banking, a prominent advantage of mobile banking is that it can easily apply various new authentication technologies on the smartphone platform, such as fingerprints, iris, facial recognition, etc., instead of relying on users to increase password strength or regularly Preventive measures such as changing passwords, after all, it is unrealistic for people to remember many complicated passwords. With the maturity of biometric technology and integration into smart phones, it is believed that it will soon replace the current original identity authentication method that relies on input of character passwords and digital verification codes, fundamentally solve the problems that arise, and improve user trust and satisfaction.

6.5   Increase account protection measures

At this stage, the most effective way to improve safety performance is to increase protective measures to prevent risks. For example, use https secure links to encrypt access to sensitive information, reserve welcome messages to identify fake websites, use security controls to prevent malicious programs, use secure keyboards to enter account passwords, set transaction limits, and send SMS reminders. Banks provide customers with multiple security protection mechanisms through various means to ensure the safety of their property. At the same time, they should pay attention to active publicity and guidance to eliminate user misunderstandings and unnecessary worries.

With the rapid development of society, professional knowledge and complex technologies are difficult for ordinary consumers to understand and master, but simple measures are often the most effective. For example, the "same card in and out" mechanism means that funds are transferred from the bound bank card when they are transferred out. When a refund or business cancellation occurs, the funds return to the same bank card. In this case, even if the user's mobile phone is stolen and the payment password is also stolen, the user's large amount of property is still safe, because the funds can only flow into the bound bank card. Similar measures can gradually regain consumer confidence and change their attitudes.

6.6   Increase university students' trust

In recent years, the information exchange between consumers and financial institutions does not achieve real-time and two-way equal interaction as in traditional services, but is based on consumers' one-way passive acceptance, selection and evaluation of information. Therefore, businesses need to think about problems from the perspective of university students and formulate the most effective marketing strategies. The results of this research just confirm that financial institutions can improve themselves by enhancing their trust.

Specifically, financial institutions can get the following enlightenment from the results of this research. Firstly, enhancing users' trust in institutions and mobile apps and increasing the convenience of mobile banking can have a direct positive impact on usage intentions. For example, in order to enhance the trust of users, when it is difficult to strengthen network security, financial institutions can start with trust clues, increase guarantee agreements and admiration promises, etc., to enhance consumer trust; they can also start with communication, being intimate and quick. The online customer service will reduce the delay of information and also make a positive contribution to consumer trust. In addition, actively handling user reviews will also contribute to the growth of user trust. Financial institutions should encourage mobile phone users to actively provide detailed feedback as much as possible, which is also conducive to subsequent user trust. At the same time, perceived risk has the greatest impact on store reputation trust in trust. Therefore, in order to prevent the decline of their own reputation, financial institutions can use measures to reduce consumers' perceived risks, including the protection of user privacy and the improvement of transaction rules.

Conflict of interest statement

All of the authors do not work for, consult, own shares in or receive funding from any company or organisation that would benefit from this article and have disclosed no relevant affiliations beyond their academic appointment.

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Authors' contributions

Sukjeet Kaur Sandhu and Syarifah Mastura conceptualized the central research idea and provided the theoretical framework. Jin Kai and Ritwik Maity carried out the research by collecting data. As the data were collected during pandemic, Abidah Saad and Harpajan assisted in the data collection process and data analysis. Jinkai wrote and investigated the article. Both Jin Kai and Ritwik Maity designed the research as per the methodology. Ritwik Maity reviewed and edited the article. Sukjeet Kaur Sandhu and Syarifah Mastura supervised the whole research progress and validated the data sources. Sukjeet Kaur Sandhu anchored the review, revisions and approved the article submission.