

Conceptual Model for Adoption of Mobile Banking Technology in Savings and Loans Cooperatives

Ni Kadek Dessy Hariyanti*, I Gusti Ngurah Sanjaya

Department of Business Administration
Politeknik Negeri Bali
Badung, Indonesia

*dessyhariyanti@pnb.ac.id, gustingurahsanjaya@pnb.ac.id

I Putu Sutawinaya

Department of Electrical Engineering
Politeknik Negeri Bali
Badung, Indonesia

putusutawinaya@yahoo.co.id

I. G. P. Fajar Pranadi Sudhana

Department of Tourism
Politeknik Negeri Bali
Badung, Indonesia
fpranadi@pnb.ac.id

Abstract—In an effort to maintain competitiveness and sustainability, organizations must pay attention to the needs of their members. The use of online applications amidst conditions that limit human mobility is urgently needed. This study aims to analyze the technology adoption of Saving and Loans Cooperatives (KSP) mobile banking based on the Technology Acceptance Model (TAM). This research uses a descriptive approach, conducted by survey method through the use of a questionnaire. The control variables in this study were gender, age, education, profession and understanding of technology. The result of this research is a mobile banking technology adoption model that can be implemented in analyzing technology acceptance. The model describes 2 main factors that influence members' decisions in using technology, namely user trust factors and user attitude factors. User attitude factors consist of usability, ease of use and consumer awareness. User trust factors consist of risk awareness and social influence.

Keywords—mobile banking, technology adoption, TAM

I. INTRODUCTION

Every organization must always make strategic innovations so that it is not destroyed by competitors. In addition, strategic innovation can gain a competitive advantage over competitors [1]. One of the most appropriate strategic innovations to gain competitive advantage is organizational rearrangement, by involving the advantages of Information Systems and Information Technology in existing processes in the organization. The rapid development of Information Systems and Information Technology today has also been considered a very important resource for an organization that does not only act as a support, but also has a key operational role, high potential, strategic role and can be used. To support effectiveness, efficiency and productivity in an organization,

the Savings and Loans Cooperative organization is no exception.

A cooperative is a business entity whose members are persons or legal entities by basing its activities on the principle of cooperatives and also as a social economic movement based on the principle of kinship [2]. The cooperative aims to improve the standard of living of its members. Savings and loan cooperatives (KSP) are cooperatives engaged in savings and loans. KSP is a non-bank financial institution that is tasked with providing community service, in the form of loans and a place to save money for the community. KSP plays a role in helping members' credit needs with mild conditions, educating members to actively save regularly so that they can form their own capital, increase knowledge about cooperatives, and keep members away from loan sharks. In general, the scope of cooperative activities is the collection and distribution of funds, in this case in the form of loans and savings to members, in its development this savings and loan cooperative serves not only members but also to the wider community. In its development, the existence of KSP in Indonesia is able to alleviate poverty by empowering poor rural communities [3]. KSP requires complicated records to process data on the savings and loan transactions of its members. Excellent service for all members, especially for the needs of information access and real time transactions, is of particular concern in improving KSP's performance. This really requires the support of technology-based information systems in order to facilitate data processing and to optimize the use of resources and time efficiency. In addition, fast and accurate data processing also supports the decision-making process for leaders and managers of KSP. So that information systems/information technology are very important to be implemented and become a priority for development. The development of a mobile banking system is

very important in supporting services to its members and increasing organizational competitiveness and excellence.

Savings and Loans cooperative (KSP) is a family-based organization engaged in microfinance that uses a mobile banking application. KSP serves the needs of micro businesses that support financial needs with easy requirements for loans and low interest loans. KSP continues to grow with an increasing number of members so that it is deemed necessary to continue to develop in all fields, especially information systems and technology in the form of mobile banking applications. The focus of the analysis of technology acceptance observed in this study is the mobile banking system. This study aims to examine and identify important factors that determine the acceptance and utilization of mobile banking by its users using the Technology acceptance model as an innovative adoption theory approach. By knowing the factors that influence user acceptance of mobile banking, the leadership can find out the attitude and level of acceptance of this information system user, so that the next steps can be determined for the development of the system.

II. LITERATURE REVIEW

The object of the research was KSP Mobile Banking. This study used a qualitative descriptive approach, which carried out several stages of research including: first, conducting an overview of previous research that had examined the evaluation of adoption of information systems technology. Then proceed with an overview of the existing TAM concept [4] model to provide a theoretical basis for the proposed conceptual model to be built. It was continued by forming a Mobile Banking system acceptance model by determining variables, indicators and questionnaires that became the research model instrument.

A. Mobile Banking

Mobile banking is a service provided by banks to carry out various banking transactions through sharing features on smart phones (smartphones) [5]. At a glance, this mobile banking service is similar to the SMS banking service, but in fact mobile banking has more features than SMS banking. Mobile banking services have advantages over internet banking because they are relatively easy to get connectivity due to direct connections from each customer's cellphone. This makes it easier for customers to make financial transactions, thus saving a lot of time. Its simple features make mobile banking via mobile very easy to understand. All instructions are given in an easy and detailed manner making it cost effective. In addition, mobile banking facilities have low costs compared to internet banking, which requires connection via a browser.

In terms of security, mobile banking can reduce the risk of fraud because customers will get an SMS when there is activity on the customer's account, whether it is deposits, money withdrawals, or transfers between accounts. Banks also feel lucky with Mobile banking services because they can reduce costs from tele-banking and are more economical [6]. Besides,

this additional facility can make it easier for consumers to make transactions, so that banks can increase their customer satisfaction. In addition, banks also feel closer and can reach their customers with mobile banking.

Bank products can also be easily promoted through advertisements for mobile banking services such as credit cards, loans, and others to certain customer groups. In addition to product promotion, various bank services that can be accessed through mobile banking include information on account payments, information on the amount of savings, transaction history, money transfer facilities, and so on, which can be accessed directly through the customer's cellphone. Another thing that has made mobile banking increasingly popular is that customers can transfer money directly to the same or different bank accounts via mobile banking with a wide network connectivity coverage that exceeds internet banking.

The security feature is one of the issues [7] in using mobile banking. This is after security experts generally agree that mobile banking is safer than online banking because there are very few viruses and Trojans that attack smart phone. However, mobile banking users are more prone to being attacked by fraud. In an era of increasingly advanced technology, the internet and wireless communication networks have begun dominate. Many applications and features appear on smartphones which of course make things faster and more practical. When Customer have to buy an electricity token, they can do it via a smart phone. Almost everyone now has a sophisticated smartphone. Not only make communication easier, smart phones can also facilitate banking transactions. Various banking applications have emerged, one of which is mobile banking. The existence of mobile banking [8] can simplify all banking matters. Starting from paying electricity and water bills, paying off credit cards, transferring between banks, to charging electronic money.

Mobile banking is a service that allows bank customers to carry out banking transactions via cell phones or smartphones. Mobile banking services can be used by using a menu that is available through an application that can be downloaded and installed by the customer. Mobile banking offers convenience when compared to SMS banking because customers do not need to remember the format of the SMS message to be sent to the bank and also the SMS banking destination number.

Features of mobile banking services include information services (balances, account transfers, interest rates, and the location of the nearest branch / ATM); and transaction services, such as transfers, bill payments (electricity, water, internet), credit purchases, and various other features. To use mobile banking, customers must first register with the bank. Customers can take advantage of the mobile banking service by accessing the menu that is available on the application installed on the cellphone. If a customer uses mobile banking through an application installed on a cellphone, the customer must first download and install the application on the cell phone. When opening the application, the customer must enter

a User-ID and password to log in, then the customer can select the available transaction menu and is asked to enter ID when executing the transaction. Various banking features are provided in the mobile banking application which aims to facilitate customer transactions. Mobile banking is a service provided by banks to carry out various banking transactions through various features available on smart phones (smartphones). Mobile banking is a development of the mobile banking feature that has been developed previously and is familiar. Mobile banking application is attached to the sim card, while the mobile banking application is actually installed on the cellphone. Another change that can be seen immediately is [9] that the application is more attractive and user friendly. Mobile banking can be accessed using the application by downloading the mobile banking service application at the app-store available on a smartphone. Mobile banking can also be accessed through the provider menu. However, not all providers have this mobile banking service, there are only a few providers that provide mobile banking services. Some mobile banking is connected to internet banking, so to be able to activate a customer, you must first activate an account on the internet banking.

The advantage of mobile banking is that it is easier to access even on a slow internet connection. The connection range is wider than internet banking. The features are simple and easy to understand. The fees charged are generally lower than internet banking. Safe and minimizes the risk of fraud. Make it easier for customers to reach bank facilities. Can be accessed at any time, anytime and anywhere. The disadvantage of mobile banking is a range of scams called smising, in which mobile banking users receive fake SMS or calls from someone claiming to be from a financial institution, asking for bank account details. Security features over an encrypted connection were hacked when the smartphone was stolen. A sophisticated smartphone is required to access it.

Mobile banking is an interesting thing to study because [9] people now don't like long periods of time, they need fast and cheap services. Based on statistical data, by the end of 2019 mobile banking users reached 80% of the total existing customers, and nearly 68% were active users. Meanwhile, banking itself realizes that digitalization can make banking more efficient [9] by up to 20-30%, this is a necessity for saving company operational funds. However, the biggest barrier to using mobile banking for financial transactions is the issue of trust. 32% of mobile users in Indonesia mentioned this as the main problem that made them worried about using this solution. The same thing is experienced by e-commerce services and mobile wallets. This means that the issue of trust is [10] a classic thing that must be resolved jointly by all electronic and online-based services. The most widely used transactions for mobile banking services are transfers, both among and with other banks, payment of electricity or water bills, purchasing pulses or data packages also electricity tokens and e-money top up. In fact, it is estimated that in 2020 the use of mobile banking will increase sharply in reference to the pandemic conditions that require restrictions on human mobility.

B. Technology Adoption

The adoption process goes through several stages [11] the first is the target of becoming aware of the innovation being offered. The second stage is attention (interest), which is the growth of interest which is often marked by the desire to ask questions or to find out more about everything related to the innovation offered. The third stage is evaluation [12] which is an assessment of the good, bad or the benefits of innovation, which has complete information and an assessment of its technical aspects. However, the evaluation stage also analyzes economic, as well as socio-cultural aspects, often in terms of political aspects or compliance with government policies on national and regional development. The fourth stage is trial (trial), which is trying on a small scale to make the assessment more convincing, before applying it to a wider scale. So that the adoption process can be said to be an awareness [8] of the interest in accepting an innovation with full confidence based on the assessments and trials that have been done and observed by himself and then confirms by trying to implement the innovation as its implementation. Adoption is influenced by many factors, namely: the characteristics or characteristics of the innovation, the traits or characteristics of potential users, adoption decision making, the channels or media used and the qualifications of the innovation extension instructor.

The Indonesian banking sector has reported their performance during the first semester of 2020 [9] there is one type of income that is increasing rapidly, which is income from digital services. This phenomenon is evidence that the adoption of digital technology by banking consumers has increased rapidly during the pandemic. This condition forces consumers to go digital. For transaction matters, for example, consumers are now more comfortable using internet banking or mobile banking. They only want to go to a bank or ATM if they need to take cash. The same trend also occurs in the retail, health, education and entertainment industries. And, interestingly, it appears that the acceleration of digital adoption has reached an all-time high.

The process of adopting mobile banking technology has encouraged a cashless society. Less cash society is a lifestyle using transaction media or electronic money in transactions, so there is no need to carry physical money. Less cash society, besides being able to improve a payment system that is fast, safe and efficient, can accelerate the cycle of economic activity and financial system stability, and can also prevent criminal acts and money laundering [11]. At this time, online shopping services continue to grow in society. There is interaction between sellers and buyers without having to meet face to face, but can make buying and selling transactions using the internet. The development of this online shopping service has made mobile banking services very much needed as a medium of payment [6]. The adoption of mobile banking technology is expected to provide more optimal services than previous services, this service arises due to the large number of customer needs that require transactions anytime and anywhere [7]. As an innovative technology, mobile banking is a good example of a breakthrough in cellular technology in the banking sector,

which allows customers to make financial transactions (checking balance information, money transfers and bill payments) via smartphones [13]. The banking sector seems interested in implementing mobile banking services, as a business to provide better services to their customers, as well as increase effectiveness and efficiency.

Globally, there has been a tremendous acceleration of digital adoption known as decades in days. As a result of the pandemic, the digital adoption trend that previously took years, even decades, is now happening in a matter of days. In the online delivery business, an increase that has been recorded for 10 years, now, can be achieved in just eight weeks. Telemedicine usage increased by 1,000% in just 15 days [6]. The number of online meeting attendees also increased 20 times in just three months. In the world of entertainment, in five months, Disney Plus managed to attract as many subscribers as Netflix has achieved in seven years.

III. LITERATURES STUDY

This study will analyze the technology acceptance model, to build conceptual model of technology adoption of mobile banking in savings and loans cooperatives.

The analysis will be based on the TAM that has been developed and adapted to the case raised, namely the acceptance of mobile banking technology [6] in the financial institution sector. The model built includes a description of the variables used in this study which are described in a model. The model also includes detailed indicators describing each variable along with a list of questions used to extract information from the intended respondents.

A. Technology Adoption Model

This study will analyze technology adoption based on the technology acceptance model (TAM) on the factors that affect customer acceptance of mobile banking (empirical study of cooperative members). The research will begin with conducting an evaluation analysis of the implemented information system to determine the important factors that affect the adoption of Mobile Banking technology. Furthermore, based on these factors, a mobile banking technology adoption analysis model can be built. There are 4 variables of the TAM model [12] of concern in this study, namely: Perceived usefulness, Perceived ease of use, Consumer Awareness, Perceived of Risk, and Social Influence.

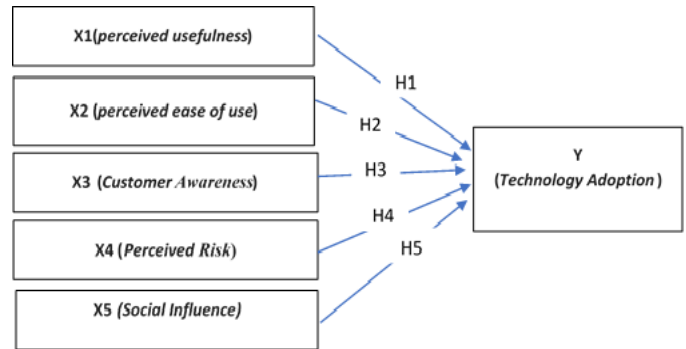


Fig. 1. Technology adoption model of mobile banking.

This research model uses the TAM model which uses a psychological approach that measures the factors that can influence a person in an individual's acceptance of a technology. TAM was first introduced by Fred Davis in 1986 [4]. According to Davis, TAM is one of the behavioral models in the use of information technology in the management information systems literature. TAM aims to explain and estimate user acceptance of an information system. TAM provides a theoretical basis to determine the factors that affect the acceptance of a technology in an organization. TAM describes the causal relationship between behavior and beliefs (benefits of an information system and ease of use), objectives, and actual use of information system users. The benefits felt by users of information systems are the extent to which a person believes that the use of a particular system will improve the performance and perceived ease in using the information system. TAM has been generally accepted as a model used to predict individual acceptance of new technology [14]. Perceived ease of use and usability are important factors influencing individual acceptance of new information systems or technologies. Several previous studies have found that there is a positive relationship between perceived ease of use and perceived usefulness as an important factor in using e-banking [4,15]. The model used in this research based on the TAM model is depicted in Figure 1.

From the literature review and previous research, by applying the TAM model according to the research conceptual model above, the research hypothesis can be determined, namely:

H1: Perceived Usefulness has a positive influence on the adoption of Mobile Banking technology

H2: Perceived ease of use has a positive influence on technology adoption

H3: Customer awareness has a positive influence on the adoption of Mobile Banking technology

H4: Perceived Risk has a positive influence on the adoption of Mobile Banking technology

H5: Social Influence has a positive influence on the adoption of Mobile Banking technology.

B. Variable Model

This study raised 5 variables independent, 1 variable dependent, and 4 variables control. After determining the research model, a questionnaire was compiled with the questions adapted and developed from previous research based on the model and objectives of the study.

1) *Perceived Usefulness (PU)*: Perceived Usefulness according to Davis [4,16] is the level where individuals believe that using a particular system will improve their job performance. In this research, it can be interpreted that the user believes that using Mobile Banking the user can increase the effectiveness in all administrative activities of budget proposals and activities. This PU variable is measured through indicators, namely: Transaction Speed, Mobile Banking Usability, Transaction Effectiveness, Supporting Activities.

2) *Perceived Ease of Use (PEU)*: Perceived ease of use according to Davis [4,17] is the level where individuals believe that using a particular system will be free from physical and mental efforts. In this research, it can be interpreted that users believe using Mobile Banking is easy and does not require hard effort. The PEU variable is measured through indicators: time efficiency, ability to make transactions, ease of mobile banking operations, and flexible use.

3) *Consumer Awareness (CA)*: Consumer awareness is a condition in which someone who feels, knows, remembers or understands a product or service. Adoption or rejection starts when consumers become aware of the product. Consumers will go through a process of knowledge, persuasion, decision and confirmation before they are ready to adopt a product or service. Consumers will be looking for products and banking that can offer them the best value. Previous research [6,18] on consumers in Australia found that consumers are aware of the advantages or disadvantages associated with using online banking services. CA variables are measured by indicators: Recognizing and remembering mobile applications, understanding mobile banking services, likes to use mobile banking, and choosing mobile banking compared to other services.

4) *Perceived of Risk (POR)*: Perceived of Risk [18] is the risk refers to the overall uncertainty felt in a particular buying situation. Perceived risk is a state of uncertainty regarding online transactions due to the open internet technology infrastructure. The risks faced by customers relate to security and confidentiality. Previous research [19] found that risk is one of the main factors influencing internet banking adoption. The X4 variable is measured by indicators: the amount of risk, transaction security, transaction needs, security guarantees from the bank.

5) *Social Influence (SI)*: Social influence is the influence from the environment that can cause a person to use a technology. Social influence refers to a change in attitude or behavior as a result of the interaction or influence of another party. Social influence factors can be seen from the relationship between friends, family and parents in influencing purchasing decisions. Seeing that KSP is an organization based on kinship and mutual cooperation allows social influence to be very important in giving an influence on the use and adoption of technology. Several research results indicate that social influences influence consumer decisions. To select a product. The SI variable is measured through indicators: the presence of friends, the presence of family members, the presence of parents or elders [20,21].

6) *Technology Adoption (TA)*: Adoption refers to the process of accepting something new (innovation), namely accepting something that is offered and pursued by other parties. By acceptance which implies actually implementing or continuing to use a service, product or idea. Adoption or rejection of innovation begins when consumers are aware of the product [10,22]. Technology adoption variables are measured through indicators: Desire to use mobile banking in the future, suitability of mobile banking use with needs, support for using mobile banking, desire to recommend mobile banking.

7) *Control variable*: In this study, the characteristics of the respondents as control variables were described regarding [23,24] age, gender, occupation and experience using mobile banking. They were consisting of Gender with 2 categories, Age with 4 ranges of ages and occupation with 9 types of occupations. The experience of using mobile banking describes the experience of using and the frequency of using mobile banking.

C. Quizionare Model

From the TAM model variables that have been described, a series of questionnaires was compiled based on the indicators obtained, namely the Perception of Usability Variable (PU) described by 4 dimensions, Perception of ease of use (EOU) explained by 4 dimensions, Customer Awareness (CA) explained by 4 dimensions, Perception Risk (POR) is described by 4 dimensions, social influence (SI) is described by 3 dimensions, and technology adoption (TA) is described by 4 dimensions. Each dimension will be used to compile a list of questions as a tool to gather information in accordance with the objectives of each research variable. List of questions described in questionnaire form can be seen in Table 1.

TABLE I. QUIZIONARES MODEL

Variable		
Perceived Usefulness of Mobile Banking (PU) [5,19]		
PU1	Transaction Speed	mobile banking application has fast access
PU2	using mobile banking	The management's policy to build a mobile banking application was the right decision
PU3	effectiveness of mobile banking	mobile banking application is very effective and useful
PU4	support activities	mobile banking application supports financial transaction activities
Perceived Ease of Use of Mobile Banking (EOU) [19,25]		
EOU1	time efficiency	mobile banking application can save time
EOU2	the ability to make transactions	mobile banking application is always correct and never error
EOU3	ease of mobile banking operations	the mobile banking application is easy to use
EOU4	flexible use	The baking mobile application is very flexible and can be used anywhere and anytime
Consumer awareness (CA) [6,19]		
CA1	recognize and remember mobile applications	remember username and password
CA2	understand about mobile banking services	the procedure for using the mobile banking application is systematic and easy to understand
CA3	love to use mobile banking	simple and elegant mobile banking application interface
CA4	choose mobile banking over other services	always use the mobile banking application for payments and financial transactions
Perceived Of Risk (POR) [6,19]		
POR1	understand the risk	keep username and password secret
POR2	transaction security	immediately report to admin in case of loss of cellphone
POR3	transaction needs	although there are risks, a mobile banking application is an important requirement
POR4	security guarantee from the bank	The security of the mobile banking application is guaranteed by the organization
Social Influence (SI) [5,6]		
SI1	The existence of friends	using the mobile banking application because a friend suggested it
SI2	The existence of family members	use the mobile banking application because it is recommended by family members
SI3	The existence of parents or elders	use the mobile banking application because it is a cooperative member
Technology Adoption (TA) [15,19]		
TA1	desire to use mobile banking in the future	will continue to use the baking mobile application in the future
TA2	suitability of use of mobile banking with needs	the features offered by the mobile banking application are complete and clear
TA3	support in using mobile banking	mobile banking application in accordance with the needs of the demands of the times
TA4	wishes to recommend mobile banking	will advise anyone to use the mobile banking application

IV. CONCLUSION

This proposed model of technology adoption of mobile banking acceptance is a modification of Tam model concept which is adapted to the characteristics of cooperatives organization. Variables and indicators that support the analysis are selected through a literature review that refers to important factors in the successful acceptance and adoption of mobile banking.

The result of this research is a mobile banking technology adoption model that can be implemented in analyzing technology acceptance. The model describes 2 main factors that influence members' decisions in using technology, namely user trust factors and user attitude factors. User attitude factors consist of usability, ease of use and consumer awareness. User trust factors consist of risk awareness and social influence.

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