

# SECURITY STRATEGY IN FACING PHISHING AND SKIMMING THREATS: ANALYSIS AND TECHNOLOGY SOLUTIONS AT BANK MUAMALAT INDONESIA DENPASAR BRANCH OFFICE

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**Abstract.** *The background to this research is that the trend of non-cash or cashless transactions is increasingly widespread in Indonesia. The Bank is also trying to expand its network sector by providing a number of conveniences when carrying out financial transactions without the need to come to the bank. One of them is transactions via smartphone or M-Banking. However, behind the development of banking and the ease of making transactions via M- Banking, there is also the risk of cyber-based crime or threats, so this research aims to analyze the security of transactions when using M-Banking services. The focus of this research is: 1) What is the security of transactions when using M-Banking services at Bank Muamalat Indonesia Denpasar Branch Office? 2.) What are the efforts to increase security for customers who make transactions via M-Banking services at Bank Muamalat Indonesia Denpasar Branch Office? The objectives of this research are: 1) To find out the security of transactions when using M-Banking services at Bank Muamalat Indonesia Denpasar Branch Office. 2) To find out how efforts to increase transaction security are carried out by Bank Muamalat Indonesia Denpasar Branch Office. The research method that will be used is descriptive qualitative, with data collection techniques through observation, interviews and documentation, as well as data validity techniques through the triangulation method. The research results will be presented in a descriptive manner. The result of this research is that transaction security in M-Banking services carries out risk analysis to detect threats that occur. 1) risks in using M-Banking services can be detected through the risk analysis process carried out by the bank, which includes identification, evaluation and risk assessment, as well as risk management. 2) the improvement efforts made are by managing customer information security in accordance with CIA standards (Confidentiality, Integrity, Availability) so that customers can use M-Banking services safely and comfortably.*

**Keywords:** Security, Transactions, M-Banking.

## BACKGROUND

After the Covid 19 disaster that occurred in 2019 to 2022, there were many changes, especially changes in the field of technology. Like it or not, all lines have experienced many changes. These changes also have an impact on the digitalization of banking, where all transactions are directed to use an online system, in order to avoid the transmission of the Covid 19 virus. At the beginning of the establishment of banking, namely in 1955, banking was only a money exchange service which was then transformed into a money deposit service or what we now call savings. In an effort to improve services, banking has implemented technology in various fields, one of which is the Automated Teller Machine (ATM). ATMs are used as a substitute for the function of cashiers in transactions such as cash withdrawals and other transaction processes. In general, the banking process that has

implemented technology is called E-Banking (Electronic Banking).<sup>1</sup>

It is undeniable that the trend of non-cash transactions or cashless transactions is increasingly widespread in Indonesia. Banks are also trying to expand their network sector by providing a number of conveniences when making financial transactions without having to come to the bank. One of them is transactions via smartphone or M-Banking. M-Banking is a feature offered by banks that allows you to use financial functions through various functions of your smartphone. M-Banking has many advantages, several banking functions such as checking account balances or bank transfers can be done mobile via cellphone. M-Banking services also offer easy application features that allow users to use the M-Banking application easily. For security reasons, service providers verify information for each payment with M-Banking, not 5 Irma Aidilia Putri, "The Influence of Cashless Transaction Development on the Need for Cash (Kartal) in Society".<sup>2</sup>

However, behind the development of banking and the ease of transacting through M-Banking, there are also various risks of crime and passive or active cyber-based threats. Threats to information systems are divided into two types, namely passive and active threats. Active threats include fraud and computer crimes. While passive threats include system failures, human error and natural disasters. There are 6 common methods used by people in penetrating computer-based systems, namely input manipulation, program replacement, direct file replacement, data theft, sabotage, and misuse and theft of computing resources.<sup>3</sup> Cybercriminals have begun to launch their actions to seek individual gain. This action is very detrimental in terms of privacy, to the point of causing financial losses if the personal information obtained is misused, in addition to financial losses, it can also cause other problems such as loss of personal data and defamation.

## THEORETICAL STUDIES

Analysis is an activity consisting of a series of activities such as, breaking down, differentiating, sorting something to be regrouped according to certain criteria and then looking for the relationship and then interpreting its meaning. The definition of analysis can also be interpreted as an effort to observe something in detail by breaking down its constituent components or arranging the components for further study. There are also those who consider the meaning of analysis as the ability to solve or break down information or

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<sup>1</sup> Muhammad Khairul Faridi, "Kejahatan Siber dalam Bidang Perbankan" Cyber Security dan Forensik Digital, Volume 1 Nomor 2, (November 2018), h.57

<sup>2</sup> Irma Aidilia Putri, "Pengaruh Perkembangan Cashless Transaction Terhadap Kebutuhan Uang Tunai (Kartal) Masyarakat", Jurnal Ilmiah Mahasiswa FEB, Volume 3 Nomor 1, (Januari 2015), h. 1.

<sup>3</sup> Muhammad Sholihin, "Upaya Peningkatan Keamanan Bertransaksi Melalui Layanan Mobile Banking (M- Banking) di PT Bank Syariah Mandiri" Jember 2019, h. 31

material into smaller components so that it is easier to understand and easy to explain. Meanwhile, according to experts such as Sugiyono, analysis is defined as an activity to find a pattern, besides that analysis is a way of thinking related to systematic testing of something to determine parts, relationships between parts and their relationship to the whole.

Keamanan berasal dari bahasa latin *securus* yang berarti terbebas dari bahaya, ketakutan, dan ancaman. Kata "keamanan" berasal dari akar kata "aman". Menurut Kamus Besar Bahasa Indonesia (KBBI), "aman" berarti "bebas dari bahaya, bebas dari gangguan, atau tenteram tidak merasa takut atau khawatir".<sup>4</sup> Keamanan informasi adalah bagaimana dapat mencegah suatu penipuan (cheating) atau paling tidak, mendeteksi adanya penipuan disebuah sistem yang berbasis informasi, dimana informasinya tidak memiliki suatu arti fisik. Keamanan adalah suatu upaya untuk mengamankan aset informasi terhadap ancaman yang mungkin timbul, sehingga keamanan secara tidak langsung dapat menjamin kelangsungan bisnis dan mengurangi risiko-risiko yang terjadi.<sup>5</sup>

Security comes from the Latin word *securus* which means free from danger, fear, and threat. The word "security" comes from the root word "safe". According to the Big Indonesian Dictionary (KBBI), "safe" means "free from danger, free from disturbance, or peaceful not feeling afraid or worried".<sup>4</sup> Information security is how to prevent fraud (cheating) or at least, detect fraud in an information-based system, where the information does not have a physical meaning. Security is an effort to secure information assets against threats that may arise, so that security can indirectly guarantee business continuity and reduce the risks that occur.<sup>5</sup>

Security itself is the main factor needed in online business processes and information system operations. Security aims to prevent threats to information and communication systems, especially online transactions, so that the security system can be maintained and provide convenience to consumers. Threats to information systems can be divided into two types, namely active threats and passive threats as follows:

- a. Active threats include data theft, illegal use of the system, illegal destruction of data and illegal modification.

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<sup>4</sup> Oktavia Sekar Hermarani dan Kuswardani, "*Sistem Keamanan Dan Ketertiban Masyarakat Swakarsa Sebagai Upaya Penanggulangan Kejahatan*," *Dih: Jurnal Ilmu Hukum*, Vol. 18 Nomor 2, (Agustus 2022): h. 214

<sup>5</sup> Amad Pambudi, "*Pengaruh Persepsi manfaat persepsi kemudahan keamanan dan ketersediaan fitur terhadap minat ulang nasabah bank dalam menggunakan internet banking (studi pada program layanan internet banking BRI)*." *journal of management studies* Volume 8 Nomor 1, (2014) h. 11

- b. Passive threats include system failure or software and hardware failure, human error system operating errors made by humans can threaten the integrity of the system and data.<sup>6</sup>

A narrower definition of fiqh al-mu'amalat, put forward by Mustafa Ahmad al-Zarqa, is the laws on actions and relationships between humans regarding property, rights and dispute resolution regarding these matters. A more technical definition is put forward by Mohammad Ma'sum Billah, namely a form of beneficial agreement that occurs between humans to fulfill all daily life needs, especially in matters related to trade and commerce.

M-Banking is a service facility in providing easy access and speed in obtaining the latest information and financial transactions in real time. M-Banking can be accessed by individual customers via mobile phones that have General Packet Radio Service (GPRS) technology. M-Banking service products are bank distribution channels to access customer accounts through GPRS technology with mobile phone (cell phone) facilities.<sup>7</sup>

## RESEARCH METHODS

This research method uses a qualitative approach of a descriptive type. Sugiyono stated that a qualitative approach is a research method that is based on and the results of qualitative research emphasize meaning rather than generalization.<sup>8</sup> Meanwhile, according to Furchan, the descriptive type is designed to obtain information about the status of symptoms when the research is conducted. In descriptive research, there is no treatment given/controlled as can be found in experimental research. The purpose of this study is to describe the variables or conditions of "what is there" in a situation.<sup>9</sup>

## RESULTS AND DISCUSSION

Based on the interview results, the researcher found several handling and improvement efforts carried out by Bank for the risks that occur in M-Banking services. So that existing errors can be minimized, the following are risk management and risk grouping that are discussed by the researcher:

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<sup>6</sup> Paryati, "Keamanan Sistem Informasi", Seminar Nasional Informatika 2008 (semnasIF 2008), h. 380

<sup>7</sup> Annisa Fitri Iriani, "Minat Nasabah dalam Pengguna Mobile Banking Pada Nasabah Bank Mandiri Syariah Kota Palopo," Journal of Islamic Management and Bussines Vol. 2, No. 2 (Oktober 2018), h. 100

<sup>8</sup> Sugiyono, Metode Penelitian Kuantitatif Kualitatif dan R & D, (Bandung: Alfabeta, 2020), cet. 2, h. 9

<sup>9</sup> Arief Furchan, Pengantar Penelitian dalam Pendidikan, (Yogyakarta: Pustaka Belajar, 2005), h. 447

#### **a. Security of transactions in M-Banking services at Bank Muamalat Indonesia, Denpasar Branch Office**

The results of the study indicate that there is a risk in the M-Banking service at Bank Muamalat Indonesia, Denpasar Branch Office, thus banking conducts risk analysis in their products, including the Muamalat M-Banking service. What is done by Bank Muamalat Indonesia includes:

##### **1) Risk Identification**

Risk identification is a process of recognizing, finding, and determining risks that can affect a project and documenting these risks in a risk register. The main benefit of this process is the documentation of existing risks and the information it provides to the project team to anticipate possible events. The purpose of risk identification is to identify various things, events and situations that may occur that have an impact on the achievement of company goals including the source or input of risk identification and a description of an event.<sup>10</sup>

Based on the findings of the researcher during the interview, it can be explained that the risk identification carried out by Bank Muamalat Denpasar Branch Office is to take a comprehensive approach involving several steps such as risk analysis and risk assessment that cover all aspects of the service. Identification can start from listening and recording every detail of the complaint carefully. Ensuring that customers feel heard and understood. After that, the operational team conducts initial verification to identify the problems faced and determine the right resolution steps. Then, grouping complaints based on the type of problem, such as transaction errors, unauthorized access, technical problems, or fraud and so on.

##### **2) Risk Evaluation and Assessment**

The next step is to measure the risk and evaluate the risk. The purpose of risk evaluation is to better understand the characteristics of the risk. If we gain a better understanding, the risk will be easier to control. A more systematic evaluation is carried out to 'measure' the risk. There are several techniques for measuring risk depending on the type of risk.<sup>11</sup> Based on the findings of the researcher during the interview, risk management in M-Banking services at Bank Muamalat Indonesia, Denpasar Branch Office. Aims to ensure that the risks in M-Banking services such as customer complaints on active threats and

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<sup>10</sup> *Buku manajemen risiko tinjauan dan praktik*, April 2021, h. 28, *Loc. Cit.*

<sup>11</sup> Dr. Mamduh M. Hanafi, MBA. *Risiko, Proses Manajemen Risiko, dan Enterprise Risk Management*, h. 111, *Loc. Cit.*

passive threats can be handled properly by Bank Muamalat Indonesia. This also involves assessing the impact and likelihood of risk. Risk assessment is carried out by customer service as staff who are tasked with receiving customer complaints directly. This involves assessing the impact and likelihood of the risk occurring. The bank also uses various methods, such as risk matrices or analysis, to understand how big the threat is.

The types of complaints at Bank Muamalat are unsuccessful or delayed transactions, be it fund transfers, bill payments, or electricity token purchases. This is usually due to system failures because the network may be less stable, cases like this are grouped into passive threats. However, cases like this are caused by poor customer smartphone connections or the server is having trouble. Then the second is a fake link that is shared like a wedding invitation through customer social media. This aims to make customer data readable by hackers and then misused and can even cause financial losses. Cases like this are grouped with active threats. However, this case at Bank Muamalat Indonesia Denpasar Branch Office can still be resolved quickly so that it does not cause losses that have a major impact on the bank or customers using M-Banking services.

### 3) Risk Management

After risk analysis and evaluation, the next step is to manage the risk, the risk must be managed. If the organization fails to manage the risk, then the consequences can be quite serious, such as large losses. Risk can be managed in various ways, such as avoidance, retention, diversification, or transfer to other parties. Closely related to risk management are risk control and risk financing.<sup>12</sup>

Based on the findings of the researcher during the interview, in handling the risk of M-Banking services at Bank Muamalat Indonesia Denpasar Branch Office when customers will make a complaint in their M-Banking services are required to fill out a customer complaint form. The bank team works together to find a solution as quickly as possible. For example, if there is an indication of fraudulent activity, customer service can block the indicated account and help customers to secure their accounts.

#### **b. Efforts to Improve Transaction Security Through M-Banking Services**

In order to improve the security of customer services, banks are improving security because security is a top priority for financial institutions and customers to ensure that users can enjoy the benefits of digital banking services with a sense of security and comfort. Based on the findings of researchers during interviews, it can be explained that efforts to improve transaction security through M-Banking services carried out by Bank Muamalat Denpasar

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Branch Office are to have end-to-end data encryption technology, detect and monitor in real-time to avoid threats or suspicious things during transactions, hold periodic security and application updates and use complete authentication, such as OTP (One Time Password) codes, PIN (Personal Identification Number), TIN (Transaction Identification Number), fingerprints, facial scans and two-factor F2F authentication. Efforts to improve security that Bank Muamalat has made and are no less important are to provide education to customers.

Ensuring security is not only done by Bank Muamalat Denpasar Branch Office, its customers also ensure that the M-Banking transactions they make are safe, as the results of the interview showed that customers ensure the security of their M-Banking transactions by rechecking, activating the notification and information features available in the M-Banking service, downloading applications from official sources such as the Play Store and App Store, updating the application regularly to use the latest features and logging out when finished using the M-Banking service.

Information security is an effort to protect information assets from potential threats. Information security indirectly ensures business continuity, reduces emerging risks, and allows for optimizing return on investment. There are three elements of information system security, namely Confidentiality, Integrity, and Availability:

#### 1) *Confidentiality*

Confidentiality can also be called confidentiality is an aspect that guarantees the confidentiality of data and information sources. There needs to be certainty that information can only be accessed by authorized persons or those who have access rights to guarantee the confidentiality of the information sent. As from the results of interviews with key informants, it was stated that maintaining confidentiality in Bank Muamalat's M-Banking services already uses strong data encryption, then the bank's operational team periodically conducts security checks on the bank system, implements regulations in accordance with statutory regulations, which can access personal data only certain staff and must request written approval from customers. The last effort is to provide notification to customers if there is a failure in protection.

#### 2) *Integrity*

Integrity can also be called integrity, an aspect that ensures that information cannot be changed without the permission of the authorities, maintains the accuracy and integrity of information and its process methods to ensure the integrity aspect.<sup>13</sup> The results of the research interview show that the way Bank Muamalat Denpasar Branch Office maintains integrity in its M-Banking by passing the test by the Financial Services Authority (OJK),

every transaction made by customers is equipped with a digital signature, Bank Muamalat also applies strict Standard Operating Procedures (SOP) in every transaction and there is continuous monitoring to detect if there is a violation of attempts to manipulate bank data can immediately provide preventive measures.

### 3) Availability

Availability can be called availability is an aspect that ensures that data will be available when needed, ensuring that authorized users can use information and related devices anytime and anywhere.<sup>14</sup> In this study, researchers concluded that the M-Banking service of Bank Muamalat Indonesia Denpasar Branch Office is very safe because it has gone through many transaction security tests before being used by customers, such as risk analysis conducted by Bank Muamalat and information security according to the ISO 27000 standard, the Information Security Management System that has been established. Bank Muamalat has also determined the SOP for customer complaints to be made with CS or through the Muamalat call center so that they can be handled quickly.<sup>13</sup>

## CONCLUSIONS AND SUGGESTIONS

Transaction security in M-Banking services at Bank Muamalat Indonesia Denpasar Branch Office has a definition of being free from threats. With the existence of these threats, Bank Muamalat Indonesia Denpasar Branch Office carries out a risk analysis process, namely through risk identification, risk evaluation and assessment, and provides reviews related to research limitations, as well as recommendations for future research.

Security enhancement efforts made by Bank Muamalat for customers who transact using M-Banking services include providing education to customers by implementing end-to-end encryption technology, conducting real-time detection, using complete authentication such as OTP codes, PINs, TINs, fingerprints, facial scans, and two-factor authentication. In information system security, three important aspects are considered, abbreviated as CIA: Confidentiality, in maintaining the confidentiality of Bank Muamalat using strong data encryption, the bank's operational team conducts security checks on the bank system periodically. Integrity, in maintaining the integrity of Bank Muamalat's M-Banking services, it has passed the trial by the Financial Services Authority (OJK), implementing strict Standard Operating Procedures (SOP) for each transaction, conducting continuous monitoring to detect threats or attempts to manipulate bank data. Availability, in the availability of services using M-Banking services, Bank Muamalat operates a strong

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<sup>13</sup> Abdul Halim Harahap, Dkk, "Pentingnya Peranan CIA Triad Dalam Keamanan Informasi dan Data Untuk Pemangku Kepentingan atau Stakholder," JMPD Jurnal Manajemen dan Pemasaran Digital, Volume 1 Nomor 2, (April 2023): h. 76



infrastructure, in addition to extensive servers, it also has an automatic back up system in the event of disruption or error to stabilize services on its M-Banking. If an error occurs in the M-Banking service, Bank Muamalat will first diagnose the problem and then repair the application and restore the server.

It is recommended that the Bank in efforts to improve transaction and information security can be continued and updated so that customers are more comfortable and safe in using M-Banking services. And the results of this study can be used as reference material for subsequent research related to transaction security analysis in M-Banking services. Further researchers are expected to be able to compile a study that contains more information, so that a new result or finding is expected to be successfully obtained in further research.

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