

Information System Audit: A Case Study of Bank Syariah Indonesia

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| Article Info | ABSTRACT |
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| <p>Keywords: Audit, TI, COBIT, BUMN, BSI</p> | <p>The increasingly advanced development of technology requires the business world to compete competitively, effectively, and efficiently. PT Bank Syariah Indonesia, Tbk, is one of the companies engaged in the banking sector that has placed technology in achieving its goals. The company uses the workflow integrated system engine (WISE) application to process home ownership financing applications. The author identifies problems or weaknesses in the WISE application related to its performance, security, reliability, and functionality. This study aims to describe data in the form of tables and graphs. To determine the maturity level criteria for the WISE application. This study uses a quantitative research type, namely research that produces findings that can be obtained using statistical methods. This study focuses on the maturity level of the WISE application using the COBIT 4.1 framework. The average maturity score of each subdomain is at level 3.5, and its maturity index is in the range of 3.51 to 4.5, namely 3.51 to 4.5 at maturity level 4 (four), namely, managed and measurable. Regarding the results of the information system control maturity level expected in this study, the author obtained a score of 4.8 with a maturity index of 4.51 - 5.00 or level 5 or Optimization. Accounting information systems have become widely used in various organizations or institutions, both private and government. Remember that banking data is very sensitive because it is related to financial data, which needs to be supported by a reliable data security system. The vulnerability of information systems can result in data hacking by irresponsible parties. This qualitative research examines and analyzes audits of technology or IT-based information systems in Indonesian BUMN, in this case, Bank Syariah Indonesia, which is based on Risk Management with the Control Objectives for Information and Related Technologies (COBIT) framework^{1,2,3}. The COBIT framework has been trusted as a reliable framework for assessing an organization's IT governance. This research found that Bank BSI has managed risk well in its IT-based system.</p> |
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INTRODUCTION

According to Saibaba and Murthy (2013), the development of information technology has changed how individuals and businesses carry out activities worldwide over the last 20 years. The development of information technology has significantly impacted the activities of individuals and organizations. It is called an information system because it combines several information technologies and uses them with its users to achieve goals. According

to Romney and Steinbart (2018), using information technology in an information system can help decision-makers become more effective in filtering information.

Information systems have a significant impact on the world of accounting, and one of its applications is the accounting information system. The Accounting Information System AIS means collecting, storing, processing, and recording data to produce helpful facts for users to make decisions (Romney & Steinbart, 2018). Of course, the quality of information is needed to make it easier for users to achieve their goals. According to Romney and Steinbart (2018), information can be of good quality if it is easy to understand, relevant, complete, timely, reliable, verifiable, and accessible. With quality information, the accounting information system can efficiently achieve the objectives of the information system itself. Applying an accounting information system makes it easier for users in several sectors, including banking. With an accounting information system in the banking sector, it is very easy for users to carry out banking activities; one of the impacts is that customers are free to carry out banking activities without having to transact at a bank office. The banking sector in any country is one of the main pillars of the financial market because of its contribution to economic growth by recycling cash in other economic sectors that contribute to GDP (Al-Okaily & Abd Rahman, 2017). If you look at data based on the Financial Services Authority in November 2021, the number of banks registered in Indonesia was 107 banks, with 32,332 offices spread across Indonesia. The large number of banks in Indonesia requires them to continue competing with their competitors. The facilities provided to customers can be used as one of the factors that prospective customers will consider when considering the bank. In recent years, many banks have introduced internet-based banking systems to their customers. One is implementing an accounting information system, electronic banking, which banking sector users often use to carry out banking activities. Electronic Banking provides many advantages, one of which is the freedom of customers to transact anywhere, anytime. Still, some threats need to be considered, namely the security of these facilities.

This cybercrime will have a significant impact on banking, especially on customer trust in using banking services, especially electronic banking facilities. According to research by Afghani and Yulianti (2017), confidence in the security of electronic banking affects customer attitudes toward adopting electronic banking. In electronic transactions, the trust variable is vital in using electronic banking in the banking environment. In contrast, the trust variable does not play a crucial role in conventional transactions.

To explain the reasons behind individual acceptance or rejection of information systems, Davis (1989) proposed a relevant model in this field, namely the Technology Acceptance Model (TAM). TAM is a model that many researchers use to determine what factors influence individual acceptance or adoption of information systems. TAM says that the greater the benefits felt from the information system and the easier it is to use, the more positive the individual's attitude will be in adopting it. In the central construct of TAM, a set of external variables are assumed to indirectly influence the adoption of information systems through perceived usefulness and perceived ease. Several previous researchers have developed the TAM construct with several variables. However, researchers found an external variable that had never been studied before, namely WebTrust services. The American Institute of Certified Public Accountants (AICPA) and the Canadian Institute of

Chartered Accountants (CICA) created WebTrust services to increase public and corporate trust in electronic online transactions. The development of internet technology has resulted in a link of communication between individuals and groups that is very easy and quick. The ease of communication can be done anytime and anywhere as long as the internet is available. In this era of digitalization, almost all daily activities use the internet, including activities within financial institutions such as BSI. An information system audit is a method of assessing information systems to ensure that information system governance and management functions are carried out correctly (Muthmainnah et al., 2021).

Controlling and securing information technology (IT) in an organization was considered fun, but today the stakes are much higher. Effective IT governance has become law for many companies by enacting Sarbanes–Oxley (SOX) in the United States and other laws worldwide (Hardy, 2006). In achieving the organization's vision, the use of IT in the organization must constantly be monitored so that the services provided to users can be maximized, including by conducting an audit process to determine the level of IT maturity so that IT management can find solutions to the process, which is considered less than optimal.

Today's all-digital era requires information system-based audit techniques. Information systems-based audit techniques have revolutionized auditing by allowing for broader data analysis and a better understanding of issues in the data. IT audits play a critical role in evaluating an organization's ability to protect its information assets and ensure operational efficiency in achieving its goals. The importance of IT audits lies in their ability to address IT threats and disruptions (Muhazzab Alief Faizal et al. 2023) that impact every industry, including data breaches, external threats, and operational issues³. This audit evaluates the system's ability to protect information assets, maintain data integrity, operate effectively, and comply with regulations and standards³. The history of IT audits has undergone rapid changes due to technological advancements and the incorporation of technology into business operations. Information systems audits are essential for organizations to ensure IT systems' security, integrity, and efficiency, as well as effective governance in an increasingly digital landscape (Irwan Dermawan et al., 2023).

METHOD

This study was conducted to analyze the application of the WebTrust principle on the effectiveness of the Accounting Information System through the implementation of electronic banking which is part of the implementation of the Accounting Information System in the banking world. The Technology Acceptance Model theory model was chosen to help identify the effect of the application of the WebTrust principle on the acceptance of electronic banking. The variables used in this study are 5 dimensions of the WebTrust principle as exogenous variables in the construct plus 3 main constructs in the TAM theory model, namely perceived usefulness (PU), perceived ease of use (PEOU), and attitudes towards the use of electronic banking (ATU). The five dimensions of the WebTrust principle are the security principle (SEC), the process integrity principle (PI), the confidentiality principle (CON), the availability principle (AVA), and the online privacy principle (PRI). Partial Least Square (PLS) is a research method utilized using SmartPLS 3.3.9 and the data used in this study were 150 questionnaires filled out by respondents who had a BSI Bank account,

using Internet Banking or Mobile Banking . The COBIT 5 framework, or COBIT 2019, describes best practices for effective IT governance and management. COBIT 2019 is based on five key principles of IT governance and management. These principles help organizations build effective governance and management frameworks that protect stakeholder investments and produce the best information systems 1,2,3.

As is known, the APO domains in COBIT are as follows:

- APO01 Manage The IT Management Framework
- APO02 Manage Strategy
- APO03 Manage Enterprise Architecture
- APO04 Manage Innovation
- APO05 Manage Portfolio
- APO06 Manage Budget and Costs
- APO07 Manage Human Resources
- APO08 Manage Relationships
- APO09 Manage Service Agreements
- APO10 Manage Suppliers
- APO11 Manage Quality
- APO12 Manage Risk
- APO13 Manage Security

This research focuses on the process at APO 12, considering the purpose of the study to analyze risk management in IT at BSI, as well as time constraints in research.

RESULTS AND DISCUSSION

This research is a descriptive study with a quantitative approach. Quantitative research is a study that aims to show the relationship between variables, test theories, find generalizations that have predictive value (Sugiyono, 2015). The sample in this study was 150 employees of Bank Syariah Indonesia with a random sampling technique. One of the measures of a bank's success in running its business professionally is the satisfaction of its customers with the use of the bank's services. The company's ability to provide high-quality services will strengthen the company's image, retain consumers to continue using the company's services, and attract new potential customers. The better the quality of a bank's services, both in terms of transactions offered by the bank and other financial activities, the faster customers will prioritize the products provided by the bank. The use of BSI Mobile is now increasing. Generally, BSI customers mostly use BSI Mobile as a type of m-banking that can facilitate their banking transactions. However, some time ago, there was a problem with the BSI Mobile service, the cause of which could not be ascertained. Therefore, based on the data obtained by the researcher with 30 respondents, what is the number of people using Bank Syariah Indonesia's Mobile banking? Of course, this has attracted attention for customers, related parties, observers, and researchers, as shown in the data obtained from the study in Table 1 below. Table 1 shows that of the 30 respondents who were used as the object of the study, 60% were BSI customers, and most had BSI mobile banking. In the incident that befell the information system at the BSI bank, it can be seen that most of the users felt disappointed, even though a third were neutral.

Table 1 Pre-Research Results

| No | Question | Presentase | |
|----|--|------------|-------|
| | | Yes | Not |
| 1. | BSI Customers | 60% | 20% |
| 2. | BSI Mobile Users | 73,3% | 26,7% |
| 3. | Feeling disappointed over issues that occurred with BSI Mobile service (26.7% neutral) | 70% | 3,3% |

This research takes a case that occurred at one of the state-owned banks in Indonesia, namely Bank Syariah Indonesia (BSI). There are many news stories and issues related to disruptions in BSI Mobile services, but PT. Bank Syariah Indonesia did not issue an actual statement about what disrupted its system. From the bank side, BSI only issued information that BSI has carried out system maintenance, and customers are expected to maintain the confidentiality of their PINs and passwords. This information and appeal were officially published through BSI's bank's Instagram and Twitter accounts on May 13, 2023. The occurrence of this problem also has an impact on customer activities in the banking sector. Reporting from some news in the article, it was said that one of BSI's bank customers, who is the rector of the Ahmad Dahlan Institute of Technology and Business, Ahmad Dahlan Mukhaer Pakkana, stated that his university was extraordinarily affected. Cash flow was halted for three days.

Regarding the losses caused, the simple calculation with lecturers and employees is 500 people, and of course, the payroll is mandatory at BSI. You can imagine how many parties were affected by this incident. In addition, this problem has also had an impact on the economy in the Aceh region. Because the people of Aceh rely heavily on Islamic banking services in their daily economic activities, disruptions automatically interfere with their activities. The *Kumparan Bisnis* page reported that petrol station entrepreneurs in Aceh cannot transfer fuel purchases due to problematic transaction services at Bank Syariah Indonesia (BSI). Chairman of the Aceh National Oil and Gas Entrepreneurs Association (Hiswana Migas), Nahrawi Noerdin, admitted that he was disappointed due to the error in the BSI service, because his party could not redeem the purchase of fuel and LPG to Pertamina through BSI. "If BSI makes a mistake in the system like this, it can run out of fuel oil at all petrol stations in Aceh, because we cannot withdraw and transfer fuel redemption money at Pertamina through BSI," he said. In addition, the disruption of banking services has caused hundreds of thousands of Acehnese people to be unable to carry out economic transactions through banking.

The data hack that occurred at BSI was claimed by a hacker group known as *LockBit* 3.0, who claimed they were the perpetrators behind the attack. The group threatened to release 1.5 TB of personal data that included the information of BSI customers and employees if their demands were not met. This creates customer panic and urges BSI management to address this problem immediately. Digital forensic expert from Vaksincom, Alfons Tanujaya, also admitted that there were rumors of Ransomware attacks against BSI. Ransomware is a malware attack or malicious program that demands a ransom and is accompanied by the threat of publishing the victim's data. Steps that can be taken to

prevent this from happening are to have a contingency plan, such as using vaccine protect, backing up data regularly, limiting remote access, and adding a one-time password (OTP) system.

However, although there are problems with BSI Mobile, as reported by CNN Indonesia, in the midst of service errors, BSI shares have risen in the past week. Citing RTI Infokom, BSI or BRIS shares rose 3.13% to 1,810 at the stock market's close on Friday, May 12, 2023. In this case, the details of the ups and downs of BRIS shares opened at 1,760 and moved in the range of 1,760-1,810. The frequency of BRIS stock trading was recorded 8,864 times. The volume of shares transacted was 49.50 million shares worth Rp. 89 billion. In a week, BRIS's share price rose 3.43%. On Monday, May 8, 2023, BRIS shares rose to 1,755. Then dropped to 1,750 on Tuesday, May 9, 2023. Then it rose again to 1,795 on Wednesday, May 10, 2023, and again dropped to 1,755 on Thursday, May 11, 2023.

However, behind this problem, BSI Bank managed to restore the system on BSI Mobile so that BSI Bank customers can reuse it. According to a report from the UIN Suska Riau website, according to BSI President Director Hery Gunardi, the company has carried out the normalization process of BSI services, with the main priority being to ensure that customer funds and data remain safe. On Sunday, May 7, 2023, said Hery, BSI increased capacity so that core banking and critical channels could be restored quickly and stably so that customer services could be completely normal. Regarding stocks, BSI Mobile's recovery from its original condition also made BSI shares jump by 3%. Reporting through the CNBC Indonesia page, this rapid recovery was responded to positively by the market, which made BRIS shares rise last Friday. It was recorded that BRIS shares jumped more than 3% to IDR 1,810, and foreign investors also made net purchases of IDR 35.7 billion in the regular market. Within a week, the disruption did not affect BRIS's performance. This week, BRIS was strengthened by 3.34%, with foreign investors making net purchases of IDR 139.3 billion. With these results, the movement of BSI shares has been quite impressive so far this year. This means the market believes that BRIS can continue to perform well. It is recorded that so far this year, BRIS shares have shot up more than 40%. The 25% weakening in 2022 has also been successfully reversed. Foreign investors are also keen to hunt for BRIS shares, with a net buying action of IDR 1.2 trillion this year.

Olah Data Interview

IT audits are an integral part of the audit function because they support the auditor's assessment of the quality of the information the computer system processes. COBIT is a framework for assessing information technology management practices issued by the IT Governance Institute (ITGI). COBIT aims to provide clear policies and good practices for IT governance and assist senior management in understanding and managing IT-related risks. The purpose of the interview was to assess the extent of the suitability of management planning with the APO12 domain (align, plan, organize; risk) in the COBIT 5 framework and to measure the level of IT management planning capabilities at BSI based on the COBIT 5 framework. Furthermore, the percentage obtained is included in the Process Assessment Model (PAM) assessment category (Sujana et al., 2020), (Supriady et al, 2023) with the following activity range categories:

N = Not Achieved: if the level achieved is less than 15%.

P = Partial Achieve: if the level achieved is between 15% and 50%.

L = Large Achieve: if the rate achieved is between 50% and 85%.

F = Fully Achieved: if the rate achieved is more than 85%.

Based on the results of interviews conducted at the management level in July 2024, the results show that the level of capability of the APO12 domain is at a *fully achieved level*, which means that all domain components are met. This is obtained from the processing of interview results data by calculating the percentage of answers obtained with the following formula:

$$P = f/n \times 100\%$$

P: Percentage

f: Number of components met

n: Number of components in each domain

The table in the attachment shows that all the components in each domain are met, where each domain is valued at one if the answer is "Yes" and zero if the answer is "No". Then it can be calculated as follows:

$$\begin{aligned} P &= 6/6 \times 100\% \\ &= 100\% \end{aligned}$$

Based on these calculations, the APO12 process is at the level of 100% achievement.

Discussion

Based on the assessment results, the risk management level at Bank BSI is already relatively good. The incident that befell BSI bank is just one of the consequences of the increasingly sophisticated intruders in information technology-based systems (Qadriah et al, 2023). How can hackers freely hack an information system by looking for weak points that can be penetrated? Not only did it affect the BSI bank, but when you look at the incident that just happened to Microsoft in Australia, which was also attacked by hackers, causing flights in Australia to stop. This shows that it is not only in developing countries, such as Indonesia, that have experienced hacker attacks on their information systems. Developed countries such as Australia have also experienced a severe attack on Microsoft's systems, so many flight activities have been forced to stop.

CONCLUSION

Incidents that often occur in technology-based systems in this digital era can happen anywhere and to anyone. What should be done by business people and individuals is to make efforts to avoid hacking of their company and personal data. Things that can be done by agencies and us as individuals who use technology-based systems include avoiding the use of non-original applications because they are vulnerable to being infiltrated by hackers because they are freely available online, so hackers can easily hack them. Information system audits must continue to be carried out and improved to avoid negligence that can open loopholes for hackers to break into information systems. Continuous audits are continuously maintained and improved. The IT department must continue to improve and enhance the security of its information systems with training and studies that must be carried out intensively. Multilevel and layered security must always be improved. Periodic password changes by personal users and internal bank parties must increase their caution

by being more responsive to incidents that befall customers and current issues related to information technology systems. Events that have befallen many technology-based systems in this all-digital era can happen anywhere and happen to anyone. Things that business people and individuals should do should include making efforts to avoid hacking of company and personal data. Things that can be done by agencies and us as individual users of technology-based systems include preventing the use of applications that are not original because they are vulnerable to being infiltrated by hackers, because they are freely available online, hackers can hack them easily. Information system audits must continue to be carried out and improved to avoid negligence that can open gaps for hackers to break into information systems. Continuous audits are continuously maintained and improved. The IT department must continue to enhance and improve the security of its information system with intensive training and studies. Multi-layered security must continually be improved. Periodic password changes by personal users and internal bank parties must increase their prudence by being more responsive to incidents that befall customers and current issues related to information technology systems.

REFERENCE

- Supriady, Nava Gia Ginasta, and Rahma Hanum. 2023. "OPERATIONAL INFORMATION SYSTEM AUDIT USING THE COBIT 5 FRAMEWORK (CASE STUDY: BANK XYZ)." *Indonesian Journal: Informatics and Communication Management* 4(1):157–63. doi: 10.35870/jimik.v4i1.147.
- Ahmad Sujana, Ahmad Sujana, Nurcaweda Riztria Adinda, Nurcaweda Riztria Adinda, Ninik Sri Lestari, Ninik Sri Lestari, Ninik Sri Lestari, Hetty Fadriani, Hetty Fadriani, Hetty Fadriani, Adrew Mahardika, and Adrew Mahardika. 2020. "Audit Information System Using COBIT 5." *Proceedings of the Third Workshop on Multidisciplinary Applications, WMA-3 2019, 11-14 December 2019, Medan, Indonesia*. doi: 10.4108/eai.11-12-2019.2290885.
- Hardy, G. (2006). "Using IT Governance and COBIT to Deliver Value with IT and Respond to Legal, Regulatory and Compliance Challenges." *Information Security Technical Report* 11(1):55–61. doi: 10.1016/j.istr.2005.12.004.
- Irwan Dermawan, Asmat Baidawi, Iksan, and S.H. Murti Pramuwardani Dewi. 2023. "Cyber Attacks and Cyber Security Readiness against Bank Indonesia." *Journal of Information and Technology* 5(3):20–25. doi: 10.60083/jjdt.v5i3.364.
- Laila Qadriah, Sayed Achmady, and Husaini Husaini. 2023. "Document Security System with Time-Based One-Time Password (TOTP) Algorithm on Two-Factor Authentication (2FA)." *Journal of Science and Informatics* 29–35. doi: 10.34128/jsi.v9i1.519.
- Muhazzab Alief Faizal, Zelyn Faizatul, Binti Nur Asiyah, and Rokhmat Subagyo. 2023. "INFORMATION TECHNOLOGY RISK ANALYSIS IN ISLAMIC BANKS: IDENTIFICATION OF CURRENT THREATS AND CHALLENGES." *Journal of Ash-Sharia: Journal of Islamic Financial, Economic and Business Institutions*. doi: 10.47435/asy-syarikah.v5i2.2022.

- Muthmainnah Muthmainnah, Muthmainnah Muthmainnah, Desvina Yulisda, Desvina Yulisda, Veri Ilhadi, and Veri Ilhadi. 2021. "Academic Information System Audit Using Cobit 5 Domain APO Framework." *International Journal of Engineering Science and Information Technology* 2(1):123–30. doi: 10.52088/ijesty.v2i1.223.
- Romney B. Marshal et al. Accounting Information System. 15th edition. Pearson.
- Laudon & Laudon. Management Information Systems: Managing the Digital Firm, Enhanced eBook, [GLOBAL EDITION]. 17th edition. Pearson.
- Otero R. Angel. Information Technology Control and Audit. 5th edition. CRC Press. Taylor & Francis Group.
- Vladimir Zwass. Information systems audit. <https://www.britannica.com/topic/information-system/Information-systems-audit>. Diakses pada 22 Juli 2024.
- Information technology audit. https://en.wikipedia.org/wiki/Information_technology_audit. Retrieved July 21, 2024.
- Anantha Sayana, CISA, CISM, CIA. 2022. The Evolution of Information Systems Audit. <https://www.isaca.org/resources/isaca-journal/issues/2022/volume-1/the-evolution-of-information-systems-audit>. Diakses 31 Mei 2024.
- CNN Indonesia Team. BSI's Excuse Regarding Customers Finding It Difficult to Take Money and Transactions Last Monday. <https://www.cnnindonesia.com/ekonomi/20230509080753-78-947010/dalih-bsi-soal-nasabah-sulit-ambil-uang-dan-bertransaksi-senin-kemarin>. Retrieved 31 May 2024.
- Strategic Plan of the Ministry of SOEs 2020-2024. https://www.bumn.go.id/storage/kontenlaporan/files/files_1673249782.pdf. Retrieved May 31, 2024.
- BSI. https://x.com/bankbsi_id?lang=en. Retrieved May 31, 2024.
- Intan Rakhmayanti Dewi, CNBC Indonesia. Australia Paralyzed, General Answers Alleged Hacker Attack. <https://www.cnbcindonesia.com/tech/20240719154529-37-556128/australia-lumpuh-jenderal-jawab-dugaan-serangan-hacker>. Retrieved July 22, 2024.