

"ANALYSIS OF ARTIFICIAL INTELLIGENCE UTILIZATION IN BANKING RISK MANAGEMENT"

Mutiara Eka Putri^{*1}, Tulus Suryanto²

Islamic College of Economics and Business Lampung¹

Raden Intan State Islamic University Lampung²

Email: mutiaraep89@gmail.com

Abstract

Artificial Intelligence (AI) has great potential to improve efficiency and effectiveness in risk management within the banking industry. However, its implementation also presents significant challenges, particularly regarding data security, ethics, and regulation. This study aims to analyze the role and utilization of AI in supporting banking risk management through a comprehensive literature review. The method used is qualitative descriptive with a literature review approach. The analysis results show that AI can increase accuracy and speed in risk assessment, enable early identification of potential problems, and support more sophisticated predictive modeling. However, its implementation also faces challenges such as customer data security, compliance with sharia principles in Islamic banking, and the need for adaptive regulations. Human resource development and system integration are also key success factors. In conclusion, although AI offers revolutionary potential in banking risk management, its application requires a careful and comprehensive approach that considers aspects of regulation, data security, and human resource development.

Keywords: Artificial Intelligence, Banking, Risk Management

A. INTRODUCTION

Along with the rapid advancement of technology in this digital age, all professional fields are required to continuously develop faster and more accurate work methods (Saraswati & Nugroho, 2021). The existence of technology is expected to provide benefits and make it easier for people to carry out their various daily activities (Barovih, G., & Sugara, 2020). Likewise, the banking industry is very sensitive to financial risks, because it acts as a manager of public funds, banks are obliged to maintain their internal and external financial stability in order to protect customer interests. Sources of financial risk that threaten the banking sector can come from credit risk, market fluctuations, liquidity problems, or operational failures (Naja, HD, Sh, MH, & Kn, 2018). Artificial intelligence or Artificial Intelligence is a new breakthrough that emerged in the era of the modern industrial revolution. This technology is one form of progress created in the current digital era. AI is present as an innovation that is part of a major change in the industrial sector today (Arly et al., 2023).

Artificial intelligence (AI) plays a key role in disrupting work paradigms and decision-making mechanisms. The financial audit sector is one of the fields that has been massively impacted by the implementation of AI. Audit procedures that initially relied on human evaluation

of financial information are now facing a revolutionary shift through the integration of advanced Artificial Intelligence (AI) technology (Pratama et al., 2024) . Artificial intelligence or artificial intelligence is an effort to replicate human intellectual abilities in machines or devices that are programmed in such a way that they can perform tasks like humans (Dicoding, 2015) . Artificial intelligence or AI is a computational approach that aims to develop intelligent systems that are able to simulate or imitate human intelligence. Another definition states that AI is a computational method that allows machines to do things that usually require human intelligence related to the ingenuity of automated actions (Elwandayudistira, 2015) .

Artificial Intelligence (AI) can be seen as an approach to engineering aspects of human intelligence by applying scientific principles to information. Involves building systems, or modules, that are capable of making decisions and acting in a human-like manner, using machines or computers as implementers (Saleh et al., 2020) . AI can also be interpreted as a technology that adapts human habits with identical thought procedures (Supriyadi, EI & Asih, 2020) .

The development of Artificial Intelligence (AI) technology that is able to carry out tasks and activities like humans has raised doubts and concerns among the public. AI's efforts to match and replace human efforts in various fields are seen as a potential threat that can cause anxiety (Elwandayudistira, 2015) . Artificial Intelligence (AI) has experienced rapid development and functions as a tool to help reduce the workload in various industrial sectors, including the financial and banking sectors.

Law Number 10 of 1998 concerning Banking defines that "banking includes everything related to banks, starting from their institutions, business activities, to methods and procedures in carrying out their business operations" (Law, nd) . Initially, operational activities in the banking sector were carried out through direct face-to-face interaction between the bank and customers, but this method was considered inefficient and time-consuming, and less effective in terms of operations and security. In line with the industrial revolution, artificial intelligence (AI) has contributed to increasing the efficiency of public services, such as in banking and other financial institutions. Various financial transactions for customers and prospective customers can be facilitated in an effective and efficient manner (Saptia, Y. et al., 2021) .

The implementation of artificial intelligence (AI) in the banking industry can contribute to maximizing profits, such as bank budget efficiency through simple data access. AI can also be used as a basis for banks in determining strategic policies. Through AI applications, banks can realize digital chat services with customers (Purnomo, 2018) . The application of artificial intelligence (AI) in the banking sector will certainly facilitate and simplify the transaction service process for customers. Along with the current globalization that causes tight competition, risk management is important in the banking industry (Sleimi, 2021) . There are various types of risk management applied in the banking industry, including financing risk, liquidity risk, market risk, operational risk, and others (Tavana, M. et al., 2018) .

Based on the problems above, this study aims to analyze the role and utilization of artificial intelligence (AI) in supporting risk management in the banking industry through a comprehensive literature review.

B. RESEARCH METHOD

The method of writing this article is with a Qualitative Descriptive approach and Literature Review or Library Research, using online sources Vos Harzing Publish & Perish, Google Scholar, Mendeley and other online applications with a limit of 100 articles. In qualitative research, a

literature review is essential to review reference sources that are relevant to the research. A theoretical basis is essential for review. One of the main reasons for conducting qualitative research is that the research is descriptive (Sujarweni, 2019) and uses numerical data (Istianingsih, 2021) . This study examines the use of Artificial Intelligence in Banking Risk Management with the results of previous researchers.

C. FINDINGS AND DISCUSSION

Based on a literature review conducted by researchers, in general Artificial Intelligence has enormous potential to increase efficiency and effectiveness in various sectors, especially in banking risk management, but in its implementation there are also challenges that need to be overcome such as data security, ethics and regulations.

(Data Security) Security of personal information is a crucial ethical issue in the application of AI in the Islamic banking sector (Rahman, 2021) . The confidentiality of customer data must be guaranteed and its use is limited only to justified purposes (Rosadi, 2023) . In this context, the supervisory role of the authorities needs to be increased to ensure that the use of AI Artificial Intelligent in the Islamic banking industry remains within the corridor of applicable ethics and regulations (Sulistiyowati et al., 2023) . AI technology has the potential to be used for the benefit of certain parties, but this can have a negative impact on its users. The personal information collected becomes a valuable asset that has high economic value (Andika & M. Soemarno, 2023) .

According to (Wasko, Janet., Murdock, Graham., Sousa, 2011) , there has been Transaction Generated information – TGI which is generated through the collection of user data without their notification or consent. This secretly collected data can be used to develop better and more appropriate products or services.

When an AI system gains access to personal information, it processes and analyzes it to predict the user's interests and preferences. Through this data processing, AI attempts to anticipate things that might interest the individual. (Siti Masrichah, 2023) . Personal information is continuously and systematically collected without the knowledge, without notice, and without the consent of each individual. This data collection process is carried out secretly and continuously . (Wasko, Janet., Murdock, Graham., Sousa, 2011) . Personal data if it falls into the hands of irresponsible parties or groups, then the personal information has the potential to be traded, either to gain financial gain or to achieve political goals. Misuse of this data can occur when it is in the hands of entities that do not have integrity (Budiono, 2017) .

The spread of customer personal information can have significant negative impacts. Sensitive data that is exposed has the potential to be used illegally by irresponsible parties for criminal activities (Edbert & Putra, 2023) . Therefore, the government is required to take an active role in maintaining the security of people's personal information. This aims to prevent misuse of personal data in banking transactions that can harm customers (Setiantoro et al., 2018) . As a country of law, Indonesia guarantees protection of human rights in the country's constitution. Referring to the increasing use of information and communication technology in various individual activities, this raises the potential for increased personal data violations. Therefore, it should be noted that there must be special regulations governing the protection of personal data, so that the data is used according to its intended use and is not misused. (Wachid, MR, & Wardah Yuspin, 2023) .

In line with this, the Electronic Information and Transactions Law (UU ITE) classifies artificial intelligence (AI) as an electronic agent. The definition includes devices that automatically

process information received from individuals (Chairani, MA, Yitawati, K., & Pradhana, 2024) . Thus, implicitly, if a bank's artificial intelligence (AI) system carries out actions that are contrary to the law, then the bank can be held legally responsible for the violations that occur.

Artificial Intelligence technology in the Islamic banking sector is a significant step forward in the financial industry. The goal is to optimize operations and improve the quality of service for customers. However, the integration of AI into the Islamic banking system is not free from various ethical dilemmas that need to be studied in depth (Larah et al., 2023) .

Today, Islamic banking is known for its solid ethical foundation, derived from Islamic teachings. Rejection of usury or interest is one of the fundamental rules in the operation of Islamic banks. Consequently, the use of AI technology for calculating returns or profit and loss management must be carried out with great care to ensure compliance with this basic principle. (Bombang, 2018) .

Other principles in Islamic banking, such as avoiding elements of gambling (maisir) and excessive uncertainty (gharar), must also be considered when implementing AI. This technology can be used to evaluate financial products and transactions to ensure they remain in line with these principles (Asri Jaya, SE, 2023) . It is important to emphasize that the use of AI must be carried out openly and responsibly. Customers need to understand the decision-making process by the AI system and its compliance with sharia principles. This requires clear communication and educational efforts for customers.

Crises generally have a surprising nature that can shake all parties. The systemic nature of a crisis is often difficult to detect, and each crisis has statistical characteristics from historical data, even though it includes previous crises, becoming a major challenge for artificial intelligence systems. As a result, regulators are often only able to identify things to watch out for after a crisis has occurred (Jón Daníelsson, Robert Macrea, Andreas Uthemanna, 2021) . The implementation of artificial intelligence is seen as being able to increase operational effectiveness, especially from the perspective of the banking industry (Mikalef, P., & Gupta, 2021) . The financial sector, especially banking, faces demands to optimize the use of Artificial Intelligence , given the high level of competition in this industry (Jakšič, M., & Marinč, 2019) .

Artificial Intelligence (AI) brings significant transformation in banking risk management, offering a more dynamic and adaptive approach in the digital era (Nuraziza et al., 2024) . This technology increases the accuracy and speed of risk assessment, enabling early identification of potential problems and more sophisticated predictive modeling (Kalogiannidis et al., 2024) . The implementation of AI covers various stages of risk management , from screening to handling non-performing financing, with specific applications such as AI-based credit scoring (Sulartopo et al., 2023) . For Islamic banking, AI helps manage unique risks related to compliance with sharia principles, while optimizing revenue and minimizing losses (Garbo & Latifah, 2024) .

Although promising, the application of AI in banking risk management faces several challenges (Sudaryanto & Hanny, 2023) . Data security and customer privacy are major concerns, requiring a balance between technological innovation and consumer protection (Yetno et al., 2024) . The regulatory aspect is also crucial, requiring synergy between authorities such as OJK and DSN-MUI to formulate an adaptive legal framework. The issue of legal liability in the use of AI by banks needs to be clarified to anticipate potential errors or violations (Arta et al., 2024) .

Human resource development is key to optimizing the use of AI in the banking sector. It is necessary to improve staff competency in understanding and managing AI-based risk management systems, supported by ongoing training and development programs. Integrating AI

with existing systems is also a challenge, requiring a mature transition strategy to ensure operational sustainability.

Despite these challenges, AI has the potential to revolutionize the way banks manage risk, offering a competitive advantage to institutions that successfully implement it. With a careful and comprehensive approach, taking into account regulatory, security, and human resource development aspects, AI can be a powerful tool in increasing the resilience and competitiveness of banks in the digital era. The application of AI in banking risk management is not just about adopting technology, but also a complete transformation in the way banks operate and manage risk in the future.

D. CONCLUSION

Artificial Intelligence (AI) shows great potential to improve efficiency and effectiveness in various sectors, especially in banking risk management. However, its application in the Islamic banking sector faces significant challenges related to data security, ethics, and regulations. The security of customers' personal information is a crucial issue that must be guaranteed, with data use limited to justified purposes only. The risk of misuse of customers' personal data can result in significant negative impacts if it falls into the hands of irresponsible parties. Therefore, special regulations and an active role of the government are needed in maintaining the security of people's personal information.

In the context of Islamic banking, the application of AI must pay attention to Islamic principles such as avoiding usury, gambling (*maisir*), and excessive uncertainty (*gharar*). Although AI can improve the accuracy and speed of risk assessment, this technology also faces challenges in detecting and handling crises that are surprising and systemic. The implementation of AI in banking risk management requires the development of competent human resources and a mature integration strategy. Despite these challenges, AI has the potential to revolutionize the way banks manage risk and increase competitiveness in the digital era. With a careful and comprehensive approach, AI can be a powerful tool in increasing the resilience and effectiveness of banking operations in the future.

Policy recommendations that can be considered are:

To optimize the implementation of AI in Islamic banking, the government and financial authorities need to develop a comprehensive regulatory framework that covers aspects of data security, ethics, and consumer protection. Implementation of strict data security standards, including encryption and regular audits, is essential to protect customers' personal information. In addition, the establishment or expansion of the mandate of a dedicated regulatory body is needed to ensure that the AI systems used are in accordance with Islamic principles and ethics. These steps will create a safe and trusted environment for the adoption of AI in the Islamic banking sector, encouraging innovation while maintaining integrity and compliance with Islamic values.

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