

Application Of Artificial Intelligence In Risk Management Of Lembaga Keuangan Mikro Syariah

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Informasi Artikel	Abstract
Submitted: xx-xx-2024 Revised:xx-xx-2024 Published:xx-xx-2024 Keywords: AI Risk Management, LKMS	<p>This research discusses the application of artificial intelligence (AI) in risk management of Lembaga keuangan mikro syariah (LKMS). Sharia LKMS face various risks that can affect financial sustainability, fulfillment of sharia principles, customer satisfaction, and regulatory compliance. The application of AI in the risk management of Islamic LKMS can be an effective solution. AI can assist Islamic LKMS in protecting financial sustainability, fulfilling sharia principles, improving customer satisfaction, and complying with regulations. The application of AI in risk management of Islamic LKMS has the potential to improve performance and providesustainable benefits for LKMS and the communities they serve. This study aims to analyze the application of Artificial Intelligence (AI) in risk management of Lembaga keuangan mikro syariah (LKMS). Sharia LKMS have challenges in managing risks that can affect financial sustainability, fulfillment of sharia principles, customer satisfaction, and regulatory compliance. The application of AI in risk management of Islamic LKMS can be an effective solution. The research method used is descriptive qualitative method by collecting data through literature study. The results showed that AI can help Islamic LKMS in protecting financial sustainability, fulfilling sharia principles, improving customer satisfaction, and complying with regulations. In conclusion, the application of AI in risk management of Islamic LKMS has the potential to improve performance and provide sustainable benefits to SMFI risk management in utilizing technology.</p>

Abstrak

Intelligence (AI) dalam manajemen risiko Lembaga Keuangan Mikro Syariah (LKMS). LKMS syariah menghadapi berbagai risiko yang dapat mempengaruhi keberlangsungan keuangan, pemenuhan prinsip-prinsip syariah, kepuasan nasabah, dan kepatuhan terhadap regulasi. Penerapan AI dalam manajemen risiko LKMS syariah dapat menjadi solusi yang efektif. AI dapat membantu LKMS syariah dalam menjaga keberlangsungan keuangan, pemenuhan prinsip syariah, meningkatkan kepuasan nasabah, dan kepatuhan terhadap regulasi. Penerapan AI dalam manajemen risiko LKMS syariah berpotensi meningkatkan kinerja dan memberikan manfaat yang berkelanjutan bagi LKMS dan masyarakat yang dilayaninya. This study aims to analyze the application of Artificial Intelligence (AI) in risk management of Lembaga keuangan mikro syariah (LKMS). Sharia LKMS have challenges in managing risks that can affect financial sustainability, fulfillment of sharia principles, customer satisfaction, and regulatory compliance. The application of AI in risk management of Islamic LKMS can be an effective solution. The research method used is descriptive qualitative method by collecting data through literature study. The results showed that AI can help Islamic LKMS in protecting financial sustainability, fulfilling sharia principles, improving customer satisfaction, and complying with regulations. In conclusion, the application of AI in risk management of Islamic LKMS has the potential to improve performance and provide sustainable benefits to SMFI risk management in utilizing technology.

Kata Kunci : Kecerdasan Buatan, Manajemen Resiko, LKMS

INTRODUCTION

Lembaga Keuangan Mikro Syariah (LKMS) are financial entities that operate based on sharia economic principles in providing financial services to the community, especially to the micro and small economic segments (Azizah, 2022). LKMS aim to promote the economic empowerment of the community through easier and fairer access to financial services that are in accordance with sharia principles (Anastasia & Oktafia, 2021).

A distinctive feature of LKMS is a strong commitment to sharia principles in all aspects of operations (Aryanti dkk., 2022). These principles include the prohibition of usury (interest), the prohibition of speculative practices (gharar) and haram (prohibited in Islam), as well as an emphasis on the principles of fairness and risk sharing between lenders and recipients (RASYIDAH, 2023).

The services offered by Sharia LKMS include microfinance, sharia savings, sharia insurance, and various financial products and services that comply with sharia principles. Sharia LKMS also endeavor to provide financial training and education to their members to improve their understanding of sharia principles and sound financial management.

LKMS have an important role in financial inclusion and inclusive economic development (Sari, 2023). It helps reduce the financial gap by providing access to individuals and small businesses that may find it difficult to obtain financial services from conventional banks. By following sharia principles, Islamic LKMS also contribute to sustainable and equitable economic development.

Previous research has examined the “Penerapan Artificial Intelligence Sebagai Inovasi Di Era Disrupsi Dalam Mengurangi Resiko Lembaga Keuangan Mikro Syariah” (Rahayu & Naja, 2023) explains the development of technology. Sharia LKMS have also begun to adopt innovations such as artificial intelligence (AI) technology in various operational aspects, including risk management, to improve efficiency and services; the difference in previous research lies in the application of risk management that adopts Artificial Intelligence that knows the application, and its impact on its use.

The trend of adopting artificial intelligence (AI) technology in Sharia LKMS is an important step in dealing with changing market dynamics and improving services. With the help of AI, Islamic LKMS can strengthen risk analysis, monitor portfolio performance more accurately, and even design financial products that better suit members' needs. (Fattah dkk., 2022).

The application of AI can also help Sharia LKMS in making smarter and more timely decisions (Tripalupi dkk., 2023). With more in-depth data analysis, Islamic LKMS can better identify opportunities and risks, thus effectively managing risks while maximizing the potential for financial growth.

The adoption of AI in Islamic LKMS also raises various ethical challenges and considerations. It is important to ensure that the use of these technologies remains consistent with Shariah principles, such as avoiding speculation and ensuring compliance with Islamic law (Ifna & Enre, 2022). The aspect of data privacy is also an important concern in the use of AI.

As part of technological development, Islamic LKMS need to engage experts in Islamic economics and technology to ensure that AI implementation is in line with Islamic values and norms. Training and education on AI and sharia principles are also important to ensure a strong understanding among LKMS Syariah.

By utilizing AI wisely and adhering to sharia principles, Islamic LKMS can continue to play a role in supporting financial inclusion and sustainable economic development in society, while maintaining their integrity and values (Sahib dkk., 2023). As such, Islamic LKMS can be one of the key elements in addressing the challenges and opportunities in the rapidly changing world of modern finance.

Risk management has a very important role in the operations of Lembaga Keuangan Mikro Syariah (LKMS). Here are some reasons why risk management is important in its operations:

1. Protecting Financial Sustainability LKMS have limited resources, and risks can have a

significant impact on financial stability (Timbang, 2022). With effective risk management, LKMS can identify, measure, and manage risks properly, thereby reducing the possibility of large losses that can threaten operational sustainability.

2. Fulfillment of Sharia Principles Sharia SLKMS must ensure that operations are in line with sharia principle(Akroma, 2022). Risk management helps avoid risks that may violate these principles, such as riba risk or risks involving haram activities.
3. Customer Satisfaction Good risk management enables LKMS to provide more reliable and secure services to their members (Afwaa, 2023). This can increase customer trust and strengthen long-term relationships.
4. Regulatory Compliance LKMS must comply with applicable financial and sharia regulations.(Suprayugo, 2022). Risk management helps to ensure that it always meets the requirements of applicable legislation, thus avoiding sanctions and legal problems.
5. Operational Efficiency Risk management can help LKMS identify areas where risks can be minimized or eliminated, which in turn can improve operational efficiency (Oktapian & Fauzi, 2023).
6. Better Decision Making Information obtained through risk management can help MFI management make better decisions. This includes smarter portfolio management, proper product selection, and more effective business strategies(Syafitri dkk., 2022).
7. Recovery from Crisis: LKMS that have strong risk management are better able to cope with economic crises or other unexpected events (Mursyidah & Khoiri, 2022). They can have emergency response plans and adequate reserve funds to deal with difficult situations.
8. Improved Reputation LKMS that are known to have good risk management can gain a good reputation in the eyes of the public, investors, and other stakeholders.(Fadlilah dkk., 2023).

Risk management plays a critical role in maintaining the sustainability of Lembaga Keuangan Mikro Syariah(LKMS) and ensuring that they play a positive role in the local economy and the communities they serve. Risk management helps Sharia MSFIs maintain operational stability and continuity. (LINDA, 2023) By identifying, measuring and managing risks properly, Sharia SLKMS can avoid large losses that could threaten their existence. This allows them to continue providing much-needed financial services to the local community, especially to those in the micro and small economic segments.

Effective risk management helps Sharia LKMS maintain customer and member confidence (IHSAN, 2022). This is especially important in the financial business where trust is a very valuable asset. Through good risk management, such as avoiding risks that violate sharia principles, Islamic SLKMS can maintain customer trust and lure more customers.

Risk management also supports local economic growth (Poenna, 2023). By carefully identifying risks, Islamic LKMS can plan and execute better business strategies. This may include business expansion, product or service diversification, or the launch of new initiatives. With sustainable growth, Islamic SLKMS can contribute to the local economy by creating additional jobs, increasing access to finance, and improving the welfare of the communities they serve.

Risk management is not just about protecting Sharia SLKMS from financial loss.(Rizki dkk., 2022), It is also about ensuring that it can serve as a positive player in supporting the local economy and providing sustainable benefits to the communities it serves.

RESEARCH METHODOLOGY

The research method used in the study "Application of Artificial Intelligence in Risk Management of Islamic Microfinance Institutions" is descriptive qualitative method. This method is used to describe and review the phenomena that occur related to the application of artificial intelligence (AI) technology in risk management of Lembaga keuangan mikro syariah (LKMS) in detail because the focus of the

research is to describe and analyze in depth how Sharia LKMS apply AI in risk management. This approach allows researchers to explain the phenomena that occur in detail and in depth.

The main data in this research was obtained from a literature study involving the review and analysis of various sources of information such as journals, articles, books, policy documents, and reports related to the application of AI in Islamic LKMS. Data was collected through searching and selecting literature relevant to the research topic. This includes information on strategies, technologies, benefits, constraints, and impacts of using AI in risk management of Islamic LKMS. The data obtained from the literature will be analyzed qualitatively. This involves categorizing, coding, and identifying patterns and key findings related to the application of AI in risk management of Islamic LKMS.

RESULT AND DISCUSSION

Basic Concepts About Artificial Intelligence

Artificial Intelligence (AI) is a field of computer science that deals with the development of computer systems that can perform tasks that would normally require human intelligence. The basic concept of AI includes the understanding that computers or machines can "learn" from data, make intelligent decisions, and execute tasks that require understanding, reasoning, and adaptation. Types of AI can be divided into several categories based on capabilities and functions.

Designed to perform specific tasks with a limited level of intelligence in Artificial Intelligence (AI) (Zebua dkk., 2023). is highly limited to a specific task domain and lacks breadth of understanding. Examples of inclusions in this category are virtual assistants such as Siri and Alexa, as well as online recommendation systems. Weak AI, also known as Limited Artificial Intelligence, is a type of AI that is created to perform specialized tasks with a limited level of intelligence. It is very limited in task scope, can only operate within a predefined task domain, and does not have a deep understanding of the broad context. For example, virtual assistants such as Siri and Alexa, as well as online recommendation systems, fall under the category of Weak AI. It is capable of performing specific tasks, such as responding to user queries or providing product recommendations, but lacks the ability to understand the full context or have a broad understanding of various topics beyond the specific task.

Artificial Intelligence (AI) which has the ability to understand a broader context and complete various types of tasks that require human intelligence. (Masrichah, 2023). Strong AI does not yet fully exist and is still a long-term development goal. Strong AI, or Robust Artificial Intelligence, is a type of AI that has the capability to understand a broad context and complete different types of tasks that require human-like thinking and intelligence. However, at present, Strong AI has not been fully realized and is still a long-term development goal. In other words, Strong AI is the vision of creating AI that can think, learn, and adapt like a human in a variety of different situations and contexts. Currently, most of the existing AI is Weak AI or AI that has a very limited focus, and the development of Strong AI is still a complex and ambitious challenge in the world of artificial intelligence.

AI Based on Conventional Intelligence is based on pre-programmed rules and algorithms (Sirait dkk., 2023). It does not have the ability to learn from data or experience. An example is a rule-based system in a chess game. AI Based on Conventional Intelligence is a type of AI that operates on pre-programmed rules and algorithms to perform certain tasks. This type of AI does not have the ability to learn from data or experience like humans or machine learning-based AI. Instead, it performs tasks based on instructions predefined in the program.

Conventional intelligence can be found in the game of chess. In a chess game, this AI program has been programmed with pre-defined chess rules and strategies. It applies these rules to analyze the current position of the chessboard, makes the best deemed moves based on the chess rules, and tries to win the game. However, the AI will not learn from previous games or adapt to various situations that are not described in the chess rules.

The importance of AI based on conventional intelligence is for tasks that require understanding and application of strict rules without the need for extensive context learning or

adaptation. While this AI may not be as flexible as machine learning-based AI, it is still effective in well-programmed situations.

Machine Learning (ML) is a branch of AI that allows machines to "learn" from data and their own experiences. It uses learning algorithms to identify patterns in data and make predictions or decisions. Examples of ML applications include sentiment analysis, image classification, and product recommendations. Machine Learning (ML)-based AI is a branch of artificial intelligence that allows machines or computers to "learn" from given data and their own experiences. (Diana dkk., 2023). Machine learning uses special learning algorithms to analyze data and identify patterns or relationships in the data. Then, based on the identified patterns, these machines can make predictions, make decisions, or perform other relevant tasks. Here are some key points about machine intelligence-based AI:

Belajar dari Data: ML memungkinkan mesin untuk belajar dari kumpulan data pelatihan yang diberikan. Data ini berisi contoh-contoh dan informasi yang diperlukan untuk memahami pola-pola yang mendasari tugas yang ingin dijalankan oleh mesin tersebut.

1. **Learning from Data:** ML allows machines to learn from a given set of training data. This data contains examples and information needed to understand the underlying patterns of the task the machine is trying to perform.
2. **Learning Algorithm:** Learning algorithms are mathematical guidelines or procedures used to transform data into understanding. The type of algorithm used may vary depending on the type of task to be performed, such as regression, classification, or clustering.
3. **Pattern Identification:** ML looks for patterns in data that may not be visible to humans or patterns that are too complex to process manually. This allows machines to make decisions or make predictions based on an understanding of these patterns.
4. **Diverse Applications:** ML has a wide range of applications, including sentiment analysis (analyzing sentiment from text or reviews), image classification (recognizing objects in images), product recommendation (generating recommendations based on user behavior), as well as many other applications in various industries.
5. **Adaptability:** ML also has the ability to adapt to new data or changes in the environment. This means machine learning can update understanding as it gets new data, which allows it to remain relevant and accurate over time.

Computer Vision-Based AI This type of AI is used to process and analyze image or video data. Examples include object recognition, computer vision for autonomous vehicles, and facial recognition. **Autonomous AI** This is the type of AI used in autonomous vehicles, robots, and other automated systems. (Mezrich, 2022). capable of making decisions autonomously and operating without human intervention. It is important to remember that the development of AI continues, and its use is expanding in various industries and applications. AI has great potential to change the way we work, interact with technology, and live our daily lives.

The role of AI in the conventional banking and finance sector.

Artificial Intelligence (AI) is playing an increasingly important role in the conventional banking and finance sector. Here are some of the key roles of AI in this sector:

1. **Risk Management:** AI is used in more sophisticated risk analysis, enabling banks and financial institutions to better identify potential credit, market, and operational risks. AI systems can analyze historical data and market trends to provide more accurate risk predictions.
2. **Transaction Security:** AI is used in fraud detection and transaction security. Through transaction pattern analysis, AI can recognize suspicious behavior and protect customer accounts from illegal activities.

3. **Portfolio Management:** In investments, AI is used to manage portfolios automatically and intelligently. Robot Advisor or Robo-Advisor is an example where AI helps investors plan investments based on financial goals and risk tolerance.
4. **Customer Management:** AI-based chatbots are used to improve customer service. It can provide quick answers to customer queries and provide solutions to common problems. It can also be used for service personalization based on customer behavior.
5. **Credit Analysis:** AI is used for more accurate credit scoring. AI systems can analyze customer data more carefully, including non-traditional data such as online activity, to better assess credit risk.
6. **Market Prediction:** AI can be used to analyze market data in real-time and provide more accurate market predictions. This can help financial companies make better investment decisions.
7. **Security Risk Management:** In securing IT infrastructure, financial companies use AI to detect cyberattacks and security threats. AI can identify suspicious patterns in network traffic and take quick action.
8. **Business Process Automation:** AI is used to automate administrative and operational tasks. This can reduce operational costs and improve efficiency.
9. **Data Processing:** In managing big data, AI is used to identify insights and trends that human analysis may miss. This helps financial companies make smarter decisions.
10. **Regulatory Compliance:** AI can help banks and financial institutions to adhere to strict regulations and compliance standards. It can automate reporting processes and ensure that operations are in compliance with the rules.

The use of Artificial Intelligence (AI) in the conventional banking and finance sector continues to grow in line with technological developments (Ngamal & Perajaka, 2022). This has had a positive impact on companies in these sectors, helping them become more efficient, accurate, and responsive to changes in the business and regulatory environment.

Better Risk Analysis AI enables financial companies to perform better risk analysis. It can combine data from multiple sources and analyze it quickly to identify potential risks. This helps companies make smarter decisions when it comes to lending, investment, and risk management.

AI Fraud Prevention is used to detect fraudulent activities and identity theft. AI systems can monitor transactions in real-time and identify suspicious patterns, such as unusual transactions or inappropriate locations. This helps protect customers and companies from fraud losses.

AI Automated Portfolio Management enables financial companies to manage investment portfolios automatically. Robot Advisor or Robo-Advisor can provide investment advice that is based on the customer's financial goals and risk profile (Hesniati dkk., 2022). This makes investing more accessible to individuals.

Enhanced Customer Service AI-based chatbots are used to respond to customer inquiries quickly and efficiently. It can provide information about products, answer common questions, and direct customers to appropriate services. **Deep Data Analysis** AI can analyze big data quickly and deeply. This helps companies identify market trends, customer preferences, and new business opportunities.

Regulatory Compliance AI helps financial companies to adhere to strict regulations and compliance. It can automate reporting processes and ensure that operations are in compliance with applicable rules. **Business Process Automation** AI can automate repetitive administrative and operational tasks, such as document processing, data verification, and inventory management.

With the widespread use of AI, companies in the banking and finance sector can increase operational efficiency, make more timely decisions, and improve customer service. This helps stay competitive in a changing market and comply with increasingly stringent regulations.

Application of AI in Islamic banking risk management.

The application of Artificial Intelligence (AI) in Islamic banking risk management has a significant role in improving efficiency, accuracy, and resilience to risk. Here are some of the ways in which AI is used in Islamic banking risk management:

1. **Credit Risk Assessment:** AI is used to analyze customer data and credit history more carefully. This helps Islamic banks in assessing credit risk more accurately, so as to make informed decisions related to lending to customers.
2. **Fraud Detection:** AI systems are used to detect fraudulent activities and suspicious transactions. It can analyze transaction patterns and unusual customer behavior, which may indicate potential fraud.
3. **Investment Portfolio Management:** AI can help Islamic banks manage investment portfolios more efficiently. AI-based Robot Advisors or Robo-Advisors can provide investment advice that complies with Shariah principles and customers' financial goals.
4. **Market Monitoring:** AI is used to monitor market conditions in real-time. It can analyze news, market trends, and economic events that affect the investment portfolio of Islamic banks. This helps the bank to take prompt action to mitigate investment risks.
5. **Liquidity Management:** AI is used to optimize banks' liquidity management. It can analyze cash flow and future liquidity forecasts, enabling banks to take the necessary steps to ensure sufficient funds are available.
6. **Customer Sentiment Analysis:** AI can be used to analyze customer sentiment based on reviews and feedback. This helps banks in understanding customer preferences and responding to changes in behavior.
7. **Understanding Shariah Regulations:** AI can assist Islamic banks in complying with strict Shariah regulations. It can examine financial transactions and products to ensure compliance with Shariah principles.
8. **Operational Risk Monitoring:** AI is used to monitor operational risks, such as technology risk and other operational risks. It can identify potential problems or disruptions in the bank's operations and provide early warning.

The application of AI in Islamic banking risk management helps banks to optimize decision-making, reduce risk, and comply with sharia principles. (Syakarna, 2023). It can also improve efficiency in investment portfolio management, customer supervision, and market monitoring. Along with technological developments, AI continues to be an important tool in dealing with challenges and risks in the Islamic banking sector.

Management Types of risks faced by LKMS.

Lembaga Keuangan Mikro Syariah (LKMS) face a number of risks that can affect operational sustainability. The main risk for these LKMS relates to the possibility that customers are unable or unwilling to repay loans. (Purba, 2023). This can be caused by various factors, such as changes in the economic condition of the customer or lack of collateral for the loan. This risk relates to the possibility that an LKMS customer is unable or unwilling to repay the loan taken out.

Liquidity risk is a type of risk that occurs when a Lembaga Keuangan Mikro Syariah (LKMS) faces difficulties in meeting its maturing financial obligations, especially those related to customer withdrawals (Suharto, 2022). This risk arises if the MFI does not have sufficient resources to meet the demand for funds from customers, and this condition can disrupt operations

Operational risk is a type of risk that includes everything related to the internal processes and technology used by Lembaga Keuangan Mikro Syariah (LKMS) (INSYAFANI, 2022). This risk includes various possibilities, such as errors in data management, system disruptions, or acts of fraud. Operational errors have the potential to negatively impact both the reputation of the LKMS and the financial aspects.

Legal and Compliance Risk LKMS must comply with sharia regulations and principles (Reni & ANWAR, 2022). Legal and compliance risks arise if LKMS do not comply with applicable rules or violate sharia principles. This may result in legal sanctions and poor reputation.

Market risk is a type of risk associated with fluctuations in the value of assets and liabilities of Islamic Microfinance Institutions (LKMS) as a result of market changes (Nazar, 2022). These market changes may include changes in interest rates or changes in currency values. The impact of these market changes can affect the value of the investment portfolio and the operating results of the LKMS.

Reputation risk is a type of risk that arises when an Islamic Microfinance Institution (LKMS) experiences controversy or problems that damage its image in the eyes of customers, business partners, or the general public (Nazar, 2022). This risk relates to how the LKMS is viewed by external parties and can have a serious impact on business operations and growth.

Microeconomic risk is a type of risk that involves economic factors that affect individual customers of Lembaga Keuangan Mikro Syariah (LKMS) (Nuraisah, 2022). This risk relates to changes in economic conditions that affect customers directly, such as changes in customer income or changes in business conditions.

Lembaga Keuangan Mikro Syariah (LKMS) must actively identify, measure, and manage the risks described above to ensure operational sustainability and compliance with sharia principles. Effective risk management is key to mitigating the negative impact of these risks and maintaining the stability of the LKMS. In an effort to manage risks.

Application of AI in LKMS Risk Management

The application of artificial intelligence in risk management of lembaga keuangan mikro syariah (LKMS) memiliki sejumlah keunggulan yang relevan dengan prinsip-prinsip ekonomi syariah (Fitri, 2023). has a number of advantages that are relevant to the principles of Islamic economics. (Fitri, 2023). In the context of Islamic economic law. More Accurate Risk Identification AI enables Islamic LKMS to identify risks more accurately and transparently. In Islamic economics, the aspects of transparency and honesty are very important. With AI, LKMS can efficiently analyze financial transactions and detect potential risks that violate sharia principles, such as the risk of usury (riba).

Continuous monitoring of Shariah economic principles encourages transactions that are fair and compliant with Islamic law. AI enables continuous monitoring of transactions and investment portfolios, ensuring that no violation of sharia principles occurs. With this, LKMS can mitigate legal risks associated with non-compliance with sharia principles. AI sharia-compliant investment optimization can help Islamic LKMS in choosing investments that are in accordance with sharia principles, which are free from usury, gharar (excessive uncertainty), and other haram activities (Hidayati, 2023). This helps LKMS to build

sharia-compliant investment portfolios and avoid legal risks as well as reputational risks that may arise due to violations of sharia principles.

AI financial risk prediction can be used to predict the financial risks that Sharia LKMS may face, such as credit risk or liquidity risk (Sarayati, 2015). With a better understanding of these risks, LKMS can take appropriate precautions to maintain stability and compliance with sharia principles, the

application of AI in risk management of Islamic LKMS not only improves efficiency, but also helps maintain the integrity of the underlying sharia economic principles.

Challenges and Obstacles

The application of Artificial Intelligence (AI) in Lembaga Keuangan Mikro Syariah(LKMS) may face several challenges that need to be considered. Below, we will discuss some of the key challenges that may arise, as well as possible solutions to overcome them:

1. Shariah Regulation and Compliance:
 - 1) Challenge: Islamic LKMS must comply with conventional financial regulations and Shariah principles simultaneously. The application of AI can involve complex algorithms that must be ensured to be compliant with Shariah principles.
 - 2) Solution: LKMS should work closely with regulatory authorities and Shariah experts to develop guidelines and frameworks that are compliant with Shariah principles. Regular audits and monitoring can ensure that the AI system remains compliant with the applicable sharia rules.
2. Limitations of Sharia Data:
 - 1) Challenges: Historical data specific to Shariah principles may be limited, so AI may struggle to build adequate models for Islamic LKMS.
 - 2) Solution: LKMS can cooperate with data provider institutions that specialize in Shariah data or collect as much historical data as possible that complies with Shariah principles. The construction of a suitable AI model should consider the available data.
3. HR Skills and Capacity:
 - 1) Challenges: Training LKMS staff in the use and maintenance of AI systems can be a challenge. Managing and understanding the results generated by AI also requires specialized skills.
 - 2) Solution: Investment in staff training in the use of AI, both internally and with external assistance, is key. Providing continuous training to understand AI results and maintain the quality of AI systems is important.
4. Adequacy of Funds:
 - 1) Challenges: The implementation of AI in Islamic LKMS requires significant initial investment in hardware, software, and technical expertise.
 - 2) Solution: LKMS can consider a more long-term investment model that takes into account the long-term benefits of implementing AI. Return on investment can be assessed in terms of improved efficiency and service quality.
5. Data Security:
 - 1) Challenge: AI processes and stores sensitive data. Data security is a major concern in implementing this technology.
 - 2) Solution: LKMS should adopt strong data security measures, including data encryption, double authentication, and strict access policies to protect customer data.
6. AI Model Complexity:
 - 1) Challenge: Complex AI models can be difficult to understand and explain, which can raise concerns from a Shariah perspective.
 - 2) Solution: LKMS should focus on a clear understanding and documentation of how the AI model works. Explanations and audits of the model by Shariah experts can help address these concerns.

Addressing these challenges requires a holistic approach that includes collaboration between Lembaga Keuangan Mikro Syariah(LKMS), technologists, and sharia experts. With a strong

commitment and deep understanding of sharia principles, LKMS can successfully implement Artificial Intelligence (AI) in risk management with success and high compliance.

Cooperation between various stakeholders, such as the technical team responsible for AI implementation, the sharia team that ensures compliance with sharia principles, and the LKMS management that provides support and strategic direction, will be the key to success in facing the challenges of AI implementation in the context of Sharia LKMS. With this approach, LKMS can optimize the benefits of AI while maintaining the integrity of their business.

Impact of Artificial Intelligence

The application of Artificial Intelligence (AI) in risk management of Lembaga Keuangan Mikro Syariah (LKMS) brings a number of benefits that can be obtained. There are positive impacts that can be felt by Sharia LKMS. The application of AI in risk management provides significant benefits to Islamic LKMS, including improved operational efficiency, more informed decision-making, and the ability to maintain financial stability. This helps to meet the demands of the market and the Shariah principles espoused (Norrahan & Badruddin, 2023). Benefits Gained by Islamic LKMS:

1. **Faster Risk Identification:** AI enables Islamic LKMS to identify risks more quickly and accurately. This gives them an edge in taking timely preventive measures.
2. **Better Decision Making:** With in-depth data analysis, LKMS can make more informed and data-driven decisions, especially in terms of credit risk assessment, investment, and business strategy.
3. **Real-Time Monitoring:** AI enables real-time operational monitoring, allowing LKMS to respond quickly to changing conditions that affect risk.
4. **Future Risk Prediction:** AI assists LKMS in forecasting potential risks that may arise in the future, enabling them to prepare more effective risk management strategies.
5. **Better Portfolio Management:** For LKMS with investment portfolios, AI helps in selecting Shariah-compliant investments and managing the portfolio for better investment returns.
6. **Operational Efficiency:** AI implementation improves operational efficiency by automating manual tasks, reducing the risk of human error, and allowing LKMS staff to focus on more strategic tasks.
7. **Compliance with Shariah Principles:** AI ensures that the transactions and operations of the LKMS are in line with Shariah principles, helping to maintain the integrity of these principles in all business activities.

The positive impact of implementing AI in the risk management of Islamic LKMS:

1. **Improved Operational Efficiency:** Process automation and faster data analysis result in significant operational efficiencies, reducing the cost and time required to manage risk.
2. **Improved Service Quality:** With AI's ability to provide more accurate recommendations, LKMS can provide better services to customers with more customized product and service offerings.
3. **Better Competitiveness:** With better risk management, LKMS can compete more effectively in the increasingly competitive Islamic finance industry.
4. **More Sustainable Growth:** By reducing unwanted risks, LKMS can maintain financial stability and support sustainable business growth.
5. **Maintenance of Shariah Integrity:** By ensuring compliance with Shariah principles, LKMS maintain business integrity, which is a key element in the Islamic financial sector.

CONCLUSION

The application of Artificial Intelligence (AI) in Risk Management of Lembaga keuangan mikro syariah (LKMS) has a significant impact on operations and financial stability. Here is a summary of how

the application of AI affects Sharia LKMS and the resulting impact. Application of AI in Risk Management of Sharia LKMS.

Faster Risk Detection: AI enables Sharia LKMS to detect risks more quickly and accurately. In-depth data analysis enables the identification of risks that may be missed by manual approaches. **More Accurate Decision Making:** With AI support, LKMS can make more accurate and data-driven decisions, especially when it comes to credit risk assessment, investment, and business strategy.

Real-Time Monitoring: AI systems enable real-time operational monitoring, allowing LKMS to respond to changes in market conditions and risks more quickly and efficiently. **Future Risk Prediction:** AI assists LKMS in forecasting potential risks that may arise in the future, enabling them to prepare more effective risk management strategies.

Better Portfolio Management: For LKMS with investment portfolios, AI can assist in selecting Shariah-compliant investments and managing the portfolio for better investment returns.

Impact of AI Implementation in Risk Management of Islamic LKMS. **Improved Operational Efficiency:** AI implementation automates manual tasks, reduces the risk of human error, and improves overall operational efficiency. **Improved Service Quality:** With AI's ability to provide more accurate recommendations, LKMS can provide better services to customers with more customized product and service offerings.

Better Competitiveness: With better risk management, LKMS can compete more effectively in the increasingly competitive Islamic finance industry. **More Sustainable Growth:** By reducing unwanted risks, LKMS can maintain financial stability and support sustainable business growth.

Compliance with Shariah Principles: The implementation of AI ensures that the transactions and operations of the MFI are in line with Shariah principles, helping to maintain the integrity of these principles in all business activities. **Challenges and Recommendations** The application of AI in Islamic LKMS is also faced with challenges, including regulation and sharia compliance. The recommendation for Islamic LKMS in adopting AI technology in risk management is to take a holistic approach that involves collaboration between LKMS, technologists, and sharia experts. This requires a strong commitment and deep understanding of sharia principles, as well as the development of adequate regulations.

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