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ARTIFICIAL INTELLIGENCE IN LIQUIDITY RISK MANAGEMENT IN ISLAMIC BANKS: OPPORTUNITIES AND CHALLENGES

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Abstract:

This article analyses the potential of artificial intelligence (AI) applications for managing liquidity risk in Islamic banks. These banks operate in accordance with Sharia, which prohibits several products used by conventional banks. This restriction limits access to financial instruments and can create challenges in liquidity management. This study compares the two liquidity management systems and demonstrates the usefulness of AI in addressing operational and analytical system problems. Studies in Malaysia and Indonesia have shown very high liquidity ratios that Islamic banks achieved during crises such as COVID-19. This study also shows that, thanks to the innovative and automated system of AI, it can ensure Sharia compliance and respect for ethics. With the regulatory and technical difficulties linked to data, AI offers tools for forecasting and generating liquidity. It helps in making decisions easier by helping them decide; thus, decreasing the chance of either liquidity risk or non-compliance. This research recommends methods for Islamic banks to adopt AI that will enhance the overall quality of the Islamic banking system and improve the way that ethics are incorporated.

Keywords:

Artificial Intelligence (AI); Islamic Banking; Liquidity Risk Management; Sharia Compliance.

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Introduction

Liquidity risk is one of the critical challenges that confront Islamic banks in today's world. It has been defined as a bank's incapacity to fulfill its duties at a given moment without undergoing significant losses. Islamic banks face challenges in managing this risk due to the prohibitive nature of some of the standard practices employed by conventional banks for controlling their liquidity and responding to potential threats, such as riba, gharar, and maysir (Zaheer & Farooq, 2014). Unlike conventional banks, Islamic banks cannot use traditional liquidity instruments, including Treasury bills, Bonds, or Interbank loans provided with Riba (Van Greuning & Iqbal, 2007). This limitation reduces the benefits of use and exposes Islamic banks to liquidity problems, especially in moments of crisis (Mabrouk & Farah, 2021). The liquidity risk management systems that Islamic banks are enabled to use are often obsolete, rigid, or not adapted to the financial reality of today(Effendi & Disman, 2018). They have a very weak precision and do not allow for the identification of the signs that announce liquidity crises (Haroon Mahmood et al., 2018). In a context of instability of financial markets, geopolitical tensions, and increasing regulatory obligations, in particular those of Basel III, it is asked to search for a solution that is rapid and innovative, effective, and that conforms to Sharia, to reinforce the strength of Islamic banks and avoid liquidity crises (Ling et al., 2022). The artificial intelligence integration isn’t limited only to the improvement of the efficiency of liquidity risk management or to the operational (Crisanto et al., 2024). It helps to strengthen financial institutions' compliance, also improving the decision-making in Islamic banks, and to ensure their financial viability in the long term (Arsyad et al., 2025). Given the current situation of rapid digitalization in the financial system, Islamic banks do not have the choice to advance with technological innovation to guarantee competitiveness, resilience, and to stay faithful to the values of Islamic finance, that is to say, Sharia (Sain & Adinugraha, 2025).

In this perspective, artificial intelligence reveals itself as a precious and transformative tool (Hamadou et al., 2024). AI provides advanced analytical capabilities that allow Islamic banks to process large volumes of financial data simultaneously, which can reveal hidden trends and propose models that the existing tools will not offer (Martin Leo et al., 2019). AI can assist Islamic banks in anticipating the dangers with methods like machine learning, predictive analysis, and natural language processing, principally the liquidity risk, and to identify the processes of crisis and to implement mitigation methods adapted to Islamic finance (Mohd Najib et al., 2025). Moreover, we can personalize solutions so that they answer the needs of Islamic banks and conform to the principles of Sharia, combining thus innovation and Islamic ethics (Khan, 2025).

Islamic banks face significant difficulties managing liquidity risk because they are always working with traditional tools, which are not adapted to the current reality. Islamic banks cannot use the tools of conventional banks because they do not conform to Islamic financial concepts. The methods used by Islamic banks do not make it possible to avoid liquidity issues; they are limited and cannot very easily improvise unpredictable things and cannot anticipate liquidity shocks. In this case, artificial intelligence has future solutions to prevent or resolve liquidity

problems while respecting Sharia. This study aims to examine how artificial intelligence can improve Islamic banks in managing liquidity risk.

Literature Review

For years, the danger of liquidity has been recognized as a major issue in the banking domain, because it has a direct impact on the capacity of a banking institution to honor its engagements and to maintain the confidence within the financial system. Generally, banks manage this type of risk with a variety of market instruments Treasury bills, government bonds, and interbank financing options. These instruments provide banks flexibility to manage their liquidity. However, many traditional banking practices cannot easily be applied to Islamic banking due to legal and moral constraints imposed by Sharia law(Al-Deek, 2025).

Islamic banks work in an economic system that prohibits usury (riba), excess of uncertainty (gharar), and speculative gambling (maysir). Thus, they do not have access to liquidity tools that traditional banks use and must find a solution that is compliant with the principles of Sharia (Rizkiah, 2018). The literature shows that Islamic banks have the habit of favoring tools such as sukuk, murabaha, tawarruq, and wakalah for the management of their liquidity. Although these instruments are legally and ethically acceptable, many experts have judged that these tools do not have the same flexibility as traditional means, especially in the moment of financial crisis (Alzoubi, 2017).

It would seem that Islamic banks generally have liquidity ratios higher than those of conventional banks, highlighted by comparative studies on Islamic finance. This makes us know that Islamic banks are prudent in the management of their liquidity. However, this apparent robustness masks underlying weaknesses. Islamic banks have difficulties in reacting effectively to unexpected liquidity shocks due to the limitation of access to liquidity instruments and the non-development of activities in Islamic money markets (Firdaus et al., 2024). During the COVID-19 crisis, for example, empirical data from countries such as Malaysia and Indonesia demonstrated that, even if Islamic banks had maintained their liquidity, they proved to be more likely to adjust their liquidity position than conventional banks (Butt & Chamberlain, 2025).

The previous writing discusses the behavior of depositors in regard to one more important aspect, which is that customers of Islamic banks are not only concerned about the potential for getting financial benefits (as they would be at other banks) but also take into account certain religious and ethical factors. By demonstrating loyalty through trust, customers have contributed to creating stability and thus reduced the risk of mass withdrawals.(Hanif Noor Athief & Ma'ruf, 2023). However, this could affect the capacity of the bank to act in a rapid way in terms of the management of its liquidity, given that customer deposits often serve to identify market capacity. This behavioral trait complicates the management of liquidity risk in Islamic banks compared to conventional systems.

Current research still explores the importance of the use of artificial intelligence in the management of banking risks. Conventional banks already use AI in operations such as the analysis of credit risk, the identification of fraud, stress tests, and asset liability management. Machine learning is praised for its ability to quickly analyze large amounts of data, identify complex outlier and generate accurate forecasts. The ability of AI to support liquidity risk management by enabling timely identification and quick remediation has made it particularly

effective in such situations. Machine learning models have been valued for their ability to assess large datasets and identify non-linear patterns or trends that can help generate accurate predictions. With all these capabilities combined, AI provides an excellent solution for managing liquidity risk as a result of being able to identify early and respond rapidly (Gustanto et al., 2025; Zainudin & Hidayatulloh, 2025).

Numerous studies indicate that businesses may leverage artificial intelligence in enhancing cash flow forecasts/monitoring and also identifying possible early warning signals of distress, rather than relying on the typical signs (i.e., indicators) of trouble before taking preventative measures (Muhammad Bashri Bas et al., 2025). This anticipatory approach is particularly attractive for Islamic banks, given that it reduces their dependence on short-term instruments, often subject to debate, such as tawarruq (Gustanto et al., 2025).

According to Sharia, the literature admits that AI is not intrinsically problematic. It is considered a neutral tool, and its conformity to Islamic principles depends on its fabrication and its use (Azwar et al., 2025). When AI is well managed, it can ensure the respect of Sharia by improving transparency and responsibility. For example, the automatic analysis of natural language could serve to examine the conformity of contracts and identify the points that could imply riba (usury) or gharar (excessive risk), whereas automated monitoring systems can report the irregular transactions.

In parallel, experts have warned against a blind integration of AI in the field of Islamic finance. And it shows the existence of problems such as the absence of Sharia-compliant databases, legal uncertainty, algorithmic biases, and the restriction of the exploitability of decisions taken by artificial intelligence persist as important issues. These difficulties highlight that strict surveillance by humans is necessary, particularly by Sharia committees, in order to guarantee that AI applications conform to the principles of Islamic law (Maqasid al-Shariah)(Bin-Armia & Kambakov, 2026; Wahab & Mahdiya, 2025).

To conclude, while current literature has made contributions towards our understanding of managing liquidity risks through Artificial Intelligence (AI) technology, there are few examples of AI being utilized within Sharia-compliant methods for managing liquidity risk. Therefore, further detailed investigations are warranted regarding the ethical and practical implications of using AI to manage liquidity risk in Islamic banking. This is the goal of this study.

Methodology

This research employs a qualitative, descriptive, and analytical vision to evaluate the role of artificial intelligence (AI) for strengthening liquidity risk management in Islamic banks, while ensuring the compliance of activities with Sharia. The main objective of this research is to examine liquidity risk in banks. It is important to recall that Islamic banks are required to comply with the principles of Sharia. This research helps us understand how artificial intelligence can be integrated with Sharia to manage bank liquidity. It also provides insights into how Islamic financial institutions can use artificial intelligence in a way that is compliant with Sharia and beneficial to their activities.

The methodology is composed of four parts, which are coupled and together give assurance of rapid development and produce consequent results for this study.

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Data Collection

The analysis is entirely based on secondary data from a wide range of authoritative sources, including:

Peer-reviewed academic publications on Islamic banking, liquidity risk, and AI technologies; Institutional annual reports published by regulatory bodies such as the Basel Committee on Banking Supervision (BCBS) and the Islamic Financial Services Board (IFSB); Statistical bulletins of central banks and financial statements of Islamic and conventional banks; Books, conferences, and research papers indexed in international databases such as Scopus, ScienceDirect, Emerald Insight, and Google Scholar. And the documents were selected according to their relevance to the objectives of this research, their publication date (2000–2026), and the extent to which they directly cover liquidity risk management or the use of AI in Islamic financial institutions.

Analytical Framework

The study uses two types of analytical approaches to interpret the data collected. A comparative study to identify the difference between the liquidity risk management systems of Islamic and conventional banks, based on available financial tools, regulatory contexts, and resilience capacity during crisis periods. The thematic evaluation allows us to learn the impacts of AI, especially in machine learning, prediction, crisis-prevention models, and natural language processing (NLP), for the optimization of liquidity projections and for the improvement of the early-warning system and automated Sharia compliance management. With these two types of analyses, a link is woven between the operational constraints of Islamic finance and the technological capabilities offered by AI. Evaluation of the applicability of AI to Sharia-compliant liquidity management.

The effectiveness of AI applicability in Islamic banks is evaluated based on three important criteria:1.Technical efficiency, its predictive reliability, its ability to support decisions, and its ability to handle all heavy and complex financial data; 2. Sharia compliance, which quantifies the contribution of technology to prevent prohibitions such as riba, maysir, and gharar, while promoting transparency and fairness; 3. The ability of the technology to adapt to regulations, the compliance of AI instruments with AAOIFI standards, the Basel Committee, and national regulatory authorities (Bank Negara Malaysia and OJK Indonesia).

Reliability And Validation of Results

For the credibility of the results, several validation techniques were used, including: The combination of information extracted from academic documents, sector reports, and regulatory documents. Making international comparisons based on data from Malaysia, Indonesia, and the United Kingdom, covering the period from 2018 to 2024. This validation approach ensures, at several levels, that the study offers a balanced analysis and is supported by a significant influence of AI in the management of liquidity risk in Islamic banks.

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Limitations

This research has some limitations. Artificial Intelligence adoption in the management of liquidity risk in Islamic banks, and also the development of AI applications, are in the testing phase, which will reduce empirical consumption. The research is based on information that does not necessarily represent the development of technology or changes in standards. Moreover, the differences in regulation, market conditions, and technological institutions between countries reduce the possibility of generalizing the results. Therefore, to increase the security of AI liquidity management instruments in Islamic finance, future research should deepen and adapt larger databases, and also the applications used.

Figure 1. Research Methodology Framework

Source: Author's own elaboration

Results and Discussion

Results

Islamic banks are facing a liquidity risk due to the prohibition of certain practices in the Islamic financial system, such as riba (interest), speculation, and gambling (Mikou et al., 2024). Unlike conventional banks, which have access to several resources such as treasury bills, interbank loans, and bonds, Islamic banks have only a few very limited instruments (Mabrouk & Farah, 2021). The most widely used and widespread instrument today is the sukuk, an Islamic bond generally issued by governments (Fitch Ratings, 2025). Investors in Sukuk provide Islamic financial institutions with liquidity and flexibility for their short-term liquidity needs. While Sukuk forms are broadly classified (according to the nature of the underlying assets and type of sukuk cash flow), including both physical and non-physical cash flows, the sukuk market tends to remain much smaller than the conventional market for bonds. Often, because of their lower average returns, Islamic bonds can underperform relative to conventional bonds, which limits their utility during a time of crisis (Dey et al., 2025). A third way of providing access to

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liquidity through property/equipment or working capital is through the use of murabaha or tawarruq as a means for generating liquidity by selling raw materials with an interest rate mark-up While very effective for short-term financing, there are varying opinions among Islamic scholars regarding the permissibility of murabaha and tawarruq as they share many similarities with riba (interest)(Saifuzzaman & Rosli Mahmood, 2023). Another avenue for Islamic financial institutions to move capital to other Islamic financial institutions for investment purposes is through wakalah placements which depend on the confidentiality of the existence of the local banking system. (Press Release,2022). Furthermore, murabahah investment accounts mobilize funds from depositors, but only with their participation in the investment profile, even if the lack of a guarantee of return complicates planning (Jobst & Solé López-Pinto, 2020). Overall, the tools used by Islamic banks provide some liquidity management capability, but are less flexible than those used by conventional banks (Chapra & Khan, 2000). Because of the limited markets and reliance on interbank placement, Islamic banks face liquidity pressures during economic downturns or even crises (Daud Vicary Abdullah, 2010).

Traditional liquidity risk management instruments used by Islamic banks, such as sukuk, tawarruq, and wakalah investments, have shown their limitations in liquidity risk management(Mikou et al., 2024). The first observation is that Islamic banks have a very limited portfolio compared to conventional banks (Rizkiah, 2018). This portfolio limitation shows that Islamic banks don't have the exact flexible liquidity management techniques like conventional banks, especially in times of economic problems or money market tensions (Ledhem, 2022). Furthermore, some products, such as murabahah, are only available for short-term liquidity management. Moreover, they are also very similar to the instruments conventional banks use, such as interbank interest-rate securities, which they seek to replace (Song et al., 2014).

Ultimately, they are also linked to the availability of excessive liquidity in interbank investments, which creates a kind of dependence on interbank investments and other short-term financial markets (Sharma, 2025). On the other hand, during times of stress and economic slowdown, interconnection can have repercussions on liquidity and directly expose Islamic banks to very serious shocks (Nabil Bello et al., 2025).

Overall, while traditional instruments that Islamic banks use to manage the liquidity problem, to provide the fundamental means for Islamic banks to exist, the search for new, more advanced, and efficient methods is essential to maintain the ideal productivity of Islamic banks. Artificial intelligence can help them overcome difficulties related to liquidity management and compliance with Sharia principles. In particular, it can enable them to manage their finances and operate in accordance with Sharia (Gustanto et al., 2025). One of the most important fundamental principles is liquidity management and supervision in Islamic banks. It analyzes the current financial data, and AI can predict the risks of liquidity shortage and the scenarios of economic crisis (Hamadou et al., 2024). This allows the banks to take rapid and effective measures to limit their dependence on short-term instruments, such as murabaha and tawarruq. The liquidity management of Islamic banks will thus be much more flexible and reliable in facing crises. AI can also play an important role in Sharia compliance. With the natural language processing system (NLP), AI analyzes the contracts and shows the conformity of the contract as well as the elements that do not conform to Sharia, and those that can be likely to involve riba, maysir, and gharar (Shalhoob & Babiker, 2025). Combined with technology and blockchain, AI facilitates the implementation of smart contracts for some products like ijara and murabaha, promoting transparency and minimizing the risk of non-compliance (Mohd

Najib et al., 2025). Other aspects of Islamic finance, such as customer service and financial guidance, are optimized by AI The emergence of AI-based chatbots is increasing and expanding their ability to conduct business with customers by answering questions and providing suggestions for products that fit within the parameters of Sharia law (Hamadou et al., 2024). Additionally, the new AI-based credit models utilize analysis of historical transactions and behaviors rather than focusing on interest rates, thereby enhancing access to capital for people who do not have access to traditional banks; therefore, helping out many small businesses (Hashem, 2025).

Lastly, AI will further reduce the risk of money laundering and enhance the security of cross-border transactions by monitoring the banking industry for irregular behaviour and providing a mechanism to detect fraud which will increase the security of sensitive information, thereby positively impacting the Cyber Security industry. There is a growing demand for AI within the Sharia-compliance and Islamic finance auditing industries, specifically in the areas of auditing and Sharia-compliance functions(Nawaz, 2025).

The comparison between liquidity risk management systems in Islamic banks and conventional banks shows clear differences (Jaafar et al., 2024) (refer to Figure 1). Conventional banks work in an environment where they have a wide range of tools, such as Treasury bills, government bonds, and interbank loans. These instruments make it easy for them to manage their liquidity risks.

As for the Islamic bank, they are obliged to conform to Islamic financial principles, which frame the Islamic financial system by prohibiting instruments that have interest and speculation. They turn, therefore, towards tools such as sukuk, murabaha on commodities, or wakala, which are the principal instruments of liquidity mobilization with conformity. Although these instruments are operational, their flexibility is limited, especially when the capital markets are in difficult moments. Experience-based data highlights the effects of these disparities. The academic data put the emphasis on the effect of these disparities. During COVID-19 in Indonesia, some research has shown that liquidity difficulties had affected the two systems, but that Islamic banks had been more affected (Viverita et al., 2023). It is very important to note that when liquidity exceeds a certain threshold, the relationship between the bank and the clients becomes fragile, which shows the need for a deep analysis to improve the prediction tools that are reliable (Ahmad & Amran, 2023). And another study reveals that Islamic banks created higher liquidity than conventional banks, due to reasons of religion, the depositors showing themselves faithful to Islamic banks for reasons of their religious commitment (Firdaus et al., 2024). In Malaysia, comparative studies have revealed that, despite lower returns and very limited reserves, Islamic banks very often display stronger liquidity ratios than conventional banks (see Table 1), which, however, reduces their overall resilience (Javaria, Kiran, 2016).

The difference is also visible in the United Kingdom, where the Islamic bank Al Rayan Bank has liquidity reserves lower than the conventional bank HSBC UK Bank plc (see Table 2). However, Al Rayan Bank's reserves continue to increase, moving from £339,739,000 in 2019 to £539,046,000 in 2024, showing the efforts put in place by the Bank to improve its liquidity in all Sharia compliance. On the other hand, HSBC UK Bank plc has a much higher balance with the central bank, going from £37.1 billion in 2019 to £52.3 billion in 2024, which

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highlights the considerable gap between the two systems in terms of liquidity management, notably because of the instruments used and the regulatory access available.

These data imply that Islamic banks cannot rely entirely on traditional banking instruments and conventional financial indicators to achieve effective liquidity management. Instead, a more comprehensive strategy is required, one that incorporates depositor behavior, regulatory frameworks, and market dynamics (An Nisaa' Rahmadany et al., 2024). Artificial intelligence (AI), with its capacity to analyze complex and non-linear patterns and to integrate multiple variables, can provide significant support to Islamic banks in narrowing the gap between Islamic and conventional banking systems (Hamadou et al., 2024).

Table 1. Liquidity Coverage Ratio (LCR) Comparative analysis of Islamic and Conventional Banks in Malaysia (2019–2024)

Year	Conventional Banks (LCR %)	Islamic Banks (LCR% %)
2019	148%	152%
2020	152%	141%
2021	153%	139%
2022	153%	139%
2023	156%	142%
2024	153%	148%

Source: Author's Calculation Based On Data From *Bank Negara Malaysia, Monthly Statistical Bulletin (2019–2024)*

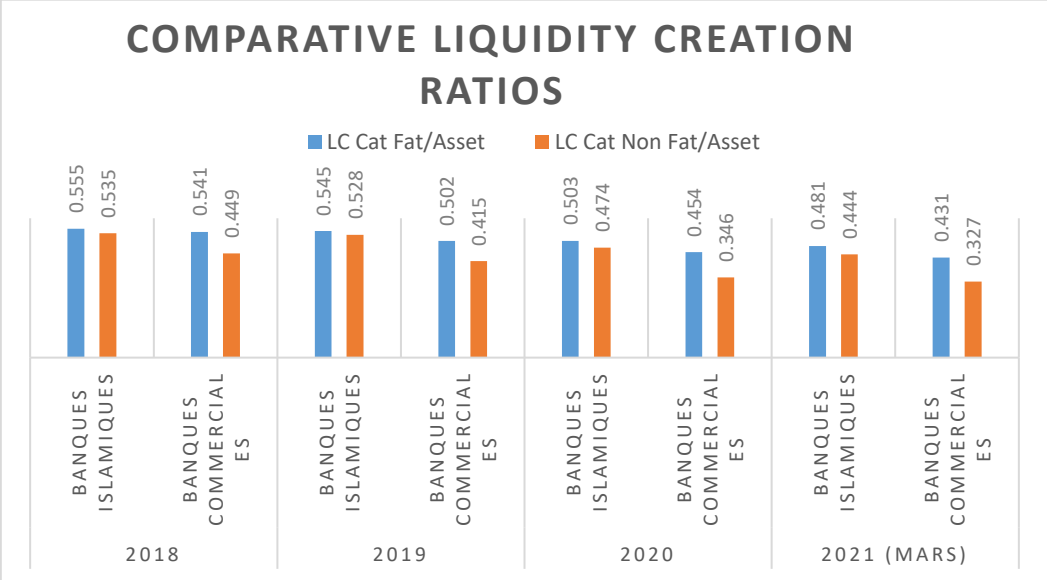

Figure 2: Comparative Liquidity Creation Ratios

Source: Viverita, Y., Bustaman, Y., & Danarsari, D. N. (2023). Liquidity Creation By Islamic And Conventional Banks During The Covid-19 Pandemic. Heliyon, 9(7), E15136. Https://Doi.Org/10.1016/J.Heliyon.2023.E15136\

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Table 2: Cash and Central Bank Balances of Al Rayan Bank and HSBC UK (2019–2024)

Year	Al Rayan Bank – Cash & Equivalents (£ 000s)	HSBC UK Bank plc – Cash & Balances at Central Banks (£ m)
2019	339 739	37 102 000
2020	385 376	76 513 000
2021	—	112 551 000
2022	—	94 471 000
2023	397 753	65 783 000
2024	539 046	52 334 000

Source: Al Rayan Bank Plc. (2019–2024). Annual Reports And Financial Statements. Https://Www.Alrayanbank.Co.Uk/About-Us/Financial-Information/ ; Hsbc Uk Bank Plc, *Annual Reports And Pillar 3 Disclosures* (2019–2024), Available At Https://Www.Hsbc.Com/Investors/Results-And-Announcements.

Discussion

The results show that the liquidity risk management by Islamic banks faces structural and ethical limitations linked to Sharia. While conventional banks offer a wide range of liquidity instruments such as Treasury bills, bonds, and interbank loans, Islamic banks operate within a very strict structure, relying only on sukuk, tawarruq, murabahah, and wakalah. These instruments are very functional but lack flexibility during periods of stress in financial markets (Mabrouk & Farah, 2021). The Malaysian and Indonesian examples show a double reality: Islamic banks show a higher liquidity ratio but remain more exposed to systemic shocks due to the limitation of instruments and the weakness of liquidity reserves. In addition, the loyalty of depositors is linked to a religious or ethical commitment, which acts both as a stabilizing factor and a source of firmness, thus affecting the process of liquidity creation. This one shows an unusual link between liquidity and financial stability. The adoption of artificial intelligence gives a future perspective to fill these gaps, and to improve the precision of stress tests, to estimate liquidity, and to develop optimization models that are compliant with Sharia, while also strengthening resilience and promoting innovation in Islamic banking sector (Mohd Najib et al., 2025).

As an extension of the technical aspect of this research, examples of specific AI models that can be successfully applied in this regard include: Machine Learning techniques, for instance Random Forest and Support Vector Machine (SVM); which are capable of forecasting liquidity shortages by evaluating historical data and recognizing non-linear patterns (Martin Leo et al., 2019; Gustanto et al., 2025). Additionally, Deep Learning models such as Artificial Neural Networks (ANN) and Long Short Term Memory (LSTM) networks have proven to be very useful for forecasting using time series data and for the early detection of liquidity stress (Zainudin & Hidayatulloh, 2025); and furthermore, Natural Language Processing (NLP) will assist with compliance to Sharia through the review of financial contracts and the identification of Islamic issues such as riba, gharar and maysir (Shalhoob & Babiker, 2025). Clustering techniques like K-means can also be utilized to help analyze depositor behaviours and anticipate potential withdrawal risks. Overall, the combination of these AI models improves accuracy in predicting, enhances decision making and ultimately increases the overall efficacy of managing liquidity risk within Islamic banks.

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From a Shariah perspective, using artificial intelligence in liquidity risk management it maybe compliant with Sharia, with conditions that it must be designed and supervised according to the standards of Islamic finance (Waqar et al., 2025). Artificial intelligence as a whole is a neutral technology; it will be in compliance with the principles of Sharia depending upon the data and the objectives of its use(Arsyad et al., 2025). In Islamic banks, artificial intelligence will have a role in strengthening the ability to make decisions, particularly with regard to preventing the use of instruments that are prohibited in Islam. For example, predictive AI models optimize liquidity estimations by staying away from falling into prohibitions. Also, AI assists the Sharia committee in making decisions on contracts more easily and quickly, by guaranteeing the transparency of contracts, and automates compliance controls and the monitoring of transactions in real time in order to detect any violation of Sharia (Bakar et al., 2025). However, experts request the need for human supervision to prevent algorithmic biases and outcomes contrary to ethics. In this case, the use of artificial intelligence in Islamic banks can be compliant with Sharia if it is applied according to the ethical values of Islam, and oriented toward the Maqasid al-Sharia, which are the objectives of Islamic law.

In addition to enhancing compliance, Artificial Intelligence (AI) can offer Islamic banks several opportunities to promote the efficiency of products and compliance, and also improve the trust of customers in the services offered (Gustanto et al., 2025). With AI tools such as automatic analysis of data and prediction, AI optimizes liquidity forecasts and asset and liability management by reducing compliance risks and checking the operations, the contracts, and the investment portfolio to ensure compliance, and also reduces operational costs and minimizes the errors that are linked to humans (Al-amrkani & Arabiyat, 2023). In addition, chatbots are a tool of personalized advice and assistance that strengthen the confidence of customers by offering them ethical and reliable financial solutions that respond to their needs (Iqbal et al., 2025). And in the field of liquidity management, AI has the capacity to identify the movements of financial evolutions and the behavior of depositors. The banks can also strengthen their short-term capital without resorting to prohibited instruments (Hendarti et al., 2024). This technology also gives perspectives of innovation for Islamic financial products, such as the flexible structuring of sukuk or smart contracts, which several Islamic banks have already begun to use for risk-sharing. In summary, the adoption of AI is an advantage for Islamic banks to position themselves well internationally and to strengthen transparency and the respect of Sharia principles.

AI provide considerable opportunities, but also, using it in Islamic banks can has a several difficulties and limitations. One challenge is the absence of a data model complainant with Sharia: artificial intelligence algorithms work many times with conventional banking databases, which affects compliance. In addition, the implementation of AI technology is interrupted by very expensive technological infrastructure costs and a lack of technical expertise and AI experts within the field of Islamic finance (Islam & Hasan, 2024). Regulatory issues also constitute a major obstacle, and most Islamic finance frameworks have not yet provided clear guidelines on the management and application of AI in large Islamic financial institutions. Moreover, transparency and responsibility in AI-driven decision-making are always considered important challenges, especially to ensure that automated systems respect Sharia standards. In short, small Islamic banks are confronted with risks linked to the evolution of trends and cybersecurity, which affects customer trust if the management tools are not adapted. These limitations show the need for an adequate Islamic analytical institution that adapts to the ethics of Islamic finance and to innovation.

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Islamic banks must create a Sharia-compliant approach towards incorporating AI technology within their laquidity risk management practices. For banks to achieve this goal, they will need to officially employ both Sharia-compliant financial advisors and Artificial Intelligence engineers to work with each other to construct AI algorithms that reflect Sharia-compliant business practices and eliminate the use of any database that includes any records of speculative-based transaction records or any records of interest-rate-based transaction records (Eddy et al., 2025). In the second place, the improvement of skills is necessary: it is crucial to train the staff on AI technologies and on the basic foundations of Islamic finance, to guarantee transparency and Shariah compliance (Fitria, 2025). The regulatory institutions like AAOIFI and the central banks, like Bank Negara Malaysia or OJK Indonesia, have the responsibility to elaborate clear standards in the matter of the use of AI. Again, the establishment of a regional network for transmitting data appears to improve the harmonization of liquidity forecasting models. Working with specialists in the field of Islamic finance in FinTech can assist in promoting innovation whilst ensuring shariah compliance (Hasan et al., 2020). In conclusion, regularly reviewing AI models by the shariah committee will ensure that automation does not replace but complements the ethical and transparency objectives of shariah.

Conclusion

The use of artificial intelligence (AI) in managing liquidity risk represents a major advancement in Islamic finance. Islamic banks are required to comply with Sharia, which governs certain operations and creates specific challenges in managing liquidity risk, unlike conventional banks that have more flexible instruments. Artificial intelligence promotes compliance with Sharia, automates decision-making, enables real-time monitoring, and provides more accurate forecasts, ensuring clarity. However, to fully take advantage of these benefits, it is necessary to address technological, legal, and Sharia-related challenges. The results of this study indicate that, to establish trust and transparency, cooperation between AI developers, regulatory bodies, and Sharia experts is essential. The responsible use of AI allows Islamic banks to increase their strength, improve customer confidence, and recover their lack of operational activity compared to conventional banks. Finally, careful use of AI can help Islamic banks to achieve the objective: guarantee financial stability while respecting the Shariah and social principles that illustrate the Islamic financial systems.

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