ASSESSING THE FEASIBILITY OF ISLAMIC BANKING ROBO-ADVISORS ADOPTION WITHIN THE ASEAN ECONOMIC COMMUNITY: EVIDENCE FROM INDONESIA

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ABSTRACT

The ASEAN Economic Community (AEC) aims to enhance regional financial integration and competitiveness, creating opportunities for digital innovation in Islamic banking. Within ASEAN, Indonesia serves as one of the principal hubs of Islamic finance, offering regulatory leadership, market depth, and support for Shariah-compliant financial development. In this context, robo-advisors (RA) have significant potential to expand Islamic investment services through scalable, data-driven, and cost-efficient advisory models. Despite fintech

growth, empirical research on RA adoption in Islamic banking within ASEAN remains limited, especially in leading jurisdictions. This study addresses this gap by assessing the feasibility of RA adoption within the AEC, particularly in Indonesia. Using a qualitative design, it conducts systematic library research of academic literature, policy documents, and industry reports on Islamic banking, fintech, and ASEAN financial integration. Data are analysed via thematic analysis supported by NVivo 15 to identify key feasibility dimensions. The findings highlight four interrelated dimensions: regulatory preparedness, Shariah governance and compliance, technological readiness, and customer acceptance. While Indonesia shows growing institutional commitment and market potential, challenges persist in regulatory harmonisation, Shariah-compliant algorithm transparency, and uneven technological capacity. Malaysia's established regulatory clarity and Shariah governance provide benchmarks for regional best practices. This study proposes a conceptual feasibility framework to guide RA implementation in Indonesian Islamic banking and offers policy and strategic insights for strengthening ASEAN's Islamic fintech ecosystem, particularly in its leading Islamic finance hubs.

Keywords: *Islamic banking, artificial intelligence, robo-advisors, digital finance, ASEAN Economic Community*

INTRODUCTION

The development of AI (artificial intelligence) and machine learning has transformed the finance world.[1] These advancements have significantly impacted the financial industry, including the banking sector.[2] Banks can reduce costs by employing AI-based systems to increase efficiency and make decisions based on information incomprehensible to humans.[3] The use

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[1] M.N Wexler and J Oberlander, "Robo-Advisors (RAs): The Programmed Self-Service Market for Professional Advice," *Journal of Service Theory and Practice* 31, no. 3 (2021): 351–65.

[2] Gavin Northey et al., "Man vs Machine: How Artificial Intelligence in Banking Influences Consumer Belief in Financial Advice," *International Journal of Bank Marketing* 40, no. 6 (2022): 1182–99, https://doi.org/10.1108/IJBM-09-2021-0439.

[3] T. M Brill et al., "Siri, Alexa, and Other Digital Assistants: A Study of Customer Satisfaction with Artificial Intelligence Applications," *Journal of Marketing*

of AI in banking also contributes to increased security and customer service.[4] Additionally, AI has contributed to improving the speed and effectiveness of responsiveness, strengthening industry trust in the banking sector.[5] Robo-advisors (RA) are a prime example of using AI in banking. It is a virtual financial advisor that utilizes algorithms to provide financial services, enabling investors to select and manage their portfolios without the need for a human advisor.[6] Financial Technology (Fintech) banking and RA have surfaced as possible AI for digital banking in recent years.[7] They further classified the evolution of digital banking into four eras: Digital Bank 1.0 (1998–2002) including internet banking, email, databases, and web-based services; Digital Bank 2.0 (2003–2008) including online payments, KYC, digital channels, and data warehouses; Digital Bank 3.0 (2009–2016) included cloud banking, big data, mobile transactions, and 360 customers, and Digital Bank 4.0 (2017–now) includes Fin-Tech banking, artificial intelligence, virtual banks, virtual branches, and inter-cloud collaboration. A substantial amount of research indicates that digital banking 5.0 is about to arrive,[8] which is primarily driven by the COVID-19 pandemic and rapid technological advancements. [9] A hallmark of digital banking 5.0 is the increasing interconnection of the digital, biological, and physical domains, as seen by human-machine cooperation and the increased contribution of


    Management 35, nos. 15–16 (2019): 1401-1436., https://doi.org/10.1080/0267257X.2019.1687571.

[4] C.J.S Lourenço et al., "Whose Algorithm Says so: The Relationships between Type of Firm, Perceptions of Trust and Expertise, and the Acceptance of Financial Robo-advice," *Journal of Interactive Marketing* 49 (2020): 107–1.

[5] P Karthikeyan, "Technology Adoption and Customer Satisfaction in Banking Technological Services," *Journal of Internet Banking and Commerce* 21, no. 3 (2016): 1.

[6] F.D Hodge et al., "The Effect of Humanizing Robo-Advisors on Investor Judgments," *Contemporary Accounting Research* 38, no. 1 (2021): 770–92.

[7] Kausar Abbas and Muhammad Hafeez, "Will Artificial Intelligence rejuvenate Islamic finance? a version of world academia," *Hitit İlahiyat Dergisi* 20, no. 3 (2021): 311–24, https://doi.org/10.14395/hid.931401.

[8] Adrian Eka Darma Serang, "Banking Digitalization in the Era of Revolution 5.0: Opportunities and Risks for Financial Inclusion," *Nomico* 1, no. 9 (2024): 13–23, https://doi.org/10.62872/x3ta4h52; Juniawan Mandala Putra et al., "Fintech Transformation: An Analysis of Era 5.0 Technology in Digital Finance Applications," *Seascapeid Journal of Economics, Management, and Business* 1, no. 9 (2024): 1–11; Bintang Narpati, "The Role of Digital Transformation in Facing the Era of Society 5.0 at Banking Industry," *Jurnal Valuasi: Jurnal Ilmiah Ilmu Manajemen Dan Kewirausahaan* 3, no. 1 (2023): 1–12.

[9] Bernardo Nicolleti, *Banking 5.0: How Fintech Will Change Traditional Banks in the "New Normal" Post Pandemic*, 1st ed. (Springer, 2021).

humans to technical growth.[10] Figure 1 shows how digital banking has evolved.

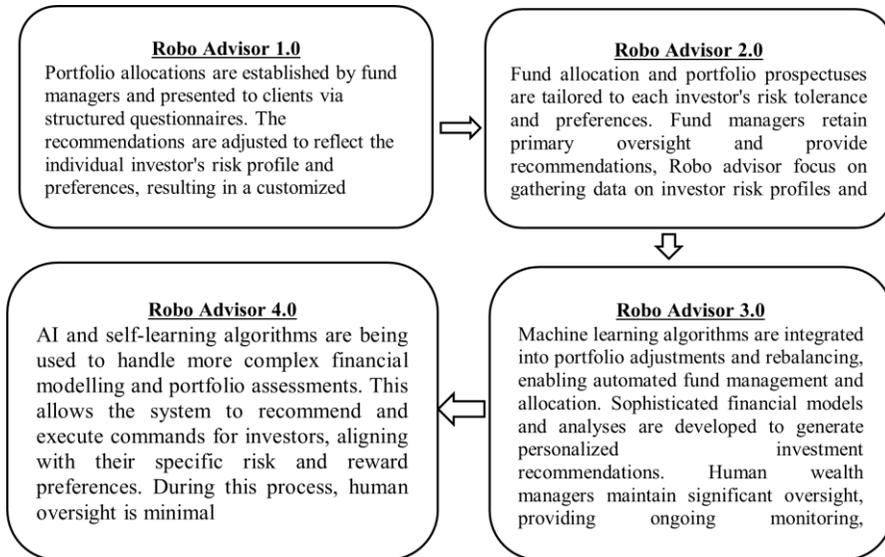Figure 1: The Development of Digital Banking
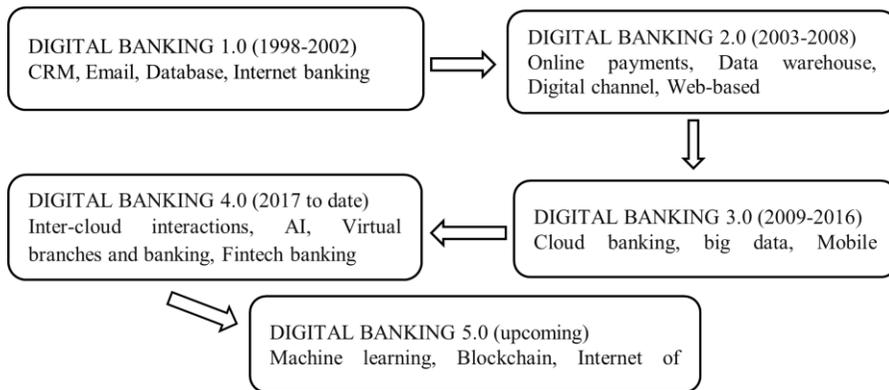
Source: Compiled by the authors.

The Deloitte study in [11] provides a framework for understanding the phased growth of RA implementation, as visually represented in Figure 2.

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10 S Kurniawan et al., "Development of MSMEs with Financial Technology in the Society Era 5.0: Digital Financial Literacy, Digital Wallet, Digital Accounting," *Riau International Conference on Economic Business and Accounting (RICEBA)*, 1, vol. 1 (2024): 11–20.

11 Kevin Mulia Rachman and Citra Sukmadilaga, "Influence of Robo Advisory in Investment Decision: A Case Study in Indonesian Mutual Fund Market," *Journal of Digital Innovation Studies* 1, no. 1 (2022): 1–20, https://doi.org/10.24198/digits.v1i1.37806.

Figure 2: The Development of Robo-Advisor

Robo Advisor 1.0
Portfolio allocations are established by fund managers and presented to clients via structured questionnaires. The recommendations are adjusted to reflect the individual investor's risk profile and preferences, resulting in a customized

Robo Advisor 2.0
Fund allocation and portfolio prospectuses are tailored to each investor's risk tolerance and preferences. Fund managers retain primary oversight and provide recommendations, Robo advisor focus on gathering data on investor risk profiles and

Robo Advisor 4.0
AI and self-learning algorithms are being used to handle more complex financial modelling and portfolio assessments. This allows the system to recommend and execute commands for investors, aligning with their specific risk and reward preferences. During this process, human oversight is minimal

Robo Advisor 3.0
Machine learning algorithms are integrated into portfolio adjustments and rebalancing, enabling automated fund management and allocation. Sophisticated financial models and analyses are developed to generate personalized investment recommendations. Human wealth managers maintain significant oversight, providing ongoing monitoring,

Source: Rachman and Sukmadilaga (2022).

Furthermore, the AI application, particularly RA in Islamic banking, is also important.[12] Its role in assisting customers and investors in selecting the appropriate investment portfolio[13] will contribute to the growth of Islamic banks since they are essential for promoting financial stability and inclusion worldwide[14]. These portfolios were created to exclude businesses that engage in activities forbidden in Islam, including gambling, alcohol, and tobacco.[15] Islamic banking RAs provide recommendations by evaluating

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[12] H Litimi et al., "Impact of FinTech Growth on Bank Performance in GCC Region," *Journal of Emerging Market Finance* 23, no. 2 (2023), https://doi.org/10.1177/09726527231218423.

[13] Ren Tao et al., "Robo Advisors, Algorithmic Trading and Investment Management: Wonders of Fourth Industrial Revolution in Financial Markets," *Technological Forecasting and Social Change* 163 (2021).

[14] Tate Agape Bawana et al., "International Islamic Banks' Popularity amidst the ASEAN Economic Community: Insights from Indonesia and Malaysia," *Journal of Central Banking Law and Institutions* 3, no. 3 (2024): 471–94, https://doi.org/10.21098/jcli.v3i3.269.

[15] R.S.R Kasim, "A Smart Shariah-Based Decision-Making in Islamic Fintech," paper presented at The 10th International Islamic Economic System Conference, Malaysia, *The 10th International Islamic Economic System Conference*, 2023.

religious law (Sharia) and applying previous legal rulings (*fatwas*).[16] RA should also serve as a literacy tool, introducing various types of Sharia-compliant portfolios to those who are still unfamiliar with Islamic banking products. The establishment of Islamic banking alongside conventional systems in prominent ASEAN countries, such as Indonesia, Malaysia, Singapore, the Philippines, Thailand, and Brunei, has created a robust dual banking foundation.[17] This, coupled with the implementation of the ASEAN Economic Community (AEC), provides a significant opportunity for the regional integration of Islamic banking. In light of ASEAN's considerable potential as a nucleus for Islamic banking development, RA warrants a prominent role in fostering Islamic banking literacy and its broader promotion.

This study aims to address a significant research gap under several conditions. While previous studies have examined the advantages and limitations of Robo-advisors (RAs), including efficiency, accessibility, cost reduction, and risks related to algorithmic transparency, cybersecurity, and customer trust, these findings are predominantly derived from conventional financial contexts. The specific benefits and constraints of RAs within Islamic banking, particularly in Indonesia, remain underexplored. Empirical evidence on customer readiness, regulatory alignment, and technological capacity for RAs in Islamic banking is scarce, limiting a comprehensive understanding of their feasibility and potential impact. At the regional level, knowledge is also limited regarding the potential benefits of implementing Islamic banking RAs across the ASEAN Economic Community (AEC). Issues such as cross-border integration, harmonization of regulations, and the development of a regional Shariah-compliant digital finance ecosystem are largely absent from current literature. Understanding the strategic implications for ASEAN's Islamic finance competitiveness, including scalability, financial inclusion, and cross-border investment facilitation, is essential for advancing both academic knowledge and practical applications.

Moreover, this study examines the potential benefits and drawbacks of using RAs in Islamic banking within the AEC. In this study, Indonesia provides a relevant case, characterized by its status as an ASEAN member

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[16] A.A Sa'ad et al., "Robo-Advisory for Islamic Financial Institutions: Shari'ah and Regulatory Issues," *European Journal of Islamic Finance*, no. First Special Issue for EJIF Workshop (2020).

[17] Tate Agape Bawana, "The Contribution of Profit and Loss Sharing (PLS) Financing for MSMEs of ASEAN Member States in the New Normal Post-Covid 19," *Journal of Global and Area Studies* 5, no. 1 (2021): 43–62.

state with multiple regulatory bodies governing Islamic banking and the expanding deployment of RA services in its banking sector. This study commenced by firstly examining the potential and challenges of RA in banking systems using the library literature database, and applying a systematic literature review (SLR) of 29 chosen publications from journals indexed by Web of Science (WoS). The next step was to thoroughly examine the pros and cons of RAs in Islamic banking. We then used a thematic analysis of the SLR results, using NVivo 15, to develop a suggested framework for Indonesian regulators. Four distinct research questions were formulated to address the objective of the study.

1. What major research areas and trends regarding RAs in banking systems were found in the existing literature?
2. What are the advantages and limitations of using RAs?
3. What are the prospects for implementing RA in Indonesian Islamic banking?
4. What potential benefits could arise from implementing Islamic banking Ras across the ASEAN Economic Community?

Following the introduction, the second section offers a comprehensive literature review on the use of Ras in financial systems. Section three provides a detailed description of the research approach, and section four presents the findings and analysis. The fifth part includes conclusions, limitations, and suggestions for further research.

LITERATURE REVIEW

RA can be described as a FinTech financial advisor that processes data using AI to offer time-infinite financial advice,[18] with limited human involvement, customized risk analysis, and real-time assistance.[19] RA provides continuous consulting by first assessing an investor's personality and risk tolerance. It helps them recommend the best way to distribute funds and establish a solid client relationship. The operation of an RA service typically includes five essential components: asset selection, investor risk profile definition, portfolio optimization, monitoring and rebalancing, and performance

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18 J.Y Park et al., "Robo Advisors for Portfolio Management," *Advanced Science and Technology Letters* 141 (2016): 104–8.
19 L Zhang et al., "Who Do You Choose? Comparing Perceptions of Human vs Robo-Advisor in the Context of Financial Services," *Journal of Services Marketing* 35, no. 5 (2021): 628–64.

reporting.[20] The recognition of RA is rising because they minimize conflicts of interest and enable small investors to participate in automated asset management with minimal expenses and minimum investment requirements.[21]

RAs are considered by banks and financial institutions as the next significant advancement in operational strategy.[22] The rise of RA is solving issues in the traditional, human-centric banking industry. These issues include unnecessary extra service fees for investors and human advisors' tendency to favor clients with larger portfolios.[23] Islamic banking has experienced a shift in its trajectory due to the introduction of RA. Table 1 presents several Islamic banks and financial institutions that have implemented RA to support their operational strategies.[24]

[20] Z.L Dong et al., "Robo-Advisor Using Closed-Form Solutions for Investors' Risk Preferences," *Applied Economics Letters* 29, no. 16 (2021): 1470–77.

[21] E.K.W Leow et al., "Robo-Advisor Using Genetic Algorithm and BERT Sentiments from Tweets for Hybrid Portfolio Optimization," *Expert Systems with Applications* 179 (2021): 1–9.

[22] Eleonora Isaia and Noemi Oggero, "The Potential Use of Robo-Advisors among the Young Generation: Evidence from Italy," *Finance Research Letters* 48 (August 2022): 103046, https://doi.org/10.1016/j.frl.2022.103046.

[23] D Jung et al., "Designing a Robo-Advisor for Risk-Averse, Low-Budget Consumers," *Electronic Markets* 28, no. 3 (2018): 367-380.

[24] Syaima Adznan et al., "Islamic Banking and the Fourth Industrial Revolution: The Current Application, Adoption, and Future Challenges of Artificial Intelligence," in *The Future of Islamic Finance*, ed. Edib Smolo and Mohamed Mahees Raheem (Emerald Publishing Limited, 2024), https://doi.org/10.1108/978-1-83549-906-120241013.

Table 1: RA Adoption in Islamic Banking and Financial Institutions

No.	Name of Robo-Advisor	Remarks
1	Wahed Invest	A US-based RA founded in 2017 that complies with Sharia law, providing a selection of investment choices designed tailored to diverse investor profiles and risk levels.
2	Sarwa	A *Sharia*-compliant RA platform headquartered in Dubai, UAE, serving investors in various countries.
3	Jarir Investment	A Saudi Arabian company that provides Sharia-compliant Robo-advisory services, offering a range of investment opportunities such as *Sukuk* (Islamic bonds) and real estate.
4	Innovative Lab of Bahrain Islamic Bank (BisB)	Through this unit, BisB invested Sharia Robo technology, allowing for automated investment recommendations that consider client-specific financial goals and risk profiles.
5	Ethis-Robo	A RA located in UK that adheres to Islamic finance principles and provides a selection of ethically sound investment choices.

Source: Compiled by the authors.

The emergence of RA in Indonesia commenced in 2019 with the launch of Bibit. Subsequently, in 2021, Bareksa became the first platform to receive official authorization from the Financial Services Authority (Otoritas Jasa Keuangan/OJK).[25] In the banking sector, PT Bank KEB Hana Indonesia (Hana Bank) claims to be the first bank to launch an RA application named Hana Al dvisor in 2023.[26] It assists customers in beginning of their investment journey by offering guidance and analysis to help them select the most suitable Mutual Fund products through several steps, including: 1. assessing a customer's risk profile based on their input, 2. analyzing the data concerning current market conditions, and 3. subsequently, providing investment recommendations aligned with the customer's risk tolerance,

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[25] Azim Fairus Alam and Didi Achjari, "Analisis keberlanjutan penggunaan Robo Advisor di Indonesia," *ABIS: Accounting and Business Information Systems Journal* 12, no. 2 (2024), https://doi.org/10.22146/abis.v12i2.96479.

[26] Hana Bank, *Hana Bank Launches Hana AIdvisor Feature - the First Bank in Indonesia to Use the Robo Advisor Feature*, Banking website, 2023, https://www.hanabank.co.id/about/news/hana-bank-launches-hana-aidvisor-feature-the-first-bank-in-indonesia-to-use-the-robo-advisor-feature.

enabling them to make informed and potentially less risky investment decisions in Mutual Fund products at Bank Hana.[27] Nevertheless, a significant gap exists in the documentation and reporting of RA development and implementation within the Indonesian Islamic banking industry. This deficiency presents challenges in determining the precise stage of RA implementation and identifying currently available Islamic financial investment platforms.

METHODOLOGY

This study employed a qualitative method, analyzing gathered literature in two phases. First, a systematic review addressed the initial research question. Subsequently, thematic analysis was used to explore the second and third research questions. Building on the systematic review's findings and incorporating extra sources, thematic analysis created a framework for understanding the prospect of RA implementation within Indonesian Islamic banks. Subsequently, the analysis findings were generalized to evaluate the potential for implementing Islamic banking RA across ASEAN, especially within the current AEC. A thorough and open SLR was ensured by adhering to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework. This framework offers a methodical approach to carrying out systematic literature reviews, which includes locating relevant research, evaluating its quality, and extracting pertinent information.[28] The PRISMA framework provides an organized method for developing research objectives, locating pertinent literature, and evaluating the efficacy of included studies.[29] Furthermore, by following the PRISMA standards, this study ensures that the SLR method was transparent and replicable.

The SLR's initial step was identifying pertinent databases and search phrases to find possible research. The Web of Science (WoS) databases were searched extensively for peer-reviewed publications from 2018 to 2024. The quantity of pertinent research found can be increased by broadening the

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[27] Yoga Sukmana, "Hana Bank Has AIdvisor Feature, What Are the Benefits for Customers?" News Website, *Kompas.Com*, August 22, 2023, https://money.kompas.com/read/2023/08/22/155718426/bank-hana-punya-fitur-aidvisor-apa-manfaatnya-untuk-nasabah.

[28] C Joseph et al., "Factors Influencing Corporate Ethical Values Disclosures: A Systematic Literature Review," *International Journal of Business and Society* 24, no. 1 (2023): 219–36, https://doi.org/10.33736/ijbs.5613.2023.

[29] N Ishak and R. C. C Jiun, "Cyclical Industries' Stock Performance Reaction during Covid-19: A Systematic Literature Review," *Jurnal Ekonomi Malaysia* 55, no. 1 (2021): 147–58, https://doi.org/10.17576/JEM-2021-5501- 11.
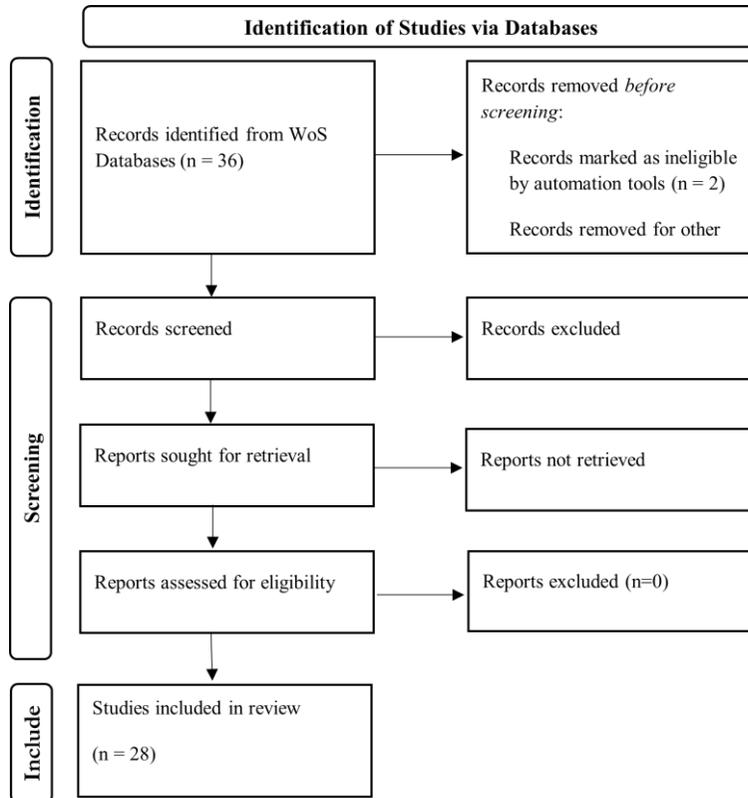
search parameters, adding more keywords, and easing the inclusion requirements. The terms "robo advisor in banking" and "robo advisor in Islamic banking" were used to search the WoS topic field to find appropriate studies. Those two keywords were purposefully employed as high-precision umbrella keywords. These terms encapsulate the core phenomenon under investigation while implicitly covering related concepts such as automated investment advice, algorithmic advisory services, and digital wealth management within banking contexts. Consequently, the adoption of focused keywords functioned as an explicit exclusion mechanism, reducing conceptual dispersion and ensuring the retrieval of studies directly aligned with robo-advisory applications in both conventional and Islamic banking contexts. Regarding database selection, the WoS was chosen due to its rigorous indexing criteria, comprehensive multidisciplinary coverage, and emphasis on high-quality peer-reviewed publications. WoS is widely acknowledged as a reliable and authoritative source for systematic reviews in finance and financial technology research. Restricting the search to WoS enhanced the transparency, replicability, and quality assurance of the review process, which are fundamental principles underpinning the PRISMA framework. Although expanding the search across multiple databases may increase the volume of retrieved records, such an approach also heightens the risk of redundancy and variability in scholarly quality. Therefore, a single-database strategy was adopted to prioritize analytical depth and contextual relevance over sheer breadth.

In terms of thematic saturation, the screening and eligibility stages indicated that extending the search through additional keywords or alternative databases primarily yielded repetitive findings rather than novel conceptual contributions. The selected studies consistently converged on key thematic dimensions, including technological readiness, regulatory alignment, Shariah compliance, customer trust, and adoption barriers. The recurrence of these themes across the final corpus of literature suggests that thematic saturation had been attained and that further expansion of the search scope would be unlikely to generate substantively new insights relevant to the study's objectives. Furthermore, the final searches yielded 36 articles in total. Identifying and excluding unsuitable studies was essential for ensuring a rigorous review process. Two records were excluded by automation tools as they were not open access articles, and two records were removed as they failed to be accessed.

The following step was a screening procedure to find relevant studies using preset inclusion and exclusion standards. The inclusion criteria

comprise articles that meet the following standards: First, topic relevance, meaning the study focuses on Robo-advisors (RAs), digital financial advisory services, or automated investment tools in banking and financial services. Second, the Islamic finance context, where the articles address Islamic banking, Shariah-compliant financial products, or fintech solutions within the Islamic finance sector. Third, geographical focus, requiring studies conducted in Indonesia or other ASEAN member countries, particularly those discussing the ASEAN Economic Community (AEC). Fourth, timeframe, limiting publications to the period between 2018 and 2024, in order to capture developments from two years after the establishment of the AEC up to the year prior to this study. Meanwhile, the exclusion criteria are defined as the inverse of the inclusion criteria, with the additional restriction that articles not published in English were excluded of 32 articles in the screening process, two articles were excluded because they did not fit the desired study topic. Reports serve as a source of literature, including conference papers, book chapters, and other non-journal publications. A mere two reports in this study qualified as book chapters or review papers, and both were suitable for referencing. From the identification and screening process, 30 articles were obtained for this study, sourced from 28 journals, 1 book chapter, and 1 review paper. Figure 1 presents a schematic diagram of the SLR process.

Figure 3: Reporting Items for SLR

Identification of Studies via Databases

Identification

Records identified from WoS Databases (n = 36)

Records removed *before screening*:

Records marked as ineligible by automation tools (n = 2)

Records removed for other

Screening

Records screened → Records excluded

Reports sought for retrieval → Reports not retrieved

Reports assessed for eligibility → Reports excluded (n=0)

Include

Studies included in review (n = 28)

Source: Adapted from the PRISMA framework.

Moreover, Figure 4 visually represents the publication timeline of the included studies. In this study, the majority of the literature was published in 2023, with 10 publications, while no literature was found to be published in 2019. Eight publications were found in 2024, indicating that the potential for research on the contribution of RA in the banking sector remains a fruitful area of inquiry.

Figure 4: Distribution of Publications
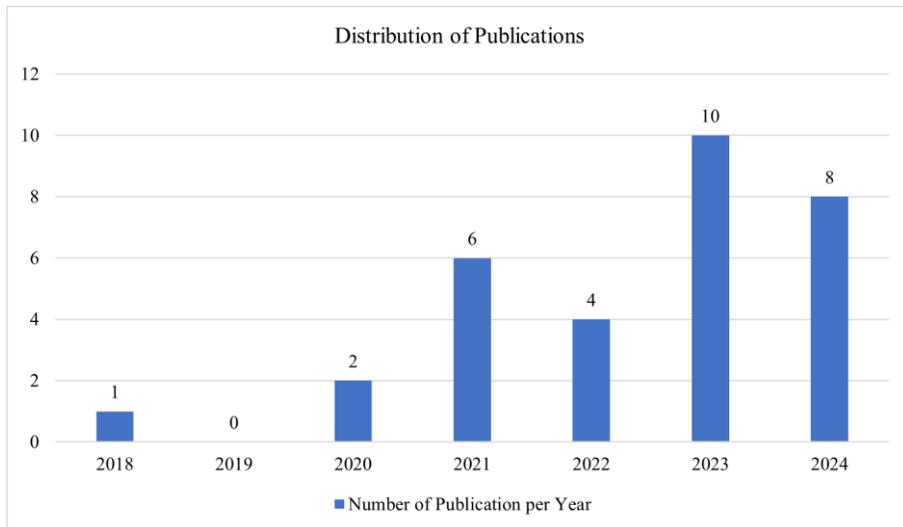
Source*: Analysis result of SLR.

RESULT AND DISCUSSION

This section presents the literature review findings, organized to answer the research questions.

1. Major Research Areas and Trends on RAs

The VOS Viewer application was employed to address the first research question. An analysis of keywords, titles, and abstracts was conducted to summarize the main topics covered in the publications. The following stage involved listing generalized discussions, which were then analyzed to produce a map utilizing bibliographic data. The minimum frequency for author keywords to be considered was two occurrences. Figure 5 examines the study's focus and identifies key trends in prior research. This figure reveals that the most common topics discussed regarding RA and banking systems center around AI, FinTech, and trust. The visual representation in the prior studies indicates a moderate correlation between RA and banking, evidenced by the thinness of the connecting lines. Given that RA is a fairly recent AI innovation, it is unsurprising that its adoption in the banking sector

is currently limited. However, this finding highlights the importance of further examining RA implementation in the banking sector, particularly in the context of Islamic banking, as a promising direction for future research and discussion. In addition, the implementation of RA in banking is also related to customer trust, investments, and wealth management.

Figure 5: Major Themes of Influential Works
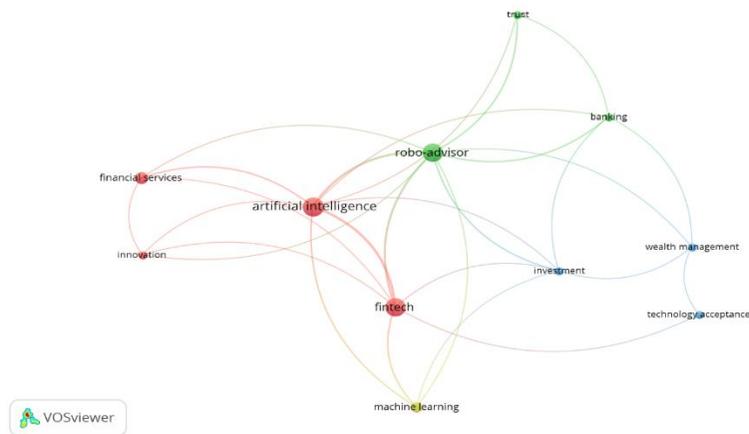
Source: Data processed by the authors.

2. The Benefits and Limitations of Using Robo-Advisor in Banking

Each article has been examined to identify some variables that could be classified within those two areas. A substantial number of articles show that RA positively boosts investors' trust in banking institutions.[30] [31] RA also offers significant advantages for individual investors, enhances bank operations and efficiency, and provides banks with a valuable opportunity to strengthen their competitive position.[32] Despite the potential benefits, the adoption of RA faces challenges such as information bias, a lack of clear regulations, the risk of service disruptions, and limited user adoption.[33] These issues need to be addressed before widespread implementation can occur. Investors' trust in banks can increase with the presence of RA because investors feel they gain convenience in determining an investment portfolio and returns that match their financial profile.[34]

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[30] Volker Seiler and Katharina Maria Fanenbruck, "Acceptance of Digital Investment Solutions: The Case of Robo Advisory in Germany," *Research in International Business and Finance* 58 (December 2021): 101490, https://doi.org/10.1016/j.ribaf.2021.101490.

[31] Mustafa Nourallah, "One Size Does Not Fit All: Young Retail Investors' Initial Trust in Financial Robo-Advisors," *Journal of Business Research* 156 (February 2023): 113470, https://doi.org/10.1016/j.jbusres.2022.113470.

[32] Yung-Ming Cheng, "Will Robo-Advisors Continue? Roles of Task-Technology Fit, Network Externalities, Gratifications and Flow Experience in Facilitating Continuance Intention," *Kybernetes* 50, no. 6 (2021): 1751–83, https://doi.org/10.1108/K-03-2020-0185.

[33] Szu-Yu Chou et al., "The Complementary Effects of Bank Intangible Value Binding in Customer Robo-Advisory Adoption," *International Journal of Bank Marketing* 41, no. 4 (2023): 971–88, https://doi.org/10.1108/IJBM-08-2022-0392.

[34] Northey et al., "Man vs Machine," 2022.

Table 2: The potential of Robo-Advisor in banking

No.	Indicators
1	RA can increase investor trust in banks [35] [36] [37] [38] [39] [40] [41]
2	RA offers substantial benefits to individuals [42] [43] [44] [45] [46]
3	RA improves bank business models and efficiency [47] [48]

[35] Seiler and Fanenbruck, "Acceptance of Digital Investment Solutions."

[36] Nourallah, "One Size Does Not Fit All."

[37] Cheng, "Will Robo-Advisors Continue?"

[38] Gavin Northey et al., "Man vs Machine: How Artificial Intelligence in Banking Influences Consumer Belief in Financial Advice," *International Journal of Bank Marketing* 40, no. 6 (2022): 1182–99, https://doi.org/10.1108/IJBM-09-2021-0439.

[39] Berrin Arzu Eren, "Antecedents of Robo-Advisor Use Intention in Private Pension Investments: An Emerging Market Country Example," *Journal of Financial Services Marketing* 29, no. 3 (2024): 683–98, https://doi.org/10.1057/s41264-023-00229-5.

[40] Huosong Xia et al., "Exploring Investors' Willingness to Use Robo-Advisors: Mediating Role of Emotional Response," *Industrial Management & Data Systems* 123, no. 11 (2023): 2857–81, https://doi.org/10.1108/IMDS-07-2022-0400.

[41] Shumaila Fatima and Madhumita Chakraborty, "Adoption of Artificial Intelligence in Financial Services: The Case of Robo-Advisors in India," *IIMB Management Review* 36, no. 2 (2024): 113–25, https://doi.org/10.1016/j.iimb.2024.04.002.

[42] Xuhui Wang et al., "Intention to Use AI-Powered Financial Investment Robo-Advisors in the M-Banking Sector of Pakistan:" *Information Resources Management Journal* 34, no. 4 (2021): 1–27, https://doi.org/10.4018/IRMJ.2021100101.

[43] Thi Phuong Lan Nguyen et al., "Factors Influencing Acceptance of Robo-Advisors for Wealth Management in Malaysia," *Cogent Engineering* 10, no. 1 (2023): 2188992, https://doi.org/10.1080/23311916.2023.2188992.

[44] Atul Shiva et al., "A Model Validation of Robo-Advisers for Stock Investment," *Borsa Istanbul Review* 23, no. 6 (2023): 1458–73, https://doi.org/10.1016/j.bir.2023.09.005.

[45] Carlos Flavián et al., "Intention to Use Analytical Artificial Intelligence (AI) in Services – the Effect of Technology Readiness and Awareness," *Journal of Service Management* 33, no. 2 (2022): 293–320, https://doi.org/10.1108/JOSM-10-2020-0378.

[46] Ankita Bhatia et al., "Digital Innovation in Wealth Management Landscape: The Moderating Role of Robo Advisors in Behavioural Biases and Investment Decision-Making," *International Journal of Innovation Science* 14, no. 3/4 (2022): 693–712, https://doi.org/10.1108/IJIS-10-2020-0245.

[47] Giovanni Cardillo and Helen Chiappini, "Robo-Advisors: A Systematic Literature Review," *Finance Research Letters* 62 (April 2024): 105119, https://doi.org/10.1016/j.frl.2024.105119.

[48] Liurui Deng et al., "Impact of Fintech on Bank Risk-Taking: Evidence from China," *Risks* 9, no. 5 (2021): 99, https://doi.org/10.3390/risks9050099.

4	RA offers banks a strong opportunity to improve their competitive standing [49] [50]

Source: Authors' SLR results.

Table 3: The Limitations of Robo-Advisors in Banking

No.	Indicators
1	RA may offer insufficient information and bias [51] [52] [53] [54] [55]
2	Several bank customers remain reluctant to use RA [56] [57]

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[49] Domenica Barile et al., "Exploring Artificial Intelligence Robo-Advisor in Banking Industry: A Platform Model," *Management Decision*, ahead of print, April 25, 2024, https://doi.org/10.1108/MD-08-2023-1324.

[50] Flavián et al., "Intention to Use Analytical Artificial Intelligence (AI) in Services – the Effect of Technology Readiness and Awareness."

[51] Chou et al., "The Complementary Effects of Bank Intangible Value Binding in Customer Robo-Advisory Adoption."

[52] Yung-Ming Cheng, "How Can Robo-Advisors Retain End-Users? Identifying the Formation of an Integrated Post-Adoption Model," *Journal of Enterprise Information Management* 36, no. 1 (2023): 91–122, https://doi.org/10.1108/JEIM-07-2020-0277.

[53] Ankita Bhatia et al., "Robo Advisory and Its Potential in Addressing the Behavioral Biases of Investors — A Qualitative Study in Indian Context," *Journal of Behavioral and Experimental Finance* 25 (March 2020): 100281, https://doi.org/10.1016/j.jbef.2020.100281.

[54] Matthias Horn and Andreas Oehler, "Automated Portfolio Rebalancing: Automatic Erosion of Investment Performance?" *Journal of Asset Management* 21, no. 6 (2020): 489–505, https://doi.org/10.1057/s41260-020-00183-0.

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[56] Eugene Cheng-Xi Aw et al., "Counteracting Dark Sides of Robo-Advisors: Justice, Privacy and Intrusion Considerations," *International Journal of Bank Marketing* 42, no. 1 (2024): 133–51, https://doi.org/10.1108/IJBM-10-2022-0439.

[57] Mustafa Nourallah et al., "No Trust, No Use: How Young Retail Investors Build Initial Trust in Financial Robo-Advisors," *Journal of Financial Reporting and Accounting* 21, no. 1 (2023): 60–82, https://doi.org/10.1108/JFRA-12-2021-0451.

3	The regulations and ethical frameworks of RAs are still underdeveloped [58] [59] [60] [61] [62] [63] [64]
4	RA may experience service failures [65] [66]

Source: Authors' SLR results.

The implementation of RA allows banks to realize significant operational cost reductions. This, in turn, boosts efficiency and frees up resources that can be strategically invested in the development of new business models.[67] RA also provides broad benefits to bank customers, as they can access financial risk profile information and investment assistance without time and place constraints, making it easier for them to choose the right investment products.[68] Finally, the rise in customer trust, coupled with service

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[58] Hui Zhu et al., "Implementing Artificial Intelligence Empowered Financial Advisory Services: A Literature Review and Critical Research Agenda," *Journal of Business Research* 174 (March 2024): 114494, https://doi.org/10.1016/j.jbusres.2023.114494.

[59] Cam-Duc Au et al., "Business Model of Sustainable Robo-Advisors: Empirical Insights for Practical Implementation," *Sustainability* 13, no. 23 (2021): 13009, https://doi.org/10.3390/su132313009.

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[62] Duc Khuong Nguyen et al., "Big Data, Artificial Intelligence and Machine Learning: A Transformative Symbiosis in Favour of Financial Technology," *European Financial Management* 29, no. 2 (2023): 517–48, https://doi.org/10.1111/eufm.12365.

[63] Kevin Chen, "Financial Innovation and Technology Firms: A Smart New World with Machines," in *International Symposia in Economic Theory and Econometrics*, vol. 25, ed. William A. Barnett and Bruno S. Sergi (Emerald Publishing Limited, 2018), https://doi.org/10.1108/S1571-038620180000025012.

[64] Dariusz Piotrowski and Witold Orzeszko, "Artificial Intelligence and Customers' Intention to Use Robo-Advisory in Banking Services," *Equilibrium. Quarterly Journal of Economics and Economic Policy* 18, no. 4 (2023): 967–1007, https://doi.org/10.24136/eq.2023.031.

[65] Janin Karoli Hentzen et al., "Artificial Intelligence in Customer-Facing Financial Services: A Systematic Literature Review and Agenda for Future Research," *International Journal of Bank Marketing* 40, no. 6 (2022): 1299–336, https://doi.org/10.1108/IJBM-09-2021-0417.

[66] Mike K. P. So, "Robo-Advising Risk Profiling through Content Analysis for Sustainable Development in the Hong Kong Financial Market," *Sustainability* 13, no. 3 (2021): 1306, https://doi.org/10.3390/su13031306.

[67] Cardillo and Chiappini, "Robo-Advisors."

[68] Wang et al., "Intention to Use AI-Powered Financial Investment Robo-Advisors in the M-Banking Sector of Pakistan."

diversification through RA, enables banks to both preserve their good standing and gain a competitive edge.[69] Tables 2 and 3 provide a summary of the potential benefits and limitations associated with adopting RA in the banking industry.

3. The Prospects for Implementing a Robo-Advisor in Indonesian Islamic Banking

This section examines the potential for implementing Robo-advisors (RAs) in Indonesian Islamic banking, drawing on the findings of the preceding systematic literature review (SLR). The analysis focuses on eight key dimensions derived from the advantages and limitations of RA adoption and is supported by relevant literature on the Indonesian Islamic banking landscape. Furthermore, the SLR findings are utilized to develop a thematic analysis aimed at identifying the feasibility dimensions for adopting RAs within Indonesian Islamic banking.

4. RA can Increase Investors' Trust in Islamic Banks

Indonesia has the world's largest Muslim population, creating a substantial demand for Sharia-compliant financial products and services.[70] RA can cater to this demand by offering personalized investment advice and portfolio management that adheres to Islamic principles. As financial literacy in Indonesia improves, more individuals seek sophisticated investment options. RA can empower these investors by providing easy-to-understand information and automated portfolio management tools. RA can increase investor confidence in Islamic banks, especially in the context of Sharia-compliance, because it will be linked to their strict adherence to Sharia law. Compliance is maintained through regular supervision by a council of Islamic scholars (*ulama*) and the Sharia Supervisory Board who oversee the investment products and strategies. Currently, no Islamic bank in Indonesia has implemented RA to assist their customers or new investors in investing in their products, but the embryo of a Sharia-based RA already exists, one of which is through an application called Bibit. The Sharia feature in Bibit functions to ensure that the application only displays mutual funds and Sharia-compliant State Securities (SBN). This makes it easier for users to choose Sharia-compliant investment products that suit their needs and Sharia

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[69] Barile et al., "Exploring Artificial Intelligence Robo-Advisor in Banking Industry."

[70] Alex Fahrur Riza and Dwi Marlina Wijayanti, "Strengthening a Sustainable Islamic Financial Industry through Digital Banking," *Journal of Islamic Marketing* 15, no. 11 (2024): 2732–58, https://doi.org/10.1108/JIMA-01-2023-0025.

principles. The Sharia mutual fund selection in Bibit consists of more than 30 products.[71] Therefore, the implementation of RA in Islamic banks will have a positive impact on investors' trust in Islamic banking.

a) RA Offers Substantial Benefits to Individuals

The rapid growth of fintech in Indonesia creates a conducive environment for RAs. The increasing use of smartphones and internet access makes it easier for individuals to engage with digital financial services. The Indonesian government and regulatory bodies like OJK are supportive of fintech innovation, including RAs. This creates a favorable environment for the growth of RA services in the Islamic banking sector. RA can offer investment services at a lower cost compared to traditional financial advisors. This makes Sharia-compliant investment options more accessible to a wider range of individuals. Additionally, RA adoption in Islamic banks lowers the barriers to entry for Islamic investment. Lower minimum investment amounts and digitally-driven platforms make Islamic financial products accessible to a broader segment of the population, including younger generations and those with limited capital. It is particularly important in Indonesia, where Islamic financial inclusion is one of the key goals. RA can be designed to tailor investment portfolios based on individual risk profiles, financial goals (e.g., retirement, education, *hajj*), and time horizons. This personalized approach caters to diverse investor needs and preferences.

b) RA Improves Islamic Bank Business Models and Efficiency

RA has the potential to significantly improve Indonesian Islamic bank business models and efficiency in several ways. for examples, RA can reach a wider audience, including those in remote areas, through online platforms. This feature increases financial inclusion by providing access to Sharia-compliant investment products and services to a larger population. RA also typically has lower fees compared to traditional financial advisors, making investment more accessible to those with limited capital. This benefit can attract new customers who were previously excluded from the market, particularly those who are interested in Sharia products. As a result, RA can help Islamic banks develop innovative Sharia-compliant investment products and services that cater to evolving customer needs.

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[71] Della Safitri et al., "Investasi Berbasis Syariah Melalui Aplikasi Bibit," *Jurnal Religion: Jurnal Agama, Sosial, Dan Budaya* 2, no. 5 (2023).

c) RA Offers Islamic Banks a Strong Opportunity to Improve Their Competitive Standing

In Indonesia, a dual banking system allows for the operation of both conventional and Islamic banks. However, Islamic banks continue to struggle to compete with conventional banks in areas such as market share and product innovation. The introduction of RA in Islamic banking is expected to stimulate innovation, particularly in investment products, thereby strengthening the competitive position of Islamic banks within the Indonesian banking sector. Additionally, RA is particularly attractive to the younger generation of digitally native Indonesians, who are comfortable with online platforms and prefer self-directed services. Consequently, the implementation of Ra services enables Islamic banks to engage this expanding demographic and secure their future growth prospects.

The promising future of RA in Indonesian Islamic banking depends on the establishment of robust implementation policies by Indonesian Islamic banking regulators, with OJK being the primary regulator. While the OJK has the overall responsibility for regulating and supervising all financial institutions in Indonesia, including Islamic banks, it works in close coordination with other key institutions, such as Bank Indonesia (BI), the central bank of Indonesia, and the National Sharia Council (Dewan Syariah Nasional Majelis Ulama Indonesia – DSN MUI); a body of Islamic scholars that issues *fatwas* (religious rulings) on Shari-compliance for financial products and services.

In light of the foregoing, the implementation of RA in Indonesian Islamic banking holds considerable promise, with several policy directives and legal frameworks already established to support its advancement. OJK has granted Bareksa, an e-investment platform, an Investment Advisor license, paving the way for the launch of their RA service. This license was officially recognized in the OJK Board of Commissioners Decree No. KEP-17/D.04/2021, issued to PT Bareksa Portal Investasi on April 20, 2021. The establishment of Bareksa is a significant step towards the growth of Sharia RA, given that Bareksa includes Sharia-compliant choices in its operational features. The OJK also has released its legal on Information Technology-Based Collective Financing Services in 2022 through POJK 10/POJK.05/2022, the Roadmap for the Development and Strengthening of Indonesian Islamic Banking 2023-2027, and 2024-2028 Roadmap for the Development and Strengthening of Financial Sector Technology Innovation, Digital Financial Assets, and Crypto Assets (IAKD). These policies and

legal frameworks are targeted specifically at promoting growth in the digital Islamic banks and financial services sector.

Even so, other regulatory bodies, for example, Bank Indonesia, have issued regulations, such as Regulation 19/12/PBI/2017 (article 1), which provide a legal foundation for the implementation of financial technology, thereby fostering secure digital transactions, which include investment activities. Similarly, the DSN-MUI has established guidelines concerning Information Technology-based Financing Services based on Sharia principles under *Fatwa* DSN MUI NO 117/DSN-MUI/II/2018. Table 4 summarizes the regulatory policies and legal frameworks that enable the development of Islamic financial technology, specifically for RA in Islamic banking.

Table 4: Policy/Legal Framework Implementation
by Indonesia's Islamic Banking Regulators

No	Regulator	Year	Policy/Legal Framework
1	OJK	2021	OJK Decree No. KEP-17/D.04/2021 authorized the launch of BaTaRa (Bareksa Tactical Robo Advisor)
		2022	POJK 10/POJK.05/2022 on Information Technology-Based Collective Financing Services
		2023	The orientation of the Digitalization Acceleration of Islamic Banking as stated in the Roadmap for the Development and Strengthening of Indonesian Islamic Banking 2023-2027
		2024	Boosting digital financial services by launching the 2024-2028 Roadmap for the Development and Strengthening of the Financial Sector Technology Innovation, Digital Financial Assets, and Crypto Assets (IAKD)
2	BI	2017	Article 1 of Bank Indonesia regulation No. 19/12/PBI/2017 ensures the security of digital transactions
3	DSN-MUI	2018	*Fatwa* DSN MUI NO 117/DSN-MUI/II/2018 rules Information Technology-based Financing Services based on *Sharia* principle

Source*:* Compiled by the authors.

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Figure 6: Feasibility Dimension of RA Adoption in Indonesia
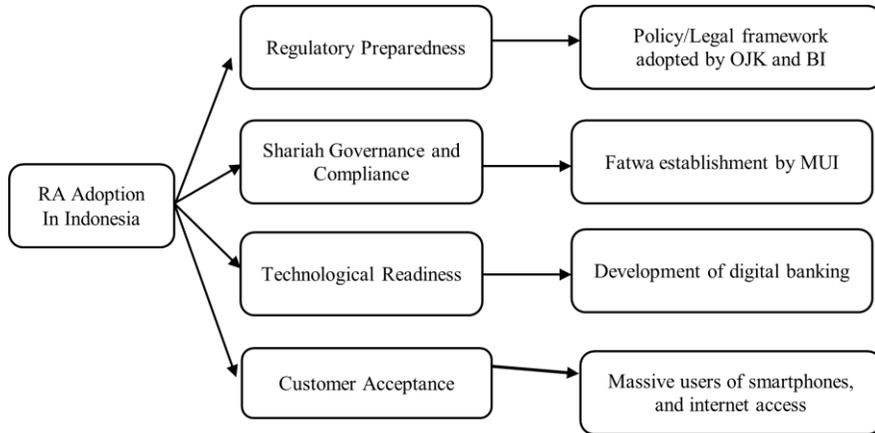
Source: Thematic analysis results.

Figure 6 shows the key feasibility dimensions affecting Robo-advisor adoption in Indonesia, identified through thematic analysis of the SLR. The findings indicate that RA adoption in Indonesia is shaped by four interrelated dimensions: regulatory preparedness, Shariah governance and compliance, technological readiness, and customer acceptance. Together, these dimensions reflect the institutional, religious, technological, and societal conditions necessary for the effective implementation of RAs within the Indonesian Islamic banking context.

The first theme, regulatory preparedness, is reflected through the code policy and legal frameworks adopted by the Financial Services Authority (OJK) and Bank Indonesia (BI). Regulatory readiness is a fundamental prerequisite for the adoption of automated financial advisory services, as RA operate within highly regulated financial systems. In Indonesia, OJK and BI have introduced various regulations governing digital banking, fintech innovation, consumer protection, and risk management. Although specific regulations dedicated exclusively to RA are still limited, the existing regulatory infrastructure provides a legal foundation that supports the integration of RA services within Islamic banking institutions. This framework reduces regulatory uncertainty and enables banks to explore RA adoption while ensuring compliance with prudential standards, data protection requirements, and financial stability objectives.

The second theme, Shariah governance and compliance, is underpinned by the code fatwa establishment by the Indonesian Council of Ulama (Majelis Ulama Indonesia, MUI). In Islamic banking, technological innovation must align with Shariah principles to gain legitimacy and acceptance. The issuance of fatwas by MUI plays a critical role in validating whether RA algorithms, investment screening processes, and advisory mechanisms comply with Islamic law. This includes ensuring the avoidance of interest (*riba)*, uncertainty (*gharar)* and speculation (*maysir)*, as well as promoting ethical and socially responsible investments. Strong Shariah governance enhances institutional credibility and customer trust, making fatwa endorsement a crucial enabler for RA adoption in Indonesia's Islamic finance ecosystem.

The third theme, technological readiness, is reflected in the code development of digital banking**.** Indonesia has experienced rapid growth in digital banking services, supported by advances in financial technology, artificial intelligence, and data analytics. Islamic banks have increasingly invested in digital platforms, mobile banking applications, and automated systems to enhance efficiency and service accessibility. This digital transformation indicates that the technological infrastructure required to support RA systems, such as data integration, algorithm deployment, and cybersecurity, is largely in place. Technological readiness also suggests the capability of financial institutions to integrate RA services into existing digital ecosystems, enabling scalable and cost-effective advisory solutions.

The final theme, customer acceptance, is supported by the code massive users of smartphones and internet access. Indonesia's large population, combined with high smartphone penetration and widespread internet connectivity, creates a favorable environment for digital financial services. Consumers, particularly younger and urban segments, are increasingly comfortable using mobile applications for banking and investment activities. This digital familiarity enhances the likelihood of RA adoption, as users value convenience, accessibility, and real-time financial guidance. However, customer acceptance is also influenced by trust, transparency, and perceived Shariah compliance, which must be addressed through effective communication and education.

5. The Potential Advantages Could Arise from Implementing an Islamic Banking Robo-Advisor Across the AEC

The AEC seeks to enhance economic integration within ASEAN, and banking integration initiatives are essential for achieving this goal.[72] The prospective utilization of Islamic banking robo-advisor (Ib-RA) within ASEAN's Islamic banking presents an opportunity to advance both the AEC's objectives and the integration of banking across the region, owing to their impact in the following areas.

a) Ib-RA can Facilitate Cross-Border Access to Islamic Financial Services and Investment Opportunities

Ib-RA can operate with digital accessibility, bypassing geographical obstacles and enabling people to access Islamic financial services and investment opportunities regardless of their physical location, as RA can operate online and through mobile applications.[73] This feature is especially advantageous in areas with potentially restricted access to conventional Islamic banks or financial institutions. Ib-RA can also reach underserved markets by entering markets with a sizable Muslim population that nearby Islamic financial institutions might not sufficiently serve. Ib-RA can make Islamic investment more accessible to a larger spectrum of people, including those with limited investment resources, and RAs generally charge cheaper management costs than standard financial advisors. Cross-border involvement is encouraged, even with minimal capital, through the fact that many RA platforms enable individuals to begin investing with far lower minimum quantities than traditional institutions.

Ib-RA also offers Shariah-compliant solutions globally, as AI algorithms can automatically screen and filter investments to ensure compliance with Shariah principles, such as avoiding interest (*riba*), speculation (*gharar*), and investments in prohibited industries (e.g., alcohol, gambling, pork). Likewise, Ib-RA can provide access to a range of Sharia-compliant assets from other markets, including Halal-certified funds, Islamic stocks, and *Sukuk*, possibly broadening investment portfolios internationally.

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[72] Sofi Suryasnia and Ina Primiana, "Banking Strategy and Implementation of Banking ASEAN Integration Framework (ABIF) in ASEAN Economic Community (AEC)'S Era 2020," *Munich Personal RePEc Archive* 1, no. 1 (2016): 1–18.

[73] Fatima and Chakraborty, "Adoption of Artificial Intelligence in Financial Services."

b) Ib-RA can Stimulate the Development of the Islamic Fintech Ecosystem

Ib-RA offers several key contributions that can boost the Islamic fintech ecosystem, primarily by enabling the creation of innovative and easily accessible Shariah-compliant financial solutions tailored to diverse risk appetites and investment goals, including streamlined *Sukuk* access, ethical equity screening, and automated *Wakala* investing. Simultaneously, the expansion and flourishing of Ib-RA can draw more investment and venture capital to the larger Islamic fintech market, fostering additional innovation and advancement. Additionally, a satisfying user experience with trustworthy and Sharia-compliant RA increases confidence in digital Islamic financial solutions, promoting the broader usage of other Islamic fintech technologies. And for future potential, the Sharia-compliance guidelines and technical frameworks created for RAs may also lead to more general industry standards in the future, fostering platform interoperability.

c) Ib-RA can Strengthen ASEAN as a Hub for Islamic Finance

Ib-RA can help create goal-based, customized Shariah-compliant investment plans that meet the various objectives and risk tolerances of ASEAN's population, particularly by embracing digital solutions. Regionally, ASEAN can further solidify its position as a global leader in Islamic finance. Nevertheless, a flourishing ASEAN Ib-RA industry would demonstrate the region's dedication to Islamic finance innovation and strengthen its standing as a global hub. Ib-RA also has the potential to foster the development of a more advanced Islamic fintech ecosystem, thereby attracting foreign investors seeking Sharia-compliant opportunities. However, this study has several limitations. Existing literature primarily focuses on the application of RA in financial institutions and conventional banking, while research on its potential use in Islamic banking is limited. This gap presents a challenge for conducting a comprehensive analysis of RA implementation in the Islamic banking sector. Nonetheless, this study aims to contribute by addressing the literature gap regarding the prospects for RA adoption in Islamic banking, specifically in Indonesia and ASEAN countries, within the context of the AEC. Therefore, future research is recommended to examine the readiness of the legal foundation of ASEAN Member States regulators and the operational foundation for Indonesian Islamic banking to adopt RA.

CONCLUSION

This study investigated the feasibility of adopting robo-advisors (RA) in Indonesian Islamic banking within the context of the ASEAN Economic Community (AEC). Drawing on a systematic literature review (SLR) and subsequent thematic analysis, the study identified four critical feasibility dimensions: regulatory preparedness, Shariah governance and compliance, technological readiness, and customer acceptance. These dimensions provide a comprehensive framework for understanding the conditions necessary for successful RA implementation. While RAs offer significant opportunities such as operational efficiency, cost reduction, personalized advisory services, and the potential to expand market reach their adoption is constrained by challenges in regulatory clarity, technological infrastructure, Shariah compliance, and customer trust.

The development of RAs in ASEAN's banking sector, particularly within the AEC, is generally lagging. For instance, in Indonesia, conventional Hana Bank launched its RA application only in 2023, and no established Ib-RA system currently exists. Nevertheless, the implementation of Ib-RAs in Indonesia holds strong potential. Given Indonesia's large Muslim population, Ib-RAs can serve as an effective tool for literacy and education, encouraging new investors to engage with Islamic bank products, particularly in the AEC era. Currently, the application of RAs in Indonesia is limited to mutual fund advisory services and has not been applied to banking investment products. Introducing RAs as an advisory tool for Islamic banking products would be a significant advancement. This integration could help both new and existing customers diversify their investment portfolios by including a wider range of Sharia-compliant products. This can help increase the market share of Islamic bank products in Indonesia by improving efficiency and reducing operational costs, as RAs will be more accessible without time limits.

The findings carry several practical and theoretical implications. From a practical perspective, Indonesian Islamic banks can leverage the identified feasibility dimensions to guide strategic planning for RA implementation, ensuring that technological investments align with regulatory requirements and Shariah principles while addressing customer expectations. Regulatory authorities, such as Bank Indonesia, the Financial Services Authority (OJK), and the National Sharia Board (DSN-MUI), can use these insights to strengthen oversight, provide clearer guidance on digital financial innovation, and create an ecosystem conducive to innovation that complies

with Islamic principles. Academically, this research contributes to the limited body of literature on digital transformation in Islamic finance, particularly in emerging ASEAN markets, by highlighting the interplay between technological, regulatory, Shariah, and customer-related factors in RA adoption.

Despite these contributions, the study also highlights directions for future research. Empirical investigations into actual RA deployment in Indonesian Islamic banks are needed to validate the feasibility dimensions identified and examine their practical impact. Comparative studies across ASEAN countries could provide insights into regional variations, regulatory best practices, and differing levels of technological and customer readiness. Additionally, research focusing on customer perceptions, trust, and behavioral acceptance of AI-driven, Shariah-compliant advisory services would provide critical information for improving adoption rates and designing effective user-centric RA solutions.

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