

Sector Analysis of Islamic Capital Markets and Artificial Intelligence Functioning as Sharia Advisors

Widhy Setyowati¹, Intan Sri Rahayu²

¹STIE BANK BPD Central Java, Semarang, Indonesia

²University of Raharja, Tangerang, Indonesia

e-mail: widhisetyowati61@gmail.com, intan.sri@raharja.info

Article Info

Article history:

Received March 31, 2023

Revised April 13, 2023

Accepted April 14, 2023

Keywords:

Artificial intelligence

Sharia advisor

Islamic capital market

Islamic urbanism

ABSTRACT

Artificial intelligence technologies will have a significant impact on a variety of career areas, including jobs in finance and law. The fact is that the Islamic capital market sector tends to use AI technology. There are now proposals to replace the role of sharia advisors with AI technology. The research conducted is legal research using qualitative methods. The legal historiographical approach was chosen to show the responsibility of the sharia board in realizing the concept of Islamic urbanism. The idea of Islamic urbanism is closely related to AI technology and the capital market as the main places for both of them to work in cities. This research has three objectives. It analyzes the role and function of artificial intelligence technology, Islamic capital markets, and the part of Sharia Advisors in the industry. Then the problem of using AI technology in the Islamic capital market is identified. Moreover, it offers a solution to using the proposed innovative technology. This paper argues that the ability of technology to replace the role of Islamic advisors in the Islamic capital market sector is limited. This is because AI technology, although advanced, can only deal with the physical world of cities but still needs to embody the concept of Islamic urbanism. At the same time cannot replace the role of sharia advisors.

This is an open access article under the [CC BY 4.0](https://creativecommons.org/licenses/by/4.0/) license.



Corresponding Author:

Widhy Setyowati

STIE BANK BPD Central Java, Semarang, Indonesia

Email: widhisetyowati61@gmail.com

1. INTRODUCTION

The Fourth Industrial Revolution has attracted the attention of many parties from various backgrounds and backgrounds because its impact has been felt in various fields, including politics, the economy, society, and even law[1]. In political affairs, for example,

psychographic micro-targeting techniques were used during the campaign process to influence voters in the 2016 US presidential election and referendum on whether to continue or withdraw from the UK membership[2]. The revolution driven by 'big data' and 'internet of things' technology is also being used in commerce to develop marketing and advertising strategies that are much more precise and efficient, in line with customer demands[3]. This technology is championed by cyberspace providers such as Amazon, Microsoft, Facebook, and Google[4]. The labor market is the most efficient in a sector of the economy undergoing major structural changes due in part to "labor-saving" technologies. All of these things affect the social structure of society, which is entirely dependent on political, business, and economic leadership[5]. That is why this revolution has attracted the attention of so many people. This revolution must also be supported by dynamic and stable principles and legal institutions to maximize its positive impact and minimize its negative impact[6].

Among the examples given, this article only aims to highlight their impact on the work, particularly the Sharia advisory profession in the Malaysian Islamic capital market[7]. This article should answer the question, should artificial intelligence technology (from now on KB), one of the essential elements of the fourth industrial revolution, replace the sharia advisory profession? This question piqued the author's interest considering several aspects, including the development of family planning technology itself and its proposed use in contemporary Muslim society's affairs[8].

This article aims to bring forward the KB debate ideas presented by prominent figures in the Islamic financial system and one of the members of the Sekuritas Commission's Sharia Advisory Board and the former Chairman of Bank Negara Malaysia's Sharia Advisory Board, Daud Bakar (2016), appointed in his book *Shariah Minds in Islamic Finance*[9]. The book contains three separate recommendations for using KB, including as a replacement for Sharia Advisors in innovating financial instruments and evaluating Sharia compliance of financial products using essential interests[10]. Information technology that combines traditional and up-to-date jurisprudence collections, guidelines, and judgments issued by Sharia Advisors[11]. On the other hand, he also suggested that KB could be employed, perhaps if not a complete replacement, as an expert assistant to Shari'a advisers, in addition to his work as ulema' Maya (virtual master) to mentor young Shari'a advisers. to train. In his opinion, this saves costs and time and allows for a level of accuracy that today's Sharia advisors may be unable to match[12].

According to the author, Daud Bakar's proposal is not a suggestion based on fantasy and science fiction but instead on research and discovery as well as the utilization and development of family planning technology[13]. For example, using robo-advisors, which is growing in the capital markets sector, is expected to control \$385 billion of capital by 2021. The Farringdon Group Private Wealth Managers were the first to introduce Sharia-compliant robo-advisors[14]. They proposed to the Securities and Exchange Commission to permit its use in the Islamic capital market. This is just one of many other examples discussed in the next section[15]. This thesis is also supported by the potential of family planning technology in the field of Islamic Studies, which will also be addressed in the next section[16].

In addition, this article humbly wishes to bring ideas into the discussion of the revelation of Islamic civilization in contemporary social practices, which are increasingly being forgotten in the Muslim world, including Malaysia[17]. Ahmad Fauzi Abdul Hamid, in his first lecture on 26 April 2018, entitled *Islamism and Its Material: The Great Challenges of Malaysian Politics in the 21st Century*, acknowledged that the process of "contraction" of this type of discourse is the result of an extreme focus on the process of Shari'atization and Salafization. This "shrinkage process" is a cause of great concern that must be addressed collectively[18].

Three essential components form the framework of the discussion of this article, namely 'Sharia Advisory,' 'artificial intelligence,' and 'Islamic urbanism.' In the first component, the role of the sharia advisor is seen only in Malaysia's Islamic capital market sector[19]. This is because the part of sharia advisors in this field is felt within a broad financial framework. It cannot be denied that the capital market is the highest state of the

economy in today's modern system. It is also for all economic actors, such as individual traders, companies, banks, and even the state, directly or indirectly involved in the capital market[20].

The second component, artificial intelligence, is a new technology and an essential element in the fourth industrial revolution. It has had and will have a very profound impact on all fronts, including finance and law[21]. Some experts consider her ability to mimic the way people think impressive, while others see it as an opportunity for advancement. This article discusses the theoretical and practical aspects of assessing its properties in the real world.

According to Islam, the third component is urbanism, a field of knowledge that has long been forgotten[22]. Some even think that Islam does not have this field of expertise. However, it is widely contested by contemporary Islamic scholars who show through philosophical and historical studies that Islam does not only offer the concept of urbanism but has been expressed in Medina since the time of the Prophet Muhammad SAW. Discourse on the built environment is getting more and more attention because social, economic, and city administration issues are increasingly worrying modern society[23]. This prompted scholars to start from scratch and value more the literature on Islamic urbanism to shape sustainability[24]. The concept of a city in Islam also symbolizes the micro world for the macro world, namely the city as a micro world for the macro-Islamic civilization[25].

Why were these three sections chosen to be combined in this article? The author believes there is an organic link between the three built since the beginning of human civilization but in a different form. These three components represent managers in the market or square, city, and technology. In today's world, the relationship between Family Planning and Sharia Advisors is seen from the perspective of the impact of the fourth industrial revolution on professional employment. The link between Sharia Advisory and urbanism is that Islamic capital markets contain valuable transactions carried out in most urban areas involving urban communities. The relationship between family planning and urbanism is the main birthplace of technologies first tested and implemented in cities and used by urban communities.

It is also essential to re-experience Islamic urbanism from a sustainable development perspective. In Malaysia, the density of the capital city of Kuala Lumpur prompted the government to move the center of government to Putrajaya, a former plantation area called the Great War. The international airport was also moved from Subang to Sepang. This creates new coordinations that increase the need for essential resources such as clean water and energy. New construction also carries various socio-economic issues and must be carefully planned to achieve sustainability goals emphasizing low-carbon urban aspects, starting with using alternative and renewable energy. For example, Kuching in Sarawak has deployed zerocarbon hydrogen energy-powered buses. In this context, several Sukuk has been issued in the Sustainable and Responsible Investment (SRI) segment to develop solar power projects.

2. METHOD

The author chooses a qualitative method, i.e., the historical-legal approach to answering the questions raised in this article. This is due to the nature of law, which is highly dependent on the state of society, particularly legal issues related to finance and business, as well as the fact that history is used as a lesson in shaping future law. The author also uses this approach because it follows the Islamic concept of change, progress, and development, which relates to "returning" the best generation in a dynamic form, according to the needs and challenges of a particular era. And certain places, which forces us to take a closer look at history. This approach has been adopted by many scholars, such as Murat Cizakca (2011), Yahia Abdul-Rahman (2014), Rohimi Shapiee (2006), Haniff Ahamat (2010), and Sarah Wilson (2014).

This article is divided into four sections, the first of which deals with the role of Sharia Counsel under Malaysia's Islamic Securities Law. This section also provides an overview of the history of the Hisbah institution and the muhtasib's role in market administration. This section shows similarities and differences between modern sharia advisors and mujtahid in several aspects of functions. The second part examines the

concept of Islamic urbanism and its manifestations in Islamic history by looking at the development of two cities, Baghdad and Malacca. This review shows that the physical and spiritual worlds are harmonious in developing Islamic towns. The third section presents the history and development of family planning technology in general and law and finance. This section also examines the use of this technique in Islamic studies. The last team analyzes the limitations of KB in replacing Sharia Advisors.

This article states that family planning technology, even at the most advanced level, can only deal with the physical world of cities, which is limited to understanding and embodying the concept of Islamic urbanism. In other words, KB cannot replace the role of the Sharia Council, which needs to be written in existing laws to express the concept of urbanism. Still, this responsibility has belonged to all Muslims since the beginning of Islam, especially those who follow power.

3. RESULTS AND DISCUSSION

3.1 SHARIA ADVISORS and MUHTASIB

The Securities and Exchange Commission regulates the capital market in Malaysia, a statutory body established by the Securities Industry Act 1993. As a public company, its primary role is to maintain the smooth functioning of the country's economy and its people while protecting the interests of investors. To establish an Islamic capital market, this Commission, empowered under Article 16 of the Securities Commission Act 1993, first founded an Islamic Capital Market Unit, which developed into an Islamic and Sharia Research Group. Advisory Committee. This council is generally formed to investigate instruments' structure, mechanism, and uses and design new appliances. Logically, therefore, the task of the Sharia Advisory Committee constituted by the Commission is also to keep the country's economy and people running well and then only take care of the interests of investors, not the other way around, which only cares about investors and people only get second-class service.

This responsibility is further strengthened by the introduction of the Sustainable and Responsible Investment Sukuk instrument, which revolves around four areas of investment, namely, first, investment in the development of natural resources such as cultivation, forestry, and sustainable agriculture, biodiversity conservation, development degraded areas, construction of utility infrastructure, water treatment and recycling, and sustainable material waste management. The second is investment related to the construction of energy-efficient and renewable projects such as the management of new or existing renewable energy, development of efficient power generation and delivery systems, and efficient management of energy capable of reducing gas release. Greenhouse. The third is investment related to community and economic development, such as projects for hospitals or community health services, community education, community services, urban regeneration, sustainable housing, and affordable housing. The fourth type of investment is the development of waqf assets and real estate.

4.2. HISBAH and MUHTASIB

Market institutions are related to their physical location and include commercial activities permitted in the country. It is called a market, a place, and an activity. These institutions become increasingly complex with space and time demands and logically require rules and regulations.

Regardless of the difference in nominal value, all of this shows a management system in the management of market institutions, using Islamic concepts as the foundation. These concepts include Amar ma'ruf Nahi Munkar and la darbar wa la dinar. Both of these concepts are expressed in monotheism, which encompasses the activities of the entire community, in contrast to today, where the implementation is separate and relative.

Unfortunately, the muhtasib's role is not limited to the market but also to the city administration because of the logical relationship between the two. Muhtasib's part is to carry out weighing and measuring checks in the market, enforce government regulations related to transactions and set tax rates, maintain relations with merchants and merchants

to protect the interests of society and prevent price manipulation, usury, exploitation, and avoid unjust enrichment through illegal business, legal or fraudulent. Meanwhile, in the city, the mujtahid plays a role in supervising mosques and activities such as education (metallic and mu'addib), health, distributing water to residential areas, cleaning streets, and animal welfare.

4.3. SHARIA ADVISORY IN THE ISLAMIC CAPITAL MARKET

The Board has four specific functions and one general function, defined in Section 31ZJ, which is to determine applications, make decisions in all matters relating to transactions or transactions in the Islamic capital market, and advise the Commission and all persons. From - where Sharia matters about Islamic capital market matters or transactions. The Minister of Finance can generally determine which tasks he sees fit.

Regarding the appointment of board members, Section 31ZK stipulates that Yang diPertuan Agong, on the Advice of the Minister of Finance and after consultation with the Commission, may appoint a person with qualifications in fiqh muamalat, useful fiqh, Islamic finance, or like—discipline as a member of the Sharia Advisory Board. The appointment is also subject to the terms of the respective appointment letter, even though the Commission determines all the total salaries and bonuses of board members.

From a practical and practical perspective, the role and duties of a Sharia advisor in the Islamic capital market include the functions of inspecting products and services to ensure that they are Shariah-compliant, reviewing and verifying relevant documents, and overseeing investments. Islamic capital market institutions, discuss Sharia matters related to institution operations and provide appropriate Advice, conduct research and development of new products, provide training related to Mu'amalat based on Sharia agreements, and provide support and Advice to related parties on sharia matters at their request.

In addition, the Board was tasked with determining the Shariah status of securities listed on the Malaysian Stock Exchange by adopting a two-tier quantitative approach using business benchmarks and a qualitative approach, often referred to as a screening methodology. Before November 2013, securities were classified as non-sharia if the company's profitable activities included the sale of usury, gambling, alcohol, or pork by more than 5%, the company's interest income and tobacco sales were more than 10%, and mixed. Rental income from businesses that violate Sharia law exceeds 20%, and income from catering, resorts, buying, and selling, and stockbroking exceeds 25%.

4.4. ISLAMIC URBANISM: ITS RELATIONSHIP WITH SHARIA ADVISORS

The paragraph above mentions the link between the market and the city and the role of the Muhtasib, who directly regulates the two because of their close relationship. This section covers the concept of Islamic urbanism. Before proceeding with this discussion, it should be noted that cities are not simply external phenomena that have no control or are merely created by natural selection and evolution. This vision of the city is held by many intellectuals whose minds have been captured by secularism which separates the spiritual world from the physical world. Such understanding is pervasive in most societies because we are only seen as unplanned tall buildings, increasing social problems, pollution, hedonistic living, and the power of the upper class and the rich.

In contrast to the concept of secular urbanism, which separates the spiritual world from the physical world, the idea of urbanism which is reduced to the words "Madinah" and "Tamadun," which are rooted in the phrase Din adheres to both of them says that Urbane. They were making space the center of production, distribution, consumption, and goods and services and the most important place where individuals and Muslims submit themselves collectively to Allah. It is no exaggeration to say that the Islamic city encompasses a whole range of conceptual and philosophical phenomena, including politics, facilities, services, economics, planning, and architecture.

4.5. ACHIEVEMENTS OF ARTIFICIAL INTELLIGENCE TECHNOLOGY

Information technology is now growing and bringing most of humanity to places and times that human civilization never thought of before. The invention of semiconductor

technology increased the power and capabilities of computing, thereby expanding the possibilities for new achievements, both from a theoretical and practical standpoint. What's more, severe research and encouragement are being carried out in the field of quantum computing (quantum computing), which is believed to further the power of computing far beyond the efforts of any supercomputer today

Technological advances that already exist will not stop but will continue to grow. There are many examples of efforts being carried out by experts in the world of technology to reach the 'artificial general intelligence' and 'singularity' stages which are said to have more "intelligence" than existing family planning technology because they can "think" independently without relying on input from computer programmers. Existing technology is still considered "pseudo-artificial intelligence" because it relies on information and actions in a goal-oriented direction determined by the programmer.

It is said to have more "intelligence" than existing KB technology because it can "think" independently without relying on input from computer programmers. Existing technology is still considered "pseudo-artificial intelligence" because it relies on information and actions in a goal-oriented direction determined by the programmer.

The fields most focused on in this regard are the economic and financial fields. Scholars such as Klaus Schwab and Jeremy Rifkin opened the eyes of many stakeholders to the start of the fourth industrial revolution. They urged the global community to be better prepared by maximizing positive and limiting adverse effects. Promoting business life through more efficient industrial implementation may also influence the professional life of doctors, lawyers, and accountants.

According to the Intelligence Unit study results for The Economist magazine, entitled The Automation Readiness Index: Who Is Ready for the Coming Wave of Automation? (McCauley 2018), which divides the readiness index into three indicators: the environment for innovation, education bases, and labor market basics. Overall, Malaysia occupies 14th place and first place in the group of emerging countries (emerging countries). The index was won by South Korea, Germany, and Singapore, respectively, in first to third positions.

The use of family planning technology in the Islamic study environment is also being sought. It has been running since 2012 again by interpreting the primary source of Muslims, namely the Koran. Abdul Baquee Muhammad developed two software in his dissertation, QurAna, and QurSim. The software, which starts with "Quran commentary" and "data mining" of all Quranic verses and traditional interpretations from selected commentators, uses "machine learning" techniques to interpret Quranic verses to identify hidden patterns or patterns.

The results of this research which were considered successful, were then uploaded to the corpus.quran.com website as part of a project at the Institute for Artificial Intelligence and Biological Systems at the University of Leeds. The impact and contribution of this site are expected to help people understand Islam through impartial and objective online Qur'an experts, a deeper understanding of the meaning of the Qur'an for non-Arabic people to face complex problems to provide in accordance: new interpretations and easier access for Muslim and non-Muslim Internet users.

4.6. LIMITATIONS OF ARTIFICIAL INTELLIGENCE

The author believes that achieving KB through so many examples, as stated in the section above, is the main principle of the reserve so that KB replaces the role of Sharia Advisor. Because of this, it is necessary to assess these reserves as a whole without rejecting them simplistically or accepting them carelessly. This assessment must also be made by comparing KB with the role of Sharia Advisors who are currently there and by summarizing its aspirations and potential future, especially the realization of the concept of Islamic urbanism, as discussed in the previous sections. This is so that the analysis made by looking at the development of the role of Sharia Advisor is in line with the development of family planning technology. An investigation will look skewed if the two can be changed, not aligned, and compared at the same level.

However, the analysis only focuses on the role of the Sharia Council as enshrined in law. In that case, the author agrees with Daud Bakar's opinion that the Sharia Council

must be replaced by KB. This is because the role of the Sharia Advisor is limited to innovating contractual instruments, most of which are reverse conventional instruments and only control rules. Although these methods are divided into quantitative and qualitative, family planning has yet to achieve the second method, it is only used in rare cases. Most still rely on quantitative methods, indicating that having access to the financial statements of companies participating in the Islamic capital market logically makes family planning screening more accurate, cost-effective, and time-effective.

4. CONCLUSION

This article highlights the significant role of sharia advisors in Islamic capital markets and urban areas because of their proximity. The connection between the two is not only noticed. Still, it has been going on for a long time, and history primarily shows the experience of Islamic civilization through the Hisbah institution and the role of the Muhtasib. Everevolving technology continues to challenge this meaning, as it is proposed to be used to the extent that the role of Shari'ah Adviser is replaced by artificial intelligence technology. The article shows that technology has limitations, especially in formulating the concept of Islamic urbanism, an idea that includes both physical and spiritual life.

As mentioned above, this role continues beyond the physical level. For example, the ability to understand the responsibilities of managing nature is based on spiritual understanding. Nature as a guide to God's greatness and its preservation under the obligation of the Earth Caliphate must always be watched out for and fought for by all parties, including the Sharia Council. The author is by no means suggesting that all this burden should be placed on the shoulders of only one party, but the monotheistic point of view is indispensable for the commanders in chief. Islam has never separated the physical and spiritual meanings in anything.

Seeing these burdens and responsibilities, the author believes that no matter how sophisticated family planning is, it will not be able to replace Sharia Advisors in the future. The role of sharia in the manifestation of Islamic urbanism cannot be achieved through complex mathematical calculations and algorithms. As a tool limited to the mathematical method, KB has no place in the social hierarchy, let alone as a reference work. The most advanced birth control abilities are only limited to the physical world of cities and cannot see any spiritual meaning

REFERENCES

- [1] P. Rashi, M. C. Lohani, N. Luftiani, T. Hermansyah, and I. N. Hikam, "New Personalized Social Approach Based on Flexible Integration of Web Services," *Int. Trans. Artif. Intell.*, vol. 1, no. 1, pp. 1–17, 2022.
- [2] A. S. Bist, V. Agarwal, Q. Aini, and N. Khofifah, "Managing Digital Transformation in Marketing: Fusion of Traditional Marketing and Digital Marketing," *Int. Trans. Artif. Intell.*, vol. 1, no. 1, pp. 18–27, 2022.
- [3] M. R. Anwar, F. P. Oganda, N. P. L. Santoso, and M. Fabio, "Artificial Intelligence that Exists in the Human Mind," *Int. Trans. Artif. Intell.*, vol. 1, no. 1, pp. 28–42, 2022.
- [4] H. T. Sukmana, A. E. Widjaja, and H. J. Situmorang, "Game Theoretical-Based Logistics Costs Analysis: A Review," *Int. Trans. Artif. Intell.*, vol. 1, no. 1, pp. 43–61, 2022.
- [5] M. Wahyudi, V. Meilinda, and A. Khoirunisa, "The Digital Economy's Use of Big Data," *Int. Trans. Artif. Intell.*, vol. 1, no. 1, pp. 62–70, 2022.
- [6] U. Rahardja, "Camera Trap Approaches Using Artificial Intelligence and Citizen Science," *Int. Trans. Artif. Intell.*, vol. 1, no. 1, pp. 71–83, 2022.
- [7] A. Ramadhan and T. Nurtino, "Integrated Energy System Systems and Game Theory A Review," *Int. Trans. Artif. Intell.*, vol. 1, no. 1, pp. 84–101, 2022.
- [8] C. Sriliasta, D. S. S. Wuisan, and T. Mariyanti, "Functions of Artificial Intelligence, Income Investment Instrument, and Crypto Money in Era of The Fourth Revolution," *Int. Trans. Artif. Intell.*, vol. 1, no. 1, pp. 117–128, 2022.
- [9] P. A. Sunarya, "Machine Learning and Artificial Intelligence as Educational Games," *Int. Trans. Artif. Intell.*, vol. 1, no. 1, pp. 129–138, 2022.
- [10] A. G. Prawiyogi, S. Purnama, and L. Meria, "Smart Cities Using Machine Learning and Intelligent Applications," *Int. Trans. Artif. Intell.*, vol. 1, no. 1, pp. 102–116, 2022.
- [11] N. Sadrifar and M. Molavi, "Recognizing the Values and Forms of Islamic Urbanism Based on Religious Teachings," *J. Soc. Theor. Muslim Thinkers*, vol. 10, no. 1, pp. 211–233, 2020.
- [12] H. T. Sukmana, A. E. Widjaja, and H. J. Situmorang, "Game Theoretical-Based Logistics Costs Analysis: A Review," *Int. Trans. Artif. Intell.*, vol. 1, no. 1, pp. 43–61, 2022.
- [13] F. A. Salam, "Review of New Islamic Urbanism: The Architecture of Public and Private Space in Jeddah, Saudi Arabia," *Arc J. Sch. Relig. Stud.*, vol. 48, pp. 140–145, 2020.

- [14] U. Rahardja, "The Economic Impact of Cryptocurrencies in Indonesia," ADI J. Recent Innov., vol. 4, no. 2, pp. 194–200, 2023.
- [15] M. Heydari Torkamani, Y. Shahbazi, and A. Belali Oskoyi, "Explaining resilience model of historical bazaars using artificial neural network," Smart Sustain. Built Environ., 2023.
- [16] A. Karmaoui, S. El Jaafari, H. Chaachouay, and L. Hajji, "A bibliometric review of geospatial analyses and artificial intelligence literature in agriculture," GeoJournal, pp. 1–18, 2023.
- [17] M. Wahyudi, V. Meilinda, and A. Khoirunisa, "The Digital Economy's Use of Big Data," Int. Trans. Artif. Intell., vol. 1, no. 1, pp. 62–70, 2022.
- [18] B. Michelle and M. P. Gemilang, "A Bibliometric Analysis of Generative Design, Algorithmic Design, and Parametric Design in Architecture," J. Artif. Intell. Archit., vol. 1, no. 1, pp. 30–40, 2022.
- [19] R. Habibi and A. C. Panjaitan, "A Model for Blood Bank Facility-Location Problem at Post Disaster Area," ADI J. Recent Innov., vol. 4, no. 2, pp. 128–137, 2023.
- [20] S. Y. Koh, Y. Zhao, and H. B. Shin, "Moving the mountain and greening the sea: the micropolitics of speculative green urbanism at Forest City, Iskandar Malaysia," Urban Geogr., vol. 43, no. 10, pp. 1469–1495, 2022.
- [21] N. Baryshnikova, P. Altukhov, N. Naidenova, and A. Shkryabina, "Ensuring global food security: Transforming approaches in the context of agriculture 5.0," in IOP Conference Series: Earth and Environmental Science, 2022, vol. 988, no. 3, p. 32024.
- [22] P. A. Sunarya, "Machine Learning and Artificial Intelligence as Educational Games," Int. Trans. Artif. Intell., vol. 1, no. 1, pp. 129–138, 2022.
- [23] L. Hudson and A. N. Sedlackova, "Urban sensing technologies and geospatial big data analytics in internet of things-enabled Smart cities," Geopolit. Hist. Int. Relations, vol. 13, no. 2, pp. 37–50, 2021.
- [24] C. Sriliasta, D. S. S. Wuisan, and T. Mariyanti, "Functions of Artificial Intelligence, Income Investment Instrument, and Crypto Money in Era of The Fourth Revolution," Int. Trans. Artif. Intell., vol. 1, no. 1, pp. 117–128, 2022.
- [25] A. Asgari and R. Fathi, "Examining the Role of Design Tools in Quality of Ideation and Presenting Architectural Designs," Mon. Sci. J. Bagh-e Nazar, vol. 19, no. 113, pp. 87–104, 2022.

	Widhy Setyowati STIE BANK BPD Central Java, Semarang, Indonesia. She can be contacted at email: widhisetyowati61@gmail.com
	Intan Sri Rahayu University of Raharja, Tangerang, Indonesia. She can be contacted at email: intan.sri@raharja.info
	