

The Readiness of Islamic Institutions Educational Institutions to Face the Era of Artificial Intelligence: A Strategic Analysis of Information System and E-Value Chain Integration in Building Competitive

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ARTICLE INFO

Keywords:

Artificial Intelligence,
Information System, E-value
Chain

Article history:

Received 2026-07-02

Revised 2026-07-03

Accepted 2026-07-04

ABSTRACT

The development of Artificial Intelligence has prompted various professionals in fields including education to transform from conventional systems to technology- and data-based governance. For these changes, Islamic educational institutions face challenges in order to integrate information systems and e-value chains as a strategy to build a competitive advantage without losing Islamic values and principles. This research aims to analyze the readiness of Islamic educational institutions in facing the AI era. This study uses a literature study method with a thematic literature review approach to various references, such as scientific articles and books. The results of the study show the main findings. First, the use of AI in Islamic educational institutions is still dominated by administrative functions so that it has not been optimally utilized as a strategic instrument for decision-making. Second, digital transformation readiness is influenced by human resource competence, digital leadership, technological infrastructure, and organizational governance. Third, the integration of information systems with *the e-value chain* has the potential to increase operational efficiency, service quality, and institutional competitiveness through integrated management of the education value chain. Fourth, the implementation of AI also presents ethical challenges in the form of declining academic integrity, technological dependence, and the potential for a reduction in the humanistic dimension of education so that it requires governance based on Islamic values.

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1. INTRODUCTION

Digital transformation based on Artificial Intelligence (AI) has shifted the paradigm of global education management towards a more adaptive, efficient and data-based system. AI is no longer just a technological tool, but has developed into a strategic instrument in decision-making, learning adjustment, and management efficiency of educational institutions (Yulia & Surpratman, 2025). However, Islamic educational institutions still face serious challenges, namely limited information system integration, unpreparedness of human resources to transform from the manual era to the all-digital era, and the dominance of administrative functions over strategic functions (Usrowiyah, 2025). In the context of Islamic educational institutions, the birth of 21st-century innovation, aka AI, is like a knife that has dual functions; On the one hand it benefits by making human work easier and faster, but on the other hand it has the potential to pose significant ethical challenges such as the abuse of technology, dependency so as to weaken the moral compass both individually and communally. Islamic educational institutions such as Islamic boarding schools and madrassas are asked to be able to adapt to digital transformation without eliminating Islamic fundamental values and ethics.

AI integration is considered to be able to improve the quality of education management through administrative automation, strengthening learning systems, and optimizing digital-based services. However, the implementation of AI also presents problems related to human resource readiness, digital gaps, data security, and the potential for a reduced role of educators in shaping students' character (Khoiruddin and Dzulkifli 2026). A number of studies reveal that some Islamic educational institutions are still experiencing limitations in the implementation of integrated information systems. The management information system used in general is still administratively oriented and has not been used as a strategic instrument to support the competitiveness of the institution. As a result, the decision-making process is often not based on integrated and real-time data. In addition, the low digital literacy of educators and the limitations of technological infrastructure are the main obstacles in the digital transformation process of Islamic education (Khomsinuddin 2024).

It is undeniable that competition between educational institutions in the era of technological sophistication and AI requires the ability to build a competitive advantage through the integration of information systems and the strengthening of the *value chain*. The *value chain* concept allows educational institutions to effectively integrate key and supporting activities to improve service quality, operational efficiency, and stakeholder satisfaction (Rahmania, 2023). The concept introduced by Porter integrates the organization's core activities and supporting activities to create added value in a sustainable manner. In digital growth, the concept has evolved into an *e-value chain*, which is the integration of information technology-based value chains that allows the coordination of data, services, and organizational processes to be carried out precisely, accurately and time-efficiently (Yulia and Surpratman 2025).

The application of the *e-value chain* concept can be realized through the integration of various activities such as student admissions, curriculum management, AI-based learning, academic evaluation, to academic and stakeholder services. With this integration, educational institutions can build a more effective management system while improving the quality of services. In this situation, AI functions as a strategic enabler that strengthens the ability of information systems to process data, predict user needs, and support accurate strategic decision-making (Maskur & Bin Othman, 2025).

However, studies related to the integration of AI, Islamic education management information systems and *e-value chains* are still relatively limited. Some of the studies examine AI in terms of learning or education administration partially, while studies that link digital transformation with strategies to increase the competitiveness of Islamic educational institutions are still not found. Meanwhile, in this era, educational institutions are required to be more adaptive to change, one of them is by adopting technology that is strategically integrated with a management system to build a sustainable competitive

advantage (Rahman and Aslan 2025). Based on this presentation, this study intends to analyze the readiness of Islamic educational institutions in facing the AI era through the perspective of the integration of information systems and e-value chains. This research was conducted with a literature study approach to examine various concepts, findings of previous research, and digital transformation strategies that are relevant to the goal of increasing the competitive advantage of Islamic educational institutions in the era of artificial intelligence.

2. METHODS

This study uses a *library research* approach with the Thematic Literature Review (TLR) method to analyze the readiness of Islamic educational institutions to face the Artificial Intelligence (AI) era through the integration of information systems and *electronic value chains (e-value chains)*. This approach was chosen because it allows researchers to conduct conceptual synthesis of various previous research results so that they can produce a comprehensive understanding of the phenomenon being studied (Yam 2024). Research data is in the form of secondary data obtained from scientific journal articles, academic books, proceedings, international organization reports, and policy documents relevant to the research topic. The literature was collected through a search of several scientific databases, including Scopus, Web of Science, ScienceDirect, SpringerLink, Taylor & Francis Online, DOAJ, Google Scholar, as well as official documents from UNESCO.

3. FINDINGS AND DISCUSSION

Readiness of Islamic Educational Institutions in the AI Era

Digital transformation supported by the development of AI has changed the management paradigm of educational institutions globally. In this context, the readiness of educational institutions in facing the AI era is not only measured by the ability to adopt technology, but also by the ability of organizations to integrate AI into institutional governance strategically (Richter et al. 2019). Readiness to face the AI era is a multidimensional issue that includes technology readiness, human resources, leadership, organizational culture, and orientation to digital transformation. So in this context, Islamic educational institutions such as *madrasah* and Islamic boarding schools, are not only required to transform from the manual era to all-digital, this is not only a matter of adaptation to technological changes, but a challenge on how to ensure that the use of AI continues to go hand in hand with the ethical and spiritual values of the institution.

The results of the literature review show that most Islamic educational institutions in Indonesia are still in the digital adaptation stage, which at this stage the orientation of the institution is still in the administrative part, not the strategic function (Richter et al. 2019). The use of information systems is still limited to aspects of academic data management, attendance, finance and institutional issues. Meanwhile, the use of AI in the aspects of predictive analysis, learning personalization, or managerial decision-making support is still relatively limited (Niemi et al. 2023). This condition shows that digital transformation in Islamic educational institutions is still partial and has not fully moved towards an *intelligent educational management system model*. One of the main factors that determine the readiness of the institution is the readiness of human resources, especially educators. UNESCO as one of the special agencies under the auspices of the United Nations emphasized that the success of AI integration in the education realm is greatly influenced by the level of digital literacy readiness, the sharpness of data analysis and the pedagogical readiness of educators in utilizing technology ethically and effectively (Niemi et al. 2023). This is an increasingly complex challenge because there is still a digital competency gap among educators. Therefore, AI is often perceived as a threat to the role of a teacher, rather than as a strategic instrument in managing and improving the quality of education.

Apart from the readiness of human resources, digital infrastructure is also a major factor in measuring the readiness of Islamic educational institutions in facing the digital era and AI

transformation. Infrastructure not only includes hardware and internet networks, but also includes integrated information systems and access to digital learning platforms that support the implementation of AI in education. A number of studies have found digital infrastructure gaps at several points in areas that are in limited technology access areas (Richter et al. 2019). This condition causes AI adoption to not run optimally and has the potential to widen the gap in education quality between institutions.

More specifically, in the realm of education management, another factor that greatly determines the readiness of Islamic educational institutions in the AI era is digital leadership. This transformation cannot be effective without leaders who have a visionary spirit in integrating technology in the internal institutional and managerial management systems (Fullan and Langworthy 2014). The leader needed in this era is not only a figure who has administrative skills, but also as a figure who is able to build a culture of innovation in the work environment or organization he leads. Of course, he should also ensure that the use of this technology remains based on ethical principles and Islamic values. Literature findings show that the biggest challenge for Islamic educational institutions today does not lie in the absence of technology, but in the gap between technology adoption and organizational readiness. Many institutions have used it in administrative needs, but do not yet have a mature digital strategy to make AI an instrument to improve service quality and competitiveness between institutions (Niemi et al. 2023). Therefore, the readiness of Islamic educational institutions in the AI era must be understood in its entirety and comprehensively, which includes technology, human resources, leadership, organizational culture and integration between various aspects in the use of educational technology.

Information System Integration as an Enabler of Competitive Advantage

Strategic management views the Management Information System (MIS) not only as an administrative tool for storing, processing and distributing data, but much more functional than that, namely as a strategic instrument that plays a role in supporting organizational effectiveness, time efficiency for decision-making, and building a sustainable competitive advantage (Pearson 2008). In the scope of education, information systems allow institutions to integrate various academic, managerial and administrative activities more effectively, resulting in transparent, efficient and responsive outputs to changing environmental conditions (Porter 2008). Therefore, to respond to the current AI era, namely by placing information systems as strategic assets in the development and advancement of educational institutions. The development of Artificial Intelligence (AI) further strengthens the strategic function of the information system through predictive and automated data analysis skills. AI provides information systems with the opportunity that it is not only able to present historical data, but more than that it is able to make predictions, classifications and recommendations algorithm-based decisions (Richter et al. 2019). In educational institutions, AI can be used to predict the academic performance of students, map individual or individual learning needs, and assist leaders in making strategic decisions based on integrated data.

Turning to the perspective of competitive advantage, for example, the integration of information systems with AI provides an opportunity for Islamic educational institutions to significantly improve the quality of services. According to Porter (1985), an organization will have a competitive advantage if it is able to create more value than other organizations, both in terms of innovation, service quality, and transformative with the needs of the community quickly and precisely. In the field of education, these advantages can be realized through the quality of academic services that are responsive to the virus, adaptive learning systems, accurate administrative management and increased stakeholder satisfaction (Porter 2008). Therefore, an AI-based integrated information system has the potential to be a strategic instrument in building the competitiveness of Islamic educational institutions in the digital era.

For example, educational institutions that have readiness in terms of integrated information systems can control academic performance in real-time, resulting in responsive communication service outputs to student guardians, as well as efficiently manage institutional resources through automated data analysis. This system allows institutional leaders to make accurate decisions based on actual data, not just assumptions or intuition. In the increasingly competitive competition between institutions, this ability is an important factor to build the image, quality, and public trust in the institution.

In the AI era, the ideal information system for Islamic educational institutions must move from an administrative information system model to a strategic intelligent system, which is a system that not only stores data, but is able to process data into information, information into knowledge, and knowledge into the basis for strategic decision-making. This is what distinguishes educational institutions that simply use technology from institutions that actually manage technology as a strategic asset to build a competitive advantage. Thus, the integration of AI-based information systems must be positioned as an enabler of competitive advantage in Islamic education management. The higher the institution's ability to utilize information systems strategically, the greater the institution's opportunity to improve service quality, governance effectiveness, and competitiveness in an increasingly competitive education ecosystem. In this perspective, information systems are no longer just administrative tools, but become a strategic foundation in the transformation of Islamic education in the era of artificial intelligence.

The results of the study show that the readiness of Islamic educational institutions in facing the AI era is not fully determined by the availability of technology, but is also influenced by the readiness of the organization in integrating technology with managerial systems. This finding answers the purpose of the research that digital transformation is not enough to be understood as an adoption of a set of technologies, but as transformative and innovative changes that include aspects of leadership, organizational culture, human resource readiness and others. Thus, AI is positioned as a strategic enabler that supports the decision-making process (Miao et al. 2021). This interpretation is in line with the concept of strategic information systems which states that the main value of information systems lies in their ability to produce information that supports the achievement of organizational goals (Pearson 2008). In the context of Islamic educational institutions, an integrated information system allows the process of managing students, curriculum, human resources, and relationships with stakeholders to take place more effectively. Therefore, the low digital readiness found in various literature is not solely due to technological limitations, but also because of the lack of digital governance that is able to integrate all organizational processes.

The findings of this study reinforce the Value Chain theory put forward by Porter, that competitive advantage is obtained through the integration of key activities with organizational support activities. In the context of Islamic education, the concept continues to develop into an e-value chain, namely the integration of all information technology-based academic services, starting from the process of accepting new students, learning activities, administrative services, to partnership services. This integration then becomes an added value in the form of service transparency, precision and speed of decision-making, and operational cost efficiency. Thus, *the e-value chain* not only serves as an instrument for digitizing services, but also as a strategy to strengthen the competitiveness of Islamic educational institutions in the midst of increasing competition in technology-based education.

Nevertheless, this study offers a different perspective than most previous studies. While previous research generally discussed AI from the perspective of learning or the development of educational technology, this study places AI as part of the education management strategy through the integration of information systems and *e-value* chains. This perspective expands the understanding that the success of digital transformation is not only measured by the level of technology adoption, but also by the ability of institutions to create value (*value creation*) and competitive advantage in a sustainable manner. Thus, the conceptual contribution of this research lies in the effort to connect strategic

information system theory, *e-value chain*, and Islamic education management in one integrated analytical framework.

4. CONCLUSION

This research aims to analyze the readiness of Islamic educational institutions in facing the AI era through the perspective of the integration of information systems and electronic value chains (*e-value chains*) as a strategy to build a competitive advantage. Based on a synthesis of various literature, this study shows that the readiness of Islamic educational institutions is not only determined by the adoption of AI technology, but also by organizational readiness including digital leadership, human resource competence, organizational culture, and the ability to integrate these aspects. This finding emphasizes that AI should be positioned as a *strategic enabler* that supports data-driven decision-making and improving the quality of education services, not just as an administrative automation tool. This research also shows that the integration of information systems with *e-value chains* has the potential to create a competitive advantage through increasing operational efficiency, service quality, governance transparency, and strengthening relationships with various stakeholders. Thus, digital transformation in Islamic educational institutions needs to be directed at the development of an integrated management ecosystem, so that all organizational activities are able to produce added value (*value creation*) in a sustainable manner as stated by the concept of value chains proposed by Porter (1985). However, the implementation of AI still requires governance oriented towards ethics, academic integrity, data protection, and character building so that the use of technology does not shift the humanistic function of Islamic education.

Theoretically, this research enriches the study of Islamic education management by integrating the perspectives of strategic information systems, *e-value chains*, and AI-based digital transformation in one conceptual framework. Meanwhile, this study practically implies that leaders of Islamic educational institutions need to prepare a digital transformation *roadmap* that includes strengthening technological infrastructure, increasing AI literacy for educators and education personnel, developing accountable data governance, and developing policies for the use of AI that are in line with Islamic ethical principles. This study has limitations because it uses a literature study approach so that the findings produced are still conceptual and depend on the characteristics of the literature analyzed. Therefore, further research is recommended to develop an empirical model regarding the level of AI readiness in Islamic educational institutions through quantitative approaches, case studies, or *mixed methods*. Further research can also explore *AI governance* implementation models, measurement of *digital maturity*, and the development of *e-value chains* in various types of Islamic educational institutions to produce more contextual and applicable recommendations.

REFERENCES

- Fullan, Michael, and Maria Langworthy. 2014. *A Rich Seam: How New Pedagogies Find Deep Learning*.
- Khoiruddin, M. Arif, and Izuli Dzulkifli. 2026. 'Integrating Artificial Intelligence In Islamic Education: Ethical, Pedagogical, And Sustainability Perspectives'. *INTIHA Islamic Education Journal* 3 (2): 490–99. <https://doi.org/10.58988/intiha.v3i2.458>.
- Khomsinuddin. 2024. 'Revitalizing Islamic Education Management Through The Use Of Artificial Intelligence At Darul Ishlah Tulang Bawang Tarbiyah College Of Science'. *Mudir Jurnal Manajemen Pendidikan* 6 (1). <https://doi.org/10.55352/mudir>.
- Maskur, Said, and Hasyamuddin Bin Othman. 2025. 'Integrating Artificial Intelligence in Islamic Education Management: Challenges and Opportunities in the Digital Era'. *QAYID Jurnal Pendidikan Islam* 1 (1): 25–33. <https://doi.org/10.61104/qd.v1i1.375>.

- Miao, F., W. Holmes, R. Huang, and H. Zhang. 2021. 'AI and Education: Guidance for Policy-Makers, UNESCO'. *Paris*.
- Niemi, Hannele, Roy D. Pea, and Yu Lu. 2023. 'AI in Learning: Designing the Future'. *Springer Cham*, ahead of print. <https://doi.org/10.1007/978-3-031-09687-7>.
- Pearson, McLeod. 2008. 'Management Information Systems'. *Jakarta: Salemba*.
- Porter, Michael E. 2008. *Competitive Advantage: Creating and Sustaining Superior Performance*. Simon and schuster.
- Rahman, Abdul and Aslan. 2025. 'Islamic Education Management Facing Industry 4.0 And Society 5.0: Innovative Leadership Transformation Strategies Based On Artificial Intelligence (Ai) Technology, Web Platforms, And Virtual Reality To Optimise Institutional Performance Based On A Review Of The Latest Literature'. *Indonesian Journal of Education (INJOE)* 5 (1): 303–3013.
- Rahmania. 2023. 'Analisis Kesulitan Pengelola Lembaga Pendidikan Dalam Penggunaan Education Management Information System (EMIS) 4.0'. *Jurnal Al-Idarah: Jurnal Manajemen Pendidikan Islam*, ahead of print. <https://doi.org/10.24042/alidarah.v5i1.15570>.
- Richter, Olaf Zawacki, Victoria. I. Marin, Melissa Bond, and Franziska Gouverneur. 2019. 'Systematic Review of Research on Artificial Intelligence Applications in Higher Education – Where Are the Educators?' *International Journal of Educational Technology in Higher Education* 19:39. <https://doi.org/10.1186/s41239-019-0171-0>.
- Usrowiyah, Ririn. 2025. 'Analisis Strategis Sistem Informasi Dan Teknologi Informasi Berbasis Value Chain Dalam Mendukung Keunggulan Kompetitif Organisasi Pendidikan: Studi Kasus SMKN 1 Kota Anyar Probolinggo'. *Jurnal Teknologi Pendidikan* 3 (2): 1–9. <https://doi.org/10.47134/jtp.v3i2.2447>.
- Yam, Jim Hoy. 2024. 'Kajian Penelitian: Tinjauan Literatur Sebagai Metode Penelitian'. *Jurnal Empire* 4 (1): 61–70.
- Yulia, Meri and Surpratman. 2025. 'Integrasi Kecerdasan Buatan Sebagai Solusi Inovatif Dalam Manajemen Pendidikan Islam'. *JECCO Journal of Education, Cultural and Politics* 5 (3): 601–6013.