

Management Information System Through the Student Guardian Application in Islamic Boarding Schools

Luluk Sulthoniyah¹, Totok Sudarmanto², Zenol Rasul³, Abu Bakar⁴

^{1,2&3}UIN Kiai Haji Achmad Siddiq Jember, Indonesia, ⁴Education Board, Dhaka, Bangladesh

 luluksulthoniyah@uinkhas.ac.id¹, zenolrasul12@gmail.com²,
siamtalukder2468@gmail.com³

Article Information:

Received, 2024-10-31

Revised, 2025-05-21

Accepted, 2026-06-02

Published, 2026-06-30

Keywords: Management
Information System, Student
Guardian Application, Islamic
Boarding Schools.

Abstract:

Advances in information technology have encouraged Islamic boarding schools to adopt Management Information Systems to improve administrative services for students' parents. This study aims to examine the planning, implementation, and evaluation of the Wali Santri application at Pondok Pesantren Fatihul Ulum Al Mahfudz Jember. A qualitative descriptive approach was employed using purposive sampling. Data were collected through semi-structured interviews, observation, and documentation, and analyzed using an interactive model with triangulation to ensure credibility. The findings indicate that system planning was based on user needs assessment and stakeholder involvement, while implementation enhanced the effectiveness, efficiency, transparency, and accessibility of administrative services through integrated digital features. Continuous evaluation enabled system improvements based on user feedback and operational needs. Overall, the Wali Santri application has improved the quality of administrative services, strengthened communication between the pesantren and students' parents, and supported more effective, technology-driven institutional management.

How to cite:

Publisher:



Sulthoniyah, L., Rasul, Z., & Bakar, A. (2026). *Management information system through the student guardian application in Islamic boarding schools*. *International Journal of Islamic Boarding School (IJIBS)*, 4(1), 25-35 <http://doi.org/10.35719/Ijibs.V4i1.46>
Centre for Research and Community Service (LP2M), Universitas Islam Negeri (UIN)
Kiai Haji Achmad Siddiq Jember

INTRODUCTION

Islamic boarding schools, known as *pesantren*, are indigenous educational institutions in Indonesia that have existed long before the country's independence and have become one of the historical pillars of the national education system (Husnan, 2019; Inayatillah et al., 2022; Tasman Hamami, 2021). As institutions deeply rooted in Islamic traditions, pesantren are increasingly challenged by digital transformation, requiring improvements in educational management, administrative processes, and service delivery for students and their parents

(Muzakky, Mahmuudy, & Faristiana, 2023). Rapid advances in information technology have encouraged pesantren to adopt Management Information Systems to enhance operational effectiveness, service efficiency, and institutional transparency while preserving the Islamic values that shape their educational identity (Jamil, 2022). Within the context of Islamic education, implementing a Management Information System goes beyond improving organizational performance; it should also promote the principles of justice, accountability, transparency, and public benefit in institutional governance (Hosseini Tabaghdehi & Ayaz, 2025; Kronblad et al., 2024; Fauzan & Chotib, 2024).

Advances in information technology have also encouraged educational institutions to develop Management Information Systems capable of providing accurate, integrated, and timely information to support planning, decision making, coordination, and service improvement (Mustofa & Prayoga, 2020; Getachew et al., 2022; Koumamba et al., 2021). As computer technology has evolved, Management Information Systems have become an essential component of modern organizational management, integrating data collection, processing, storage, and dissemination into a unified decision-support system (Laudon & Laudon, 2018). A Management Information System, therefore, functions as an interconnected set of components that enables organizations to manage information effectively for both operational and managerial purposes (Pradana, 2016), while continuous technological development has expanded its application across various sectors, including education (Budiyanto, 2013; Grassini, 2023; Wang et al., 2024). Nevertheless, many pesantren still rely on manual administrative procedures and conventional communication, resulting in delayed information delivery, limited transparency, and lower parental satisfaction with institutional services. Recognizing these challenges, Law of the Republic of Indonesia Number 18 of 2019 mandates the development of integrated information and management systems to support pesantren governance and institutional development. Consequently, implementing a Management Information System has become a strategic necessity for improving the effectiveness, efficiency, productivity, and overall quality of educational services in Islamic boarding schools (Yakub & Hisbanarto, 2014; Arroisi et al., 2025; Haddade et al., 2024).

Previous studies on Management Information Systems in educational institutions have primarily focused on system development, information technology utilization, and administrative management. Meanwhile, studies examining the implementation of Management Information Systems as a strategy to improve service quality in Islamic boarding schools remain relatively limited, particularly those that explore the integration of academic services, administrative processes, and communication with parents into a unified management system. This situation highlights the need for a more comprehensive investigation into the implementation of Management Information Systems in Islamic educational institutions. The novelty of this study lies in its analysis of the implementation of a Management Information System to improve service quality at Pondok Pesantren Fatihul Ulum Al Mahfudz as an Islamic educational institution that has implemented an integrated information system to support services for students and their parents.

This study aims to analyze the implementation of a Management Information System to improve service quality at Pondok Pesantren Fatihul Ulum Al Mahfudz and identify the supporting and inhibiting factors affecting its implementation. The findings are expected to contribute theoretically to the development of Islamic educational management, particularly regarding the implementation of Management Information Systems in pesantren. In addition, this study is expected to provide practical guidance for pesantren administrators in developing service systems that are more effective, transparent, integrated, and oriented toward improving the quality of educational services.

RESEARCH METHODS

This study employed a qualitative descriptive approach to examine the implementation of the Management Information System via the Wali Santri application to improve administrative services at Pondok Pesantren Fatihul Ulum Al Mahfudz Jember. The research site was purposively selected because the pesantren has integrated a digital Management Information System into its administrative services, communication, and information delivery for students' parents. Participants included the head of the pesantren, foundation administrators, the Fatihul Ulum Development Center team (the application developer and administrator), parents, and several students who were purposively selected for their involvement in and understanding of the system until data saturation was achieved (Creswell, 2013). Data were collected through semi-structured interviews, observation, and documentation to explore the planning, implementation, evaluation, benefits, and challenges of the Wali Santri application. Data were analyzed interactively through data collection, data condensation, data display, and conclusion drawing and verification. The trustworthiness of the findings was ensured through source triangulation, technique triangulation, and *member checking* to confirm the consistency between the interpretations and the empirical evidence obtained during the study (Miles et al., 2014).

RESULTS AND DISCUSSION

Results

Planning of the Pesantren Management Information System to Improve Services at Pondok Pesantren Fatihul Ulum Al Mahfudz Jember

Planning is a fundamental stage in implementing a Management Information System because it establishes the foundation for subsequent implementation. In the context of pesantren management, planning extends beyond providing technology to include identifying organizational needs, understanding user characteristics, and aligning the system with existing administrative procedures. Careful planning enables the institution to develop an implementation strategy that reflects operational needs and supports more effective service delivery. Accordingly, this study examines how the Wali Santri application was planned as the initial step in the digital transformation of administrative services at Pondok Pesantren Fatihul Ulum Al Mahfudz Jember.

The findings indicate that the planning process was conducted systematically through the collaboration of the pesantren leadership, the foundation administrators, and the Fatihul Ulum Development Center, which served as both the system developer and administrator. Their collaboration ensured that the system addressed administrative requirements while meeting the information needs of parents, the application's primary users. The planning phase began by identifying administrative services still managed manually, including academic information, payment administration, student progress, permission requests, and communication between the pesantren and parents. These findings formed the basis for determining system requirements, designing application features, and developing an implementation strategy suited to the pesantren's operational context.

Field observations revealed that the previous manual administrative system created several challenges. Information was often delivered late because communication relied on phone calls, text messages, or in-person visits. Parents also had limited access to updates on their children's academic and non-academic development, making information difficult to obtain promptly and consistently. In addition, the high volume of direct inquiries increased the administrative workload of pesantren staff, who were required to respond individually to

information requests. These limitations prompted the institution to develop a digital Management Information System capable of providing faster, more efficient, more transparent, and more easily accessible administrative services.

Interviews with the Fatihul Ulum Development Center showed that the Wali Santri application was designed based on a user needs assessment. Before development began, the team identified the information most frequently requested by parents while evaluating the administrative challenges faced by the pesantren. The assessment found that parents previously relied on in-person visits or direct communication with staff to obtain information about academic progress, student discipline, administrative payments, and daily activities. In response, the pesantren developed an integrated digital platform that provides real-time access to academic records, financial information, permissions, announcements, and student activities through a smartphone application. These findings demonstrate that the planning process was intended not only to introduce new technology but also to improve service quality, accelerate information delivery, strengthen communication between the pesantren and parents, and support the digital transformation of institutional management through a more effective, responsive, and user-oriented administrative system.

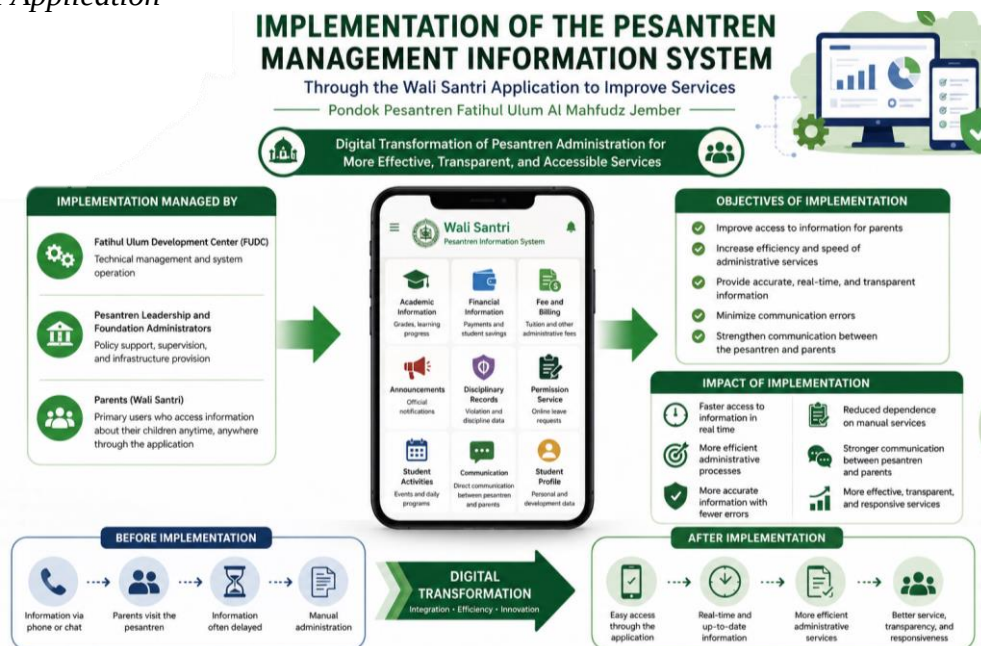
Implementation of the Pesantren Management Information System to Improve Service Quality

The implementation of a Management Information System represents a crucial stage in the digital transformation of administrative services within the pesantren. Following the planning phase, which involved identifying user needs and developing the Wali Santri application, the implementation process focused on integrating digital technology into daily administrative operations. The effectiveness of the system is reflected not only in its technical performance but also in its ability to improve access to information, streamline administrative processes, enhance service efficiency, and strengthen communication between the pesantren and students' parents. This study, therefore, examines how the Wali Santri application has been implemented and utilized to support administrative services at Pondok Pesantren Fatihul Ulum Al Mahfudz Jember.

To provide a clearer overview of the implementation process, the findings are summarized in Figure 1. The figure illustrates how the Wali Santri application integrates administrative services into a single digital platform, beginning with system management by the Fatihul Ulum Development Center and institutional support from the pesantren leadership, and culminating in parents' use of key application features. It also highlights the transition from conventional administrative practices to a more efficient, transparent, and real-time digital service system, demonstrating the contribution of the Management Information System to improving administrative service quality.

Figure 1.

Implementation of the Pesantren Management Information System Through the Wali Santri Application



The findings indicate that the Management Information System has been successfully implemented in line with its intended objectives. The application is managed technically by the Fatihul Ulum Development Center, with policy support, supervision, and infrastructure provided by the pesantren leadership and the foundation administrators. Parents serve as the primary users, accessing information about their children's academic and daily activities through the application. Interview results revealed that the application has transformed administrative services from conventional, face-to-face procedures into a digital system accessible anytime, anywhere via a smartphone. This transition has significantly improved convenience by allowing parents to obtain information without visiting the pesantren or repeatedly contacting administrative staff.

Observations further showed that the Wali Santri application integrates a wide range of administrative features, including academic records, financial transactions, student savings, tuition and administrative payments, official announcements, disciplinary records, permission requests, and student activity updates. By consolidating these services into a single digital platform, the application provides real-time access to information while reducing reliance on manual communication through phone calls, text messages, or in-person visits. The implementation has also accelerated administrative processes, improved the accuracy of information delivery, minimized communication errors, and strengthened interaction between the pesantren and parents. Overall, the findings demonstrate that the Wali Santri application has contributed to a more efficient, transparent, responsive, and user-centered administrative service system.

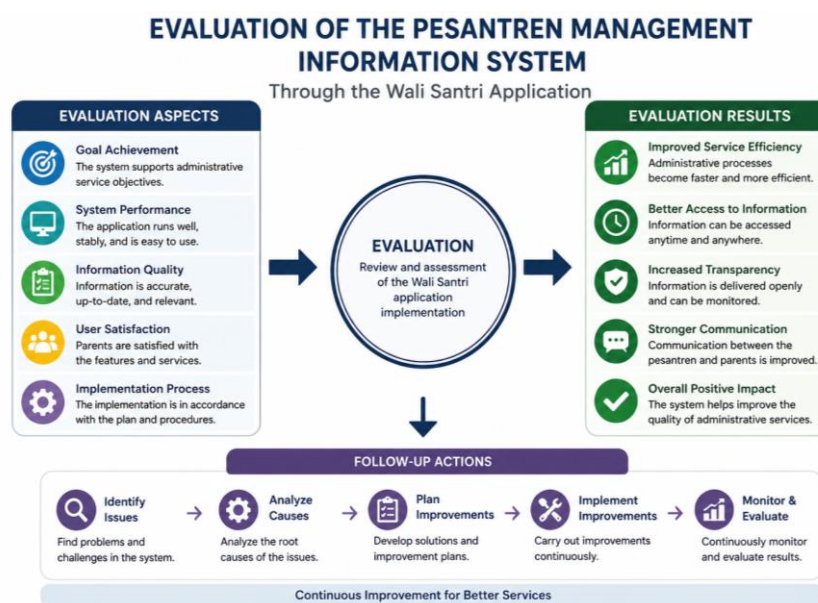
Evaluation of the Pesantren Management Information System

Evaluasi merupakan tahapan akhir dalam siklus implementasi Sistem Informasi. Evaluation represents the final stage of the Management Information System implementation cycle and plays a crucial role in assessing whether the system has achieved its intended objectives. Beyond measuring technical performance, the evaluation process examines user experiences, service quality, and the system's ability to meet the evolving needs of both the

pesantren and students' parents. It also provides a basis for identifying operational challenges and determining improvements to ensure the sustainability and effectiveness of digital administrative services. Accordingly, continuous evaluation has become an integral part of strengthening technology-based administrative management at Pondok Pesantren Fatihul Ulum Al Mahfudz Jember. To provide a clearer overview of the evaluation process, Figure 2 illustrates the key components of the evaluation conducted for the Wali Santri application. The evaluation focuses on assessing system performance, user satisfaction, information quality, and service effectiveness, followed by continuous improvement to ensure that the Management Information System remains responsive to users' needs and supports sustainable administrative service quality

Figure 2.

Evaluation Framework of the Pesantren Management Information System through the Wali Santri Application



The findings indicate that the Wali Santri application is regularly evaluated by the foundation, in collaboration with the Fatihul Ulum Development Center, which manages the system. The evaluation focuses on monitoring application usage, reviewing feedback and complaints submitted by parents, and conducting routine coordination among the pesantren leadership, foundation administrators, and the development team. Feedback from users serves as the basis for refining application features, improving system stability, and developing new services that better address users' needs. This ongoing evaluation reflects the institution's commitment to continuously improving administrative services through digital innovation.

Observations and interviews further revealed that the implementation of the Wali Santri application has significantly improved the quality of administrative services. Activities that previously depended on manual procedures, including academic announcements, administrative payments, attendance records, permission requests, and communication between staff and parents, are now managed through an integrated digital platform. Parents can access information about their children's academic progress and daily activities without having to visit the pesantren or repeatedly contact administrative staff. The system also enhances information transparency by providing real-time access according to user authorization. Overall, the implementation has reduced delays in information delivery, minimized communication errors,

accelerated administrative processes, and increased parental satisfaction. These findings demonstrate that continuous evaluation has contributed to ongoing system refinement, enabling the Management Information System to provide administrative services that are more effective, efficient, transparent, and responsive to technological developments and user needs.

Discussion

The successful implementation of the Management Information System at Pondok Pesantren Fatihul Ulum Al Mahfudz was largely driven by a thorough assessment of user needs and the active involvement of key stakeholders from the early stages of system development. A user-oriented planning process enabled the application to address administrative challenges more effectively while improving service quality. This finding supports the view of [Mustofa and Prayoga \(2020\)](#), who argue that Management Information System implementation should begin with an organizational needs assessment to ensure that the system effectively supports both service delivery and decision making. In this context, planning extended beyond technological considerations to emphasize improving administrative services for students' parents ([Asad et al., 2026](#); [Haleem et al., 2022](#); [Kayanja et al., 2025](#)).

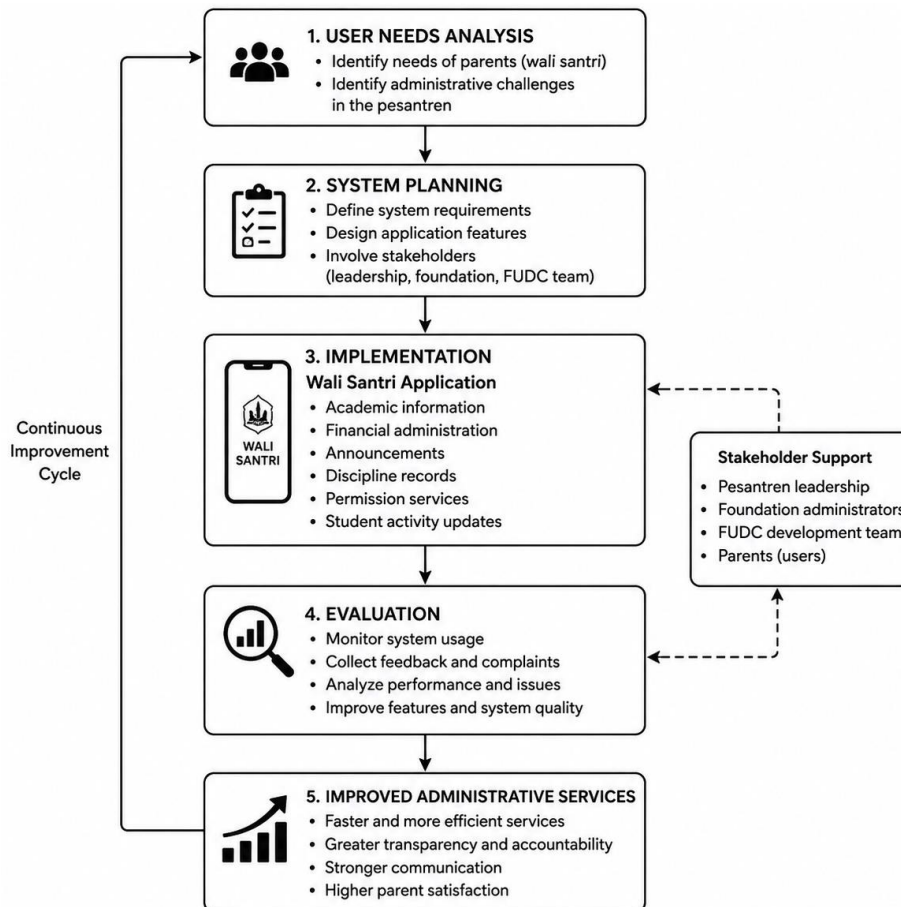
The implementation of the Wali Santri application demonstrates that the digitalization of administrative services has enhanced the efficiency, effectiveness, and transparency of pesantren management. Features such as academic records, financial information, announcements, disciplinary reports, and permission services enable parents to access essential information in real time without having to visit the pesantren. These findings are consistent with the Management Information Systems framework proposed by [Laudon and Laudon \(2018\)](#), which describes information systems as integrating data collection, processing, storage, and distribution to support organizational operations. Within the pesantren context, the system not only streamlined administrative processes but also strengthened communication between the institution and students' parents ([Basri et al., 2026](#); [Darwanto et al., 2024](#); [Mahsusi et al., 2024](#)).

Regular evaluation has proven essential for maintaining the effectiveness and sustainability of the Management Information System. Continuous monitoring enables administrators to identify technical and operational issues, refine application features, and improve service quality in response to user feedback ([Al-Assaf et al., 2024](#); [Latupeirissa et al., 2024](#); [Nankya et al., 2024](#)). These findings are consistent with Terry's concept of the controlling function, which emphasizes measuring performance, comparing outcomes with planned objectives, and implementing corrective actions when necessary. Accordingly, continuous evaluation serves as a critical component of management, ensuring that administrative services remain responsive to technological developments and users' evolving needs ([Aldoseri et al., 2024](#); [Nastoska et al., 2025](#); [Sewpersadh, 2023](#)).

To summarize the findings, the implementation of the Management Information System through the Wali Santri application can be conceptualized as an integrated management process. Figure 3 illustrates how planning, implementation, and continuous evaluation interact to improve the quality of administrative services at Pondok Pesantren Fatihul Ulum Al Mahfudz Jember.

Figure 3.

Conceptual Model of the Management Information System Implementation



Overall, this study demonstrates that implementing the Management Information System via the Wali Santri application has supported the digital transformation of administrative management at Pondok Pesantren Fatihul Ulum Al Mahfudz Jember. Beyond accelerating information delivery, the system has improved accountability, transparency, and service satisfaction among students' parents. The findings suggest that successful implementation depends on integrating technological readiness, leadership commitment, competent system management, and the institution's ability to adapt its services to users' needs. Consequently, the Wali Santri application represents a management innovation that modernizes pesantren administration while preserving the service-oriented values that characterize Islamic educational institutions.

CONCLUSIONS

This study concludes that implementing the Management Information System through the Wali Santri application at Pondok Pesantren Fatihul Ulum Al Mahfudz Jember has improved the quality of administrative services through systematic planning, integrated implementation, and continuous evaluation. The digitalization of administrative services has accelerated access to academic and administrative information, enhanced transparency, strengthened communication between the pesantren and students' parents, and supported more effective, efficient, and user-responsive administrative management. These findings extend the understanding of Management Information System implementation in Islamic educational institutions by demonstrating that successful digital transformation depends on the synergy

between technological readiness, organizational governance, and service orientation. From a practical perspective, the findings provide a useful reference for pesantren administrators seeking to develop sustainable digital administrative services. Nevertheless, this study was conducted at a single pesantren, which limits the broader applicability of its findings. Future research should therefore involve a wider range of Islamic boarding schools with diverse characteristics and employ mixed methods or quantitative approaches to examine the influence of Management Information System implementation on service quality, parental satisfaction, institutional governance, and the long-term success of digital transformation in Islamic educational institutions.

REFERENCES

- Al-Assaf, K., Bahroun, Z., & Ahmed, V. (2024). Transforming service quality in healthcare: A comprehensive review of Healthcare 4.0 and its impact on healthcare service quality. *Informatics*, 11(4), 96. <https://doi.org/10.3390/informatics11040096>
- Aldoseri, A., Al-Khalifa, K. N., & Hamouda, A. M. (2024). Methodological approach to assessing the current state of organizations for AI-based digital transformation. *Applied System Innovation*, 7(1), 14. <https://doi.org/10.3390/asi7010014>
- Arroisi, J., Mustopa, R. H. B. C., & Djayusman, R. R. (2025). Coping the discrepancy between moral and intellectual achievement: The model integration of higher education and modern Islamic boarding schools in Indonesia. *Indonesian Journal of Islam and Muslim Societies*, 14(2), 231–257. <https://doi.org/10.18326/ijims.v14i2.231-257>
- Asad, M. M., Chachar, S., & Almusharraf, N. M. (2026). Impact of K-12 school administration and parents' digital communication on students' engagement and academic self-efficacy: Insights from the global perspective. *Journal of Professional Capital and Community*, 1–29. <https://doi.org/10.1108/JPCC-11-2024-0187>
- Basri, B., Mujiburrahman, M., Nasir, M., & Nazar, M. (2026). Negotiating tradition and modernity: An ethnographic study of leadership and collaboration in Acehese Islamic higher education. *The Qualitative Report*, 31(1), 4999–5025. <https://doi.org/10.46743/2160-3715/2026.7834>
- Budiyanto, Eko. *Sistem Informasi Manajemen Sumberdaya Manusia*. Yogyakarta: Graha Ilmu, 2013.
- Creswell, J. W. (2013). *Qualitative inquiry & research design: Choosing among five approaches* (3rd ed.). SAGE Publications
- Darwanto, A., Prahmana, R. C. I., Susanti, A., & Khalil, I. A. (2024a). Transformation of boarding school management models in enhancing student accessibility and educational quality. *Jurnal Pendidikan Agama Islam*, 21(1), 145–164. <https://doi.org/10.14421/jpai.v21i1.8632>
- Fauzan, H., dan Moch. Chotib. *Sistem Informasi Manajemen Perspektif Islam*. Disunting oleh Ahmad Fauzi Rizgi Bahri. Yogyakarta: DIVA Press, 2024.
- Getachew, N., Erkalo, B., & Garedew, M. G. (2022). Data quality and associated factors in the health management information system at health centers in Shashogo district, Hadiya zone, southern Ethiopia, 2021. *BMC Medical Informatics and Decision Making*, 22(1), 154. <https://doi.org/10.1186/s12911-022-01898-3>
- Grassini, S. (2023). Shaping the future of education: Exploring the potential and consequences of AI and ChatGPT in educational settings. *Education Sciences*, 13(7), 692. <https://doi.org/10.3390/educsci13070692>
- Haddade, H., Nur, A., Achruh, A., Rasyid, M. N. A., & Ibrahim, A. (2024). Madrasah management strategies through Madrasah Reform program: An evidence from Indonesia.

- International Journal of Educational Management*, 38(5), 1289–1304.
<https://doi.org/10.1108/IJEM-05-2023-0236>
- Haleem, A., Javaid, M., Qadri, M. A., & Suman, R. (2022). Understanding the role of digital technologies in education: A review. *Sustainable Operations and Computers*, 3, 275–285.
<https://doi.org/10.1016/j.susoc.2022.05.004>
- Hosseini Tabaghdehi, S. A., & Ayaz, Ö. (2025). AI ethics in action: A circular model for transparency, accountability and inclusivity. *Journal of Managerial Psychology*.
<https://doi.org/10.1108/JMP-03-2024-0177>
- Husnan, Riayatul. "Manajemen Kepemimpinan Kiai dalam Meningkatkan Kecerdasan Emosional Santri Pondok Pesantren Husnul Ri'ayah Suboh Situbondo." *Islamic Educational Management* 1, no. 1 (2019): 90–99.
- Inayatillah, I., Kamaruddin, K., & M. Anzaikhan, M. A. (2022). The history of moderate Islam in Indonesia and its influence on the content of national education. *Journal of Al-Tamaddun*, 17(2), 213–226. <https://doi.org/10.22452/JAT.vol17no2.17>
- Jamil, Sofwan. "Teknologi dan Pendidikan Islam: Peluang dan Tantangan dalam Era Digital." *Wistara: Jurnal Pendidikan Bahasa dan Sastra* 3, no. 1 (2022): 122–126.
- Kayanja, W., Kyambade, M., & Kiggundu, T. (2025). Exploring digital transformation in higher education setting: The shift to fully automated and paperless systems. *Cogent Education*, 12(1). <https://doi.org/10.1080/2331186X.2025.2489800>
- Koumamba, A. P., Bisvigou, U. J., Ngoungou, E. B., & Diallo, G. (2021). Health information systems in developing countries: Case of African countries. *BMC Medical Informatics and Decision Making*, 21(1), 232. <https://doi.org/10.1186/s12911-021-01597-5>
- Kronblad, C., Essén, A., & Mähring, M. (2024). When justice is blind to algorithms: Multilayered blackboxing of algorithmic decision-making in the public sector. *MIS Quarterly*, 48(4), 1637–1662. <https://doi.org/10.25300/MISQ/2024/18251>
- Latupeirissa, J. J. P., Dewi, N. L. Y., Prayana, I. K. R., Srikandi, M. B., Ramadiansyah, S. A., & Pramana, I. B. G. A. Y. (2024). Transforming public service delivery: A comprehensive review of digitization initiatives. *Sustainability*, 16(7), 2818. <https://doi.org/10.3390/su16072818>
- Laudon, Kenneth C., dan Jane P. Laudon. *Management Information Systems: Managing the Digital Firm*. Harlow: Pearson Education, 2018.
- Laudon, Kenneth C., dan Jane P. Laudon. *Management Information Systems: Managing the Digital Firm*. Edisi ke-12. New Jersey: Pearson Education, 2012.
- Mahsusi, Huda, S., Fahmi, M., Kusen, Haryanti, N. D., & Wajdi, M. B. N. (2024). Achieving excellence: The role of digital transformation in madrasah management and Islamic culture. *Cogent Arts & Humanities*, 11(1). <https://doi.org/10.1080/23311983.2024.2304407>
- Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative data analysis: A methods sourcebook* (3rd ed.). SAGE Publications.
- Mustofa, Ahmad, dan Ari Prayoga. "Konsepsi Implementasi Sistem Informasi Manajemen dalam Mendukung Pelayanan Tenaga Pendidik." *Al-Idaroh: Jurnal Studi Manajemen Pendidikan Islam* 4, no. 1 (2020): 1–14.
- Muzakky, Ridwan Maulana Rifqi, Rijaal Mahmuudy, dan Andhita Risiko Faristiana. "Transformasi Pesantren Menghadapi Era Revolusi Digital 4.0." *ALADALAH: Jurnal Politik, Sosial, Hukum dan Humaniora* 1, no. 3 (2023): 241–255.
- Nankya, M., Mugisa, A., Usman, Y., Upadhyay, A., & Chataut, R. (2024). Security and privacy in e-health systems: A review of AI and machine learning techniques. *IEEE Access*, 12, 148796–148816. <https://doi.org/10.1109/ACCESS.2024.3469215>

- Nastoska, A., Jancheska, B., Rizinski, M., & Trajanov, D. (2025). Evaluating trustworthiness in AI: Risks, metrics, and applications across industries. *Electronics*, 14(13), 2717. <https://doi.org/10.3390/electronics14132717>
- Pradana, Mahir. "Perencanaan Skema Sistem Informasi untuk Aktivitas Manajemen." *EKOMBIS REVIEW: Jurnal Ilmiah Ekonomi dan Bisnis* 4, no. 1 (2016): 22–31.
- Sewpersadh, N. S. (2023). Disruptive business value models in the digital era. *Journal of Innovation and Entrepreneurship*, 12(1), 2. <https://doi.org/10.1186/s13731-022-00252-1>
- Tasman Hamami. (2021). Muhammadiyah and Nahdlatul Ulama education: Two main pillars of national education in Indonesia. *Jurnal Pendidikan Agama Islam*, 18(2), 307–330. <https://doi.org/10.14421/jpai.2021.182-06>
- Wang, C., Chen, X., Yu, T., Liu, Y., & Jing, Y. (2024). Education reform and change driven by digital technology: A bibliometric study from a global perspective. *Humanities and Social Sciences Communications*, 11(1), 256. <https://doi.org/10.1057/s41599-024-02717-y>
- Yakub, dan Vico Hisbanarto. *Sistem Informasi Manajemen Pendidikan*. Yogyakarta: Graha Ilmu, 2014.