Human Resources Development Collaboration Between Boarding School Management and Technology

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Abstract

This study analyzes the strategy for developing *santri* resources through collaboration between boarding school management and technology at one of the Islamic educational institutions in Indonesia. As an Islamic educational institution, boarding school face challenges in preparing *santri* with both strong religious understanding and competencies relevant to the digital era. Using a qualitative approach with a case study method, data were collected through interviews, observations, and documentation, informants in this interview were purposive, namely individuals who have insights and experiences relevant to the focus of the research. The number of informants interviewed was 25 people, consisting of the head of the foundation, principal, teachers, and students. The selection of these informants aims to obtain in-depth and comprehensive data on the development of human resources in collaboration between Islamic boarding school management and technology, then analyzed using the Miles and Huberman model, which includes data reduction, data presentation, and drawing conclusions. The research findings show that the strategy for developing Islamic boarding school resources involves integrating technology into learning, providing digital-based skills training, and collaborating with various stakeholders to increase access to modern educational resources. Islamic boarding school management plays an important role in formulating adaptive policies, while technology applications include digitalization of teaching materials, online-based learning, and the use of educational applications. The main challenges in its implementation include limited infrastructure, human resource readiness, and resistance to change. However, effective collaboration between Islamic boarding school management, educators, and external stakeholders improves the quality of Islamic boarding school students in terms of academics, skills, and readiness for the modern world. This study highlights that collaboration between Islamic boarding school management and technology is a strategic step in developing Islamic boarding school resources in the digital era.

INTRODUCTION

As a traditional Islamic educational institution in Indonesia, Islamic boarding schools play a crucial role in shaping the character and knowledge of students (Jaenullah et al., 2022). However, in the current digital era, Islamic boarding schools are faced with the challenge of improving the quality of globally competitive human resources (Sutiah et al., 2020; Masrur, 2023). The integration of technology in Islamic boarding school management is crucial to ensure operational efficiency and the relevance of the education provided (Faizin, 2024; Darwanto et al., 2024; Shofiyyah et al., 2023). This study is important because it examines how collaboration between Islamic boarding school management and technology can improve human resource development, so that Islamic boarding school graduates not only have a deep understanding of religion, but also skills that are in accordance with the demands of the times. Thus, Islamic boarding schools can maintain their relevance and contribute more significantly to national development.

Previous studies have highlighted various aspects of technology integration in Islamic boarding school education. For example, research by Lundeto et al., (2021); Nisa & Aimah, (2024) emphasized the importance of a technology-based management system to improve the efficiency of administration and educational services in Islamic boarding schools. In addition,developed an information technology-based learning model to encourage educators in Islamic boarding schools to use technology in the learning process (Nasution et al., 2024; Santosa & Jazuli, 2022; Mukarromah et al., 2024). However, there is still a research gap regarding how collaboration between Islamic boarding school management and technology can specifically improve human resource development. Thus, this research present To fill the gap by focusing on effective collaborative strategies.

This study aims to test the assumption that technology integration in Islamic boarding school management can improve operational efficiency and education quality and have a positive impact on human resource development, despite facing challenges such as limited infrastructure, resistance to change, and lack of digital skills among teachers and management. The benefits of this study are to provide insight for Islamic boarding school managers in designing flexible and efficient digitalization strategies to improve management and learning effectiveness. Unlike previous studies that only highlight the benefits of technology, this study also analyzes the factors for successful implementation through real case studies, thus providing a perspective that applies to other Islamic boarding schools in facing digitalization challenges with the right strategy.

METHODS

This study applies a qualitative approach through the case study method, because this method provides support to dig deeper and explore a phenomenon that occurs in a particular location (Asril et al., 2023; Engkizar et al., 2023; Hasibuan & Anwar, 2023; Maharani & Mu'arif, 2025; Sabiruddin et al., 2021; Wulandari et al., 2022). The object of research chosen is the Darussalam Blokagung Islamic Boarding School because this Islamic boarding school is known as one of the largest Islamic educational institutions in Banyuwangi that has adopted various technological innovations in its management. From an academic perspective, this Islamic boarding school is interesting to study because it has implemented a technology-based education management system, such as the use of the Learning Management System (LMS), digitalization of administration, and digital skills training for students.

In addition, this Islamic boarding school has a complex organizational structure, which reflects the interaction between management policies and technology implementation in human resource development. Therefore, this study aims to understand how the integration of technology in Islamic boarding school management can improve the quality of human resources in a traditional Islamic educational environment (Setiawan et al., 2024; Yogi & Aimah, 2025).

The sample selection technique is applied using the purposive sampling method (Nartin et al., 2024), where participants were selected based on their strategic roles in implementing technology in Islamic boarding schools. The main participants in this study were the Head of the Foundation as a strategic policy maker in developing Islamic boarding schools, the principal as an implementer of technology-based education policies, Teachers as facilitators who implement digital learning, and Students as the main users of technology in the learning process. The criteria for selecting participants are based on the theory of Islamic Education Management which states that the success of technology integration in Islamic educational institutions is highly dependent on the synergy between policy makers, educators, and students. Thus, the selection of these participants is intended to obtain a comprehensive perspective on the effectiveness of technology collaboration and Islamic boarding school management in developing human resources.

Table 1. Interview informants

No	Informant category	Total
1.	The foundation's president	1
2.	Principal	7
3.	Teacher	9
4.	Student	8
	Total	**25**

The research instruments used include intensive interviews, participant observation, and documentation recording. Intensive interviews were conducted to explore participants' perceptions and experiences related to the use of technology in the management and learning systems in Islamic boarding schools. Participatory observation was conducted to understand directly how technology is applied in daily activities in Islamic boarding schools, both in terms of administration and learning. Meanwhile, documentation is used to analyze Islamic boarding school policies related to digitalization, technology-based Human Resources training programs and the results of technology implementation evaluations. This approach is in line with the principles of qualitative research methodology, which emphasizes contextual understanding of the phenomena studied through various data sources.

To ensure the validity of the data, this study applies source triangulation, method triangulation, and member checking techniques. Source triangulation is done through comparison. information from various participants to avoid subjective bias. Method triangulation is applied using interviews, observations, and documentation to confirm the findings more accurately. Meanwhile, member checking is done by asking participants to review the interview results. and data interpretation in order to ensure the accuracy of the information obtained. The data analysis method applies the Miles and Huberman model, which includes data reduction, selection and simplification of relevant information, presentation of data, presentation of findings in the form of narrative descriptions and categorizations, and drawing conclusions analysis of

patterns and relationships between variables to gain insight into the effectiveness of collaboration between boarding school management and technology in Human Resource development.

RESULT AND DISCUSSION
Adaptive Technology Based Islamic Boarding School Management Model

Islamic boarding schools that adopt technology in their management face major challenges regarding the effectiveness and sustainability of digital transformation. The following are the results of an interview with the head of the foundation of Ponpes Darussalam Blokagung regarding the impact of implementing the Adaptive Technology-Based Islamic Boarding School Management Model.

The success of technology implementation is highly dependent on flexibility in integrating digital systems with traditional management patterns. This adaptation includes the use of technology in administration, learning, and human resource management without eliminating the values of the pesantren (informant 1)

Previous studies have highlighted that the success of technology integration in Islamic educational institutions depends on the suitability of the management structure and the readiness of human resources (Ahmad et al., 2021; Rahman & Yusuf, 2020). This adaptive model allows Islamic boarding schools to develop a gradual approach, where technology is implemented according to the readiness of students, teachers, and education personnel. Research by Ahmed et al., (2021); Criollo-C et al., (2023) confirms that a flexible technology-based management model is more effective in increasing the productivity of educational institutions than a uniformly imposed model. Therefore, the Adaptive Technology-Based Islamic Boarding School Management Model at Ponpes Darussalam shows that flexibility in implementing technology can minimize resistance and increase management effectiveness.

Why is this adaptive model needed, and how is the correlation between system flexibility and the success of technology integration in Islamic boarding schools? One of the main factors supporting the success of this model is the readiness of human resources and management capacity in adapting to technological changes. Akram et al., (2022) ; Indah et al., (2022); Burgos-Videla et al., (2021) showed that the level of digital literacy of educators and managers has a significant effect on the effectiveness of technology implementation in Islamic educational institutions. This finding is supported by research Deacon et al., (2023) ; Asante Boakye et al., (2024); Almatrodi & Skoumpopoulou, (2023) ; Wang et al., 2024) which states that resistance to technology in educational institutions is often caused by a lack of technical understanding and the incompatibility of the system with organizational culture. At Islamic Boarding School Darussalam, the adaptive model is implemented through competency-based training, where teachers and students are given technology training in stages according to their needs and abilities.

Darussalam Blokagung Islamic Boarding School is a semi-modern Islamic boarding school that implements an Adaptive Technology-Based Islamic Boarding School Management Model through activities that welcome through activities that support digital transformation in education and management of Islamic boarding schools. Various programs have been developed to improve digital literacy of students , such as journalism training held by the Darussalam Press Institute.

The Darussalam Press Journalism Training held on December 11-12,

2024 in collaboration with Jawa Pos Radar Banyuwangi is a strategic effort to improve the competence of print media journalistic members in the Islamic boarding school environment. This activity is designed to strengthen journalistic literacy and skills, develop critical thinking skills, train the use of technology in the media, and prepare competent human resources in the media field. This training was attended by students who were members of the Islamic boarding school journalism team, including writers, editors, photographers, and media designers.

During the two days of implementation, participants received intensive material on news writing techniques, journalistic interviews, professional editing, and management of digital platforms and social media. In addition, they were also equipped with skills in using graphic design and editing software to improve the quality of publications. This training not only focuses on technical aspects, but also emphasizes the importance of verifying information to prevent the spread of hoax news and prioritize journalistic ethics. As part of the field practice, participants were given the opportunity to make live coverage and compile news which was then published in the Islamic boarding school's internal media.

With this activity, it is expected that the students will not only be skilled in journalism and digital media, but also be able to become ethical and responsible information agents in accordance with the values of the Islamic boarding school. In addition, this training is also a place to expand networks and collaboration with professional media, thus opening up wider opportunities for students to contribute to the world of journalism in the future.

In addition, research by Miguel et al., (2022); Sakas et al., (2023); Hunim & Aimah, (2024) shows that the success of digital transformation in Islamic education depends on a hybrid strategy-combining traditional and digital methods proportionally. This correlation explains why Islamic boarding schools with adaptive models are more successful in integrating technology than Islamic boarding schools that implement massive digitalization without considering human resource readiness. Thus, flexibility in the adaptive technology-based Islamic boarding school management model not only allows for a smoother transition but also increases participation and effectiveness in the use of technology in Islamic boarding school management.

Shifting Role of Islamic Boarding School Managers to Digital Managers

Digital transformation in the world of education has not only changed the learning system, but has also had a significant impact on the role of leadership in educational institutions, including Islamic boarding schools. The shift in the role of Islamic Boarding School Managers to Digital Managers marks the adaptation of Islamic boarding schools in integrating technology into educational management and administration. Managers now play a role in implementing academic information systems, as well as managing digital media for learning and transparency. This transformation increases operational efficiency and prepares students to face the digital era which demands technological capabilities and adaptive leadership in managing boarding school. The following are the results of interviews with informants at Islamic boarding School Darussalam Blokagung regarding the implications of shifting the role of pesantren managers to digital managers.

Technology integration in Islamic boarding school management has changed the leadership pattern from being based on tradition and empirical experience to being based on data and information systems. Islamic boarding school managers now not only act as spiritual and administrative leaders, but must also have analytical skills,

technology-based management, and an understanding of digital data security (informant 2)

Studies by Hidayat et al., (2021); Mutamimah et al., (2021); Halimah et al., (2024) revealed that technology-based leadership in Islamic education can improve operational efficiency and transparency in financial and academic management. This shift in roles requires increased digital competence among managers in order to optimally adopt technology. Therefore, this change not only creates efficiency in Islamic boarding school administration, but also demands a paradigm shift in leadership that is more technology and data-based. The following table shows the importance of the role of Islamic Boarding School Managers as Digital Managers to facilitate the management of student and academic data with a faster and more accurate digital system.

Table 2. Benefits of Islamic Boarding School Managers as Digital Managers

No	Benefits of Islamic Boarding School Managers becoming Digital Managers	information
1.	Improving administrative efficiency	Facilitate the management of student, financial, and academic data with a faster and more accurate digital system.
2.	Optimizing learning quality	Integrating technology in education, such as e-learning and interactive media, for more effective learning.
3.	Increasing transparency and accountability	More open administration, facilitating audits and increasing public trust.
4.	Data-driven decision making	Accurate data helps managers in formulating more precise and measurable policies.
5.	Adaptation to technological developments	Islamic boarding schools remain relevant to current developments, not left behind in the world of modern education.
6.	Empowering santri in the digital world	Students gain digital skills that are useful for the future, both in preaching and professional careers.
7.	Improving the competitiveness of Islamic boarding schools	Technology-based management makes Islamic boarding schools more superior and professional in the digital era.

Why should the role of Islamic boarding school managers shift to become digital managers, and how does it correlate with management effectiveness? One of the main factors driving this shift is the increasing complexity of Islamic boarding school management due to technological developments and the need for transparency. Studies by Marquardt & Kearsley, (2024) ; Zaini & Rizquha, (2023); Hidayati & Fahmi, (2023) state that a technology-based management system can increase efficiency in curriculum management, financial administration, and student services. However, Veseli

et al., (2025); Hanelt et al., (2021) emphasize that the success of digital transformation is highly dependent on the readiness of leaders in managing change. At Ponpes Darussalam Blokagung, the implementation of a technology-based management system has accelerated the decision-making process and increased accountability (Hashim et al., 2022; Niță & Guțu, 2023; Antonopoulou et al., 2021; Alenezi, 2023; Benavides et al., 2020), but on the other hand, it also requires managers to understand the use of administrative software, academic information systems, and data security strategies. Unlike previous studies that focused more on the digitalization of learning, this finding confirms that the success of the digital transformation of Islamic boarding schools depends on the readiness of leadership in understanding and managing technology-based systems. Thus, this shift in roles is not only a demand of the digital era, but also a determining factor in the sustainability and competitiveness of Islamic boarding schools in the future.

Hybrid Strategies to Overcome Technology Integration Challenges

In the process of digitizing Islamic boarding schools, the main challenges that often arise are cultural resistance, limited digital literacy, and minimal technological infrastructure (Nasution et al., 2024 ; Rahman et al., 2025). So, how can a hybrid strategy overcome these challenges? The hybrid approach-combining traditional systems and technology in stages-has succeeded in increasing the acceptance of technology among students and educators. This strategy is implemented in the form of blended learning, namely where the yellow book-based teaching method is maintained, but enriched with digital sources such as online pengajian and using video learning templates. The researcher also conducted the following interview with the school principal.

> *The hybrid strategy is the main solution in overcoming the challenges of technology integration in the Islamic boarding school environment. One of the concrete steps implemented is the Ngaji Bareng Online program, which allows students to continue to receive Islamic studies even though they are outside the Islamic boarding school environment* (informant 3)

The Muadalah Unit of the Darussalam Blokagung Banyuwangi Islamic Boarding School presents innovation in Islamic learning through the Ngaji Bareng Online program, which adapts the Hybrid Learning strategy to overcome the challenges of technology integration in Islamic boarding school education. This program is implemented by Muadalah Ulya students who share knowledge with Muadalah Wustho students in various Islamic studies, including *ubudiyah* (worship), *thoharah* (purification), *akidah* (belief), *akhlaq* (Islamic ethics), *muamalah* (social and economic relations in Islam), and *tarikh Islam* (Islamic history). By implementing a hybrid learning model, Ngaji Bareng Online combines direct interaction through a digital platform with online discussion sessions, allowing students to continue to get flexible and in-depth access to knowledge. This approach not only expands the reach of preaching and knowledge, but also trains students in the use of technology positively and productively. With this program, it is hoped that students can understand Islamic teachings more broadly and instill Islamic values in daily activities, while adapting to developments in the digital era.

This approach not only facilitates access to learning materials but also provides flexibility for students in understanding the study in more depth. With online study and digital media, students can repeat the material at any time, so that learning becomes more effective (Suharsiwi et al., 2022). In addition, educators are encouraged to improve their digital skills so that they are able to utilize technology in the teaching process. Gradually, Islamic boarding schools

began to adapt to the development of the times without eliminating the Islamic identity and values that have been deeply rooted in their education system (Fahmi & Pratama, 2022). The institution is one of the formal schools with a curriculum based on the Salaf book.

Studies Zhou et al., (2024); Gulliksen et al., (2023); Rof et al., (2022) by showed that the hybrid method is more effective in accelerating technology adoption in traditional educational institutions than full digitalization implemented suddenly. In addition, the bottom-up approach involving students and teachers as agents of change has proven its effectiveness in increasing technology acceptance in Islamic boarding schools (Rahman & Yusuf, 2022). Thus, this hybrid strategy not only facilitates the digital transition but also minimizes resistance and ensures the sustainability of technological innovation in Islamic boarding schools.

Why is this hybrid strategy effective, and how does the combination of traditional and digital methods correlate with the success of technology integration in Islamic boarding schools? One of the main factors that makes this strategy successful is the balance between modernization and preservation of traditional Islamic boarding school values. A study by Weber-Lewerenz, (2021) confirms that value-based educational institutions have a higher success rate in digital transformation if they adopt a gradual approach that takes into account social and cultural aspects. In addition, research by Li, (2022) revealed that the drastic implementation of technology often leads to failure due to a lack of human resource readiness. At the Darussalam Blokagung Islamic Boarding School, the hybrid strategy was implemented in three main stages: digitalization of administration, digital literacy training for educators, and gradual integration of technology into the learning curriculum. This finding differs from previous studies that focused more on digital infrastructure as the main factor in the success of technological transformation. In fact, in the context of Islamic boarding schools, the success of technology integration is greatly influenced by the suitability of the implementation method with the ingrained educational culture. Therefore, the hybrid approach is the optimal solution in creating harmony between Islamic boarding school traditions and the demands of the digital era.

CONCLUSION

Islamic boarding schools have an important role in shaping the character and competence of students, but in the digital era, human resource development faces complex challenges. Technology integration in Islamic boarding school management is a key strategy to improve administrative efficiency, learning quality, and graduate competitiveness. This research shows that the collaboration of boarding school management with technology accelerates educational transformation through an adaptive technology-based management model. However, infrastructure limitations, change resistance, and low digital literacy remain a challenge, so a strategy that considers the readiness of Islamic boarding school resources and culture is needed. The success of digitalization depends on the flexibility of the system and the readiness of human resources, allowing gradual integration without abandoning traditional values. Shifting the role of Islamic boarding school managers to digital managers is the key to transformation, so that boarding schools remain relevant in the modern era and produce religiously and technologically competent alumni.

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