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Value-Embedded Adaptive Digital Transformation in Islamic Boarding School Management: Integrating Tradition and Innovation in Islamic Education

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Abstract

This study aims to examine the transformation of Islamic Boarding School Management in the digital era by focusing on the integration of traditional values and technological innovation at Al-Munawwir Islamic Boarding School, South Sangatta. A qualitative field research approach was employed, utilizing in-depth interviews, observation, and documentation for data collection. Data were analyzed using the Miles and Huberman interactive model with a thematic approach. The findings reveal that digital transformation occurs in a gradual and adaptive manner, encompassing the digitalization of administration, the enhancement of technology-supported learning, and the strengthening of digital communication integrated into managerial functions. Digitalization is found to be complementary (augmentative) rather than substitutive, where technology reinforces rather than replaces traditional practices, with Islamic values such as adab (ethics), akhlaq (morality), and the authority of the kyai serving as the core guiding principles. However, the transformation process faces several challenges, including limited infrastructure, low digital literacy among human resources, and cultural resistance. This study proposes the Value-Embedded Adaptive Digital Transformation Model, which emphasizes the integration of core values, digital innovation, and adaptive management as key determinants of successful transformation. The findings contribute theoretically to the development of Islamic education management and provide practical implications for pesantren governance in the digital era.

Keywords: digital transformation, management, traditional values, technological innovation, Islamic education

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INTRODUCTION

Islamic boarding schools are among the oldest Islamic educational institutions in Indonesia, playing a strategic role in shaping the community's character, morals, and knowledge. As tradition-based institutions, pesantren serve not only as centers for the transmission of Islamic knowledge but also as social agents that preserve cultural and religious values within society (Huda, 2024). However, amidst the rapid development of digital technology, pesantren are faced with the challenge of adapting to changing times without losing their identity.

Digital transformation has brought significant changes to various sectors, including education. The integration of information and communication technology (ICT) into the education system enables greater learning effectiveness, improved management efficiency, and expanded access to learning resources (Msambwa et al., 2024). In the context of pesantren, digitalization encompasses not only the use of technology in the learning process but also in managerial aspects such as administration, communication, and information management. Research shows that implementing digital technology in Islamic boarding schools can improve learning quality and expand students' competencies, particularly in digital literacy and 21st-century skills (Hamid et al., 2025; Saputro & Arif, 2025)

However, the digital transformation process in Islamic boarding schools is not without challenges. Limited technological infrastructure, low digital literacy among human resources, and resistance to change are major obstacles to the implementation of digitalization. Furthermore, there are concerns that excessive adoption of technology could shift the traditional values that have long underpinned Islamic boarding school education (Wijaya et al., 2024; Setiorini et al., 2024). Therefore, an approach is needed that emphasizes not only the technological aspect but also considers the cultural dimensions and Islamic values inherent in the Islamic boarding school system.

Although various studies have examined digitalization in the context of Islamic boarding schools, most have focused on specific aspects, such as the use of technology in learning, the development of digital-based curricula, or the utilization of digital communication media. A study by Hamid et al. (2025) and Saputro & Arif, 2025) for example, highlights improvements in learning quality through technology integration but has not systematically linked this to the transformation of Islamic boarding school institutional management. Meanwhile, research by Rochim et al. (2025) emphasizes technology integration in the curriculum and student skill development, yet does not comprehensively discuss managerial implications. On the other hand, a study by Kusuma et al. (2025) has begun to examine the transformation of Islamic boarding school management in the digital era. However, it remains limited to conceptual

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descriptions and does not offer an operational integrative model.

Thus, a research gap exists in the absence of studies that comprehensively integrate digital transformation into an Islamic boarding school management framework that simultaneously encompasses technological, organizational, and traditional values. However, the tradition-based characteristics of Islamic boarding schools demand a transformational approach that is not only technological, but also cultural and managerial.

Based on this gap, this study offers novelty in the form of developing an integrative approach to analyzing the transformation of Islamic boarding school management in the digital era, emphasizing the synergy between tradition and innovation. This research examines digitalization not only as a tool, but also as part of a management system encompassing technology-based planning, organization, implementation, and evaluation. Furthermore, it seeks to formulate a conceptual model for transforming Islamic boarding school management by integrating Islamic values with sustainable digital innovation. Therefore, this study is expected to make theoretical contributions to the development of Islamic education management studies, as well as practical contributions to Islamic boarding school managers in addressing the challenges of the digital era.

METHOD

This study used a qualitative, descriptive approach to gain a deeper understanding of the phenomenon of Islamic boarding school management transformation in a real-world context (Bogdan & Biklen, 2007). The study was conducted at Al-Munawwir Islamic Boarding School in South Sangatta, which has begun adopting digital technology in its management and learning processes.

The informants were selected purposively, including the Islamic boarding school leadership, administrative managers, teaching staff, and students, based on their involvement in the digital transformation process. The research data consisted of primary data obtained through in-depth interviews and observations, as well as secondary data in the form of institutional documents and supporting literature.

Data collection was conducted through in-depth interviews, participant observation, and documentation. Data analysis used the interactive model of Miles, Huberman, & Saldana, which includes data condensation, data presentation, and conclusion drawing, with a thematic analysis approach to identify patterns of management transformation (Miles et al., 2014). Data validity was maintained through triangulation of sources and techniques, as well as member checking to ensure the accuracy of the findings.

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RESULTS AND DISCUSSION

Transformation of Islamic Boarding School Management in the Digital Era

Research findings indicate that digital transformation at Al-Munawwir Islamic Boarding School, South Sangatta, is taking place gradually, particularly in the administrative aspect. The transition from manual to digital systems, as expressed by informants, reflects institutional efforts to improve the efficiency and accuracy of data management. "Previously, all student data was recorded manually in ledgers, but now we have started transferring it to computers so it's more organized and easier to search (Interview 2026)."

This phenomenon can be understood as the initial stage of digital transformation, namely digitization, the process of converting analog data into digital format (Vial, 2019). More broadly, this transformation is part of an effort to increase operational efficiency through the use of information technology (Verhoef et al., 2021). These findings align with research by Dwivedi et al. (2020) and García-Morales et al. (2021) which show that administrative digitization significantly increases organizational efficiency and managerial transparency.

However, in the context of Islamic boarding schools, this transformation is not only technical but also cultural.

This is evident from the following interview with an informant: "If Islamic boarding schools don't keep up with technological developments, they will be left behind. But we still have to be careful not to lose the distinctive characteristics of Islamic boarding schools (Informant 1)." This statement demonstrates a dual orientation: the drive to adapt to modernity and the need to maintain traditional identity. This condition is often referred to as organizational ambidexterity, which is the ability of an organization to balance exploration (innovation) and exploitation (value preservation) (Tarba et al., 2020).

However, there is debate in the literature regarding the direction of digital transformation in traditional institutions. On the one hand, the techno-centric approach argues that digitalization should be maximally encouraged to increase efficiency and competitiveness (Kane, 2019). From this perspective, delayed technology adoption can lead to institutional backwardness. On the other hand, the value-based transformation approach emphasizes that technology adoption must align with the organization's values and culture to avoid disrupting its identity (Hinings et al., 2018; Mamonov & Peterson, 2021).

This research supports the second perspective, in which digital transformation is not undertaken radically but rather through a selective, context-specific adaptation process. This is also consistent with research by Musolin et al. (2026) which shows that in Islamic education, technology is typically used as a supporting tool rather than a replacement for traditional

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systems. Compared with other studies on modern educational institutions (Marín et al., 2023; Hanelt et al., 2021), digital transformation is typically driven by efficiency, pedagogical innovation, and global competition. However, in the context of Islamic boarding schools, religious values and authority are the dominant variables that moderate the transformation process.

Thus, the transformation of Islamic boarding school management does not follow a linear pattern like that of modern organizations, but rather follows a hybrid pattern, namely the integration of technical digitalization with the preservation of traditional values. This transformation is: 1) Gradual, meaning it is not revolutionary; 2) Selective, meaning it is tailored to needs; 3) Value-driven, meaning Islamic norms control it. Therefore, digital transformation in Islamic boarding schools is not a process of technological substitution for tradition, but rather a negotiation between modernity and values, resulting in a hybrid, value-based transformation.

Integration of Traditional Values and Digital Innovation

Research findings indicate that traditional values play a very dominant role in guiding the digital transformation process at the Al-Munawwir Islamic Boarding School in South Sangatta. Values such as etiquette, morals, and obedience to the kyai remain the main foundation of every institutional practice, including the adoption of technology. "Technology is just a tool; the most important thing remains the etiquette and morals of the students."(Informant 2, 2026). Furthermore, there is institutional awareness that digitalization is not intended to replace tradition, but rather to strengthen it: "We don't want technology to replace tradition, but rather to help strengthen it." (Informant 3, 2026)

These findings confirm that digital transformation in the context of Islamic boarding schools is a value-driven process, driven by the organization's core values. From a theoretical perspective, this aligns with Nasta (2025) view, which emphasizes that the success of digital transformation is greatly influenced by an organization's ability to align technology with its values and identity.

Furthermore, Wang et al. (2023) from an institutional perspective, state that digital transformation does not occur in a vacuum but is always bound by existing norms, values, and institutional logic. In the context of Islamic boarding schools, the values of adab (adab) and akhlak (morality) serve as the institutional logic that guides how technology is accepted, used, and restricted. However, there is an academic debate regarding the relationship between technology and values in the process of organizational transformation.

The technological determinism approach holds that technology can significantly alter

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social and cultural structures (Albishri & Blackmore, 2024). From this perspective, the adoption of technology will ultimately drive inevitable changes in institutional values and practices. In contrast, the social shaping of technology approach emphasizes that technology is not neutral but is shaped by users' social, cultural, and value contexts (Sharifi, 2023). From this perspective, organizations can "tame" technology to align with their values..

This research supports the second approach. Technology does not change the values of Islamic boarding schools; rather, it adapts to them. In other words, a process of value alignment occurs in which technology is positioned as an instrument, not as the primary driver of change. This is also consistent with research (Huda et al., 2024) which shows that in Islamic education, technology is used within a normative framework governed by Islamic principles. Technology is not central; rather, it is subordinate to values.

Compared to the context of modern organizations, as explained by Paul et al. (2024), digital transformation is often oriented toward efficiency, innovation, and competitive advantage. In this model, organizational values tend to adapt to technological changes. Conversely, in the context of Islamic boarding schools, the opposite pattern occurs: technology follows values, not values follow technology. This indicates a transformation model that differs from the dominant paradigm in modern management literature.

Furthermore, this concept can be understood as a form of cultural embeddedness, in which technology is integrated into the cultural structure without altering the organization's fundamental identity. This strengthens the argument that digital transformation in tradition-based institutions is contextual and cannot be standardized with the more technocentric Western model.

Based on the above description, integrating traditional values and digital innovation in Islamic boarding schools yields a value-embedded digital transformation model, namely a process in which technology serves as an instrument guided by the organization's core values. This model has the following characteristics: 1) Value primacy, where values become the main direction, 2) Technology as an instrument, where technology is a tool, not an end, and 3) Cultural control, where Islamic norms control the use of technology. Thus, in value-based institutions, the success of transformation is not determined by the level of technology adoption, but by the ability to maintain a balance between innovation and identity.

Implementation of Digital-Based Management Functions

Research findings indicate that digital transformation at Al-Munawwir Islamic Boarding School, South Sangatta, has not only affected technical aspects but has also penetrated key

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management functions, namely planning, organizing, implementing, and monitoring. This transformation reflects the Islamic boarding school's management system adapting to the demands of the digital era.

a. Planning

Interview results indicate that digital aspects are beginning to be integrated into the Islamic boarding school's strategic Planning: "Now, in management meetings, we have started discussing the development of digital systems." (Informant 2, 2026). This finding indicates a shift from conventional Planning to digital-oriented Planning, in which technology is beginning to be considered part of the institutional strategy. In management theory, Planning is a fundamental function that determines an organization's direction (Robbins & Coulter, 2018).

In the context of digital transformation, Omrani et al. (2024) emphasize that the success of transformation is largely determined by strategy rather than solely by technology. This means that digital integration in Planning is an early indicator of an organization's readiness to face transformation. However, compared to modern organizations that have adopted data-driven Planning (Butt et al., 2024), planning in Islamic boarding schools is still in its early stages and exploratory. This indicates a gap between local practices and global trends, but also demonstrates a process of contextual adaptation..

b. Organizing

Transformation is also evident in the organizational structure, which is beginning to accommodate new roles: "There are already students and alumni helping manage the Islamic boarding school's social media." (Informant 3, 2026). The emergence of informal roles in technology management demonstrates organizational flexibility, namely the organization's ability to adapt its structure to new needs. In the literature, this phenomenon is often associated with the emergence of digital roles within organizations (Konopik et al., 2022).

However, unlike modern organizations that tend to establish formal, dedicated information technology units, Islamic boarding schools rely on a community-based approach (students and alums). This demonstrates the characteristics of communal-based Organizing, which is a hallmark of value- and tradition-based institutions. Debate arises when comparing this with modern organizational theory, which emphasizes the importance of formalizing structures (Phillips & Klein, 2023). In the context of Islamic boarding schools, informal structures actually become a strength because they are more flexible and align with the existing collective culture.

c. Actuating

Digital implementation in daily activities is evident in the use of digital communication

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media: "We use WhatsApp for communication between the ustadz and the students." (Informant 4, 2026). The use of digital communication platforms demonstrates the integration of technology into operational practices. From a management perspective, the implementation function relates to how plans are effectively executed (Anderson, 2023).

This finding aligns with Omol (2023) research, which states that digital communication technology improves the efficiency of coordination and interaction within an organization. Furthermore, the use of simple applications like WhatsApp demonstrates that digital transformation does not always require complex technology; it can begin with readily accessible tools (low-cost digital adoption). However, the literature has criticized the use of unstructured technology for fragmented communication and a lack of organizational control (Kaganer et al., 2023). In the context of Islamic boarding schools, this risk can be relatively minimized by the presence of value-based social control and the authority of the kyai.

d. Controlling)

The supervisory function has also transformed through the use of digital documentation: "Now it is easier to monitor activities because there's digital documentation." (Informant 1, 2026). This indicates a shift towards digital monitoring, where the evaluation process becomes more transparent and documented. In management theory, supervision aims to ensure that activities are running according to plan (Robbins et al., 2020).

In the digital context, Dong & Verhoef (2024) emphasize that technology enables real-time, data-driven monitoring and evaluation. However, implementation in Islamic boarding schools remains rudimentary and not yet fully integrated.

A debate has arisen regarding the potential for digitalization in supervision, which can improve control but also risks eroding trust and interpersonal relationships within the organization (Ball, 2022). However, in the context of Islamic boarding schools, supervision remains integrated with a moral and values approach, thus avoiding complete reliance on technology.

The implementation of digital-based management functions in Islamic boarding schools forms an adaptive-hybrid management model, namely a management system that integrates classic functions (planning, organizing, actuating, controlling) with digital technology in a gradual, context-specific manner. This model has the following characteristics: 1) Strategically emerging, meaning digital planning is still developing; b) Structurally flexible, meaning the organization is adaptive and community-based; 3) Operationally pragmatic, meaning the use of simple but effective technology; and 4) Culturally controlled, meaning supervision remains value-based. Thus, the description above shows that digital transformation in management

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functions is not always radical, but can develop through an adaptive process that is in line with organizational culture.

Digital Transformation Challenges

Research findings indicate that digital transformation at Al-Munawwir Islamic Boarding School in South Sangatta faces multidimensional challenges across infrastructure, human resources, and organizational culture. This confirms that digital transformation is not simply a technological issue, but is also closely related to the readiness of social and institutional systems.

a. Infrastructure Limitations

One of the main obstacles faced is limited technological infrastructure, particularly internet access: "The main obstacle is the internet network, which is sometimes unstable." This problem indicates a digital divide, namely the disparity in access to technology between regions or institutions (Quansah, 2023). In the context of education, limited infrastructure is a significant obstacle to the optimal implementation of digital transformation.

This finding aligns with research (Mhlanga, 2020) indicating that limited access to technology is a major factor hindering the digitalization of education, especially in developing regions. However, there is debate in the literature regarding the extent to which infrastructure is a key determinant. Technology-centric approaches tend to position infrastructure as a primary prerequisite for transformation (Hu et al., 2023). Meanwhile, the capability-based approach argues that an organization's ability to manage constraints is more crucial to the success of transformation (Kraus et al., 2021).

In the context of Islamic boarding schools, this study's findings indicate that infrastructure limitations do not completely hinder transformation, but rather slow it down and create a more gradual pattern of adaptation.

b. Human Resource Capacity

The next challenge concerns educators' low digital literacy: "Not all ustadz are accustomed to using technology." This indicates a digital literacy gap, which is a critical factor in educational transformation (Xu et al., 2025).

Bond (2020) research also confirms that human resource readiness is a key factor in the successful implementation of technology in learning. Without adequate competencies, technology cannot be utilized optimally. However, there is debate in the literature regarding the most effective approach to addressing this issue. The skill-based training approach emphasizes the importance of technical training to improve digital capabilities (Xia et al., 2022). Meanwhile, the socio-cultural learning approach argues that capacity building must be contextual and based

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on social practices (Selwyn et al., 2023).

In the context of Islamic boarding schools (pesantren), the second approach is more relevant, as the learning process and technology adoption tend to occur collectively through interactions among ustadz (teachers), students, and the pesantren community.

c. Cultural Resistance

Besides technical and competency aspects, the most complex challenge is cultural resistance to technology use: "There are concerns that students use gadgets too often." This reflects cultural resistance, namely the rejection or caution of changes perceived as potentially disrupting existing values (Sent & Kroese, 2022).

In the context of Islamic boarding schools, these concerns relate to the potential negative impact of technology on students' morals and behavior. This aligns with research by Kärki (2024) which shows that digital technology brings not only benefits but also risks such as distraction, decreased focus, and changes in social behavior. However, in the literature, there are two contrasting views.

The optimistic-digital perspective argues that technology can improve the quality of learning and should be widely adopted (Zawacki-Richter et al., 2024). In contrast, the critical perspective emphasizes that technology must be strictly controlled due to its potential to disrupt social values and structures (Habib, 2025).

The findings of this study indicate that Islamic boarding schools (pesantren) take a moderate stance, selectively adopting technology while maintaining value-based control. This suggests a process of cultural filtering in which technology is screened for compatibility with Islamic values. The challenges of digital transformation in Islamic boarding schools create a socio-technical constraint system, in which technological, human, and cultural factors interact to determine the direction and pace of transformation.

The main characteristics of this system include: 1) Infrastructure-limited, meaning limited access to technology; 2) Capability-constrained, meaning limited human resource competencies; and 3) Culture-filtered, where values drive technology adoption. Therefore, the success of digital transformation depends not only on the availability of technology but also on the organization's ability to manage social and cultural dynamics adaptively.

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values drive technology adoption. Therefore, this study confirms that the success of digital transformation depends not only on the availability of technology but also on the organization's ability to manage social and cultural dynamics adaptively.

The results show that the transformation of Islamic boarding school management at Al-Munawwir Islamic Boarding School, South Sangatta, is occurring adaptively and gradually, without eliminating its traditional identity. This transformation integrates Islamic values , such as etiquette, morals, and the authority of the kyai (Islamic boarding school), with digital innovation in a contextual manner. This finding aligns with the concept of value-based digital transformation, in which technology is aligned with the organization's core values as the primary driver of change. (Vial, 2019; Hinings et al., 2018),

The transformation includes administrative digitization, strengthening technology-based learning, and developing digital communication, integrated into management functions (planning, organizing, implementing, and monitoring). Digitalization is complementary (augmentative), in which technology does not replace traditional methods such as bandongan and sorogan, but rather enhances their effectiveness. This demonstrates that Islamic boarding school transformation is a complex organizational process, not solely a technological one. This finding strengthens the argument that digital transformation is not only a technological phenomenon, but also a complex organizational process (Verhoef et al., 2021)

However, the success of the transformation is influenced by internal readiness, particularly human resources and organizational culture Dwivedi et al. (2020) and (Bond, 2020). Limited infrastructure, low digital literacy, and cultural resistance are key challenges that reflect the negotiation between tradition and modernity (Howcroft & Taylor, 2022).

Conceptually, this model can be referred to as the "Value-Embedded Adaptive Digital Transformation Model." This model emphasizes that the level of technology adoption does not determine the success of digital transformation in traditional institutions, but rather the ability to integrate technology with values and management systems in a balanced manner. Based on these findings, this study develops the Value-Embedded Adaptive Digital Transformation model, which emphasizes integrating traditional values, digital innovation, and adaptive management as key to sustainable institutional transformation.

CONCLUSION

The transformation of Islamic boarding school management at Al-Munawwir Islamic Boarding School, South Sangatta, demonstrates an adaptive, gradual, and value-based pattern, integrating digitalization of administration, learning, and communication into management

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functions without shifting traditional identities. The findings confirm that digitalization is complementary (augmentative), with Islamic values such as adab, morals, and the authority of the kyai as the main drivers of the transformation. Despite challenges such as limited infrastructure, low digital literacy, and cultural resistance, the transformation process continues through contextual adaptation mechanisms that form a socio-technical constraint system. This study develops a Value-Embedded Adaptive Digital Transformation model that integrates traditional values, digital innovation, and adaptive management, and argues that the success of transformation in tradition-based institutions depends on sustainably balancing innovation and identity.

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