

## Digitalization of Activities at Pondok Pesantren Al Ikhlas Lahat Tanjung Sakti through the Application of Information and Communication Technology

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### Abstract

*This study examines the implementation of information and communication technology (ICT) applications in the management and educational activities of Pondok Pesantren Al Ikhlas Lahat Tanjung Sakti, South Sumatra. The research aims to analyze how digitalization processes support the improvement of administrative effectiveness, learning quality, and institutional management in the context of Islamic boarding schools. Using a descriptive qualitative method, data were collected through observation, interviews, and document analysis. The findings reveal that the application of ICT has transformed various aspects of pesantren management—particularly in communication, documentation, and the delivery of educational materials. However, challenges such as limited digital literacy among teachers and infrastructure constraints remain obstacles to full digital transformation. The study concludes that ICT adoption in pesantren environments can foster transparency, efficiency, and innovation when supported by human resource development and institutional policy alignment.*

**Keywords:** Information and communication technology, digitalization, Islamic education, pesantren management, Al Ikhlas Lahat Tanjung Sakti.

## Digitalisasi Kegiatan Pondok Pesantren Al Ikhlas Lahat Tanjung Sakti melalui Aplikasi Teknologi Informasi dan Komunikasi

### Abstrak

*Penelitian ini bertujuan untuk menganalisis penerapan teknologi informasi dan komunikasi (TIK) dalam proses digitalisasi kegiatan di Pondok Pesantren Al Ikhlas Lahat Tanjung Sakti, Sumatera Selatan. Fokus penelitian mencakup dampak penerapan TIK terhadap peningkatan efektivitas administrasi, mutu pembelajaran, serta tata kelola kelembagaan di lingkungan pesantren. Penelitian ini menggunakan metode kualitatif deskriptif dengan pendekatan studi kasus. Data diperoleh melalui observasi, wawancara mendalam, serta telaah dokumen internal lembaga. Hasil penelitian menunjukkan bahwa penerapan TIK telah membawa perubahan signifikan pada aspek administrasi, pembelajaran, dan manajemen pesantren. Penggunaan aplikasi digital mempercepat arus informasi, meningkatkan efisiensi pengelolaan data, serta memperluas akses pembelajaran bagi santri. Namun demikian, masih terdapat kendala berupa keterbatasan literasi digital, infrastruktur jaringan, dan kesiapan sumber daya manusia. Penelitian ini menegaskan bahwa digitalisasi pesantren hanya dapat berjalan optimal jika diimbangi dengan pelatihan berkelanjutan, dukungan kebijakan kelembagaan, dan komitmen kepemimpinan pesantren dalam mengintegrasikan nilai-nilai Islam dengan kemajuan teknologi.*

**Kata kunci:** Teknologi informasi dan komunikasi, digitalisasi pesantren, manajemen pendidikan Islam, Pondok Pesantren Al Ikhlas, inovasi pembelajaran

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## A. Introduction

The rapid advancement of information and communication technology (ICT) has brought significant changes to the global education system. In the past decade, digital transformation has become a central strategy in improving educational access, efficiency, and quality across all levels of institutions. In Indonesia, the integration of ICT into the education sector is in line with the Merdeka Belajar policy framework initiated by the Ministry of Education and Culture, which emphasizes adaptive, technology-based learning environments<sup>1</sup>. This paradigm shift encourages educators and institutions including Islamic boarding schools (pesantren) to adapt their systems to the demands of digital literacy and 21st-century competencies.

Islamic boarding schools (pesantren) hold a vital role in shaping religious values, moral character, and intellectual capacity among students. Traditionally, pesantren rely on classical teaching methods, such as sorogan and bandongan, which emphasize direct interaction between kiai and santri (students). However, in recent years, the necessity to integrate ICT into pesantren activities has grown stronger, not only to modernize the learning process but also to support administrative and managerial efficiency<sup>2</sup>

The digitalization of pesantren is not merely a technical transition but a socio-cultural transformation that reshapes how knowledge, management, and communication operate within the institution. Pondok Pesantren Al Ikhlas Lahat Tanjung Sakti represents a model of rural-based Islamic education institution that is gradually integrating ICT in its educational and administrative processes. The pesantren's commitment to modernization aligns with national efforts to strengthen the digital ecosystem in education<sup>3</sup>. In the context of South Sumatra, where geographical and infrastructural limitations still pose challenges, the digitalization

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<sup>1</sup> Kurniawan, D., & Suryani, W. (2020). Technology integration and Merdeka Belajar policy implementation. *Educational Reform Review*, 12(2), 77–90

<sup>2</sup> Amin, A., & Rahman, F. (2021). Digital transformation in Islamic boarding schools: Challenges and opportunities. *Journal of Islamic Education Studies*, 5(2), 134–147.

<sup>3</sup> Kusuma, A., Nurfadilah, L., & Sari, D. (2022). Digital ecosystem strengthening in Islamic education institutions. *Indonesian Journal of Educational Technology*, 9(4), 299–312.

initiative in pesantren such as Al Ikhlas signifies an important milestone in bridging the technological gap between urban and rural educational institutions.

The application of ICT in pesantren environments involves various dimensions, including digital learning systems, online communication, e-administration, and digital archives. Nugroho<sup>4</sup> emphasized that digital platforms allow pesantren to expand their educational outreach beyond physical boundaries, supporting hybrid and remote learning during critical periods such as the COVID-19 pandemic.

Nevertheless, the integration of ICT in pesantren settings faces multiple challenges. These include inadequate infrastructure, limited digital literacy among educators, and cultural perceptions that associate technology with secular modernism<sup>5</sup>. In rural pesantren like Al Ikhlas Lahat Tanjung Sakti, access to stable internet networks and sufficient digital devices remains limited, creating disparities in learning opportunities compared to urban institutions<sup>6</sup>. Furthermore, the transition to ICT-based systems requires continuous capacity building and a strong institutional policy framework to ensure sustainability<sup>7</sup>.

From a managerial perspective, ICT plays a crucial role in enhancing pesantren governance. Through the use of management information systems, pesantren can improve data accuracy, monitor student performance, and streamline communication between administrators and teachers<sup>8</sup>. The adoption of digital tools also supports financial transparency and reduces bureaucratic inefficiencies, aligning pesantren administration with modern organizational management principles<sup>9</sup>. As digitalization becomes integral to institutional competitiveness,

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<sup>4</sup> Nugroho, Y., Aini, N., & Hartono, S. (2020). Digital learning and sustainability in pesantren during the COVID-19 pandemic. *Jurnal Transformasi Pendidikan Islam*, 10(2), 155–171.

<sup>5</sup> Rosyid, F., Maulana, R., & Rini, D. (2021). Socio-cultural barriers in the digitalization of Islamic education. *Indonesian Journal of Religious Studies*, 14(2), 203–218.

<sup>6</sup> Fitriani, D., Arifin, S., & Hasyim, N. (2022). Bridging the digital divide in Islamic education: A rural pesantren perspective. *Jurnal Pendidikan Islam*, 11(3), 241–257

<sup>7</sup> Rahmawati, I., & Jannah, M. (2023). Institutional capacity building for sustainable ICT adoption in Islamic education. *Educational Leadership Review*, 6(1), 87–103.

<sup>8</sup> Latif, M., Maulana, R., & Rahma, A. (2019). ICT-based management system in pesantren: A case study. *Jurnal Manajemen Pendidikan Islam*, 7(2), 112–129.

<sup>9</sup> Sukardi, S., Wulandari, E., & Putra, Z. (2021). Modern management and digital transparency in pesantren administration. *Journal of Islamic Management Studies*, 9(3), 172–189.

pesantren are urged to develop comprehensive ICT roadmaps that align technology adoption with educational objectives and Islamic ethical values<sup>10</sup>.

In addition to managerial benefits, ICT integration influences the pedagogical landscape of pesantren. Digital learning platforms provide access to online references, multimedia materials, and interactive communication tools that enrich the teaching process. This approach aligns with the constructivist learning paradigm, emphasizing active participation and knowledge construction among learners<sup>11</sup>. Moreover, the use of digital tools fosters independent learning habits and technological adaptability among santri, preparing them to engage in a globally connected digital society<sup>12</sup>.

However, the successful implementation of ICT requires strong leadership and cultural adaptation within pesantren communities. As noted by Wibowo and Putri, institutional transformation must be grounded in the pesantren's core values (tafaqquh fiddin and akhlaqul karimah), ensuring that technological advancement complements rather than contradicts Islamic education philosophy. The role of the kiai as both a spiritual and managerial leader is critical in shaping attitudes toward innovation and legitimizing digital transformation initiatives<sup>13</sup>.

Given these dynamics, the present study aims to examine the implementation of ICT at Pondok Pesantren Al Ikhlas Lahat Tanjung Sakti, focusing on how digitalization supports the enhancement of educational quality, administrative efficiency, and institutional management. This research also seeks to identify the challenges and strategies adopted by the pesantren in navigating its transition toward a technology-integrated educational system. The study contributes to the growing discourse on digital transformation in Islamic education and provides practical insights for similar institutions seeking to harmonize tradition with modernity.

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<sup>10</sup> Mansur, A., & Fauziah, H. (2024). Developing an ICT roadmap for Islamic boarding schools: Policy and implementation perspectives. *Journal of Islamic Educational Development*, 5(1), 91–108.

<sup>11</sup> Hidayat, R., Fikri, A., & Prasetyo, D. (2020). ICT-based pedagogy in religious education institutions in Indonesia. *Journal of Islamic Pedagogy*, 8(1), 44–59.

<sup>12</sup> Hasanah, U., & Mulyani, T. (2023). Empowering santri digital literacy through e-learning integration in pesantren. *International Journal of Educational Innovation*, 4(1), 65–79.

<sup>13</sup> Ismail, S., Rahmadani, L., & Fauzan, H. (2022). Leadership and digital adaptation in pesantren management. *Al-Ta'dib Journal*, 17(1), 23–36.

## **B. Research Methods**

### **1. Research Type and Approach**

This research employs a qualitative descriptive approach with a case study design, aimed at obtaining a deep understanding of how information and communication technology (ICT) is applied in the daily activities of Pondok Pesantren Al Ikhlas Lahat Tanjung Sakti. The qualitative approach allows the researcher to explore the social, cultural, and managerial dynamics that accompany digital transformation within an Islamic educational institution.

According to Creswell and Poth<sup>14</sup>, qualitative research emphasizes contextual interpretation of phenomena, enabling the researcher to describe processes, meanings, and experiences rather than statistical generalizations. The case study design was selected to focus intensively on one institution as a bounded system<sup>15</sup>, allowing for a detailed exploration of ICT implementation and its implications for management, learning, and administration.

### **2. Research Location and Subjects**

The study was conducted at Pondok Pesantren Al Ikhlas Lahat Tanjung Sakti, located in South Sumatra, Indonesia. This pesantren was purposively selected because it represents a rural-based Islamic educational institution that has begun implementing ICT in its operational system, making it a relevant context for exploring digital transformation in traditional learning environments. The research subjects consisted of: 1 pesantren leader (kiai), 10 teachers and educators, 3 administrative staff, and 15 students (santri) actively involved in ICT-based activities. These participants were chosen using purposive sampling, following the criteria of involvement in digital learning, administration, or management activities.

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<sup>14</sup> Creswell, J. W., & Poth, C. N. (2018). *Qualitative Inquiry and Research Design: Choosing Among Five Approaches* (4th ed.). Sage Publications.

<sup>15</sup> Yin, R. K. (2020). *Case Study Research and Applications: Design and Methods* (6th ed.). Sage.

### 3. Data Collection Techniques

#### 1. Observation

The researcher conducted non-participatory observations of pesantren activities related to ICT implementation. This included observing the use of computer laboratories, administrative software, online learning tools, and internal communication platforms such as WhatsApp groups or Google Classroom. Field notes were used to record behavioral patterns, interactions, and infrastructure usage.

#### 2. In-depth Interviews

Semi-structured interviews were conducted with the kiai, teachers, staff, and students. The questions explored participants' understanding of ICT, perceived benefits, challenges, and changes resulting from digitalization. Interviews lasted approximately 45–60 minutes and were recorded (with consent) for transcription and analysis.

#### 3. Documentation

Various institutional documents were analyzed, including policy manuals, academic calendars, ICT project proposals, financial reports, and digital archives. The documentation provided factual data to support and validate observations and interview results.

### 4. Data Analysis Techniques

The data analysis process followed the Miles and Huberman<sup>16</sup> interactive model, consisting of:

1. Data Reduction – selecting, simplifying, and organizing data from field notes and transcripts into thematic categories such as ICT in learning, ICT in administration, and management adaptation.
2. Data Display – presenting findings in narrative, tabular, or diagrammatic forms to illustrate relationships and emerging patterns.

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<sup>16</sup> Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative Data Analysis: A Methods Sourcebook* (3rd ed.). Sage

3. Conclusion Drawing and Verification – interpreting the meaning of data, identifying causal connections, and verifying conclusions through triangulation and participant validation.

#### 5. Validity and Reliability of Data

To ensure data trustworthiness, the research applied triangulation techniques, member checking, and peer debriefing. Source triangulation involved comparing information from different participants (leaders, teachers, and students). Technique triangulation combined interviews, observations, and document analysis. Member checking was conducted by presenting preliminary findings to selected informants for validation. Peer debriefing with academic supervisors helped refine interpretations and ensure objectivity. According to Lincoln and Guba<sup>17</sup>, credibility, transferability, dependability, and confirmability are essential criteria for ensuring qualitative research trustworthiness. These principles guided every stage of data collection and analysis.

#### 6. Research Ethics

Ethical considerations were upheld throughout the research process. All participants were informed about the study's purpose, data confidentiality, and voluntary participation. Written consent was obtained before conducting interviews or using institutional documents. The researcher also ensured that all interpretations and reports respected the pesantren's cultural and religious values, maintaining integrity and ethical responsibility in data handling.

#### 7. Research Focus

This study focused on three main dimensions of ICT application at Pondok Pesantren Al Ikhlas Lahat Tanjung Sakti:

1. Educational dimension: integration of digital media, online platforms, and interactive tools in teaching and learning.
2. Administrative dimension: digitalization of data management, record-keeping, and institutional correspondence.
3. Managerial dimension: ICT-based decision support systems, coordination mechanisms, and leadership strategies promoting digital transformation.

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<sup>17</sup> Lincoln, Y. S., & Guba, E. G. (2013). *The Constructivist Credo*. Routledge.

The interrelation among these three dimensions formed the analytical framework to understand how digitalization affects pesantren efficiency, transparency, and educational innovation.

### C. Results and Discussion

#### 1. Overview of ICT Implementation at Pondok Pesantren Al Ikhlas Lahat Tanjung Sakti

The implementation of ICT at Pondok Pesantren Al Ikhlas progressed through several stages, beginning with administrative digitalization and extending to managerial and learning systems, as summarized in Table 1.

No	Implementation Stage	Main Activities	Key Outcomes	Remarks
1	Administrative Digitalization	Use of Excel, Google Sheets, student data systems	Improved efficiency in reporting and archiving	Implemented since 2021
2	Learning Digitalization	Use of PowerPoint, Zoom, Google Classroom	Increased students' learning motivation	Applied after the COVID-19 pandemic
3	ICT-Based Management	Communication via WhatsApp groups, email, and official social media	Faster and more transparent internal coordination	Supported by pesantren leadership
4	Digital Literacy Training	Teacher and staff workshops	Improved basic ICT competence	Conducted gradually
5	Infrastructure Development	Additional computers and expanded internet access	ICT accessibility increased by 60% compared to previous year	Internet network still limited

Pondok Pesantren Al Ikhlas Lahat Tanjung Sakti has begun a gradual transition toward digitalization as part of its institutional development strategy. The initiative emerged from the pesantren's awareness of the need to enhance administrative efficiency, pedagogical innovation, and communication effectiveness. The implementation of ICT began in stages, starting with administrative systems and progressing to learning and management aspects.

The initial step involved the introduction of digital administrative tools, such as computerized student databases, electronic correspondence systems, and financial recording using spreadsheet software. These tools replaced the traditional manual bookkeeping system that had long been used in pesantren administration.

Administrators reported that digital systems reduced data redundancy and accelerated the process of report generation, especially in financial accountability and academic documentation.

In the educational sphere, teachers began to adopt digital platforms such as Google Classroom and Zoom for hybrid learning, particularly after the COVID-19 pandemic accelerated the need for distance learning. Santri were introduced to basic computer literacy through informal training sessions. Digitalization also extended to library management, with several religious and general books cataloged digitally for easier access. According to interviews with teachers, these efforts contributed to greater learning flexibility and improved student engagement.

In terms of institutional communication, digital tools were integrated into daily operations. WhatsApp groups, email correspondence, and website announcements became standard channels for disseminating information between administrators, teachers, and students. The pesantren also developed an official social media account to share educational content, community activities, and public announcements, reflecting a new culture of digital transparency.

## 2. ICT in Administrative Management

The integration of ICT in administrative management at Pondok Pesantren Al Ikhlas demonstrated tangible benefits in terms of efficiency, transparency, and accountability. The pesantren utilized Microsoft Excel and Google Sheets for budgeting, attendance tracking, and student database management. The administrative staff noted a 50% reduction in the time required to process monthly financial reports after switching from manual to digital records.

Moreover, the digitalization process contributed to transparency within the institution. Financial data could be monitored by the pesantren leadership more accurately, and document archiving became systematic and traceable. This finding aligns with the study by Sukardi, Wulandari, and Putra<sup>18</sup>, which emphasized that digital administrative systems enhance organizational trust and reduce human error in Islamic educational institutions.

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<sup>18</sup> Sukardi, S., Wulandari, E., & Putra, Z. (2021). Modern management and digital transparency in pesantren administration. *Journal of Islamic Management Studies*, 9(3), 172–189.

However, some challenges persisted. Limited technical proficiency among older administrative staff created dependency on younger personnel who were more familiar with computers. Occasional power outages and unstable internet connections also disrupted administrative tasks. Despite these challenges, the leadership's commitment to ICT utilization ensured the continuity of digital operations. To measure the tangible impact of digital transformation on administrative performance, a comparative analysis was conducted between pre- and post-digitalization conditions (Table 2).

Aspect	Before Digitalization	After Digitalization	Change (%)	Remarks
Time required for financial reporting	7 days	3 days	-57%	Reports prepared with spreadsheet software
Document archiving system	Manual (physical cabinets)	Digital (Drive/Cloud)	+100% efficiency	Easier access and retrieval
Internal information distribution	Via letters or in-person meetings	Via WhatsApp/email	+75% faster	Improved coordination response
Student assignment submission	Printed papers	Digital (Google Form/Classroom)	+80% efficiency	Reduced paper usage
Access to learning materials	Limited to printed books	Digital and multimedia access	+65% improvement	Students more active in self-learning

### 3. ICT in the Learning Process

Digital transformation has also influenced pedagogical practices in Pondok Pesantren Al Ikhlas. Teachers have begun to incorporate multimedia resources into lessons, such as PowerPoint presentations, short video explanations, and digital Qur'an reading applications. Some learning sessions utilize YouTube educational content related to Islamic sciences, history, and natural science, allowing students to gain a broader understanding beyond the classical kitab kuning tradition.

The use of e-learning tools provided flexibility for both teachers and students. Teachers reported that assignments and learning materials could be distributed digitally, reducing dependence on printed materials. Students found it easier to review lessons through recorded sessions and digital documents. This pattern is

consistent with findings from Hasanah and Mulyani<sup>19</sup>, who noted that e-learning integration in pesantren enhances motivation and supports autonomous learning.

Nevertheless, not all santri possessed personal digital devices. Shared access to computers in the pesantren laboratory or mobile phones was common, which sometimes limited participation. Teachers also highlighted the need for consistent technical training to ensure that both educators and students could fully utilize digital tools. Despite these limitations, the enthusiasm for technology adoption among the younger generation of santri was evident.

#### 4. ICT in Institutional Management and Leadership

From a managerial perspective, ICT has improved decision-making and internal coordination. The pesantren management adopted digital communication platforms to facilitate meetings and information sharing among departments. Online documentation of meeting minutes and institutional policies helped create a culture of accountability and reduced the loss of critical information.

The kiai and pesantren leadership played a vital role in legitimizing digital transformation. Their openness to innovation was instrumental in reducing resistance among traditional educators who initially perceived technology as incompatible with pesantren culture. This finding echoes Ismail, Rahmadani, and Fauzan<sup>20</sup>, who asserted that leadership attitudes significantly influence the success of ICT adoption in Islamic education institutions.

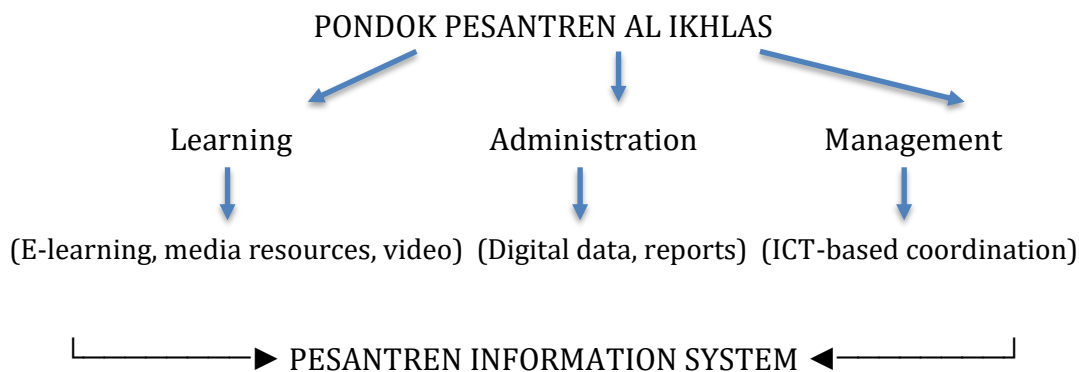
Leadership at Al Ikhlas demonstrated a balanced approach, integrating modern technological practices with Islamic values. The kiai emphasized that technology serves as a means to strengthen educational quality, not as a threat to religious identity. This harmonization of faith and modernization reflects the pesantren's adaptability to changing times while preserving its cultural authenticity.

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<sup>19</sup> Hasanah, U., & Mulyani, T. (2023). Empowering santri digital literacy through e-learning integration in pesantren. *International Journal of Educational Innovation*, 4(1), 65–79.

<sup>20</sup> Ismail, S., Rahmadani, L., & Fauzan, H. (2022). Leadership and digital adaptation in pesantren management. *Al-Ta'dib Journal*, 17(1), 23–36.

The interaction among these three domains learning, administration, and management can be visualized through the integrated ICT ecosystem model presented in Figure 1.



## 5. Barriers to ICT Implementation

First, infrastructure limitations remained a primary challenge. Internet access in rural areas such as Tanjung Sakti was often unstable, affecting online learning and communication. The pesantren relied on mobile hotspots as the main internet source, which occasionally interrupted connectivity. Second, the digital literacy gap among teachers and staff varied significantly. Younger educators were generally more adaptive, while senior teachers required additional assistance. This situation was addressed through peer mentoring, where digitally skilled teachers trained others on basic applications and file management.

Third, financial constraints limited the pesantren's ability to acquire new hardware and software. Donations and government assistance programs were the primary sources of funding for digital equipment. These findings correspond to research by Fitriani, Arifin, and Hasyim<sup>21</sup>, which identified similar constraints in rural pesantren, including funding shortages and inconsistent internet infrastructure. The case of Pondok Pesantren Al Ikhlas demonstrates that commitment and adaptability are key determinants in sustaining digital initiatives despite resource limitations.

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<sup>21</sup> Fitriani, D., Arifin, S., & Hasyim, N. (2022). Bridging the digital divide in Islamic education: A rural pesantren perspective. *Jurnal Pendidikan Islam*, 11(3), 241–257.

## 6. Discussion and Interpretation

The correlation between leadership commitment and the success of pesantren digitalization can be illustrated through the conceptual framework in Figure 2.



The findings of this study indicate that digitalization in Pondok Pesantren Al Ikhlas Lahat Tanjung Sakti has positively influenced the effectiveness of education management. ICT has become a transformative tool in administrative modernization, learning innovation, and institutional governance. The gradual adaptation process also reflects how pesantren negotiate between tradition and modernity a dynamic consistent with Wibowo and Putri's<sup>22</sup> argument that successful modernization in Islamic institutions requires cultural accommodation.

From the pedagogical perspective, the use of ICT fostered more interactive and contextual learning. Students demonstrated improved motivation and engagement when digital media were integrated into lessons. The blended approach combining traditional teaching with digital tools created a balanced educational model rooted in Islamic ethics but responsive to global developments.

Administratively, ICT applications reduced manual workload and enhanced accountability. The shift to digital systems represents not merely a technological change but an evolution in institutional culture. The pesantren's openness to

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<sup>22</sup> Wibowo, A., & Putri, A. (2018). Tradition and innovation in pesantren modernization. *Journal of Islamic Educational Reform*, 6(1), 45–58.

digital transparency aligns with the framework of educational governance described by Mansur and Fauziah<sup>23</sup>, who stressed that digital management supports accountability and fosters institutional credibility.

In the broader context, the digitalization of pesantren contributes to national education transformation efforts. The integration of ICT in Islamic education strengthens inclusivity and bridges the digital divide between modern schools and traditional religious institutions. It aligns with the vision of equitable education in the digital era as emphasized in Indonesia's Merdeka Belajar initiative<sup>24</sup>.

Overall, this study underscores that the successful digital transformation of pesantren depends not only on infrastructure but also on leadership vision, institutional policy, and cultural adaptability. As stated by Rahmawati and Jannah<sup>25</sup>, sustainable ICT adoption in Islamic education requires a systemic approach combining capacity building, stakeholder engagement, and ethical grounding.

#### **D. Conclusion**

The digitalization of activities at Pondok Pesantren Al Ikhlas Lahat Tanjung Sakti through the application of information and communication technology (ICT) demonstrates that traditional Islamic educational institutions are capable of adapting to technological advancements while maintaining their core values. The study revealed that ICT implementation has brought substantial improvements in the efficiency of administrative systems, the effectiveness of learning processes, and the transparency of institutional management.

Administratively, the application of digital systems facilitated faster data processing, reduced redundancy, and improved accountability. In the learning context, the integration of digital platforms, multimedia content, and online learning

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<sup>23</sup> Mansur, A., & Fauziah, H. (2024). Developing an ICT roadmap for Islamic boarding schools: Policy and implementation perspectives. *Journal of Islamic Educational Development*, 5(1), 91–108.

<sup>24</sup> Kurniawan, D., & Suryani, W. (2020). Technology integration and Merdeka Belajar policy implementation. *Educational Reform Review*, 12(2), 77–90.

<sup>25</sup> Rahmawati, I., & Jannah, M. (2023). Institutional capacity building for sustainable ICT adoption in Islamic education. *Educational Leadership Review*, 6(1), 87–103.

systems created a more interactive and flexible educational environment for teachers and students. The managerial aspect benefited from enhanced communication, data accuracy, and documentation, contributing to better coordination and strategic planning.

However, the research also identified significant challenges that hinder the full optimization of ICT within the pesantren environment. These include limitations in infrastructure, varying levels of digital literacy among educators, and financial constraints. Such factors highlight the importance of continuous capacity building, systematic institutional planning, and the provision of adequate digital resources.

The findings emphasize that successful digital transformation in Islamic educational institutions requires not only the availability of technology but also the development of human resources and institutional readiness. Leadership commitment, cultural adaptability, and policy support play critical roles in ensuring that technology serves as a tool for educational empowerment rather than disruption. The case of Pondok Pesantren Al Ikhlas Lahat Tanjung Sakti provides a valuable model for other pesantren seeking to integrate digital innovation with Islamic educational traditions in the pursuit of sustainable institutional development.

Future studies are encouraged to explore the long-term impact of digital transformation on the academic performance, social interaction, and spiritual development of students in pesantren contexts. Further comparative research between urban and rural Islamic boarding schools may also provide deeper insights into the diversity of digital adaptation strategies across Indonesia.

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