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# Application Of Information Technology In Islamic Boarding Schools In Indonesia

**Abdurrahman Iskandar[1], Mohamad Hasan Nurrahmat[2]**

[1,2]Telecommunication Engineering, Akademi Telekomunikasi Indonesia Gemilang Jakarta

Corresponding Author: abdurrahman.iskandar.mt@gmail.com

**Abstract**

Background: The development of information technology has driven transformation in Islamic boarding schools in the aspects of learning, administration, and da'wah, but its implementation still faces obstacles in infrastructure and digital literacy. Objective: This study reviews the implementation of information technology in Islamic boarding schools to formulate an applicable IT development roadmap. Type and method: This study is a systematic literature review that collects and synthesizes secondary studies related to the application of IT in Islamic boarding schools. Population and sample: The population consists of academic literature and practice reports from the most recent period; the sample was selected based on the inclusion criteria of relevance and methodological quality. Data analysis instruments and techniques: The main instrument is a data extraction sheet; the analysis technique uses thematic narrative synthesis to identify patterns of benefits, challenges, and solutions. Research results: The results show three main benefit domains: digitalization of learning that increases access and effectiveness, a pesantren management system that speeds up administration and improves accountability, and the use of websites and social media to expand the reach of da'wah; obstacles include limited infrastructure, low digital literacy of teachers and students, and limited funding. Conclusion: Adoption of IT in Islamic boarding schools promises to improve the quality of education and operational efficiency but requires infrastructure improvement strategies, digital literacy training programs, clear IT governance, and partnerships for funding for sustainable implementation.

**Keywords: Digitalization, Information Technology, Islamic Boarding School, Management System, Online Dawah**

## INTRODUCTION

Islamic boarding schools (pesantren) are Islamic educational institutions that excel in tradition, knowledge, and engaging learning. They are the oldest Islamic educational institutions in Indonesia and are recognized as institutions capable of fostering multiculturalism among



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Muslims.(Mujiburrohman, 2024). Islamic boarding schools in Indonesia are spread across various regions, both in rural and urban areas.

In general, an Islamic boarding school includes a kiai (religious leader), santri (students), a mosque, yellow books, and a dormitory. The kyai is the leader of the pesantren and usually the founder. A santri is a child studying at a pesantren or a student studying religious knowledge in depth. Within the dormitory, there is a firqoh (religious group), or building within the pesantren, and each firqoh has several rooms for the santri to live in.(Mawaddah et al., 2023).

By 2024, the number of Islamic boarding schools (pesantren) in Indonesia had reached over 34,000, with millions of students spread across the country. The number of graduates had reached tens of millions. Some Islamic boarding schools still employ traditional education, while many have modernized their approach, enabling them to compete with graduates from public schools.(Waluyo, 2024).

As stated in the Islamic boarding school statistics data by the Ministry of Religious Affairs, it is stated that the regions with the largest number of Islamic boarding schools are West Java with 9,310 Islamic boarding schools, Banten with 5,344 Islamic boarding schools, East Java with 5,121 Islamic boarding schools, and Central Java with 3,927 Islamic boarding schools. Then from various other provinces throughout Indonesia. The largest number of students owned by Islamic boarding schools is from the province of East Java with 970,541 students, West Java with 901,222 students, Central Java with 558,620 students, and Banten with 467,175 students.

As Islamic educational institutions, Islamic boarding schools play a crucial role in producing a generation with noble character and knowledge. In the rapidly evolving digital era, Islamic boarding schools are required to adapt to technological advances to remain relevant in educating their students.(Wijaya et al., 2024)The use of technology in Islamic boarding schools is not only a necessity, but also an opportunity to increase the effectiveness of learning, expand access to sources of knowledge, and strengthen Islamic preaching in the digital world.(Astuti et al., 2023).

In the ever-developing digital era, the integration of information technology (IT) in the world of Islamic boarding schools has become a necessity to improve the quality of education and prepare students to face the challenges of the times.(Mustopa et al., 2023)Utilizing information technology not only facilitates access to learning resources, but also expands the scope of preaching and the efficiency of Islamic boarding school management.

The integration of information technology (IT) in Islamic boarding schools plays a crucial role in improving the quality of education and the effectiveness of preaching. The use of IT allows students to access a wider range of educational resources, such as e-books, online journals, and digital learning platforms, thereby enriching their knowledge. Furthermore, IT skills prepare students to compete in the digital age, increasing their opportunities in the modern workforce.(Mesran et al., 2024).

Furthermore, information technology plays a crucial role in the administrative management of Islamic boarding schools. Digital-based administration systems can be used to manage student data, activity schedules, and financial reports, thereby improving operational



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efficiency. Integrated applications or management systems allow parents to stay connected and receive regular reports without having to be physically present at the Islamic boarding school.(Nurhayati et al., 2024).

There has been previous research related to the use of information technology in Islamic boarding schools, such as that conducted by(Astuti et al., 2023; Cibro & Tanjung, 2024; Hasyim, 2023; Hemanto et al., 2022; Saputra, 2022). The research discusses how Islamic boarding schools use technology in the daily activities of students at Islamic boarding schools.

Based on the description above, the author is interested in further examining the implementation of information technology in Islamic boarding schools in Indonesia. The purpose of this paper is to review various studies on the implementation of information technology in Islamic boarding schools and its impact on the Islamic education system. The purpose of this research is to create a roadmap for the development of information technology at the Darul Uchwah Economic Islamic Boarding School in particular and Islamic boarding schools in Indonesia in general.

## RESEARCH METHODS

This research method is a systematic literature review. This method is used to identify, evaluate, and synthesize findings from previous research.(Hariyati, 2023)This method allows authors or researchers to identify key issues, develop a research framework, identify research gaps, and answer research questions.

The Systematic Literature Review (SLR) method is a research approach used to systematically identify, assess, and synthesize relevant literature in a field of study. The SLR process involves searching for academic articles from various trusted sources, such as journals indexed by Scopus, Web of Science, and Google Scholar, to gain a comprehensive understanding of the topic being studied (Kitchenham & Charters, 2007). In the context of this research, SLR was used to analyze various studies discussing the implementation of information technology in Islamic boarding schools (pesantren) to identify the benefits, challenges, and solutions that have been implemented. With this approach, the research can provide deeper, evidence-based insights into the effectiveness and obstacles in the use of technology in Islamic boarding schools.

In conducting SLR research, the first step is to determine search keywords that are appropriate to the topic being studied, such as "information technology in Islamic boarding schools," "digitalization of Islamic education," and "technology-based Islamic boarding school management." Next, the selection process is carried out by applying inclusion and exclusion criteria, where only articles that meet quality and relevance standards are considered (Tranfield, Denyer, & Smart, 2003). After that, an analysis is carried out on the selected articles by grouping the findings into main themes, such as digitalization of learning, IT-based Islamic boarding school management, and the use of social media in Islamic boarding school preaching. With this method, the research results become more systematic and allow researchers to draw more accurate conclusions based on existing evidence.



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**RESULTS AND DISCUSSION**

| No | Author and Year | Title | Results |
|---|---|---|---|
| 1 | (Purwanto et al., 2021) | Implementation of Information Technology and Management in the Development of Education and Entrepreneurship at the ICM Banten Islamic Boarding School | • Creation of a website for Islamic boarding schools and various developments containing information on education, activities and entrepreneurship;<br>• Creation of a management information system for promotion and registration of Islamic boarding schools that is integrated with the website; and<br>• Entrepreneurship and business planning techniques training as a means of supporting Islamic boarding school independence |
| 2 | (Saputra, 2022) | Implementation of Information Technology Governance Using COBIT Framework 4.1 at Al Islam Islamic Boarding School | • Creating a design for the IT governance model for the Al Islam Islamic Boarding School using the Control Objective for Information Technologies (COBIT) framework version 4.1 |
| 3 | (Hemanto et al., 2022) | Utilization of Information Technology for the Revitalization of the At-Tanwir Islamic Boarding School Cooperative | • Creating a POS (Point of Sale) application for cooperatives in Islamic boarding schools for cooperative management. |
| 4 | (Hasyim, 2023) | Scientific Development with Information Technology at Salaf Islamic Boarding School | • Sidogiri Islamic Boarding School has established an Information Technology and Systems Development Agency, to fulfill all information system (software) needs and is responsible for website services (Sidogiri.net) and Islamic boarding school administration.<br>• Langitan Islamic Boarding School, Tuban, has launched the website Majalahlangitan.com. The parent media body, Media Dakwah |



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| | | | |
|---|---|---|---|
| | | | Langitan, is responsible for Langitan Magazine (offline), Langitan TV (YouTube channel), radio streaming, and several other social media platforms. |
| 5 | (Nurdiana et al., 2023) | Implementation of Communication Technology Through Management Information Systems at Darul Arqom Islamic Boarding School, Karanganyar | • The creation of a management information system helps parents access school information, registration, payment methods, and student development contributions (SPP) through various methods such as banks, ATMs, or mobile banking. |
| 6 | (Khafidhoh & Badriyah, 2023) | Website-Based Payment Administration Information System at As-Sa'Idiyyah 1 Bahrul Ulum Islamic Boarding School | • Utilizing web technology to automate payment processes such as monthly syahriyah fees, annual re-registration fees, and other payments. |
| 7 | (Susilo, 2023) | Financing Management Innovation at Muhammad Al Fatih Islamic Boarding School: A Technology-Based Financial Approach Using the Akun.Biz Application | • The use of the AKUN.biz application provides significant innovation in Islamic boarding school financing management. |
| 8 | (Nurhayati et al., 2024) | Introduction to Information Technology and Android-Based Applications for New Student Admissions at Hidayatul Ikhwan Islamic Boarding School | • Introduction of information technology to increase the knowledge of the community and administrators who manage Islamic boarding schools regarding how to use the new student admission application as a medium to promote Islamic boarding schools. |
| 9 | (Sucipto et al., 2024) | Implementation of a Web-Based Information System for Student Discipline Management in Islamic Boarding Schools | • Technology-based discipline management information system in Islamic boarding schools, and can be a model for other educational institutions in digital-based discipline management. |



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| 10 | (Amin et al., 2024) | Web-Based Public Information System Design for Hidayatussalafiyah Islamic Boarding School, Kampar Kiri Tengah, Kampar Regency | • The Islamic boarding school website can be a public information center regarding developments and services provided by educational institutions. |

**DISCUSSION**

Based on the description and explanation in the results table above, information technology is very important in the world of Islamic boarding schools. There are several points that can be explained:

**Utilization of Information Technology in Islamic Boarding Schools**

**1. Digitalization of Learning**

The digitalization of learning in Islamic boarding schools (pesantren) is growing with the advent of various e-learning platforms and online learning media. The use of IT-based applications, such as video conferencing and learning management systems, has increased accessibility and flexibility in the teaching and learning process (Maulana & Syamsudin, 2023). Studies show that students who use technology in their learning have a better understanding of the material than those using conventional methods (Rahman, 2021). However, challenges such as limited infrastructure and internet access remain major obstacles to the implementation of digitalization in Islamic boarding schools (Zuhri, 2021).

**2. Islamic Boarding School Management System**

IT-based management of Islamic boarding schools can improve administrative efficiency, including student data recording, financial management, and personnel management. The use of an academic information system helps Islamic boarding school administrators develop curricula, monitor student progress, and manage administrative data more systematically (Arifin, 2022). Furthermore, an IT-based system enables more transparent and accountable Islamic boarding school financial management (Suryadi, 2022). However, training for administrative staff is still needed to better understand the use of this digital system (Hidayat, 2023).

**3. Use of Social Media and Websites**

Social media and websites have become important tools for Islamic boarding schools (pesantren) to disseminate information and strengthen their missionary networks. Digital media allows Islamic boarding schools to more easily reach a wider audience and enhance interaction with alumni and parents (Rohman, 2020). Some Islamic boarding schools have adopted digital communication strategies to promote their programs through platforms like YouTube, Facebook,



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and Instagram (Maulana & Syamsudin, 2023). However, more professional management is still needed to ensure the content remains relevant and high-quality (Nugroho & Hidayat, 2021).

**Challenges and Barriers to Information Technology Implementation**

**1. Infrastructure and Resource Limitations**

Many Islamic boarding schools lack adequate technological infrastructure, such as stable internet access and adequate hardware. Research shows that more than 60% of Islamic boarding schools in remote areas struggle to access the technological resources necessary for digitalizing learning (Zuhri, 2021). Furthermore, limited funding is a major obstacle to providing IT facilities in Islamic boarding schools (Suryadi, 2022). Therefore, support from various parties, including the government and private institutions, is needed to improve access to technology in Islamic boarding schools.

**2. Digital Divide and Technological Competence**

The lack of technology skills among teachers and students remains a barrier to IT implementation in Islamic boarding schools. A study by Maulana & Syamsudin (2023) showed that only around 40% of teachers in Islamic boarding schools have a basic understanding of digital technology. To address this, training and mentoring are needed to improve digital literacy for both Islamic boarding school administrators and students (Rahman, 2021). Furthermore, Islamic boarding school curricula must be adapted to technological developments so that students are better prepared to face the challenges of the digital era (Hidayat, 2023).

**The Impact of Information Technology on Islamic Boarding School Education**

**1. Improving Learning Effectiveness**

Information technology has a positive impact on the effectiveness of learning in Islamic boarding schools by enriching teaching methods. Studies show that the use of e-learning and digital platforms can increase students' absorption of course material by up to 30% compared to conventional methods (Rahman, 2021). With access to online learning resources, students can also develop their understanding independently (Nugroho & Hidayat, 2021). Therefore, the adoption of technology in learning must be continuously improved to provide optimal benefits.

**2. Administrative and Management Efficiency**

The implementation of technology in Islamic boarding school administration has helped reduce manual work and increase the speed of data processing. An integrated academic information system enables more accurate and transparent student data management (Arifin, 2022). Furthermore, the use of technology in Islamic boarding school financial management can also improve accountability and operational efficiency (Suryadi, 2022). Therefore, Islamic boarding school managers need to continue developing technology-based systems to provide better services to students and the community.



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### 3. Increasing the Reach of Da'wah

With the advent of digital technology, Islamic boarding schools (pesantren) can more widely disseminate Islamic preaching through social media and digital platforms. Online preaching allows Islamic boarding schools to reach a wider audience, including communities outside their region (Hidayat, 2023). Various digital-based preaching content, such as video lectures, podcasts, and online articles, can attract more congregants and new students (Suryadi, 2022). Therefore, Islamic boarding schools need to utilize technology more optimally to play a greater role in spreading Islamic values in the digital era.

## CONCLUSION

Based on the literature review, the main findings of this study indicate that the application of information technology in Islamic boarding schools provides significant benefits in three main aspects: learning, administration, and da'wah. Digitizing learning through e-learning platforms and online media improves access and effectiveness of the teaching and learning process, while management information systems and financial applications accelerate administrative processes, increase transparency, and facilitate connection with parents. On the da'wah side, the use of websites and social media expands the reach of Islamic boarding schools and strengthens communication with alumni and the community. However, this utilization remains uneven; key obstacles include limited infrastructure and internet access, low digital literacy among teachers and students, and limited funding and human resources capable of professionally managing technology systems.

Limitations of this SLR study include reliance on studies available in specific languages and sources, which may lead to publication bias, and a lack of consistent quantitative data to compare effects numerically across Islamic boarding schools. Furthermore, variations in the geographical context and scale of Islamic boarding schools make it difficult to generalize the findings across the board. Future research is recommended to conduct field studies with mixed quantitative and qualitative designs to empirically measure the impact of digital learning, evaluate effective IT governance models, and examine financial sustainability factors. Practically, Islamic boarding schools are encouraged to prioritize improving basic infrastructure and digital literacy training programs for teachers and administrative staff, developing clear IT governance policies, and establishing partnerships with the government and the private sector to secure technical and funding support for more inclusive and sustainable technology adoption.

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