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UTILIZATION OF TECHNOLOGY IN EDUCATIONAL ADMINISTRATION: IMPLEMENTATION CHALLENGES AND GOVERNANCE STRENGTHENING STRATEGIES

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ABSTRACTS

Digital transformation in educational administration has become a strategic necessity in the era of Society 5.0, in line with the increasing demands for efficiency, transparency, and accuracy in the governance of educational institutions. Although various institutions have adopted technologies such as School Management Information Systems (SMIS), Learning Management Systems (LMS), and cloud-based systems, their implementation tends to remain operational in nature and has not yet been fully integrated into strategic managerial functions. This study aims to analyze the role of information technology in educational administration, identify the supporting and inhibiting factors affecting its implementation, and formulate strategic implications for educational governance. The research employs a qualitative approach through a literature review method by analyzing relevant and up-to-date academic books and national and international journal articles. The data were analyzed thematically through processes of classification, comparison, and conceptual synthesis to identify patterns and research gaps. The findings indicate that the integration of technology in educational administration enhances work efficiency, data management accuracy, service responsiveness, and supports data-driven decision-making. Technology also functions as a strategic managerial instrument through decision support systems, integrated monitoring, and evaluation mechanisms. However, its implementation continues to face challenges, including limitations in infrastructure, funding constraints, digital competency gaps among human resources, resistance within organizational culture, and disparities in access across certain regions. Therefore, a comprehensive strategy is required, encompassing the strengthening of digital infrastructure, continuous capacity building for human resources, and adaptive as well as visionary leadership. Overall, the digitalization of educational administration significantly contributes to strengthening governance and sustainably improving the quality of education.

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A. INTRODUCTION

Educational administration constitutes a fundamental component in the organization of the education system, as it encompasses planning, organizing, supervising, and evaluating to ensure that the learning process operates effectively and efficiently. In the digital era, the utilization of information technology has become a primary strategy for strengthening the quality of educational administration in order to enhance transparency, efficiency, and service accuracy within schools. Research indicates that the implementation of digital technology in school administration can accelerate administrative processes and improve the quality of educational services (Antik Pujihastuti et al., 2025). Furthermore, the digital transformation of school administration is capable of supporting excellent services for stakeholders through the development of integrated information systems (Jennah et al., 2025). More broadly, the transformation of educational administration through digital technology has emerged as a strategic necessity for optimizing efficiency and the quality of educational services in the era of Society 5.0, particularly in data management and managerial decision-making (Purwani et al., 2024). This phenomenon demonstrates that technology-based modernization of educational administration is not merely a trend, but an urgent necessity for improving the quality of educational services in Indonesia.

However, the implementation of information technology in educational administration has not yet reached its full potential, as many educational institutions continue to encounter obstacles, such as limited availability of skilled human resources and inadequate technological infrastructure. A study examining the implementation of an integrated Education Management Information System combined with e-Report (e-Raport) services revealed that the primary challenges include limited ICT infrastructure, insufficient human resource readiness, and disparities in internet access, all of which affect the overall effectiveness of system utilization (Adriana et al., 2025).

Ideally, digital administrative systems are expected to enhance work efficiency, data accuracy, and the effectiveness of educational services. In practice, however, digital technology is often used merely for routine administrative record-keeping, without innovation or strategic integration to support managerial planning and evaluation. Evaluative research indicates that many educational information systems still rely on conventional or previously established approaches, thereby limiting their capacity to support strategic decision-making and integrated school planning (Sunarya et al., 2025). Consequently, a research gap exists between technical analyses of digital usage and more comprehensive strategic analyses of its impact on managerial effectiveness and the overall quality of educational services.

Several studies have demonstrated that the use of digital technology in educational administration positively influences service quality and organizational management (Rahayu, 2025). For example, the integration of e-administration has been shown to improve service speed, recording accuracy, and information transparency in vocational secondary schools (Rahayu, 2025). Nevertheless, these studies remain largely confined to the operational level of technology use and have not comprehensively explained the relationship between administrative digitalization and broader managerial functions, such as supervision, evaluation, and long-term planning that considers the interrelated components of the organization. The novelty of this research lies in its approach, which conceptualizes information technology integration as a managerial strategic instrument rather than merely an administrative support tool. In

doing so, it seeks not only to enhance managerial governance but also to strengthen the effectiveness and overall quality of educational administration.

Based on the foregoing discussion, this study aims to analyze the role and effectiveness of information technology utilization in educational administration, as well as to identify the factors that support and hinder the integration of administrative digitalization within formal educational institutions. The research is expected to contribute theoretically by strengthening the conceptual framework of technology-based educational administration and practically by providing strategic recommendations for school administrators to improve data processing accuracy, service transparency, and the overall quality of educational services. In addition, the findings are anticipated to serve as an important reference for future research on the digital transformation of educational administration.

B. METHOD

This study employs a library research method by reviewing and analyzing various written sources, including reference books, scientific journal articles, and academic publications relevant to the utilization of technology in educational administration. Library research comprises a series of activities related to collecting bibliographic data, reading and taking notes, and processing research materials. It is also understood as a research method that focuses on gathering and analyzing data derived from literature to construct the theoretical and conceptual framework of a study (Zed, 2014). This method was selected because it enables a comprehensive and systematic understanding of concepts, theories, and previous research findings related to the topic under investigation.

Conceptually, library research does not merely involve collecting reading materials; it also encompasses critical reading, note-taking, classification, and interpretation of the literature in order to identify patterns, relationships, and research gaps (Hart, 1998; Ridley, 2012). In this study, the literature sources were obtained from national and international scientific journal databases, relevant academic books, and other credible and up-to-date scholarly documents.

The research adopts a qualitative approach, as it emphasizes the analysis of meaning, interpretation, and synthesis of scholarly perspectives on technology in educational administration. The analysis was conducted by organizing the literature thematically, comparing viewpoints among researchers, and drawing conceptual conclusions aligned with the focus of the study.

Thus, the library research method in this study functions not only as a theoretical foundation but also as an analytical instrument to generate a comprehensive scholarly synthesis regarding the utilization of technology in educational administration.

C. RESULT AND DISCUSSION

Digital Transformation in Educational Administration

Conceptually, educational administration encompasses the functions of planning, organizing, implementation, supervision, and evaluation (Mulyasa, 2013). Traditionally, these functions have been carried out manually, often requiring considerable time and effort and remaining vulnerable to human error. With the advancement of information technology, various administrative functions can now be supported by integrated digital systems, such as School Management Information

Systems (SMIS), which enable planning, organizing, implementation, supervision, and evaluation to be conducted more quickly, accurately, and in a data-driven manner. Thus, technological integration not only simplifies administrative processes but also strengthens schools' managerial capacity in making strategic decisions.

One tangible manifestation of technology utilization in educational administration can be observed through the implementation of School Management Information Systems (SMIS). SMIS serve as platforms that facilitate structured data collection, storage, and processing, thereby supporting more efficient and data-based decision-making (Eti et al., 2025).

The development of information technology has driven significant changes in educational administration, particularly in the use of technology to enhance the effectiveness and efficiency of educational management. Based on the literature review, information technology is applied across various administrative domains, including the management of student data, teaching personnel, curriculum, and finance. The use of such technology aims to streamline administrative processes, reduce reliance on manual systems, and improve the accuracy and responsiveness of educational administrative services.

The results of the literature review indicate that digital transformation in educational administration constitutes part of a broader reform in education governance grounded in information technology. Digitalization functions not merely as a tool for administrative record-keeping, but also as an integrated management support system.

The findings reveal that the implementation of digital-based school management information systems enhances the speed of administrative services and the accuracy of data archiving (Rahayu, 2025). Another study emphasizes that the digitalization of school administration supports governance effectiveness through integrated information systems that facilitate monitoring and evaluation (Purwani et al., 2024).

The synthesis of the literature demonstrates that the integration of information technology in educational administration, particularly through School Management Information Systems (SMIS), significantly improves efficiency, accuracy, and service responsiveness, while simultaneously strengthening managerial functions such as planning, supervision, and evaluation. Therefore, the digitalization of educational administration serves as a strategic instrument in school management.

Information Technology as a Strategic Managerial Instrument

Based on a thematic analysis of various scholarly sources, it was found that most previous studies continue to position technology primarily as an operational administrative tool. Theoretically, however, management information systems possess a strategic function in supporting decision-making processes.

In the context of educational administration, information technology can function as:

1. A decision support system
2. A data-based monitoring and evaluation tool
3. A strategic planning instrument grounded in needs analysis

Sunarya et al. (2025) indicate that many schools still utilize digital systems in a conventional manner, without integrating data across managerial functions. This condition limits the optimization of evaluative functions and long-term planning. It underscores the need for digital systems that operate not merely at an operational level,

but that also facilitate cross-functional managerial data integration. One widely adopted solution in the educational context is the Learning Management System (LMS), a web-based information technology system designed to manage instructional materials, learning activities, and online learning documentation.

A Learning Management System (LMS) is a web-based information technology system designed to manage instructional content, learning activities, and online learning documentation. LMS platforms provide flexibility for students to engage in independent learning while enhancing student participation and engagement (Suprihartini et al., 2024). The LMS originated from the concept of e-learning, which aims to deliver accessible, flexible, and efficient learning experiences. Such systems enable teachers to manage instruction, monitor student progress, and systematically improve instructional interaction (Suprihartini et al., 2024).

Beyond supporting instructional processes, LMS platforms also strengthen ICT-based management. These systems are typically equipped with administrative features, such as material archiving, attendance tracking, and lesson planning documentation, thereby ensuring that student data are systematically recorded and easily accessible (Nurchayati & Gunawan, 2023).

Several LMS platforms widely used in Indonesia include Moodle, Google Classroom, and Ruangkelas. Moodle offers automated quizzes and discussion forums; Google Classroom integrates seamlessly with Google Workspace; and Ruangkelas provides content aligned with the national curriculum. These platforms facilitate the management of online and hybrid learning while enhancing student engagement (Suprihartini et al., 2024).

In addition to LMS platforms, educational administration has also evolved through the adoption of cloud computing, which enables centralized, secure, and efficient storage and management of school data. The use of cloud-based systems has been shown to improve administrative performance and support data-driven decision-making (Safwandy Nugraha & Rochimat, 2025).

Theoretical and Practical Implications

The theoretical implication of this study lies in broadening the concept of educational administration by incorporating information technology as a strategic variable within the educational management system. This perspective enriches the conceptual framework of digitally based educational administration. From a practical standpoint, schools are encouraged to undertake several strategic measures, including:

1. Developing integrated information systems across managerial functions
2. Enhancing the digital competencies of administrative personnel
3. Utilizing digital data as the foundation for strategic planning and evaluation

Accordingly, the digitalization of educational administration should be directed toward the establishment of sustainable, data-driven managerial systems.

The implementation of cloud-based systems in the development of Academic Information Systems represents a concrete manifestation of technology-based educational administration. The use of cloud computing enables teachers to input students' grades and attendance records more practically and efficiently, while allowing students to access their learning outcomes anytime and anywhere. This approach aligns with the concept of cloud-based educational administration, which emphasizes accessibility, flexibility, and efficiency in managing academic data (Setyorini, 2025).

Challenges in the Implementation of Technology in Educational Administration

Although the utilization of technologies such as School Management Information Systems (SMIS), Learning Management Systems (LMS), and cloud-based administration has made significant contributions to improving the efficiency and effectiveness of educational management, their implementation continues to face various challenges. Common obstacles include limited resources, resistance to change among educators and stakeholders, as well as concerns related to data security and management.

One of the primary challenges concerns financial constraints. The implementation of information technology requires relatively substantial initial investment, including the development of infrastructure, procurement of hardware and software, and training of human resources. In addition, educational institutions must bear the ongoing costs of system maintenance and upgrades, which can impose a considerable burden, particularly on schools with limited budgets (Arbain et al., 2024).

Beyond financial considerations, limitations in infrastructure and human resource readiness also hinder the effective adoption of educational technology. According to Subroto et al. (2023), educational institutions especially those located in rural and remote areas continue to face limited internet access and shortages of digital devices, as well as insufficient teacher training in the use of instructional technology. Nevertheless, when appropriately implemented, technology has been shown to enhance student engagement and learning outcomes, particularly when supported by personalized and interactive learning approaches.

Within the context of Islamic educational institutions, the challenges of technological implementation are not solely technical but are also closely linked to organizational culture. Limited digital literacy among educators and resistance to change constitute significant barriers to the adoption of new technologies. Therefore, comprehensive and sustainable strategies are required, including strengthening infrastructure, enhancing educators' digital competencies, and fostering an organizational culture that is adaptive and open to technological innovation (Munir & Su'ada, 2024).

Implications of Technology Implementation in Educational Administration

The implementation of technology in educational administration has significant implications for enhancing the effectiveness, efficiency, and transparency of institutional management. The use of SMIS, LMS, and cloud-based systems can accelerate administrative processes, improve data accuracy, and support more reliable information-based decision-making (Safwandy Nugraha & Rochimat, 2025).

From a human resource perspective, the adoption of technology necessitates the continuous development of digital competencies among teaching and administrative staff through sustained professional training. Without adequate user readiness, technological implementation will not function optimally and may generate resistance to change (Subroto et al., 2023; Nurchayati & Gunawan, 2023). Consequently, educational institutions need to design ongoing professional development programs to ensure that educators possess the confidence and preparedness to utilize technology as an integral component of both administrative and instructional responsibilities.

The implementation of technology in educational administration also entails transformations in organizational culture and institutional management, requiring a shift from conventional systems toward data-driven and technology-based governance.

Leadership plays a pivotal role in encouraging technology acceptance and cultivating an adaptive and innovative organizational culture to prevent resistance and ensure sustainability (Munir & Su'ada, 2024).

Furthermore, disparities in access to technology underscore the importance of policies aimed at equitable digital infrastructure development and the creation of contextualized content, including the use of local languages, in order to promote inclusive education (Yazid et al., 2025). Overall, technological implementation not only enhances administrative efficiency but also contributes to human resource development and the sustainable improvement of educational governance quality (Arbain et al., 2024).

D. CONCLUSION

Digital transformation in educational administration has fundamentally reshaped school management practices, shifting from manual systems to integrated information technology–based systems. The utilization of School Management Information Systems (SMIS), Learning Management Systems (LMS), and cloud computing has been shown to enhance efficiency, accuracy, and the speed of administrative services, while simultaneously strengthening managerial functions such as planning, supervision, and evaluation. Information technology is no longer merely an operational tool; rather, it serves as a strategic instrument in decision-making, monitoring, evaluation, and data-driven planning.

From a theoretical perspective, the digitalization of educational administration enriches the conceptual framework of administration by positioning technology as a strategic variable. Practically, schools are required to develop integrated cross-functional information systems, enhance the digital competencies of administrative personnel, and utilize digital data for strategic planning and evaluation. Cloud-based implementation enables flexible, efficient, and secure access to academic data, thereby supporting informed decision-making processes.

Despite its significant benefits, the adoption of technology also faces several challenges, including financial constraints, infrastructural limitations, gaps in digital competence, resistance to change, and disparities in access in remote areas. Therefore, a comprehensive implementation strategy is essential, encompassing infrastructure enhancement, continuous professional training, the cultivation of an adaptive organizational culture, and policies aimed at equitable access to technology.

Overall, digital transformation in educational administration not only improves operational effectiveness and efficiency but also strengthens governance, human resource development, and the sustainable quality of education.

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