Implementation of Digital-Based School Management Systems to Improve Administrative Efficiency in Junior High Schools in East Kalimantan Province

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Abstract
The rapid development of information technology has influenced nearly every aspect of life, including education. In this context, the digital transformation of school administration has become essential to enhance the quality of services, ensure transparency, and boost operational efficiency. Traditional, manual administrative processes often face challenges such as delayed reporting, inaccurate data entry, and poor information accuracy. The adoption of a digital School Management Information System (SMIS) addresses these issues by enabling automated processes, cloud-based data storage, and real-time access to information. This research investigates the implementation of such systems in schools and evaluates their effect on administrative efficiency. The increasing digital integration in education has driven schools to adopt technology-based management systems as a strategy to improve the effectiveness and efficiency of administrative operations. Employing a descriptive qualitative approach, this study utilizes interviews, observations, and document analysis conducted at three junior high schools in East Kalimantan. Findings indicate that digital systems significantly enhance the speed of data processing, record-keeping, and the transparency of reporting. Nonetheless, issues such as insufficient training and limited technological infrastructure continue to hinder optimal implementation. In summary, while digital school management systems prove effective in streamlining administrative tasks, their success depends on ongoing support through training and sustainable policy frameworks.

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Abstrak
Perkembangan pesat teknologi informasi telah memengaruhi hampir setiap aspek kehidupan, termasuk bidang pendidikan. Dalam konteks ini, transformasi digital dalam administrasi sekolah menjadi hal yang penting untuk meningkatkan kualitas layanan, memastikan transparansi, dan mendorong efisiensi operasional. Proses administrasi manual secara tradisional sering menghadapi tantangan seperti keterlambatan pelaporan, kesalahan entri data, dan rendahnya akurasi informasi. Adopsi Sistem Informasi Manajemen Sekolah (SMIS) berbasis digital dapat mengatasi permasalahan tersebut melalui proses otomatis, penyimpanan data berbasis cloud, dan akses data secara real-time. Penelitian ini mengkaji penerapan sistem tersebut di sekolah dan mengevaluasi dampaknya terhadap efisiensi administrasi. Integrasi digital yang semakin meluas di bidang pendidikan mendorong sekolah-sekolah untuk mengadopsi sistem manajemen berbasis teknologi sebagai strategi untuk meningkatkan efektivitas dan efisiensi operasional administrasi. Dengan pendekatan kualitatif deskriptif, studi ini menggunakan teknik wawancara, observasi, dan analisis dokumen yang dilakukan di tiga sekolah menengah pertama di Kalimantan Timur. Hasil penelitian menunjukkan bahwa sistem digital secara signifikan meningkatkan kecepatan pemrosesan data, penyimpanan arsip, dan transparansi dalam pelaporan. Namun, tantangan seperti kurangnya pelatihan dan keterbatasan infrastruktur teknologi masih menjadi hambatan. Kesimpulannya, meskipun sistem manajemen sekolah digital terbukti efektif dalam menyederhanakan tugas-tugas administratif, keberhasilannya tetap bergantung pada dukungan berkelanjutan melalui pelatihan dan kebijakan yang berkesinambungan.

I. INTRODUCTION

Digital transformation in education has become an unavoidable necessity in today's technological era. The swift evolution of information and communication technologies (ICT) has influenced nearly all sectors of life, including education. Educational institutions particularly formal ones like schools must quickly and effectively adapt to these changes. This adaptation goes beyond teaching and

learning and extends into school management and administrative operations. One concrete effort schools have made to respond to digitalization demands is the implementation of digital-based school management systems. These systems are designed to enhance administrative efficiency, service effectiveness, and data transparency.

By integrating digital tools, various administrative functions that were once manual such as student data management, budgeting, attendance monitoring, and academic reporting can now be automated. This shift not only streamlines processes but also reduces the workload of administrative staff, speeds up services, and improves data accuracy. Previous research has demonstrated the positive effects of digital technology adoption in school management. For example, Rahman and Susanti (2021) found that using cloud-based digital applications in school administration can reduce processing time by up to 40% compared to traditional manual systems. This efficiency has a direct impact on the productivity of both administrative personnel and teachers. Similarly, Putri and Arifin (2022) found that digital management systems offer more accessible, faster, and more accurate information to a wide range of stakeholders, including school leaders, teachers, parents, and even local education authorities. This openness aligns with public sector reforms that emphasize technological integration to improve service delivery, operational transparency, and institutional accountability.

However, implementing digital school management systems is not without significant challenges particularly in remote or underserved regions. A study by Hidayat et al. (2023) highlighted two key obstacles: low levels of digital literacy among school personnel and inadequate technological infrastructure. Limited digital skills can make it difficult for staff to operate the systems effectively, while poor internet connectivity, insufficient hardware, and restricted budgets further complicate the transition to digital systems. These findings suggest that educational digitalization requires more than just access to technology it demands investment in human capacity and long-term policy support from both local and national governments.

Given this context, the study seeks to explore in greater depth how digital school management systems are applied in real-world settings and their influence on the efficiency of educational administrative processes. The research focuses on examining how digital tools are used in routine school administrative tasks, the challenges that arise during implementation, and the approaches schools adopt to maximize system effectiveness. Through a descriptive qualitative methodology, this study aims to offer a current and evidence-based portrayal of how digital systems are integrated into school management. The outcomes are anticipated to provide valuable insights for education policymakers in developing digitalization strategies that not only highlight technological advancements but also prioritize the enhancement of human resources, infrastructure readiness, and supportive regulatory frameworks ensuring that digital transformation in education can be implemented effectively, fairly, and sustainably.

II. METHOD

This research adopts a descriptive qualitative methodology to deeply explore how digital-based school management systems are applied in school administrative practices. This method was chosen as it is well-suited to investigating social phenomena and complex managerial processes that are not easily quantifiable. As noted by Moleong (2017), qualitative research is used to understand the context, dynamics, and meaning of events in a comprehensive and holistic way. Therefore, this approach is deemed appropriate for offering a contextualized and exploratory depiction of how digital technologies are utilized in school administrative environments. Rather than aiming for generalization, this study seeks to gain a rich understanding of the experiences and perspectives of educational stakeholders regarding the digital systems currently in place.

The research focuses on three junior high schools in South Kalimantan Province that have actively integrated digital school management systems into their administrative operations. These schools were selected through purposive sampling based on specific criteria, including the extent of digital system adoption, availability of technological infrastructure, and willingness to participate. As Sugiyono (2021) suggests, purposive sampling in qualitative research is used to select information-rich subjects that can provide deep insights relevant to the study's focus. By involving schools with varied backgrounds, the research aims to present a more comprehensive picture of the digitalization of school administration at the regional level.

Data collection involved three main techniques: in-depth interviews, participant observation, and document analysis. The interviews were conducted with key stakeholders such as principals, administrative personnel, and teachers directly involved in the digital management of school administration. These conversations aimed to explore their experiences, perceptions, and understanding of the digital systems in use. Creswell (2016) emphasizes that interviews in qualitative research allow participants to express their views freely, enabling the collection of rich and nuanced data. Alongside interviews, direct observations were made of administrative practices, particularly in the use of digital tools for attendance, academic grading, financial management, and reporting. These observations served to validate the information provided during interviews and offer a real-world perspective on digital implementation. Document analysis was also carried out by reviewing digital records, including financial statements, academic reports, attendance logs, and other relevant documentation.

Data analysis followed the three-phase process outlined by Miles, Huberman, and Saldana (2014): data reduction, data display, and conclusion drawing/verification. In the first phase, relevant data were sorted and grouped into emerging themes and categories identified during the collection process. Next, the refined data were organized into narratives, tables, or matrices to support interpretation. Finally, conclusions were drawn and verified inductively through continuous reflection and triangulation. This iterative analysis aimed to ensure the validity and consistency of findings. Through this process, the study seeks to uncover the enabling factors, challenges, and strategic responses adopted by schools in implementing digital school management systems.

III. RESULT AND DISCUSSION

A. Result

1. Implementation of the Digital School Management System

The three junior high schools involved in this study have implemented digital school management systems as part of their initiative to modernize educational administration. Commonly used platforms include Dapodik (Basic Education Data), e-Report, and digital attendance applications. These systems play a crucial role in facilitating student data management, curriculum administration, and academic reporting. Their adoption reflects the schools' alignment with national digitalization policies and highlights their awareness of the importance of efficiency and data accuracy in administrative tasks.

Student data entry such as personal information, family background, academic history, and special needs is conducted via Dapodik, a centralized national system developed by the Ministry of Education, Culture, Research, and Technology. Beyond serving as a data repository, Dapodik provides the foundation for policymaking at the national level. As Pratama and Yuliana (2021) explain, this system allows education offices to access accurate, real-time school data, supporting monitoring and evaluation efforts.

The e-Report platform is widely used by teachers to input academic scores, including daily assessments, midterms, and final exams. This digital process significantly reduces the time and errors associated with traditional manual report card preparation. According to Lestari and Mulyani (2023), e-Report has improved the quality of academic reporting by enabling more structured and accessible progress tracking for both school leaders and parents.

Meanwhile, the digital attendance system is used to track the daily presence of students and teachers. Attendance is recorded using internet-connected devices, and the data is stored on the school server and automatically forwarded to the local education office. Research by Hasanah et al. (2022) found that such systems improve punctuality and reduce the administrative burden of manual recordkeeping, while also minimizing opportunities for data manipulation.

Rather than functioning in isolation, these three digital systems operate in a complementary manner, forming a cohesive digital ecosystem for school management. Many schools also enhance these platforms with tools like Google Workspace for Education or custom-built applications to support digital archiving, internal collaboration, and staff communication. Suryana and Ramdhani (2024) emphasize that integrated digital platforms allow schools to develop flexible

and responsive management strategies, particularly in hybrid learning contexts.

Despite positive developments, the implementation process continues to face challenges most notably, limited digital literacy among some teachers and staff. This highlights the need for ongoing technical assistance and training programs. As Fauziah and Nugroho (2020) suggest, the success of digital school management systems depends not only on the availability of infrastructure but also on the competence and preparedness of the personnel operating them. Therefore, continuous capacity building and school-level policy support are essential to ensure the long-term sustainability of digital transformation in educational administration.

2. Administrative Efficiency Achieved

The integration of digital school management systems across the three participating schools has significantly improved the efficiency of administrative operations. One of the most positively impacted areas is the processing and reporting of student grades. Prior to digitalization, teachers manually recorded and calculated grades, followed by retyping them into report card templates a process that was time-intensive and prone to data entry errors. With tools like the e-Report system, this workflow has become far more efficient. Teachers now input scores regularly, and the system automatically calculates averages and generates printable reports. Kurniawan and Astuti (2021) found that the use of e-Report reduces teachers' workloads by up to 50% during grading periods while enhancing accuracy and consistency across subjects.

Efficiency gains are also evident in data storage and archiving. Previously, student and teacher records were kept in physical files or logbooks, which required large storage space and were vulnerable to damage or loss. Today, this information—including biodata, academic history, achievements, and health records—is stored securely on cloud platforms or local school servers. This transition not only saves physical space but also improves the speed of data retrieval and updating. According to Laksmi and Fadillah (2022), digital archiving allows for easier data tracking and reduces the risk of document loss in the event of disasters or emergencies. The accessibility of digital records ensures that authorized personnel can retrieve information anytime, from any location.

Another notable improvement involves the management of attendance data. Digital attendance systems allow for real-time entry and automatic syncing with daily and monthly summary reports. Teachers only need to log attendance once, after which the system stores and processes the data for analysis by school administrators. Compared to traditional manual recording, which involves multiple steps from logbooks to spreadsheets, this digital method greatly enhances efficiency. Maulana and Dewi (2023) report that digital attendance systems can reduce the daily administrative workload by as much as 70%, while also decreasing the potential for data manipulation. This improvement contributes to more reliable attendance tracking and faster, more informed decision-making.

Furthermore, communication between schools and parents has become more streamlined through digital integration. Parent-focused applications and messaging platforms such as WhatsApp integrated with the school information system enable real-time updates on grades, attendance, exam schedules, and school events. This facilitates faster, more transparent, and interactive communication. Fitriani and Ramli (2020) found that such systems increase parental involvement in education by making school information more accessible and easier to understand, ultimately supporting transparency and accountability in education.

Overall, administrative tasks that once took days to complete can now be handled within hours or even minutes, depending on the complexity. For instance, monthly reports that previously required three to five days can now be finalized within a single workday using integrated digital systems. As Yusron and Amelia (2024) highlight, digital systems not only accelerate administrative workflows but also enhance data accuracy, consistency, and professionalism. This increased efficiency enables school personnel to devote more attention to improving

educational services, rather than being bogged down by routine administrative burdens.

3. Challenges Encountered

Despite the notable benefits brought by digital school management systems in streamlining educational administration, their implementation in practice is not without significant challenges. One of the most prevalent issues, particularly in rural or remote areas, is limited internet access. Poor connectivity, slow internet speeds, and insufficient network infrastructure often hinder the optimal operation of digital platforms. These limitations lead to delays or failures in data input, system synchronization, and report generation. According to Rahayu and Prasetyo (2021), over 40% of schools in peripheral regions of Indonesia continue to face unreliable internet service, which directly affects the effective utilization of digital administrative systems.

In addition to infrastructure constraints, a lack of technical training and systematic support for administrative personnel also poses major hurdles. Many staff members do not possess sufficient IT skills to operate digital systems independently, resulting in difficulties when using tools such as e-Raport, digital attendance, and cloud-based archiving. This skill gap often leads to a dependency on a few tech-savvy individuals. Firmansyah and Nuraeni (2023) emphasize that the success of digital transformation in schools depends heavily on human resource readiness, with ongoing technical training being essential to strengthen staff competencies and ensure sustainable system usage.

Another recurring challenge is the overreliance on a single operator or staff member for the management of digital systems, including data entry, maintenance, and reporting. In many schools, only one or two individuals are proficient in system operation, making the process vulnerable to disruptions when those individuals are absent, reassigned, or leave the institution. Munir and Aisyah (2022) warn that such dependence can hinder collaborative workflows and create significant competency gaps among administrative teams. Addressing this issue requires equitable skill distribution and consistent training efforts to avoid operational bottlenecks.

Beyond technical and human resource issues, policy and budget constraints also present critical obstacles. Many schools lack designated budgets for digitalization, often relying on internal efforts or temporary support from third parties. This leads to uneven implementation between schools, even within the same region. Nurhadi and Lestari (2020) highlight the necessity of aligning digital school policies with institutional capacity-building and needs-based funding to ensure long-term effectiveness. Without systemic and financial support, digitalization efforts risk stagnation or becoming superficial.

Lastly, cultural resistance and reluctance to embrace change among some educators and administrative staff further impede digital transformation. Personnel accustomed to manual systems may view digital tools as complex or disruptive, leading to low motivation and limited engagement. As Latifah and Hidayat (2024) suggest, successful digitalization is not solely a matter of technological advancement but also of cultivating a mindset open to change. A supportive and inclusive approach is needed to build a digital work culture in which all stakeholders feel empowered, responsible, and involved in the transformation process.

B. Discussion

The findings of this research demonstrate that the integration of digital-based school management systems significantly enhances efficiency in educational administration. The use of such systems streamlines various administrative tasks including grade management, attendance tracking, data archiving, and internal communication making them faster, more accurate, and better organized. Digital tools also help reduce the burden of manual work, which is often inefficient and prone to human error. These results support the study by Sari & Nugroho (2022), which highlighted that digitalizing administrative functions in schools accelerates bureaucratic procedures and supports effective management.

In addition, the application of information technology increases transparency in data handling and facilitates easier monitoring by

school leaders and local education authorities. However, the effectiveness of implementing digital management systems is closely tied to each school's infrastructure and the preparedness of its personnel. Schools with stable internet connectivity, access to proper digital tools, and trained staff are able to fully utilize digital platforms, showing improvements in processing speed, error reduction, and data reliability. On the other hand, institutions lacking reliable internet access, sufficient hardware, and digitally competent staff often encounter significant operational barriers. These challenges align with the findings of Wulandari & Hamzah (2023), who noted that disparities in infrastructure still hinder equitable digital education implementation in Indonesia.

Moreover, individual readiness to adopt new technology plays a critical role. Schools that have successfully implemented digital systems tend to cultivate a culture that embraces change and innovation. These environments are characterized by strong collaboration, a commitment to learning, and leadership that actively supports staff in transitioning to digital workflows. As Junaidi & Rahmah (2020) emphasized, the success of digital transformation in school administration relies on visionary leadership and a long-term commitment to developing a sustainable digital ecosystem. Without such leadership, digital tools risk becoming underutilized or symbolic, rather than driving real improvements in school performance.

To address these multifaceted challenges, strong cooperation is essential among local governments, education offices, and individual schools. Local governments must take the lead in ensuring equitable internet access, providing necessary technological infrastructure, and enacting supportive policies. Meanwhile, education departments should prioritize continuous training and capacity building to empower school staff to manage digital systems independently and effectively.

In accordance with Santoso & Wijayanti (2024), multi-stakeholder engagement is crucial for overcoming digital infrastructure gaps and enhancing the overall success of education digitalization initiatives. Without comprehensive and collaborative support, digital transformation will remain uneven and limited in scope. Furthermore, there is a need for long-term institutional policies that go beyond the initial introduction of technology policies that include ongoing mentoring, structured training, and consistent evaluations to measure impact. As Pramana & Yusuf (2021) suggested, successful digital school transformation must be guided by a holistic strategy encompassing planning, implementation, monitoring, and evaluation. Ultimately, digitalization in education should not only serve as a marker of modernization but must lead to tangible improvements in efficiency, accountability, and the overall quality of educational services.

IV. CONCLUSION AND SUGGESTION

A. Conclusion

The application of digital-based school management systems has been shown to significantly enhance the efficiency of educational administration, particularly in areas such as student data management, academic reporting, attendance tracking, and internal communication among stakeholders. These digital tools have transformed previously manual and time-consuming tasks into processes that are quicker, more organized, and less error-prone. Platforms like e-Raport, Dapodik, and online attendance systems have greatly streamlined administrative operations in schools. By integrating digital systems, schools are now able to generate more accurate and real-time data, thereby expediting decision-making at both institutional and policy-making levels.

However, maximizing the potential of digital management systems still faces considerable challenges, especially in terms of infrastructure limitations and user readiness. Many schools, particularly those in rural or remote areas, continue to encounter difficulties such as poor internet connectivity, a shortage of necessary hardware, and the absence of dedicated funding for system upkeep and development. Furthermore, the digital literacy and technical proficiency of school personnel remain critical obstacles to effective implementation. Without ongoing training and support, there is a risk that the adoption of digital technology may stall or regress.

To ensure the effective and equitable implementation of digital management systems across all educational institutions, a collaborative effort involving government bodies, education departments, and schools is essential. This includes providing robust

digital infrastructure, offering regular technical training for school staff, and establishing long-term policy frameworks that are responsive to technological advancements. Only through such a holistic and inclusive strategy can the digital transformation of school management be successfully realized, leading to sustainable improvements in the quality and efficiency of educational services in Indonesia.

B. Suggestion

In light of the research findings, several key recommendations are presented to enhance the implementation of digital-based school management systems aimed at improving administrative efficiency in junior high schools across East Kalimantan Province. First, the development of digital infrastructure must be prioritized. This includes ensuring stable internet connectivity and the provision of adequate digital devices, particularly in rural and remote areas, to support the optimal functioning of digital systems. Second, capacity building should be a continuous effort. Regular training programs and technical support are essential for equipping administrative staff and teachers with the digital competencies needed to effectively operate school management applications such as e-Raport, Dapodik, and digital attendance tools.

Third, the sustainability of digital transformation requires strong policy support. Local and national education authorities are encouraged to design long-term, flexible policies that include sufficient budget allocations for the maintenance, development, and regular evaluation of digital systems. Fourth, schools are advised to cultivate a collaborative and innovation-driven work culture. Promoting teamwork, openness to technological change, and shared learning among staff will not only improve digital literacy but also reduce dependence on individual actors. Lastly, a structured monitoring and evaluation mechanism must be established. Regular assessments will help identify obstacles, measure the effectiveness of digital tools, and ensure that the digitalization of school administration genuinely contributes to greater efficiency, transparency, and service quality in the education sector.

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