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Digital Transformation in School Administration and the Implementation of School Management Information Systems at Madrasah Aliyah Negeri 1 Mataram

Baiq Trisni Yuliantari[1]*, Mohamad Mustari[1], Syarifuddin[1]

[1]Master of Educational Administration Study Program, Postgraduate Program, University of Mataram, Indonesia.

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***Corresponding Author**

Baiq Trisni Yuliantari,
Master of Educational Administration Study Program, University of Mataram, Indonesia.
e-mail: i2k02420017@student.unram.ac.id

Abstract

Digital transformation has become a primary demand in improving the quality of educational governance in the modern era. This study aims to analyze the management of digital transformation in school administration at MAN 1 Mataram, focusing on the implementation process of the School Management Information System (SIMS), the benefits gained, and the challenges encountered. The research employed a qualitative descriptive method with a case study design, involving the principal, teachers, and administrative staff as research subjects. Data were collected through interviews, observations, and documentation, then analyzed through data reduction, data presentation, and conclusion drawing. The findings reveal that MAN 1 Mataram possesses strong digital infrastructure readiness, supported by adequate ICT facilities and competent human resources. The implementation of SIMS has improved administrative efficiency and data transparency; however, it still faces challenges such as power outages, limited internet quotas, and network disruptions. The study concludes that the success of digital transformation depends on infrastructure readiness, digital literacy, and policy support. The implication is that digitalizing school administration can strengthen governance and enhance the effectiveness of educational services. It is recommended that schools and the government continue to improve infrastructure stability, provide digital training, and offer ongoing support for digital-based madrasahs.

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INTRODUCTION

Digital transformation has become an essential part of improving the quality of educational governance (Sudiansyah & Peterianus, 2025; Tanjung et al., 2024). It has led to comprehensive changes in the way organizations operate and deliver services by utilizing digital technology to become faster, more efficient, and relevant to the needs of the times (Ahyani & Dhuhani, 2024). One such area is school administration, which demands efficiency, transparency, and data accuracy through digital tools (Sahira et al., 2025). Digital administration refers to all administrative activities carried out with the assistance of digital technology, replacing manual or paper-based processes (Badruli et al., 2024). It emphasizes managing data, services, and administrative communication electronically through digital platforms or systems to enhance efficiency, transparency, and service speed (Yulanda & Adnan, 2023).

The utilization of information and communication technology through the implementation of the School Management Information System (SIMS) serves as a strategic step in supporting the transformation process (Han et al., 2025). This system integrates various administrative services digitally, such as student, teacher, and grade data, attendance, finance, and school archives (Hidayatullah, 2025). It helps streamline and accelerate administrative management processes, minimizing manual work (Mustari, 2025). Other benefits include easier correspondence, reporting, and documentation, which can be stored and shared digitally. Furthermore, teachers, students, and parents can access data anytime and anywhere via mobile phones or laptops (Darmansah et al., 2024). In addition, financial data, school operational assistance, grades, and attendance can be more transparently and accurately monitored (Harmi & Sumarto, 2024).

Several studies have demonstrated the effectiveness of ICT utilization in school management systems. For instance, Mania et al. (2025) explored digital transformation at Madrasah Aliyah Al-Wathoniyah Karangsuci and found that implementing management information systems contributed to improved administrative efficiency and stronger staff coordination. Tumiran et al. (2024), using a qualitative case study approach, revealed that administrative efficiency increased through the use of integrated digital platforms. Rosmini et al. (2024), in a qualitative study on school leadership transformation in the digital era, discovered that technology use accelerated administrative processes and made educational services more responsive. Gunawan & Niyu (2024) highlighted obstacles in digital transformation

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implementation at schools, identifying challenges in digital competence and infrastructure readiness. Meanwhile, Jennah et al. (2025), through descriptive qualitative research, emphasized that digital transformation strategies in Islamic school administration provide valuable insights for strengthening management systems and improving service effectiveness.

Based on interviews and observations at Madrasah Aliyah Negeri (MAN) 1 Mataram, the institution is currently striving to implement digital transformation through the use of the School Management Information System (SIMS) to enhance administrative effectiveness. However, several issues hinder the system's optimal use. Some administrative staff and teachers have not fully mastered digital applications due to limited technological literacy, while ICT facilities such as internet networks and computer devices remain inadequate to fully support operations. Moreover, data integration across divisions, such as human resources, finance, academics, and student affairs, has not yet been consistently implemented, causing some administrative processes to still rely on manual methods. This situation affects work efficiency, service speed, and data accuracy, preventing the school's administrative system from reaching the ideal standard of a fully digitalized system.

Previous studies have generally emphasized the importance of digital transformation in enhancing administrative efficiency but have rarely examined in depth how the management, utilization, and challenges of implementing management information systems are addressed within state Islamic schools (madrasahs). This underscores the need for an in-depth study at MAN 1 Mataram, which has institutional characteristics distinct from general schools. Therefore, this study aims to analyze the management of digital transformation in school administration at MAN 1 Mataram, focusing on the implementation process of the management information system, the benefits obtained, and the challenges encountered during implementation. The results of this research are expected to provide practical implications in the form of recommendations for strengthening digital-based administrative management in madrasahs, as well as theoretical implications for enriching the literature on contextual, adaptive, and sustainable models of digital transformation in Islamic educational institutions.

MATERIALS AND METHODS

Research Design, Time, and Location

This study employed a qualitative descriptive case study design. The focus of the research was to analyze the management of digital transformation in school administration at Madrasah Aliyah Negeri 1 Mataram, particularly in terms of (1) the implementation process of the School Management Information System (SIMS), (2) the benefits obtained from its use, and (3) the challenges encountered during implementation. A qualitative case study approach was selected to obtain an in-depth understanding of the phenomenon within its real-life context. The research was conducted in October 2025 at Madrasah Aliyah Negeri 1 Mataram, West Nusa Tenggara, Indonesia. The research subjects consisted of the principal, administrative staff, and teachers who were directly involved in the implementation and use of the School Management Information System. These participants were selected because they possessed relevant experience and authority related to school administrative management and digital system utilization.

Research Instrumen

This study utilized three instruments to collect research data: (1) an interview question list, (2) an observation sheet, and (3) a document conformity checklist. By using these three instruments, the researcher obtained robust data, as each instrument complemented and supported the others.

Population and Sample

The population of this study included all school personnel involved in administrative and academic management at MAN 1 Mataram. The research sample was determined using purposive sampling, with selection criteria including: (1) active involvement in school administration or teaching activities, (2) direct use of the School Management Information System, and (3) willingness to provide in-depth information. This sampling technique is commonly used in qualitative research to obtain rich and relevant data (Creswell, 2014).

Research Procedure

Data collection techniques in this case study were conducted through interviews, observations, and documentation. Interviews were used to obtain in-depth information from respondents related to the research problem, using an interview guide developed based on the research focus. Observation was carried out to directly examine activities, situations, and behaviors in the field, using an observation sheet as a guide to ensure the process was systematic and objective. Meanwhile, the documentation technique was employed to gather data from various relevant documents such as reports, archives, or photographs, using a document conformity checklist to ensure the completeness and relevance of the collected data.

Data Analysis Techniques

Data processing techniques in qualitative research are carried out through three main stages: data reduction, data presentation, and conclusion drawing with verification. Data reduction is the process of selecting, summarizing, and focusing on relevant data to make it easier to analyze. Data presentation involves systematically organizing information in forms such as narratives, tables, or charts to help the researcher identify patterns and relationships among the data. Finally, conclusion drawing and verification are conducted by formulating findings based on the processed data while rechecking them to ensure the accuracy and validity of the research results.

Data Credibility and Trustworthiness

To ensure data credibility, this study applied several trustworthiness techniques, including source triangulation, technique triangulation, and member checking. Triangulation was conducted by comparing data obtained from interviews, observations, and documentation, as well as across different participants. Member checking was carried out by confirming key findings with participants to ensure accuracy and validity of interpretations.

RESULT AND DISCUSSION

Result

Availability of Information and Communication Technology Facilities at MAN 1 Mataram

The findings indicate that MAN 1 Mataram has a high level of ICT infrastructure readiness to support digital transformation in school administration. Interview data revealed that the school is equipped with a computer laboratory containing approximately 60 desktop computers, supported by additional laptops for teachers and students. One teacher stated:

"The number of computers in the lab is sufficient for both learning and administrative activities, and almost all teachers already use laptops for daily tasks." (Teacher Interview, October 2025)

In addition, each classroom is equipped with an LCD projector, and the science and language laboratories are integrated with digital tools. The school also operates an official website and utilizes WhatsApp groups as communication platforms between the school, students, and parents. These facilities indicate that ICT resources at MAN 1 Mataram are not only available but actively utilized in administrative and academic processes.

The Implementation Process of the School Management Information System at MAN 1 Mataram

The implementation of SIMS at MAN 1 Mataram was carried out through three main stages: planning, implementation, and evaluation. During the planning stage, the school formed an internal ICT team to identify priority administrative services for digitalization, including student data, teacher records, and academic services. According to the principal:

"We started by mapping administrative needs and determining which services should be digitized first to improve efficiency." (Principal Interview, October 2025)

At the implementation stage, manual administrative data were migrated into a web-based system. Teachers used SIMS to manage schedules, grades, and student reports, while administrative staff handled correspondence and archives digitally. The evaluation stage involved regular meetings to identify technical issues and user difficulties, leading to system improvements and additional training.

Planning Stage

In the initial stage, the school identified administrative needs and mapped the services to be integrated into the digital system. The principal, together with the madrasah development team, established an internal ICT team responsible for designing the system and determining priority areas for digitalization, including student data, teacher records, staffing, infrastructure inventory, and academic services.

The school also coordinated with the Mataram City Office of the Ministry of Religious Affairs to ensure that the system aligns with the Madrasah Digital policy. In addition, teachers and administrative staff received socialization and training on how to use the information system, including data input, electronic document management, and data security. This stage served as an essential foundation to ensure that all users understood the functions and benefits of SIMS in improving administrative efficiency.

Implementation Stage

The implementation of the management information system began with the use of a web-based digital administration application accessible to teachers and administrative staff. During this stage, manual data were migrated into the digital system, covering personnel records, student data, grades, and other school documents. Teachers used the system to manage teaching schedules, assessments, and student progress reports, while administrative staff used it to handle correspondence, archiving, and inventory data management.

Furthermore, the school integrated digital assessment systems such as the Computer-Based Test (CBT) and Learning Management System (LMS) to support online learning and digital grading archives. Through this system, student data became more accessible, accurate, and easier to manage, while teachers could more efficiently prepare academic reports. The availability of digital infrastructure—such as computers, laptops, LCD projectors, and the school's internet network—greatly supported the implementation process. Each classroom was equipped with a projector and Wi-Fi connection, enabling teachers to use digital media effectively during instruction.

Evaluation and Development Stage

Evaluation was conducted periodically through meetings between the SIMS management team and the principal. The evaluation covered system effectiveness, emerging technical issues, and users' proficiency in operating the system. Based on interviews, most teachers and administrative staff were able to use the system effectively, although some still required additional technical assistance. The school also monitored data security and maintained hardware to ensure optimal system performance. The evaluation results served as the basis for continuous improvement and system development, such as upgrading server capacity, adding new digital service features, and strengthening digital literacy among teachers and administrative personnel.

The Benefits of Digital Transformation in School Administration

The findings show that digital transformation has increased administrative efficiency and data transparency at MAN 1 Mataram. Teachers reported faster report card processing, easier data access, and improved assessment management through LMS and CBT systems. One administrative staff member explained:

"Administrative work is now faster because data are stored digitally and can be accessed anytime without searching through physical documents." (Administrative Staff Interview, October 2025)

In addition to teacher competence, ICT facilities at MAN 1 Mataram are already highly adequate. The school has a computer laboratory with approximately 60 desktop computers, complemented by additional laptops available for teachers and students. Each classroom is equipped with an LCD projector, and nearly all teachers have personal laptops. Other facilities, such as the science and language

laboratories, are also equipped with digital tools that support interactive learning.

Moreover, the school has an official website that functions as an information and publication platform, as well as a channel for announcements to the community. Communication between the school and parents is facilitated through WhatsApp discussion groups, enabling quick access to information regarding students' academic progress and behavior. These facilities demonstrate that MAN 1 Mataram possesses strong digital infrastructure to support comprehensive digital transformation. Furthermore, the implementation of ICT at MAN 1 Mataram has produced several concrete benefits, including:

- Increased administrative efficiency, through digital systems such as hosted applications for report card generation, enabling automatic and integrated management of student grades and report printing.
- Utilization of a Learning Management System (LMS), used by teachers and students to manage learning materials, submit assignments, and monitor learning progress online.
- Implementation of Computer-Based Tests (CBT) for examinations and assessments, which makes the evaluation process faster, more accurate, and transparent.
- Digital-based assessment, which assists teachers in designing more varied and student-centered evaluation instruments.

Through these various implementations, teachers and administrative staff experience greater ease in managing academic activities—from planning and implementation to reporting learning outcomes. The learning process has become more engaging, efficient, and adaptive to advancements in educational technology.

Challenges in the Implementation of Digital Transformation

Despite these benefits, several challenges were identified. The most significant obstacles include power outages, limited internet quotas, and unstable network connections. Teachers reported that power interruptions often disrupt digital assessments and data entry processes. As one teacher noted:

"When electricity goes out, we have to postpone CBT exams and online grading." (Teacher Interview, October 2025)

The next obstacle is the limited internet quota for schools, which runs out quickly, especially when online learning activities or digital assessments are conducted simultaneously. In such situations, access to the School Management Information System (SIMS), madrasah websites, and learning platforms such as Learning Management Systems (LMS) is disrupted. Schools usually address this by recharging their quota or using teachers' private networks. However, these solutions are only temporary and do not address the root of the problem.

In addition to these two issues, internet network disruptions and weak Wi-Fi signals in some areas of the school are also technical obstacles that occur quite frequently. Some classrooms experience unstable connections, hindering activities such as grade entry, material downloads, and the use of digital learning media. Teachers sometimes have to wait for the connection to recover or move to another room with a stronger signal. This situation shows that the success of digital transformation implementation is highly dependent on the stability of technological infrastructure and adequate support facilities.

Discussion

The readiness of ICT Infrastructure and Facilities at MAN 1 Mataram

The readiness of Information and Communication Technology (ICT) infrastructure and facilities is a fundamental aspect in supporting digital transformation in educational institutions. The findings of this study indicate that MAN 1 Mataram possesses adequate ICT facilities, such as computer laboratories, science laboratories equipped with digital devices, LCD projectors in every classroom, and a stable internet network. The availability of these facilities aligns with the view of Harahap et al. (2025), who assert that strong ICT infrastructure is an essential prerequisite for schools to enhance access, efficiency, and the quality of educational services in the digital era. This demonstrates that technological readiness involves not only the provision of hardware but also the integration of systems and the cultivation of a digital culture within the school environment.

Furthermore, the ownership of laptops by almost all teachers at MAN 1 Mataram reflects individual readiness to support digital learning. This condition corresponds with the findings of Hadiningrat et al. (2024), who explain that the successful implementation of educational technology innovations is significantly influenced by educators' readiness and digital literacy. Teachers who are accustomed to using digital devices can more easily integrate technological media into the learning process, thereby creating an adaptive and interactive learning environment.

The utilization of the school website and digital communication forums, such as WhatsApp Groups, also illustrates the application of digital governance principles in school management. These digital media enable faster, more transparent, and more efficient communication among the school, students, and parents. This supports the findings of Irvani et al. (2024), who state that the integration of information systems and digital communication platforms can strengthen collaboration among educational stakeholders while enhancing digital literacy among students.

From a policy perspective, the readiness of facilities at MAN 1 Mataram meets most of the components outlined in the Digital Madrasah concept by the Ministry of Religious Affairs. Sholihah et al. (2025) found that educational institutions with adequate digital infrastructure are better able to adopt distance learning systems, online assessments, and data-driven management. In this context, MAN 1 Mataram demonstrates a high level of readiness to implement a School Management Information System (SIMS) and other digital innovations.

Theoretically, these findings can be explained through the Technology Readiness Index (Parasuraman, 2000), which assesses the readiness of organizations and individuals to adopt new technologies. Based on this theory, MAN 1 Mataram exhibits a high level of readiness, supported by comprehensive facilities, competent users,

and policies that promote the digitalization of administration and learning. Therefore, the readiness of ICT infrastructure and facilities at MAN 1 Mataram serves as a strategic foundation for the successful digital transformation of the madrasah.

The Implementation Process of the School Management Information System

The implementation of the School Management Information System (SIMS) at MAN 1 Mataram demonstrates a gradual digitalization process, encompassing the planning, execution, and evaluation and development stages. This phased approach aligns with the information system implementation model proposed by Kristanti and Putra (2025), who emphasize that a systematic implementation process can reduce data errors by up to 50% and improve school administrative efficiency. In the planning stage, the involvement of the principal as the decision-maker and the ICT team as technical implementers is a key factor for successful digitalization. This is reinforced by Pradikta et al. (2025), who found that active participation of school leadership and development teams in designing digital systems can accelerate user adaptation to new systems.

The execution stage of SIMS at MAN 1 Mataram involves integrating various administrative services, such as student data, teacher data, personnel, and grades, into a centralized web-based system. This practice corresponds with the findings of Supendi et al. (2025), who noted that modern educational information management systems have evolved from simple administrative functions to data-driven strategic school planning systems. Such data integration enables high efficiency in administrative workflows and decision-making processes. Additionally, the online, cross-platform nature of the system supports transparency and accountability, as highlighted by Harini et al. (2024) in their study on the use of ICT to enhance educational management efficiency.

The roles of the principal, the ICT team, and administrative staff are also crucial for ensuring the sustainability of SIMS implementation. The principal serves as a policy director and strategic decision-maker, while the ICT team manages the technical aspects of the system and provides training for teachers and administrative staff. This finding aligns with Estiningsih and Rifa'i (2023), who assert that technical competence and human resource readiness are the most influential factors in the successful implementation of information systems in schools. MAN 1 Mataram also conducts internal training for teachers and administrative staff to improve digital literacy skills, in accordance with the recommendations of Hamid and Aslan (2025), who suggest continuous guidance for system users to ensure that digital transformation is not merely formal but fully internalized into the school's work culture.

Overall, the implementation of SIMS at MAN 1 Mataram has proven to positively impact work efficiency and administrative effectiveness. The system accelerates data input processes, reduces manual errors, and provides real-time academic information. These findings support Kristanti and Putra's (2025) research, which indicates that educational management information systems play a significant role in improving service quality and administrative performance. Moreover, a systematic strategic planning is key in preparing educational institutions for digital transformation (Umais et al. 2025). Therefore, the implementation of SIMS can be considered a strategic step toward establishing a digital madrasah that is efficient, transparent, and focused on enhancing the quality of education.

The Benefits of Digital Transformation in School Administration

Digital transformation at MAN 1 Mataram has had a significant impact on improving the effectiveness of school administration. The implementation of a digital-based management information system facilitates various administrative activities, ranging from student data management and personnel administration to school finances. This aligns with the findings of Mayasari, Supriani, and Arifudin (2022), who stated that technology-based academic management information systems can enhance the quality of learning services and school administrative efficiency. Through the utilization of applications such as Learning Management Systems (LMS) and Computer-Based Tests (CBT), assessment processes become faster and more transparent, while minimizing human errors in data processing.

Furthermore, the school gains substantial benefits from digitalization of reports and archives. MAN 1 Mataram has utilized hosting services for online management of student report cards, allowing teachers to input grades flexibly from their own devices. This demonstrates time efficiency and ease of access to academic data, consistent with the research of Sugandi and Rodhiyah (2024), who emphasized that digital systems can reduce administrative burdens and accelerate reporting processes. The use of adequate ICT facilities, such as computer laboratories, teacher laptops, and projectors in every classroom, further strengthens the integration of learning and administrative activities.

Digital transformation also improves communication between the school, teachers, students, and parents. Through the school website and digital discussion forums such as WhatsApp Groups, information regarding learning activities, grades, and student attendance can be delivered quickly and accurately. Yasifa and Pelis (2023) found that the use of digital media in madrasah communication enhances transparency and parental participation in school activities. Thus, digitalization functions not only for internal efficiency but also strengthens external relations between the school and the community.

Moreover, digital transformation has fostered a data-driven work culture within the school. According to Hidayati, Rifa'i, and Rochmah (2023), the implementation of digital systems accompanied by ongoing training improves educators' technological literacy and accountability. At MAN 1 Mataram, every teacher is required to attend ICT workshops and digital learning media training. This initiative aligns with Afrine, Qosim, and Libriyanti (2021), who emphasize that the success of administrative digitalization is strongly influenced by human resource readiness. Therefore, the main benefits of digital transformation at MAN 1 Mataram are not only increased work efficiency but also enhanced professional capacity of teachers and educational staff in facing the

challenges of the digital era (Jennah, Chotib, & Sukamto, 2025).

Kendala dalam Implementasi Transformasi Digital di MAN 1 Mataram

Although the infrastructure and systems readiness at MAN 1 Mataram is relatively adequate, the digital transformation process still faces several technical and non-technical challenges. One of the main obstacles is scheduled power outages, which often disrupt digital administrative activities, such as grade input and computer-based examinations. This condition aligns with the findings of Wijaya and Firmansyah (2022), who stated that unstable energy infrastructure is one of the inhibiting factors in the implementation of digital systems in Indonesian schools. Power supply disruptions cause delays in administrative processes and reduce the efficiency of using the school management information system.

In addition, limited internet quotas and network interruptions are significant challenges in implementing administrative digitalization. When many users, such as teachers and administrative staff, access the system simultaneously, the connection often slows down or even disconnects. Nasar, Azis, and Setiawi (2025) revealed that unstable internet access and low bandwidth are factors contributing to the low effectiveness of digital transformation in educational institutions. This indicates that the availability of a strong network is an essential prerequisite for the success of digital transformation in schools.

Another challenge is the limited digital literacy among some teachers and administrative staff. Although training and workshops have been conducted, some educators still struggle to operate applications and digital systems optimally. Putra, Sobandi, and Aisah (2024) emphasize that low digital literacy among users is a major challenge in the implementation of educational management information systems. Similarly, Yuliana et al. (2023) found that human resource readiness has a direct correlation with successful technology adaptation in education.

Beyond technical and human resource aspects, limited budget support for system maintenance and internet quota extensions is also a frequent obstacle faced by schools. According to Febrianty, Ambarita, and Sentanu (2024), the sustainability of educational digitalization in Indonesia heavily depends on adequate policy support and funding allocation for infrastructure and teacher training. Without continued support, digital transformation programs risk being ineffective or halted before full implementation.

CONCLUSION

This study finds that the implementation of digital transformation in school administration at MAN 1 Mataram has been effectively realized through the systematic application of the School Management Information System (SIMS). The findings indicate that adequate ICT infrastructure, including computer laboratories, classroom-based digital facilities, and online administrative platforms, supports efficient administrative processes and data transparency. The implementation of SIMS follows three interconnected stages; planning, implementation, and evaluation, actively involving the principal, ICT team, teachers, and administrative staff. The use of digital systems such as LMS, CBT, and online report card applications has improved administrative efficiency, accelerated data processing, and enhanced accessibility of academic information. However, the study also identifies technical constraints, particularly power outages, limited internet quotas, and network instability, which affect the optimal use of digital systems. Overall, the results demonstrate that the effectiveness of digital transformation at MAN 1 Mataram is determined by the integration of infrastructure readiness, human resource competence, and continuous institutional support.

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