

Implementation of a Management Information System to Enhance the Quality of Educational Services: A Case Study at Madrasah Aliyah Negeri 2 Parepare

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ABSTRACT

Purpose of the study: This study aims to analyze the implementation of Management Information Systems at Madrasah Aliyah Negeri 2 Parepare, focusing on system management through planning, organizing, implementation, and controlling, the supporting and inhibiting factors, and the implications of MIS implementation for strengthening the quality of educational services.

Methodology: This study employed a qualitative field research approach at Madrasah Aliyah Negeri 2 Parepare. Data were collected through semi-structured interviews, direct observation, and documentation involving the principal, head of administration, operator, teachers, students, and parents. Data were analyzed using editing, data reduction, data display, and conclusion drawing, with source and method triangulation used to establish credibility.

Main Findings: The findings show that MIS implementation supports educational services through Siasi Maddupa and other digital services, including online student admission, digital report cards, digital library, e-learning, attendance, and computer-based testing. Adequate technological facilities support implementation, while unstable internet connectivity, development and maintenance costs, differences in technological competence, limited training, and incomplete system integration remain major challenges.

Novelty/Originality of this study: This study provides a contextual analysis of MIS implementation in a madrasah by examining management functions, technological facilities, human-resource readiness, implementation barriers, and educational service implications simultaneously. Its originality lies in identifying the gap between the availability of multiple digital services and their incomplete integration within one institutional information management system.

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1. INTRODUCTION

The development of information technology has brought significant changes to the management of educational institutions, including the delivery of administrative and academic services [1]. Management Information Systems (MIS) have become an important instrument for educational institutions to manage information systematically, accelerate administrative processes, and facilitate access to information needed by various stakeholders [2]. In the educational context, the use of information systems is not limited to data

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management but also involves the utilization of information to support institutional management and the quality of educational services [3], [4]. Therefore, the implementation of MIS has become increasingly important as educational institutions seek to adapt their management practices to a more dynamic and technology-based environment.

However, the implementation of management information systems in educational institutions does not always operate optimally. The availability of applications and technological infrastructure does not automatically guarantee effective educational services when it is not supported by appropriate management, human resources, infrastructure, and coordination [5]. This condition is also evident at Madrasah Aliyah Negeri 2 Parepare, which has implemented several information systems, including a digital madrasah report card system, the Siat Maddupa application, and the madrasah website. The Siat Maddupa application was developed by the madrasah's alumni to facilitate administrative tasks, improve work efficiency, support the Merdeka Belajar program, and facilitate internal and external communication. Nevertheless, its implementation still faces several challenges, including unstable Wi-Fi connectivity, the costs associated with technological development, inconsistent technology utilization among some teachers, and the lack of full integration among the applications [6].

Previous studies have examined the utilization of management information systems in educational contexts [7]. Nur Rahmi Sonia's study on the implementation of Educational Management Information Systems at Madrasah Aliyah Negeri 2 Ponorogo examined the use of information systems in supporting educational management and quality improvement. Similarly, Yunika Purwaningsih investigated the implementation of educational management information systems at Madrasah Ibtidaiyah Muhammadiyah Paremono [8]. Meanwhile, Annisa Mayasari and colleagues examined the implementation of information technology-based academic management information systems to improve the quality of learning services in a vocational school [9]. These studies indicate that management information systems have received considerable attention as instruments for supporting educational management and service quality. However, each study was conducted within a different institutional context and emphasized different aspects of information system implementation.

Based on these previous studies, a research gap remains in understanding how management information systems are implemented contextually within a madrasah that utilizes several forms of digital services simultaneously [10]. Previous studies have generally positioned information systems as instruments for supporting educational quality or learning services, whereas the comprehensive management of the system—from planning, organizing, and implementation to control as well as the supporting and inhibiting factors, requires further examination within the madrasah context. At Madrasah Aliyah Negeri 2 Parepare, MIS implementation involves not only the use of the Siat Maddupa application but also other digital services that support administrative activities, data management, communication, and educational services. This condition indicates the importance of examining MIS implementation as a management process rather than merely as the utilization of technological applications.

The examination of MIS implementation is important because the quality of educational services is not determined solely by the availability of technology but also by the institution's capacity to manage and utilize technology sustainably. The findings reported in the thesis indicate that MIS implementation at Madrasah Aliyah Negeri 2 Parepare facilitates various service processes, including accelerating administrative tasks, simplifying student grade management, supporting the New Student Admission process, and facilitating access to information for members of the madrasah community [11]. At the same time, supporting facilities such as computers, SmartTVs, and internet access contribute to implementation, while unstable connectivity, technological development costs, and the limited utilization of technology by some teachers remain challenges. Therefore, examining MIS implementation is important for understanding how technology is managed and utilized to support the quality of educational services.

Based on these conditions, this study aims to analyze the implementation of Management Information Systems in strengthening the quality of educational services at Madrasah Aliyah Negeri 2 Parepare. Specifically, the study examines the management of the information system through the functions of planning, organizing, implementation, and control; identifies the factors that support and hinder MIS implementation; and analyzes its implications for the quality of educational services [12]. This focus is intended to provide a comprehensive understanding of how management information systems are managed within a madrasah and how their implementation contributes to the provision of educational services.

The novelty of this study lies in its contextual analysis of Management Information System implementation in strengthening the quality of educational services at Madrasah Aliyah Negeri 2 Parepare, particularly by examining the interaction between system management, technological facilities, human resources, and implementation challenges. The study specifically provides an account of the utilization of the Siat Maddupa application alongside other information systems in supporting educational services, while demonstrating that optimizing MIS depends not only on the availability of applications but also on effective organization, continuous control, user readiness, and adequate infrastructure. Thus, this study complements

previous research by providing a more contextual understanding of MIS implementation and the factors that shape its contribution to the quality of educational services in the madrasah context.

2. RESEARCH METHOD

2.1. Research Design

This study employed a qualitative research approach using a field research design. The qualitative approach was selected because the study aimed to obtain an in-depth understanding of the implementation of Management Information Systems (MIS) and their contribution to strengthening the quality of educational services at Madrasah Aliyah Negeri 2 Parepare [13], [14]. Field research was conducted by directly visiting the research site and collecting empirical data based on the conditions and activities observed in the field. The research focused on the implementation of the Siat Maddupa application as the main management information system used at Madrasah Aliyah Negeri 2 Parepare and its relationship to academic and learning services. The implementation was examined through four management functions: planning, organizing, implementation, and controlling. The study also investigated supporting and inhibiting factors and the implications of MIS implementation for educational service quality.

2.2. Research Site, Subjects, and Focus

The research was conducted at Madrasah Aliyah Negeri 2 Parepare, located on Jl. Jendral Sudirman No. 80, Sumpang Minangae, Bacukiki Barat District, Parepare City, South Sulawesi, Indonesia. Data collection was conducted for 45 days, from 14 May to 28 June 2024. As a qualitative study, this research did not use a statistical population and sample. Instead, participants were selected based on their involvement and relevance to the implementation and utilization of the management information system. The participants consisted of the madrasah principal, head of administration, madrasah operator, teachers, students, and parents. The thesis records the involvement of the principal, head of administration, three teachers, a madrasah operator, three student representatives, and three parents as interview informants. The research focus is summarized in Table 1.

Table 1. Research Focus and Participants

No.	Research Focus	Main Participants/Sources
1	Management and implementation of MIS	Madrasah principal, head of administration, operator, teachers
2	Planning, organizing, implementation, and controlling of Siat Maddupa	Madrasah principal, head of administration, operator, teachers
3	Supporting and inhibiting factors	Madrasah principal, head of administration, operator, teachers
4	Educational service quality	Teachers, students, parents, administrative staff
5	Implications of MIS implementation	Madrasah principal, teachers, operator, students, parents

2.3. Data Sources and Data Collection Techniques

The study used both primary and secondary data. Primary data were obtained directly from research participants through interviews and from observations of activities and processes related to MIS implementation at the madrasah. Secondary data were obtained from relevant documents and supporting materials related to the implementation of the information system. Three data collection techniques were employed: interviews, observation, and documentation. Interviews were conducted with the madrasah principal, head of administration, operator, teachers, students, and parents to obtain information concerning the implementation, utilization, benefits, challenges, and implications of the Siat Maddupa application. Observation was used to examine activities and processes occurring directly at the research site. Documentation was used to obtain supporting evidence, including application screenshots and other relevant documents. The use of multiple data collection techniques enabled the researcher to compare information obtained from interviews with observations and documentary evidence. This procedure was important for developing a comprehensive description of MIS implementation and educational service quality at the research site.

2.4. Research Instrument

In qualitative research, the researcher served as the primary instrument, supported by interview guidelines, observation guidelines, and documentation instruments. The interview guideline was structured around the research focus and addressed the implementation of MIS, management functions, supporting and inhibiting factors, and implications for educational services. The observation guideline was used to record relevant activities and conditions at the madrasah, while documentation was used to collect supporting evidence

related to the information system. Research instruments were prepared to support the collection of information concerning MIS implementation, management functions, supporting and inhibiting factors, and educational service quality. The instruments included interview guidelines, observation guidelines, and documentation instruments, with different data sources selected according to the research focus. The details of the instruments, examined aspects, and data sources are presented in Table 2.

Table 2. Research Instruments

No.	Instrument	Main Aspects Examined	Data Sources
1	Interview Guideline	MIS implementation and objectives	Principal, head of administration, operator
2	Interview Guideline	Planning, organizing, implementation, and controlling	Principal, head of administration, operator, teachers
3	Interview Guideline	Supporting and inhibiting factors	Principal, head of administration, operator, teachers
4	Interview Guideline	Educational service quality and user experience	Teachers, students, parents
5	Observation Guideline	Activities, facilities, technology use, and service processes	Madrasah environment
6	Documentation Guideline	Application screenshots and relevant institutional documents	Madrasah documents and digital systems

Table 2 shows that the research instruments covered interviews, observations, and documentation to obtain comprehensive data on MIS implementation. These instruments supported the identification of management practices, implementation conditions, user experiences, and educational service implications. The interview instrument was designed to capture information from different stakeholders. Questions for the principal addressed the information systems used, their objectives, management processes, evaluation, implications, supporting and inhibiting factors, and socialization. Questions for teachers, operators, students, and parents focused on their experiences, utilization of the system, accessibility of services, benefits, challenges, and expectations.

2.5. Data Analysis Technique

The collected data were analyzed using qualitative descriptive analysis. The analysis was conducted systematically through several stages, including editing, data reduction, data display, and conclusion drawing. Before formal analysis, interview data were transcribed, organized, reviewed, and coded according to the themes relevant to the research questions.

First, editing was conducted by reviewing interview notes, observations, and other collected information to ensure that the data were organized and relevant. Second, data reduction involved selecting relevant information, identifying themes, categorizing data, focusing on information related to the research questions, and removing data that were not relevant [15]. Third, data display was conducted by presenting the findings narratively and systematically according to the identified categories and relationships. Finally, conclusion drawing involved interpreting the patterns and findings based on the available empirical evidence. The analysis process can be represented as follows:

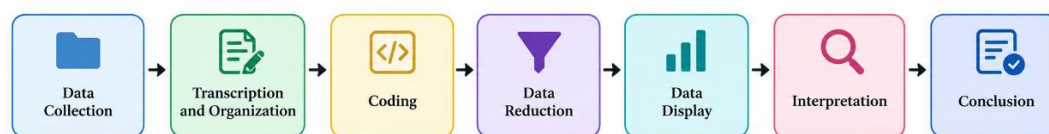


Figure 1. Data Analysis Process

2.6. Data Validity

The credibility of the findings was ensured through triangulation, particularly source triangulation and method triangulation. Source triangulation was conducted by comparing information obtained from different participants, including the madrasah principal, head of administration, operator, teachers, students, and parents. Method triangulation was conducted by comparing findings obtained through interviews, observations, and documentation. This triangulation process was used to determine the consistency of information and to strengthen the credibility of the findings. Documentary evidence, such as application screenshots and relevant institutional documents, was compared with interview statements and observations made during field research.

2.7. Research Procedure

The research procedure consisted of several sequential stages. First, the researcher prepared the research focus and instruments based on the research objectives [16]. Second, field data were collected through

interviews, observations, and documentation. Third, the collected information was transcribed, organized, reviewed, and coded. Fourth, the data were analyzed through editing, reduction, display, and interpretation. Fifth, the credibility of the findings was examined through source and method triangulation. Finally, conclusions were formulated based on the evidence obtained concerning MIS implementation, supporting and inhibiting factors, and its implications for educational service quality. Figure 2 illustrates the sequential stages of the research, from preparation and data collection to data analysis and conclusion formulation. This procedure ensured that the research was conducted systematically and that the findings were supported by the collected evidence.

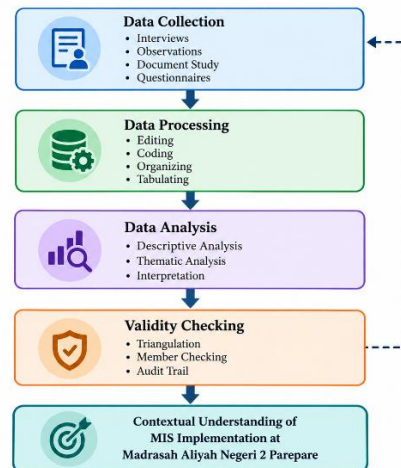


Figure 2. Research Procedure

Figure 2 summarizes the research procedure, showing the sequential process from data collection and analysis to the formulation of conclusions.

3. RESULTS AND DISCUSSION

The results of this study present the empirical findings concerning the implementation of Management Information Systems (MIS) in strengthening educational service quality at Madrasah Aliyah Negeri 2 Parepare. The findings were obtained from interviews, observations, and documentation involving the madrasah principal, head of administration, operator, teachers, students, and parents. The results are organized according to the research objectives, namely MIS management, supporting and inhibiting factors, and the implications of MIS implementation for educational services.

3.1. Management of Management Information Systems

The findings show that the implementation of MIS at Madrasah Aliyah Negeri 2 Parepare was developed in response to the increasing need for digital information management in madrasah administration and educational services. The madrasah utilized several digital applications and developed the Siati Maddupa system as an effort to facilitate the management of information and educational services. The system was developed by a madrasah alumnus and was intended to support the digitalization of madrasah activities [17]. The principal explained that the increasing use of digital applications in education required the madrasah to improve its ability to manage information more efficiently. The development of Siati Maddupa was therefore part of the madrasah's effort to respond to these needs.

The organizing process involved the distribution of responsibilities among personnel involved in the management and use of the information system. The madrasah provided socialization and training for teachers and administrative staff before the system was implemented in their respective activities. A special team was also involved in managing and monitoring the system. The operator had an important role in managing data and ensuring that information entered into the system was properly maintained. The findings indicate that MIS management was not limited to the availability of an application but also involved human resources who were responsible for operating, monitoring, and maintaining the system.

The implementation of MIS was supported by several digital services contained in Siati Maddupa. The available features included Computer-Based Testing (CBT), the Darul Ilmi Digital Library, Online New Student Admission (PPDB), Digital Madrasah Report Cards, E-Learning, Madrasah Self-Service Kiosk, Democracy Week, Ramadan Journal, and attendance services [18]. These features were used to support administrative, academic, learning, and student activities. The madrasah also utilized supporting technologies such as Wi-Fi,

Smart TVs, and digital classrooms. Smart TVs were used to support classroom learning, while digital classrooms were part of the madrasah's digital learning program.

The control process was conducted through coordination and meetings involving the madrasah principal, vice principals, head of administration, operator, and teachers [19]. These meetings were used to discuss the progress of activities, identify problems encountered in the use of the information system, and determine solutions. The operator was also responsible for checking data accuracy and updating information in Siati Maddupa. This process enabled the madrasah to monitor the operation of the information system and address problems that emerged during implementation.

3.2. Supporting and Inhibiting Factors

The findings indicate that the availability of technological facilities was an important supporting factor in the implementation of MIS. The madrasah provided computers with adequate specifications, Wi-Fi facilities, Smart TVs, digital classrooms, and a special room for the operator. Computers were used for administrative activities, data management, archiving, and operating Siati Maddupa. Meanwhile, Smart TVs and digital classrooms supported technology-based learning activities [20]. The availability of these facilities enabled teachers, administrative staff, operators, and students to use digital systems in their respective activities.

Despite the availability of technological facilities, several obstacles were identified during implementation. The most frequently reported technical problem was unstable Wi-Fi connectivity [21]. When the madrasah's internet connection was disrupted, administrative staff sometimes had to use personal mobile data as an alternative. Another obstacle was the cost required for technological development and system maintenance. In addition, the technological competence of users was not uniform. Some teachers and staff still required additional training because they had different levels of familiarity with information technology. The findings also show that the digital services used by the madrasah were not yet fully integrated into a single information system [22]. Several applications and features were available to support different activities, but their operation was still carried out through separate functions. This condition was identified as one of the factors affecting the organization of MIS implementation at the madrasah. Therefore, although digital systems had been utilized in various areas, the implementation had not yet reached a fully integrated information management system.

3.3. Implications for Educational Service Quality

The implementation of MIS produced several changes in administrative and educational service activities at MAN 2 Parepare. The findings show that online PPDB facilitated the collection and storage of prospective student data directly in the madrasah database and supported data integration with EMIS [23]. The digital report card system also facilitated the entry and access of student assessment data. Teachers reported that the digital system made the management of student scores faster and easier, while parents could obtain information about their children's academic development [24]. The use of digital services also facilitated access to educational information and learning resources. The Darul Ilmi Digital Library provided digital access to learning materials, while e-learning and Smart TVs were used to support learning activities. The implementation of these services enabled information to be accessed more easily by teachers and students [25]. Overall, the findings show that MIS implementation at MAN 2 Parepare was utilized to support administrative processes, information access, learning activities, and student services, although its implementation continued to face technical, financial, human-resource, and system-integration constraints. Table 1 summarizes the main findings of MIS implementation at MAN 2 Parepare across planning, organizing, implementation, controlling, supporting and inhibiting factors, system integration, and educational services. These findings indicate that MIS has supported various administrative and educational activities, although improvements in system integration, infrastructure, user competence, and technical support are still needed.

Table 1. Summary of MIS Implementation Findings at MAN 2 Parepare

No.	Aspect	Research Findings
1	Planning	MIS implementation was initiated in response to the increasing need for digital information management and educational services.
2	Organizing	Teachers, administrative staff, operators, and a special team were involved in managing and monitoring the information system.
3	Implementation	Siati Maddupa was used to support CBT, digital library services, PPDB, digital report cards, e-learning, attendance, and other madrasah activities.
4	Controlling	Monitoring was conducted through coordination meetings, data checking, system updates, and problem-solving discussions.
5	Supporting	Adequate computers, Wi-Fi, Smart TVs, digital classrooms, and operator
	Factors	facilities supported MIS implementation.
6	Inhibiting	Unstable internet connectivity, development and maintenance costs,
	Factors	differences in technological competence, and limited user training were

		identified as obstacles.
7	System Integration	Several digital services were available, but they were not yet fully integrated into one information management system.
8	Educational Services	MIS facilitated administrative processes, information access, student admission, assessment management, learning resources, and communication of student academic information.

Table 1 summarizes the implementation of MIS at MAN 2 Parepare and highlights its contributions, supporting factors, and implementation challenges. Overall, MIS supported administrative and educational services while still requiring improvements in integration and technical support.

The implementation of Management Information Systems (MIS) at Madrasah Aliyah Negeri 2 Parepare has been managed through planning, organizing, implementation, and controlling activities. The development of Siati Maddupa reflects the madrasah's effort to respond to the increasing need for digital information management and more efficient educational services [26]. This finding is consistent with previous research showing that structured management and the use of integrated information systems can support administrative management and decision-making in educational institutions [16]. However, the findings also show that the various digital features available at MAN 2 Parepare have not yet been fully integrated into a single information management system [27]. Therefore, MIS management at MAN 2 Parepare demonstrates that digital transformation requires not only the availability of applications but also systematic management, coordination, and integration of information systems.

The implementation of MIS at MAN 2 Parepare is supported by adequate technological facilities, including computers, Wi-Fi, Smart TVs, digital classrooms, and facilities for system operators. These facilities provide the technological foundation for administrative activities, data management, learning activities, and access to educational information. This finding is consistent with previous research indicating that infrastructure, human resources, and institutional support are important factors in implementing information systems in educational institutions [28]. However, unstable internet connectivity, technological development and maintenance costs, differences in technological competence, and limited training remain obstacles to optimal implementation. These findings demonstrate that sustainable MIS implementation requires balanced attention to technological infrastructure, financial resources, and the readiness and competence of system users.

The implementation of MIS has facilitated educational services at MAN 2 Parepare by supporting online student admission, digital report cards, digital library services, e-learning, attendance, and other digital activities. The use of these services has made administrative data processing and access to educational information easier and more efficient for teachers, administrative staff, students, and parents. Previous research has similarly found that the utilization of educational information systems can improve administrative efficiency, data management, and access to educational services. Nevertheless, the benefits of MIS implementation at MAN 2 Parepare are accompanied by challenges related to system integration and the reliability of supporting infrastructure. Thus, the findings indicate that MIS can strengthen educational services when digital technology is supported by appropriate management, adequate infrastructure, competent users, and continuous system development.

Previous studies have generally examined MIS in relation to improving educational quality, administrative efficiency, information management, and educational services. However, less attention has been given to examining the relationship between MIS management processes, implementation barriers, and the level of integration of multiple digital services within a single madrasah context. This study addresses this gap by examining MIS implementation at MAN 2 Parepare through planning, organizing, implementation, controlling, supporting factors, inhibiting factors, and its implications for educational services. The findings provide a contextual understanding of how an educational institution can utilize various digital services while still experiencing challenges in infrastructure, human resources, and system integration. Therefore, the study extends previous discussions by presenting MIS implementation not only as technology adoption but also as an organizational and managerial process [29]. The novelty of this study lies in identifying the gap between the availability of digital services and the integration of those services within the management information system at MAN 2 Parepare. The madrasah has implemented various digital features covering administration, assessment, learning, student services, and information access. However, the findings show that these features have not yet been fully integrated into one comprehensive information management system. This condition provides a specific perspective on the challenges of digital transformation in madrasahs that have already adopted multiple information technologies [30]. Accordingly, the study contributes a contextual understanding that successful MIS implementation should be assessed not only from the availability and utilization of digital applications but also from the extent of system integration and organizational readiness.

The findings theoretically indicate that MIS implementation in educational institutions should be understood as a managerial process involving technology, human resources, organizational coordination, and system integration. The findings also demonstrate that the availability of digital applications alone does not

automatically ensure optimal educational service management. Practically, MAN 2 Parepare needs to strengthen system integration, maintain stable internet infrastructure, provide continuous training for teachers and administrative staff, and allocate resources for system development and maintenance [31]. Continuous coordination among the principal, administrative staff, operators, teachers, and other users is also necessary to maintain data accuracy and address operational problems. These implications emphasize that sustainable digital transformation requires continuous improvement in both technological systems and organizational capacity.

4. CONCLUSION

This study concludes that the implementation of Management Information Systems at Madrasah Aliyah Negeri 2 Parepare has supported educational services through planning, organizing, implementation, and controlling activities. The utilization of Siati Maddupa and other digital services has facilitated administrative processes, student admission, assessment management, information access, digital learning, and communication of academic information. The implementation is supported by adequate technological facilities, while unstable internet connectivity, development and maintenance costs, differences in technological competence, limited training, and incomplete system integration remain challenges. These findings confirm that strengthening educational services through MIS requires not only digital applications but also effective management, reliable infrastructure, competent human resources, continuous training, and system integration. Future research can examine the development of an integrated MIS model that connects existing digital services and evaluate its effectiveness across broader madrasah contexts.

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