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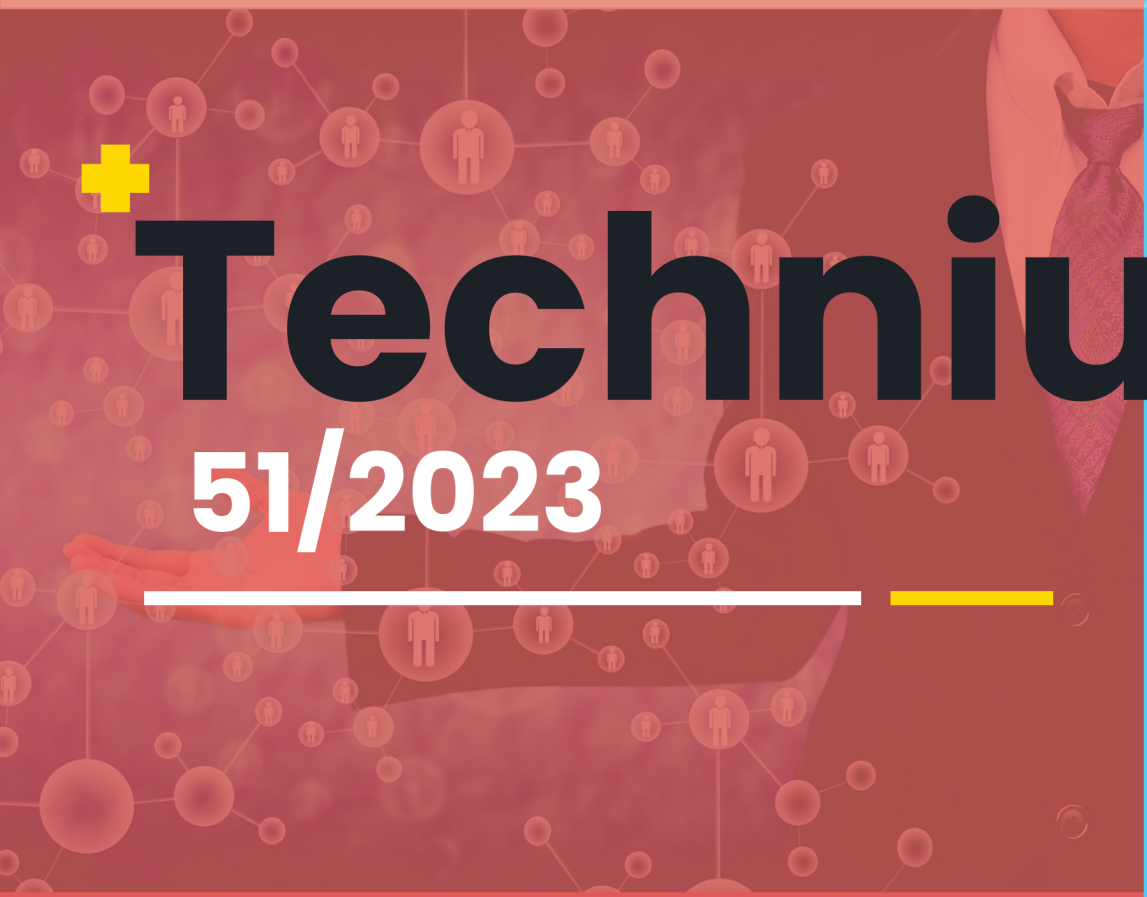

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Digital Transformation of the Management Information System (MIS) at Pondok AnNahdloh, Selangor, Malaysia

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Abstract. The role of information technology in enhancing institutional quality, particularly at Pondok AnNahdloh in Malaysia, cannot be underestimated. Information technology is vital in elevating an institution's standards by improving efficiency, communication, decision-making, security, and innovation. Institutions that effectively embrace information technology can optimize their operations and achieve higher levels of quality, resulting in enhanced competitiveness and desired outcomes. The research's primary objective is to describe the Education Management Information System (MIS) for educational documents at Pondok AnNahdloh in Malaysia, which is up-to-date and integrated. The research methodology involves focus group discussions to identify administrative activities, system application design, system testing, improvement, operator training, limited user testing, launching, and evaluation. Data collection methods include field observations, interviews, and activity documentation. Data analysis follows the theory of Miles and Huberman. The research findings reveal the successful implementation of MIS, leading to up-to-date and integrated educational document data, both in terms of input and processes. Adopting information technology in the academic environment through this system ensures efficient and accurate access, management, and utilization of essential data and information in the educational process. With this system in place, improvements in activity quality are expected, positively impacting community empowerment and national development.

Keywords. Digital, Education, Management Information System (MIS), Transformation

1. Introduction

The demand for improved education in society is essential. When individuals select a school, they undoubtedly prioritize institutions known for their quality. Besides having skilled educators, a school's management and information technology are crucial supplementary resources. A well-managed institution certainly has a positive impact on the community it serves.

Information technology is a primary resource and an essential factor for elevating the quality and competitiveness of educational institutions. Consequently, in today's landscape, almost every educational institution adopts information technology systems as part of their renewal process, aiming to gain a competitive edge over others. These systems bring forth increased efficiency and effectiveness in managing educational institutions. The demand for improved information technology in education is pressing [1], as technology has become a

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strategic advantage for many educational institutions in coping with the intensifying competition in the contemporary era [2].

Furthermore, using computers as information media has led to establishing a secure and highly efficient system. This technological advancement enables swift and accurate access to available data and information. Information technology's progress finds application in various sectors, including government, health, education, and business [3].

One educational institution that requires an enhancement in data processing and academic information quality is SMP (Sekolah Menengah Pertama) An-Nahdloh. This middle school operates as an educational institution and tutoring center in Tanjung Sepat, Negeri Selangor, Malaysia. Founded initially as an austere boarding school, it gradually evolved into a pesantren (Islamic boarding school) due to the increasing number of students from different regions. The collaboration between the Special Branch of Nahdlatul Ulama (PCINU) Indonesia and the Embassy of the Republic of Indonesia in Kuala Lumpur led to the establishment of this educational institution.

As a recently established institution, Pondok AnNahdloh faces the challenge of being more accountable to the community regarding its education services. The utilization of resources still needs to be optimized, and there needs to be more community participation in education. The manual document preparation and management processes can result in a higher likelihood of errors [4].

To enhance the quality of education at various formal and informal levels, implementing an Academic Information System offers a computerized approach to data management [5]. MIS is a structured computer-based system that plays a vital role in educational programs, teaching, and research within educational and scientific institutions. Integrating information technology in academic management proves effective when it aligns with the institution's goals, vision, and mission. Adopting digital document management promotes operational efficiency by reducing transaction costs, automating processes, increasing capacity, and minimizing errors while saving labor. However, successful digital management necessitates essential elements to support virtual performance and foster organizational capabilities and human resources toward modernization. As a result, research becomes imperative to effectively manage electronic information, encompassing technical components and system evaluation specific to Pondok Pesantren AnNahdloh Malaysia.

Furthermore, strategic planning for the Academic Information System through information technology must align with the school's development and conditions. Precise and needs-based modeling and analysis of the Academic Information System should be given greater attention.

An effective academic management information system requires a cloud computing-based information technology architecture tailored to the school's specific conditions and needs [6]. By leveraging cloud computing, access to resources and applications becomes seamless, overcoming the limitations of previous ICT infrastructure utilization [7]. To ensure success, academic services using the information system should prioritize system quality, information quality, and service quality [8]. The Academic Information System proves valuable in enhancing academic services, addressing institutional academic management issues and needs [9]. Pondok AnNahdloh aspires to become an economic and digital community, utilizing digital technology in information development and human resources to promote stability, prosperity, and sustainability [10].

Continuous development and maintenance of the information system are essential for reliable and efficient management. Necessary changes or adjustments must be accommodated

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to remain relevant to evolving education needs. Adequate training and support for educators and administrative staff are crucial to ensure effective system operation, leading to more accurate and beneficial data and information input. An effective management information system should integrate data and processes from various educational aspects, including finance, academics, and human resources, providing a comprehensive and integrated view of educational operations. Regular performance evaluations are necessary to gauge the system's success in achieving objectives and identify areas for improvement.

Numerous studies have explored the implementation needs of academic information systems. Methods like value chain analysis and SWOT analysis have been employed to analyze the implementation needs of MIS at various educational institutions [11]. Addressing issues related to planning and implementation is crucial to enhance the performance of community service activities. Implementing technology-based academic information systems for academic data processing and administrative management is instrumental in addressing field problems and creating a well-integrated tool for academic document management [4].

The challenges encountered in implementing the technology-based Academic Management Information System (MIS) at Pondok AnNahdloh pertain to planning and implementation and their implications for improving the quality of academic data management and providing accurate information to students and their parents [12]. Thus, careful planning and implementation are vital for the successful execution of the technology-based Academic Information System, enhancing efficiency and quality for the educational institution [12].

The planning phase involves a comprehensive analysis of the requirements at Pondok AnNahdloh to identify necessary improvements, including enhancing administrative efficiency and better monitoring of academics [13]. It is crucial to pinpoint existing issues in the current academic system and identify areas where implementing information technology can enhance efficiency and academic quality. This identification process encompasses various processes, such as new student admissions, assessment, and reporting of learning outcomes. The management information system requires seamless information flow and interaction between multiple units at Pondok AnNahdloh. Anticipating challenges during the digital transformation of the management information system is essential. Involving all stakeholders in the identification process ensures a comprehensive perspective and promotes engagement in developing solutions.

Preparing the information system as a solution involves reviewing various MIS options available in the market and selecting the one that best suits the institution's needs and objectives [14]. Choosing a system that integrates smoothly with the existing infrastructure at Pondok AnNahdloh is critical. The final planning stage involves forming a team or personel responsible for planning, implementing, and managing the academic management information system. The team should consist of representatives from various disciplines and functional areas within the institution.

The academic management information system at Pondok AnNahdloh is a public service system that enables online data processing and well-organized data storage using a database [15]. Utilizing an integrated MIS with a database foundation offers benefits like increased efficiency, data-driven decision-making, and faster and more accurate access to information. The structured database ensures organizational data's preservation, protection, and optimal utilization, supporting operational activities and decision-making. The system efficiently maintains data through a well-organized database structure, facilitating data retrieval, reducing errors, and promoting data consistency and integrity. Using a database enhances data security with role-based access permissions, ensuring sensitive data remains

accessible only to authorized users. Additionally, a database-based MIS enables scalable data management, easily accommodating the institution's growth [16]. Data can be easily updated, added, or deleted, maintaining data integrity and consistency throughout the system. Furthermore, a structured database enables faster data access through indexing and optimization, improving overall system performance [17].

The paper aims to describe the Education Management Information System (MIS) at Pondok Annahdloh in Malaysia, which is up-to-date and integrated, aiming to improve educational operations, achieve higher quality levels, and enhance the institution's competitiveness and success on a broader scale.

Extensive research has been carried out on MIS (e.g., [1], [5],[10],[6]), but this study stands apart from previous research due to its exploration of various innovative possibilities in designing management information systems for educational documents at Pondok AnNahdloh. The information system devised is integrated and adheres to established standards, similar to the schools in Kuala Lumpur, Indonesia. The two key innovations introduced are interoperability and standardization.

Interoperability in the SIM design allows seamless data exchange among different systems, enabling smooth communication and collaboration without compatibility issues. This, in turn, facilitates the free exchange of data and information between systems without requiring substantial modifications to each system. On the other hand, standardization ensures consistency and uniformity in the processing and storage of data.

These innovations promise significant benefits to the users, including the institution and parents of students. The improvements in connectivity and collaboration between systems and entities will facilitate smoother data and information exchange, leading to increased efficiency and productivity across various fields, particularly in education.

2. Method

This research adopts a qualitative approach, specifically a case study, focusing on Pondok AnNahdloh in Malaysia. The study targets improvements in management, teaching, and services, particularly in terms of efficient data management, financial monitoring, fund management, transparency, accountability, scalability, and operational efficiency. The research subjects consist of teachers and administrators from Pondok AnNahdloh in Malaysia. Data collection methods include interviews, observations, and document reviews. The data analysis follows the theory of Miles and Huberman [18], involving data reduction, data display, and conclusion drawing/verification. The research methodology encompasses several stages, as depicted in Figure 1 below, including focus group discussions to determine administrative activities, system application design, system testing, system improvement, operator training, limited user testing, system launching and delivery, and monitoring and evaluation.

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Figure 1. Stages of SIMADU AN-NAHDLOH Activities

3. Results And Discussion

In this study, the focus was on analyzing the education document management system at Pondok AnNahdloh, to integrate it with data and information using digital technology. The analysis employed techniques relevant to the research location, identifying issues within the current academic system and areas where information technology could enhance academic processes' efficiency and quality. The primary goal was to improve administrative efficiency and academic monitoring [19]. The impact of digital technology has been significant, influencing user behavior, organizational systems, business models, markets, and society at Pondok AnNahdloh.

The selected system can seamlessly integrate with the existing systems at Pondok AnNahdloh, allowing for quicker and more comprehensive access to data from various sources [20]. The adoption of digital technology enables real-time monitoring of business and operational performance, reducing uncertainty and enabling prompt decision-making [21].

During the application system design phase, three main activities were identified: input, output, and processes. The input function deals with collecting data related to students, teachers, and parents. It also encompasses the management of new student admissions for the year 2023. The creation of a database plays a critical role in this process, housing essential data elements required by Pondok AnNahdloh both internally and externally, such as PPDB management. New algorithms were developed to process input tables as determined by Pondok AnNahdloh's specifications [22]. The study determined appropriate input methods for each data element, defined data editing and processing steps, and established frameworks and standard reports to ensure clarity in specifying required data elements.

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The outcome of the application design is known as the SIMADU An-Nahdloh application, which stands for Sistem Informasi Manajemen Terpadu (Integrated Management Information System). This system can be accessed through https://an-nahdloh.simadu.org/ or via Google search [19].

Figure 2. Guest Application Menu

Besides designing the guest application menu, SIMADU AN-NAHDLOH offers additional supporting features, including profiles, contacts, news, the SIMADU application (Integrated Management Information System), and PPDB (new student admissions). Output, as explained by De Rahu [23], constitutes the activity carried out by an information system in response to requests, pressures, and other inputs. It plays a vital role in the information cycle within MIS, wherein data is processed and transformed into valuable information for decision-making and institutional operations. The application generates outputs periodically based on specific schedules, such as monthly, quarterly, or annual reports. Additionally, real-time outputs are produced as immediate responses to particular events or actions. These outputs primarily take the form of reports, providing structured information on various aspects, including financials, performance, human resources, and others. According to [24], these well-designed outputs in MIS offer relevant, accurate, and timely information to users and management, supporting more effective and efficient decision-making processes. Institutions can better achieve their business goals and strategies by understanding situations and conditions, identifying problems, and facilitating appropriate actions.

Regarding process activities, the focus lies in transforming elements into a more meaningful and significant form. In the context of information systems, [23] suggests that processes encompass every step anyone takes for a specific purpose. This application involves various processes, such as the admission of new students, the management of counseling guidance, and the latest news updates. Each process comprises specific steps that must be followed to achieve particular objectives. By optimizing the utilization of the management information system, institutions can enhance overall operational efficiency and effectiveness.

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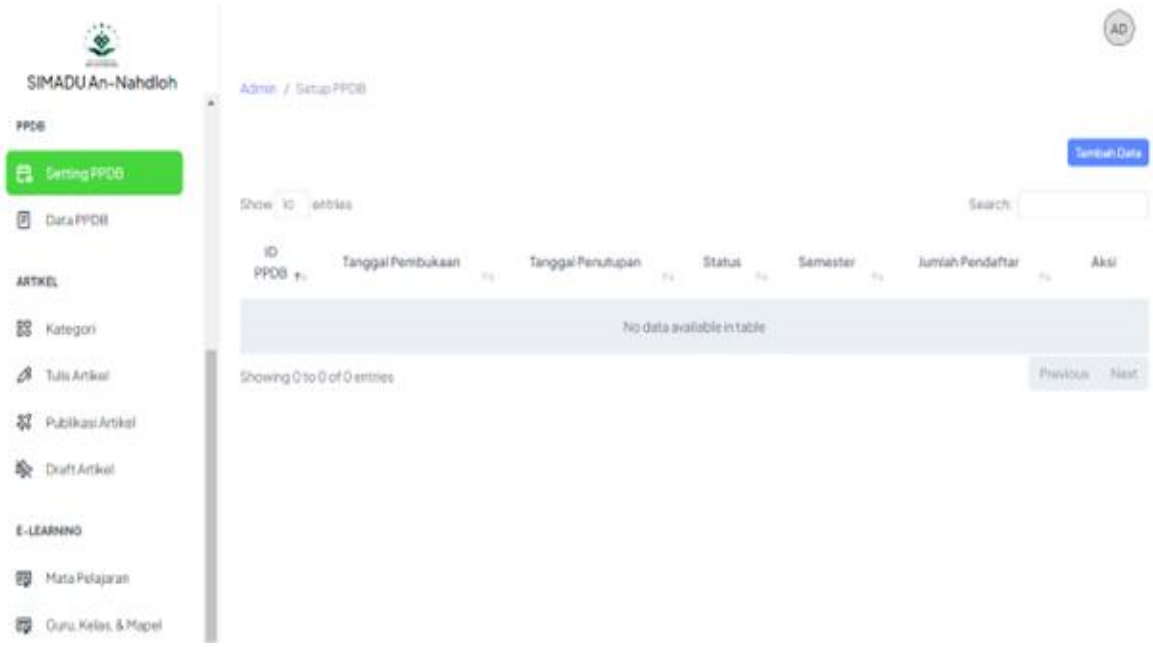

Figure 3. Menu for New Student Admissions Settings

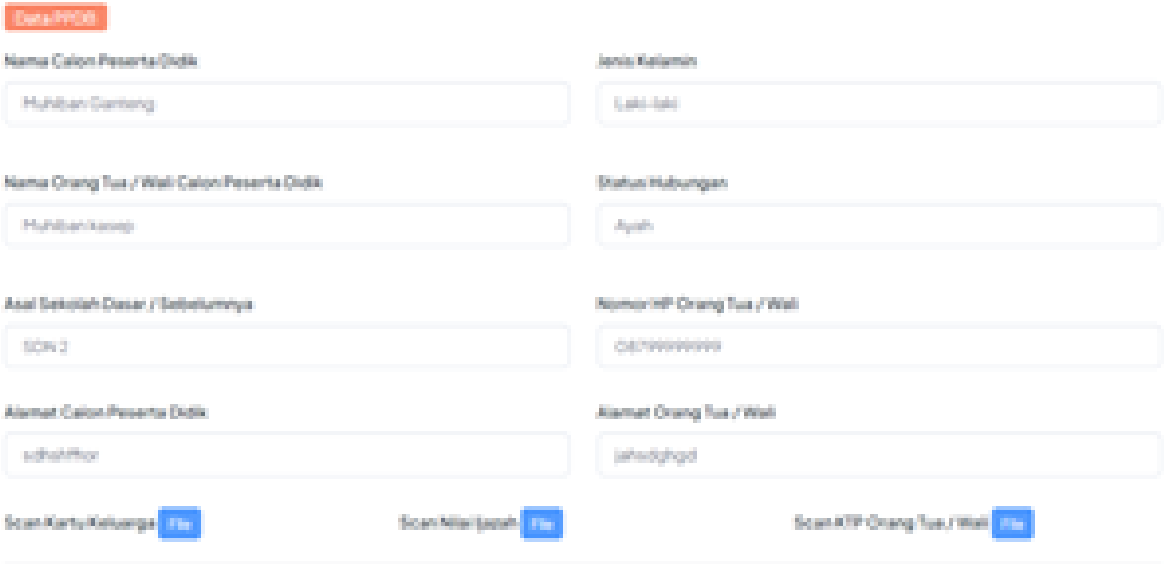

Figure 4. Tampilan data siswa pendaftar PPDB

The testing phase involves conducting separate tests for each component or module of the application to ensure their functionalities are working correctly. Furthermore, functional testing simulates real-world scenarios, assessing the application's performance under various usage conditions. During the verification phase, the application's capability to fulfill the specified needs and requirements is examined [25]. Based on the test results, it becomes evident that some menus require modifications and adjustments.

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Input from administrators, students, teachers, and parents is considered to enhance the system. Areas for improvement include updating student identification numbers, adding fields for religion, parents' occupations, and parents' income, incorporating payment types in the school payment menu, replacing student/santri and teacher/ustadz names, combining certificates upload for outstanding students into a single field, implementing attendance features for students and teachers, and changing the contact number for institutional contact rather than personal numbers. The identified improvements and corrections are made based on the test findings. Once these issues are addressed, the application is deemed ready for use, delivering optimal performance [26].

During the operator training phase, training becomes a crucial step in mastering the Management Information System (MIS), providing significant benefits for users and the institution as a whole. It improves task productivity related to the system, including data input, information processing, and report generation. With a better understanding of the correct usage of the MIS application, the likelihood of errors or usage problems is minimized, reducing the risk of failure and operational issues [27].

Limited use testing is essential before introducing MISADU AN-NAHDLOH widely as an institutional system. This testing aims to identify potential issues or deficiencies in the system and ensure its proper functioning before full implementation. Additionally, limited user testing is conducted in a real environment involving a select group of users with various roles and responsibilities. The feedback obtained from this phase aids in making further improvements. The users, including teachers and administrators of Pondok AnNahdloh, provide valuable insights into their experiences using the system, challenges encountered, and suggestions for enhancements. Addressing any identified issues promptly is crucial for a successful MIS implementation. Once the testing is completed, a comprehensive evaluation of the results is carried out to formulate improvement plans and recommendations for the next steps in the system's full implementation [28]. The assessment focuses on adding columns for student religion, parent religion, and parent's income, integrating the financial system into SIMADU AN-NAHDLOH, and implementing attendance features for teachers and students, such as e-presence (Figure 5).

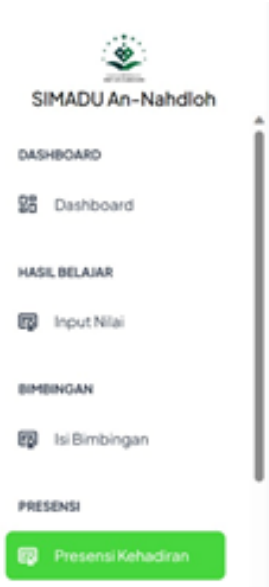

Figure 5. Attendance Feature

In the phase of launching and testing the Management Information System (MIS) implementation, the research team thoroughly understood the system to develop appropriate strategies for the launch and testing. Training sessions were conducted to familiarize users with the system, address common issues, and prepare them to handle potential situations during the launch. After this phase, a comprehensive evaluation of the system's performance and results became imperative. The evaluation findings were used to create plans for improvements and further developments.

The final stage involves monitoring and evaluation, where the system's performance is assessed to ensure it functions as intended and achieves its intended benefits. Data and information collection on efficiency and effectiveness are crucial for this evaluation. Any identified issues are continually addressed, and the system can evolve according to the organization's changing needs. Proper monitoring and evaluation allow institutions to gauge the extent of the system's benefits and identify areas for improvement or development to enhance its performance [29]. Continuous evaluation ensures that SIMADU AN-NAHDLOH remains aligned with its initial goals and continues to deliver optimal value.

4. Conclusion

In conclusion, implementing MIS is a continuous process that entails critical steps to ensure the system operates effectively and provides maximum benefits to the institution. Each stage of the implementation presents its challenges, and the success of the process hinges on a deep understanding of the institution's requirements, meticulous planning, rigorous testing, comprehensive training, and ongoing evaluation. The research findings indicate that the MIS implementation has successfully created up-to-date and integrated educational document data and information, both in terms of input and processes. The system effectively incorporates information technology into the academic environment, facilitating efficient and accurate access, management, and utilization of required data and information in the educational process. The expectation is that this system will improve the quality of activities, thereby positively impacting community empowerment and national development.

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