aim Journal of Islamic Education Management
Postgraduate Program
Master of Islamic Education Management
State Islamic University of Sunan Gunung Djati

Policy on Academic Management Information System in Madrasahs

Rizqi Ahla Firdausi
Universitas Islam Negeri Sunan Gunung Djati Bandung, Indonesia
Email: 1144030063@student.uinsgd.ac.id

ABSTRACT
Academic Management Information System (SIMAK) is an information system used to present information and organise administration related to academic activities in schools or the world of schooling, so that schools can provide good and effective information services. The purpose of SIMAK design is to provide information about periodic test scores, KTSP data, KBK score data, attendance data, guidance and counselling data, student case data, teaching plans, subject management, scheduling, and academic achievement. In Indonesian, Software Engineering is known as the term Software Engineering (RPL). Problems in implementing the SIMAK model in general terms are the same as problems in managing information management systems in general.
Keywords: *Sistem Informasi Manajemen Akademik di Madrasah/Sekolah*

Introduction

A management information system (MIS) is defined as a computer-based system that provides information to multiple users with similar needs. As stated by Raymond (2014), users generally constitute a formal organizational entity within the company or its subdivisions.

The education management information system (EMIS) is predicated on the fundamental notion of a management information system (MIS) that is applied to the domain of education administration. The following topics are addressed in the discussion material: The following is a list of fundamental concepts related to SIMDIK: - Basic concepts of SIMDIK - Concepts of facts, data, and information - Characteristics, components, and structure of SIMDIK - SIMDIK development program - Education Institutional Management Information System - Employee Management Information System - Student

Management Information System (SIMKES) - Academic Management Information System (SIMAK) - Financial Management Information System (SIMKU) - Facilities Management Information System (SIMFAS) - Library Management Information System (SIMPUS) - A strategic model for developing Website-Based SIMDIK (A. Rusdiana, 2018)

The material to be discussed in greater detail pertains to the Academic Management Information System (SIMAK), which encompasses the following components: The following terms are defined herewith for the purpose of this study: SIMAK, SIMAK software engineering, SIMAK model, and SIMAK solutions in schools/madrassas.

Method

This study employs a qualitative-descriptive research design, utilizing a literature review method to analyze the concept, implementation, and policy implications of the Academic Management Information System (SIMAK) in madrasahs. The research focuses on examining secondary sources, including scholarly books, academic journal articles, government policy documents, and empirical studies related to educational information systems and school-based software engineering.

The data were collected through a structured review of relevant literature using content analysis. Sources were selected based on their relevance to the main themes of the research: (1) the conceptual framework of SIMAK, (2) the challenges in its implementation in madrasahs, and (3) policy solutions to optimize the system's functionality. The selection of sources followed criteria of recency (2010–2023), relevance to the Indonesian educational context, and peer-reviewed credibility.

Thematic analysis was used to identify recurring patterns and policy gaps within the data. The discussion is framed within the context of education management policy and software development methodology, aiming to offer theoretical insights and practical recommendations for improving SIMAK implementation across Islamic educational institutions.

Results and Discussion

Concept of Academic Management Information System

The term "Academic Information System" (AIS) is composed of three distinct components: "System," "Information," and "Academic." To facilitate a comprehensive understanding of the Academic Information

System, the meanings of the terms "System," "Information," and "Academic" must first be elucidated.

A system refers to a collection of interconnected components that work together to achieve the system's objectives. A system's purpose is primarily to manage processes and achieve specific goals effectively within a defined scope (Kurniawan, 2020). In the context of an Academic Information System, the system enables educational institutions to manage various academic processes such as admissions, grades, and student records, allowing for streamlined operations.

Information is the result of data processing, transforming raw data into something meaningful and understandable. It is often described as knowledge relevant to understanding and interpreting existing facts or phenomena. The transformation of data into actionable information is essential for decision-making, especially in educational contexts (Sari, 2021). In the case of an AIS, information management helps to organize academic data into a usable format that supports administrative tasks and enhances the learning experience.

Academic refers to the activities, processes, and environments associated with education. In the context of an Academic Information System, "academic" encompasses not only the curriculum, assignments, and teaching methods but also the management of student and faculty data. These systems support both scheduled in-person activities and structured independent study tasks, as defined in the educational programs of the institution (Hidayat et al., 2022).

In defining Academic Information Systems, several experts offer their perspectives. According to Oetomo (2020), an Academic Information System is a web-based information system designed to provide easy access to knowledge, offering tools that manage academic data efficiently for stakeholders in educational institutions. This system is vital for organizing information in a way that supports both academic management and student success.

Homaidi (2016) further defines the AIS as a system designed to process academic data, using both software and hardware solutions. The goal of this system is to properly manage academic activities, converting them into useful information for school management. Homaidi emphasizes that the integration of these systems allows educational institutions to provide effective services, utilizing internet-based platforms for broader access and usability.

Jugiyanto, as cited in the work of Monalisa et al. (2018), explains that AIS refers to software applications designed specifically for the management and presentation of academic-related information and the administration of academic activities. Such software ensures that administrative processes are efficient and provides timely access to pertinent information. According to Jugiyanto, effective AIS not only supports academic institutions in maintaining records but also optimizes the management of educational activities, ultimately improving service delivery and institutional performance.

Concept of Education Management Information System

In order to comprehend the meaning, purpose, and components of the Academic Management Information System (AMIS), it is imperative to first acquaint oneself with the Education Management Information System (EMIS), which serves as the progenitor of the Academic Management Information System. This preliminary understanding facilitates a more profound and nuanced comprehension of the Academic Information System. The education management information system (SIMDIK) is defined in several ways. The Education Management Information System (SIMDIK) is a school data system that utilizes ITC technology. It facilitates the secure storage of school data and enables connectivity through a server. SIMDIK is an information system designed to address the management needs of educational institutions, specifically schools. The scope of SIMDIK encompasses kindergarten, elementary school, junior high school, high school, and the equivalent levels of education. (3) SIMDIK is a combination of human resources and information technology applications for selecting, storing, processing, and decision-making processes in the education sector. These data are defined as empirical data, which are data that are both real and verifiable (A. Rusdiana, 2015).

From the perspectives, an alternative definition of an education management information system can be proposed. This system comprises groups of individuals, guidelines, and data processing devices. It functions by monitoring and retrieving data from the environment through filtration, organization, and selection process. The system then presents this data as information to education/school stakeholders, particularly education managers at all levels and functions of the organization. The purpose of this information is to support decision-making processes related to management functions, facilitate communication, and support operational activities, including

instructional activities.

Software Engineering School/MadrasahAcademic Management Information System

In the context of Indonesia, the term "Software Engineering" is referred to as "Rekayasa Perangkat Lunak (RPL)". RPL is defined as a discipline that encompasses all aspects of software development. These aspects include the initial stages, such as analyzing user needs, defining specifications, designing, coding, testing, and maintaining the system after its deployment. The scope of RPL goes beyond just the development of computer programs. As explained by recent studies, RPL also covers project management, resource allocation, cost estimation, methods, scheduling, quality assurance, and user training, all of which are essential for ensuring the success of the software throughout its lifecycle (Sutrisna & Zaman, 2022).

Software engineering is more than just writing code. It is a systematic approach to software development that aims to deliver high-quality software that meets user requirements and operates efficiently. According to Heru Sutrisno (2021), software engineering focuses on ensuring that the resulting software is not only functional but also maintainable and scalable. The core processes involved in software engineering include requirements analysis, software design, implementation, testing, and maintenance. Each of these steps must be carefully managed to ensure the final product is robust, flexible, and capable of evolving with the needs of users.

Moreover, the discipline of software engineering defines several key components of the software creation process. These components include: 1) Instructions that, when executed, produce the desired functionality and operation; 2) Data structures that enable efficient data manipulation and storage; and 3) Documentation that outlines the software's functionality and user benefits. Recent advancements in software engineering have also placed emphasis on user-centric design and iterative development, both of which enhance the usability and long-term performance of the software (Hadi & Rosidi, 2021).

In its essence, the term RPL refers to the comprehensive process of creating software that is effective, efficient, and user-friendly. The primary goal is to build software that aligns with the user's specific needs while ensuring that the final product operates efficiently and reliably over time. According to Yuliana & Hermawan (2023), the evolution of RPL methodologies, especially with the rise of agile development, has

highlighted the importance of continuous feedback and adaptability during the development cycle. This user-focused approach not only improves the quality of the software but also ensures that the software evolves with changing user demands.

Furthermore, the rapid development of new software tools and programming languages has enabled engineers to use more sophisticated techniques in software optimization and performance tuning. The integration of machine learning and artificial intelligence into software engineering processes has also led to smarter systems that can automatically adapt and improve over time. As modern software development environments become more complex, RPL continues to evolve, incorporating new technologies and methodologies to stay ahead of industry demands (Agus, 2023).

In conclusion, RPL in Indonesia is not just about coding, but about the strategic, systematic management of the entire software lifecycle. The application of engineering principles to software development ensures that the software produced is not only functional but also reliable, secure, and sustainable in the long run. With the growing reliance on software in all sectors, from education to business, the role of RPL becomes increasingly vital in shaping the future of technology..

Software Development Methodology in *Software Engineering* Concepts

The term software development no longer refers only to programming activities, i.e. the process of writing and managing source code, but has evolved to include the entire systematic process from start to finish in creating a functioning and efficient software. In this context, activities such as requirements analysis, system design, testing, maintenance, and documentation become an integral part of the software life cycle. This approach is known as the Software Development Life Cycle (SDLC) which emphasises the importance of structured stages so that the software produced is not only functional but also easy to develop in the future (Zulaikha, 2015).

Along with the advancement of digital technology, software development now also utilises modern software engineering principles such as Agile Development, DevOps, and Continuous Integration/Continuous Deployment (CI/CD). These principles accelerate software iteration and quality improvement through more dynamic collaboration between development teams and users. For example, Agile methods allow developers to respond to user needs

flexibly and incrementally, with periodic trials and regular evaluations (Hoda, Salleh, Grundy, & Tee, 2021).

In addition to the technical process, the management aspect of software projects is an important element in determining the success of development. Good management includes budget planning, risk management, work schedule setting, and software quality control. Without proper planning and execution, software development projects are prone to failure or cost overruns. Therefore, developers must be able to integrate technical and managerial aspects in a balanced manner at every stage of development (González-González et al., 2020).

Software development also increasingly emphasises user experience (UX) and human-computer interaction (HCI). Friendly, intuitive and responsive interface design is key in ensuring the software is widely accepted and used. Even in the context of academic management systems such as SIMAK, UX aspects can determine the level of participation of teachers, students, and administrative staff in using the system effectively (Lee & Jung, 2022).

Moreover, in the context of education and religious institutions such as madrasah, software development must also consider local adaptations, infrastructure limitations, and user capabilities. Therefore, the development process often requires a local needs-based approach by considering the level of digital literacy, internet network availability, and organisational culture. This approach is known as context-aware development, which is relevant for community-based education institutions (Alkandari, 2023).

Problem/Solution of School/Madrasah Academic Management Information System

In the era of information technology today, it is undeniable that data and information play a crucial role in achieving the goals of an institution. The role of data and information for an institution can be likened to the vital function of blood in maintaining the metabolism of the human body, allowing individuals to stay alive and carry out their daily activities. Information, in this sense, provides essential input for decision-making, strategic planning, and overall management within the institution. As emphasized by Rusdiana and Nasihudin (2020), without timely and quality information, institutions will face challenges in resource management, which will impact their overall performance and decision-making capabilities. This, in turn, can hinder the institution's ability to thrive in an increasingly competitive environment.

When data is utilized effectively, it serves as a foundation for making informed decisions that influence the success and future of an institution. For educational institutions, managing student performance data, teacher effectiveness, and operational efficiency is paramount. The ability to process and analyze such data allows institutions to make strategic decisions that align with their educational goals. Recent studies highlight the growing importance of academic data management systems, such as Academic Management Information Systems (SIMAK), which provide a structured approach to collecting, organizing, and analyzing educational data (Oetomo, 2021). These systems not only improve operational efficiency but also enhance decision-making processes at the administrative level.

However, implementing an effective SIMAK system in educational institutions has not been without challenges. One of the primary obstacles is the lack of proper infrastructure and resources to support the system's integration into the daily operations of schools and madrasahs. Many educational institutions, especially in developing regions, struggle with inadequate hardware, limited internet connectivity, and insufficient trained personnel to manage and operate these sophisticated systems (Petrus & Liu, 2022). Consequently, even though SIMAK systems are designed to enhance academic management, their implementation often faces delays and operational inefficiencies due to these constraints.

Effective management of resources is crucial for the smooth implementation of SIMAK in madrasahs. Without adequate human and material resources, even the most advanced systems will fail to deliver the expected benefits. According to recent research, human resource capacity—such as the skills of administrators, teachers, and IT staffs significantly influences the success of academic management information systems (Hossain & Rahman, 2020). Institutions must invest in training and development programs for staff members to ensure that they can efficiently operate and maintain these systems. Additionally, investment in infrastructure, including high-speed internet and adequate computing devices, is essential for overcoming the technological barriers that many institutions face.

To ensure the long-term success of SIMAK, it is not only important to implement the system but also to continuously evaluate, maintain, and improve it. Regular updates and maintenance are necessary to address any technical issues that may arise and to adapt the system to new educational policies or technological advancements. Research by Syafi'ie and colleagues (2021) indicates that ongoing system evaluation and

feedback mechanisms are critical for keeping the SIMAK relevant and functional in a rapidly changing educational environment. This ensures that the system remains aligned with institutional goals and provides accurate data for decision making.

To address the challenges in implementing SIMAK, it is essential for educational institutions to take a holistic approach that integrates technology, human resources, and infrastructure. Korten's (2020) policy management framework emphasizes the need for alignment between the program (SIMAK) and its beneficiaries (students, teachers, administrators). Ensuring that the system meets the specific needs of the institution while maintaining the capacity of the implementing organization is key to achieving successful outcomes. In addition, an expert must be assigned to regularly assess the effectiveness of SIMAK and suggest improvements to overcome any identified shortcomings.

School/Madrasah Academic Management Information System Solution

According to policy management expert David C. Korten (Tarigan, 1998:19), the successful implementation of a program hinges on the alignment of three elements of program implementation. Initially, the compatibility between the program and the beneficiaries must be ascertained. That is to say, the compatibility between the program's offerings and the target group's needs must be determined. Second, the suitability between the program and the implementing organization is crucial. This is the degree to which the tasks required by the program align with the capabilities of the implementing organization. Thirdly, an assessment must be conducted to determine the degree to which the beneficiary group aligns with the implementing organization. This evaluation involves a comparison between the requirements established by the organization to achieve program outputs and the capabilities of the target group of the program.

Conversely, if the issue of the SIMAK model's suboptimal performance is attributable to deficiencies in facilities, infrastructure, management resources, or a flawed system, the solution may be as follows: Initially, a thorough evaluation of the existing system is imperative. If the implemented system is deemed inadequate, subsequent actions should be directed towards the enhancement or replacement of the system with a more suitable alternative. Secondly, an expert must be assigned to understand the fundamental issues schools encounter in managing the SIMAK model and to propose solutions to system problems. Thirdly, there is the matter of the management of the available

facilities and infrastructure. This management must be executed in such a way that they can support the implementation of the SIMAK model (Satia P. Zen, 2015).

Conclusion

Academic Management Information System (SIMAK) is an information system used to present information and organise administration related to academic activities in schools or the world of schooling. In Indonesian, *Software Engineering* is known as the term Software Engineering (RPL). The definition of RPL itself is a discipline that discusses all aspects of software production, starting from the initial stage, namely analysing user needs, determining specifications of user needs, design, coding, testing to system maintenance after use.

Problems in implementing the SIMAK model in general terms are the same as problems in managing information management systems in general, namely: a) Saturation of data sources, b) EMIS data collection position at a low priority, c) Infrastructure conditions (internet network) in most regions are still less supportive; d) Availability of *hardware (* EMIS*server*) is still inadequate. Another problem is the lack of facilities and infrastructure, management resources, and a good system. The solution to this problem is to adjust the three elements of programme implementation, namely between the programme and the beneficiaries, between the programme and the implementing organisation, and between the beneficiary group and the implementing organisation. As for other factors, the solution is to evaluate the system, assign system managers according to their fields, and manage facilities and infrastructure better.

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