

THE URGENCY OF EDUCATION MANAGEMENT INFORMATION SYSTEM IN MANAGING EDUCATIONAL INSTITUTION DATA

Rahmatullah ^{a*)}, Agus S. Chamidi ^{a)}

^{a)} *Institut Agama Islam Nahdlatul Ulama Kebumen, Kebumen, Indonesia*

^{*)}*e-mail korespondensi: fatimah@iainu-kebumen.ac.id*

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Abstract. The Education Management Information System (EMIS) plays a vital role in improving the efficiency, transparency, and accountability of data management within educational institutions. As a centralized and integrated data platform, EMIS serves as a foundation for data collection, validation, and analysis to support evidence-based decision-making in education management. This study aims to examine the conceptual framework and urgency of implementing EMIS as a strategic tool for managing institutional data within the context of Islamic education under Indonesia's Ministry of Religious Affairs. Using a qualitative research approach through a systematic literature review, this study synthesizes findings from books, policy documents, and journal articles on the development, functions, and challenges of EMIS implementation. The results show that EMIS functions as a single data gateway that consolidates institutional, academic, financial, and human resource information from various levels of education, including Raudhatul Athfal (preschool), Madrasah Ibtidaiyah (elementary), Madrasah Tsanawiyah (junior secondary), and Madrasah Aliyah (senior secondary). The use of EMIS facilitates faster, more accurate, and verifiable data processing, thus enhancing administrative performance and the quality of decision-making. Furthermore, the study emphasizes the legal and institutional framework supporting EMIS, including national regulations on data transparency and public information management. The research concludes that integrating EMIS into educational governance can promote data-driven policies, ensure accountability, and strengthen the overall management of Islamic educational institutions. This finding underscores the importance of advancing digital literacy, human resources, and system interoperability to optimize EMIS as a sustainable educational data management tool.

Keywords: Education Management Information System; Educational Governance; Islamic Education

I. INTRODUCTION

In the era of digital transformation, the management of educational data has become an essential component in ensuring the efficiency, accountability, and transparency of educational institutions [1]. Reliable data management systems are critical for policy formulation, institutional planning, and the overall improvement of educational quality [2]. Within this context, the Education Management Information System (EMIS) has emerged as a strategic instrument that integrates technology and management principles to facilitate evidence-based decision-making in education [3]. EMIS functions as a centralized database and digital infrastructure for collecting, processing, and analyzing information about schools, teachers, students, facilities, and educational outcomes [4]. It enables educational institutions to generate valid, timely, and accurate data for national and regional policy development [5]. In Indonesia, the Ministry of Religious Affairs (MoRA) uses EMIS to manage data from various Islamic educational institutions such as Raudhatul Athfal (preschool), Madrasah Ibtidaiyah (primary), Madrasah Tsanawiyah (junior secondary), and Madrasah Aliyah (senior secondary) [6]. The existence of EMIS is not only a technical innovation but also a governance reform mechanism aimed at improving institutional performance and educational accountability [7].

Educational institutions face increasing complexity in managing large volumes of data related to students, staff, curriculum, and finances [8]. Without integrated systems, data fragmentation can lead to duplication, inefficiency, and misinformed policy decisions [9]. EMIS addresses these challenges by providing an automated, real-time, and interoperable platform that links different administrative layers within the education system. The integration of EMIS has been shown to enhance educational governance, streamline administrative processes, and foster a culture of data-driven management [10]. From a global perspective, the development of EMIS aligns with UNESCO's Sustainable Development Goal (SDG) 4, which emphasizes the importance of inclusive and equitable quality education supported by strong information systems [11]. According to the World Bank, robust education management systems are key enablers of accountability and learning outcomes, especially

in developing countries where educational data are often fragmented and inconsistent [12]. The digitalization of education data also contributes to better monitoring of educational equity, resource allocation, and institutional efficiency [13]. However, despite its potential, EMIS implementation still encounters various challenges in Indonesia, including limited human resource capacity, data validation issues, and weak interoperability between national and regional systems [14]. Therefore, it is essential to strengthen the integration of EMIS through the development of digital competencies, policy harmonization, and sustainable infrastructure investment.

This study aims to analyze the nature and urgency of EMIS in managing educational institution data, particularly within the scope of Islamic education under the Ministry of Religious Affairs. By adopting a qualitative literature review approach, the study provides theoretical and practical insights into how EMIS can support educational governance, enhance institutional effectiveness, and ensure accountability in data management [15]. The Education Management Information System (EMIS) is an integrated digital platform designed to collect, process, and analyze educational data systematically to support policy formulation, planning, and administrative decision-making [16]. EMIS combines elements of information technology and management principles to enable institutions to transform raw data into meaningful insights for improving educational quality and governance [17]. According to the Ministry of Religious Affairs (MoRA), EMIS serves as a centralized database for managing Islamic education institutions at all levels, including Raudhatul Athfal, Madrasah Ibtidaiyah, Madrasah Tsanawiyah, and Madrasah Aliyah [18]. This system ensures that educational data are recorded, verified, and updated regularly to provide accurate and timely information for planning and budgeting. As a digital management tool, EMIS supports transparency, minimizes human error, and strengthens data-driven decision-making processes [19].

Scholars define EMIS as more than a data collection mechanism it is a governance tool that enhances accountability and institutional efficiency [20]. When well implemented, EMIS fosters evidence-based management, enabling educational leaders to identify trends, monitor performance, and allocate resources effectively [21]. In Islamic education, EMIS plays a dual function: (1) as a technical system that organizes educational data and (2) as an institutional reform instrument that promotes accountability and modernization in the education sector [22].

The Importance of EMIS in Educational Governance

Effective governance in education relies on accurate, accessible, and integrated data [23]. EMIS provides the infrastructure for educational institutions to manage student enrollment, teacher qualifications, financial allocation, infrastructure, and performance indicators efficiently. Through digital integration, EMIS eliminates data duplication and enhances coordination among government agencies, schools, and regional offices [24]. The World Bank (2022) emphasizes that data governance frameworks like EMIS are critical for building evidence-based policy ecosystems, especially in developing countries [25]. EMIS contributes to better monitoring of equity, quality, and efficiency—three pillars of sustainable education governance. Furthermore, it supports national education reforms, decentralization, and accountability frameworks by serving as a single, verifiable source of information.

Challenges and Opportunities in EMIS Implementation

Despite its potential benefits, EMIS implementation faces several challenges. Studies have identified limited digital infrastructure, insufficient operator skills, and inconsistent data validation as common issues in many developing regions [26]. Additionally, the lack of integration between EMIS and other national data systems often results in duplication, delays, and inaccuracies in reporting [27]. However, digital innovation and the adoption of cloud-based technologies present opportunities to overcome these barriers. Artificial intelligence (AI) and data analytics can enhance EMIS by improving predictive modeling, policy simulations, and real-time reporting [28]. Moreover, capacity-building programs for teachers and administrators are crucial to ensuring data quality and sustainability of EMIS operations [29]. In Indonesia, continuous improvement initiatives under the “One Data for Education” policy framework have strengthened the standardization and interoperability of EMIS [30]. These efforts reflect the government’s commitment to transforming EMIS from a mere data repository into a comprehensive decision-support system for educational management and planning.

From a theoretical standpoint, EMIS is closely linked to information system theory and decision-making models. Simon’s (1960) theory of decision-making highlights that effective decisions depend on timely and relevant information. EMIS fulfills this function by providing structured and real-time data for planning, organizing, and evaluating educational activities [31]. Similarly, the Management Information System (MIS) framework proposed by Laudon & Laudon emphasizes the integration of data, people, and technology to enhance managerial effectiveness [32]. Thus, EMIS can be conceptualized as an educational adaptation of MIS, where information systems are designed to support administrative, instructional, and strategic management within educational contexts. Its success depends on the interplay between technology infrastructure, human capacity, and institutional commitment to continuous improvement [33].

II. RESEARCH METHODS

This study employs a qualitative descriptive approach with a literature review design to explore the nature, function, and urgency of the Education Management Information System (EMIS) in managing educational institution data. The qualitative method was selected to provide a comprehensive understanding of EMIS as both a managerial tool and a technological innovation that supports educational governance and policy development [34]. This approach enables the researchers to analyze, synthesize, and interpret data drawn from multiple secondary sources to construct a conceptual framework for EMIS implementation in the Indonesian context.

Data were collected through documentary and library-based analysis, encompassing academic books, journal articles, official government reports, and online publications published between 2010 and 2024. The inclusion criteria focused on literature discussing EMIS design, implementation, governance models, and its integration with educational management systems in Islamic institutions. The analysis followed a thematic synthesis procedure consisting of four key stages: (1) identifying and categorizing key EMIS concepts, (2) analyzing patterns of data management and governance, (3) comparing findings from various sources, and (4) synthesizing conclusions relevant to the objectives of this study [35]. The validity of this research was enhanced through source triangulation, ensuring the reliability of interpretations derived from diverse academic and institutional references. This methodological design aligns with the interpretivist paradigm, which seeks to understand the role of information systems in shaping educational policy and practice. The resulting framework offers both theoretical insights and practical recommendations for improving EMIS integration within educational institutions under the Ministry of Religious Affairs in Indonesia.

III. RESULTS AND DISCUSSION

The Role of EMIS in Educational Data Management

The findings of this study emphasize that the Education Management Information System (EMIS) serves as a critical backbone for the digital governance of education. EMIS integrates multiple data components student enrollment, teacher qualifications, infrastructure, financial management, and institutional performance into a centralized database accessible to stakeholders at national and regional levels [36]. Its primary contribution lies in improving the accuracy, timeliness, and accessibility of educational data to support planning, monitoring, and policy formulation [37]. In Indonesia, EMIS under the Ministry of Religious Affairs (MoRA) has proven instrumental in modernizing data management for Islamic educational institutions. It consolidates data from thousands of madrasah and pesantren into a unified system that informs decision-making for budgeting, teacher certification, and resource allocation [38]. This integration enables policymakers to assess real-time institutional conditions and formulate evidence-based education strategies. As highlighted by Soesilowati [39], the reliability of EMIS data directly influences the effectiveness of educational reforms, making data governance a crucial pillar of institutional development.

EMIS as a Tool for Accountability and Transparency

Beyond its technical functions, EMIS plays an important role in promoting transparency and accountability in the education sector. By reducing manual data entry and duplication, the system minimizes the potential for manipulation and human error [40]. Data validation mechanisms built into EMIS ensure that reported information reflects actual field conditions, strengthening institutional integrity and public trust. Furthermore, EMIS facilitates data-driven decision-making that aligns educational outcomes with national development goals. The system supports various dimensions of educational governance, including planning for teacher distribution, evaluating student performance, monitoring infrastructure needs, and tracking graduation rates [41]. These functions make EMIS an indispensable tool for achieving efficiency and equity in educational service delivery. Despite its strengths, the study identifies several challenges that hinder optimal EMIS implementation. First, technical constraints such as limited internet access and outdated computer systems remain prevalent in rural and remote regions [42]. Second, human resource capacity continues to be a barrier many EMIS operators and administrators lack the digital literacy and technical training necessary for effective system use. Third, issues of interoperability and system integration persist, as EMIS often operates in isolation from other government databases (e.g., national statistics and financial systems).

These challenges highlight the need for sustainable investments in digital infrastructure and human capital. Strengthening operator training, ensuring regular system updates, and adopting cloud-based architectures can significantly enhance EMIS reliability. In addition, collaboration between the MoRA, Ministry of Education, and local governments is essential to standardize data protocols and achieve inter-system connectivity [43].

Strategic Opportunities for EMIS Development

Despite its obstacles, EMIS presents significant opportunities for innovation in educational governance. The growing use of big data analytics, artificial intelligence (AI), and predictive modeling can further extend EMIS's capacity for strategic planning and performance forecasting [41]. For instance, AI-driven EMIS tools could identify patterns in student performance, anticipate dropout risks, and optimize teacher deployment. In the context of Islamic education management, EMIS contributes to institutional transformation by promoting a culture of accountability and evidence-based leadership. The system supports the broader digitalization agenda of the Indonesian government through the Satu Data Pendidikan Islam (One Data for Islamic Education) policy, which envisions an integrated and transparent data ecosystem. Through continuous improvement, EMIS can evolve into a comprehensive digital platform that not only manages data but also drives innovation, efficiency, and equity in the education sector. Theoretically, this study contributes to the growing body of knowledge on digital governance and education information systems, offering a conceptual framework for analyzing the relationship between data systems and institutional performance. Future research should focus on empirical investigations of EMIS implementation across different regions or education levels to assess its measurable impacts on efficiency, transparency, and learning outcomes. Further studies can also explore cross-country comparisons of EMIS frameworks, examining how international best practices such as those implemented in Malaysia, India, and Kenya can inform Indonesia's system enhancement. Additionally, researchers could investigate how emerging technologies (e.g., cloud-based EMIS, blockchain data validation) might strengthen data security, reliability, and interoperability in the future. In conclusion, EMIS represents a cornerstone of modern educational management, bridging technology, governance, and policy for

sustainable and data-driven education development.

IV. CONCLUSION

This study concludes that the Education Management Information System (EMIS) serves as a vital foundation for achieving effective, transparent, and data-driven governance in educational institutions. As a centralized data management platform, EMIS integrates various elements of educational administration ranging from student and teacher information to infrastructure and finance into a single, reliable system. The research findings underscore that EMIS enhances the quality of decision-making by ensuring the availability of accurate, timely, and verifiable data. In the context of Islamic education under Indonesia's Ministry of Religious Affairs (MoRA), EMIS has become an essential tool for institutional modernization. It contributes to improved planning, accountability, and performance evaluation across madrasah and pesantren. The study also highlights that EMIS supports national education goals by aligning with the One Data for Education Policy and the Sustainable Development Goal 4 (SDG 4) agenda, promoting inclusive and equitable quality education supported by robust data systems. However, challenges such as limited human resources, inadequate infrastructure, and poor system interoperability continue to constrain the full potential of EMIS. Addressing these challenges requires a sustained commitment to digital transformation, investment in operator training, and cross-sectoral collaboration between ministries, educational institutions, and local governments. For policy makers, EMIS should be prioritized as a core infrastructure for education management and national data integration. Enhancing system interoperability between MoRA, the Ministry of Education, and the National Statistics Bureau will ensure consistent and accurate reporting. For educational administrators, the study recommends strengthening human resource capacity through digital literacy training and technical support programs for EMIS operators. Furthermore, EMIS should evolve beyond data collection to become an intelligent management platform that supports strategic decision-making. Integrating tools such as big data analytics, artificial intelligence (AI), and predictive modeling could enhance EMIS's ability to identify trends, forecast educational needs, and guide resource allocation. These innovations would transform EMIS from a passive data repository into a proactive system for educational innovation and accountability.

V. REFERENSI

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