



Analysis of Digitalization Readiness in the Administrative Information Service System for Early Childhood Education in Rokan Hilir Regency

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Article Info

Article history:

Received June 04, 2025

Approved August 05, 2025

Keywords:

Educational Technology,
Digitalization, Administrative
Information System,
Information System
Components, Early
Childhood Education.

ABSTRACT

This study aims to analyze the digitalization of the administrative information service system for early childhood education in Rokan Hilir Regency. Using an exploratory qualitative approach, the research was conducted at the Department of Education and Culture of Rokan Hilir Regency through documentation, observation, and in-depth interviews with relevant informants. Data analysis referred to six main components of the information system, namely hardware, software, procedures, human resources, databases, as well as data networks and data communities. The results of the study show that the implementation of administrative digitalization for early childhood education in Rokan Hilir Regency still faces various obstacles. The availability of hardware and software is uneven, digitalization procedures have not been consistently applied, and human resource competencies need to be improved. In addition, digital database management remains limited due to infrastructure and human resource constraints, while internet access and participation in data communities are still suboptimal, especially in coastal and remote areas. Therefore, efforts to improve infrastructure, provide human resource training, and strengthen data communities are necessary to support the effective and equitable implementation of administrative digitalization in early childhood education institutions in Rokan Hilir Regency.

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How to cite: Khoiroh, F., Natuna, D. A., & Mahdum, M. (2025). Analysis of Digitalization Readiness in the Administrative Information Service System for Early Childhood Education in Rokan Hilir Regency. *Jurnal Ilmiah Global Education*, 6(3), 1403–1409. <https://doi.org/10.55681/jige.v6i3.4003>

INTRODUCTION

Along with the rapid development of technology, the education sector is faced with the need to integrate digitalization. Digitalization is understood as a means to realize democracy in the education sector (Isma et al., 2022). Digitalization can be defined as a transformation process that converts conventional formats, such as printed documents, into digital or electronic formats through a series of steps designed to create digital pages compatible with the needs of data storage, management, and delivery using computer systems (Yulianti et al., 2021). Educational

digitalization is a natural consequence of technological advancement, requiring every individual to master technology and knowledge (Ristanti & Darmiyanti, 2023). Therefore, within the context of society and geographical conditions, a proper adaptation process is necessary to ensure that the technology can be utilized optimally and in accordance with established procedures.

The readiness for digitalization becomes an important aspect that needs to be analyzed, particularly in terms of the available human resources and infrastructure (Hasanuddin et al., 2022). The level of digitalization readiness does not solely depend on facilities, but can also be viewed from the perspective of the individuals involved and the competencies they possess, which together serve as benchmarks for assessing the success of digitalization implementation supported by adequate infrastructure (Purnasari et al., 2024). It can be concluded that digitalization readiness is a condition that reflects the extent to which an environment is capable of accepting, implementing, and optimally utilizing digital technology, supported by the readiness of human resources, individual competencies, and the availability of supporting infrastructure.

In this context, Rokan Hilir Regency, as one of the regions in Riau Province, faces significant challenges in implementing digitalization in the education sector, particularly in Early Childhood Education. Although several Early Childhood Education institutions have begun integrating digital technology into their administrative information services, various obstacles hinder the optimal operation of these systems. The first challenge is the limited number of trained human resources in information technology. Many Early Childhood Education managers, educators, and administrative staff lack the necessary skills and knowledge to operate digital administrative systems, as they are more familiar and comfortable with long-established manual procedures. This skill gap affects their ability to utilize technology for improving administrative efficiency and data management, which ultimately impacts educational service delivery.

Digital service delivery is defined as a system designed to facilitate public access to information more efficiently, quickly, and accurately, enabling people to obtain the data or services they need in a practical and seamless manner, which in turn enhances public comfort and satisfaction in interacting with various public services (Nurrahman et al., 2021). Through an administrative information system, various interconnected and collaborative components work together to support the processes of recording, managing, allocating, and supervising activities in order to achieve specific objectives (Yurubeli et al., 2017)..

A system information consists of several key components that work together to manage data and information efficiently. These include hardware, which provides the physical tools for system operation such as computers and network devices; software, comprising programs and applications that control hardware and process data into useful information; and procedures, which are structured steps or policies for collecting, processing, and distributing valid, accurate information. Additionally, people play a vital role as developers, administrators, and users whose skills and understanding directly affect data quality and decision-making. A database serves as a structured collection of interrelated data that ensures efficient storage, access, and management, while data networks and communities act as the connecting systems that enable data exchange and collaboration between users and devices, facilitating broader information sharing within the system (Pratiwi et al., 2022; Stair, 1992).

Therefore, this study will analyze the readiness for digitalizing the administrative information service system for Early Childhood Education in Rokan Hilir Regency by referring to these components. The assessment will focus on the availability and functionality of hardware, software, procedures, human resources, databases, as well as data networks and data communities within Early Childhood Education institutions. By examining these interconnected elements, providing a comprehensive overview of the digitalization capacity.

METHODS

This study employed an exploratory qualitative approach. The exploratory approach aims to identify key factors that cause various difficulties and serves as an initial step in formulating problems that can later be addressed using other research approaches, such as descriptive or explanatory studies. This type of research focuses on seeking new ideas and relationships without formal planning, making its success highly dependent on the researcher's skills and creativity in developing relevant ideas (Prihatiningsih et al., 2023). The study was conducted at the Department of Education and Culture of Rokan Hilir Regency, aiming to explore and understand the readiness for digitalization within the administrative information service system for Early Childhood Education in the region. Data collection techniques included document analysis, observation, and interviews. The data analysis technique involved data reduction, data display, and conclusion drawing.

RESULTS AND DISCUSSION

Hardware

Hardware is a crucial physical component that supports information system operations, including computers, laptops, printers, and networking devices, serving as the foundation for efficient data processing and information management (Pratiwi et al., 2022; Stair, 1992). In several Early Childhood Education schools in Rokan Hilir Regency, hardware availability varies widely. Some are well-equipped to support digital learning and administration, while others lack essential devices, forcing manual processes that delay reporting. Informants noted that schools with adequate hardware run digital programs more smoothly, while those without face significant challenges, hindering the optimization of digital initiatives as mandated by the Minister of Education, Culture, Research, and Technology Regulation No. 8 of 2022, and Regent Regulations No. 76 of 2021 and No. 29 of 2024. Studies by Haryati & Makarim (2024) and Ula & Sulanam (2024) affirm that hardware availability is a key factor in the success of digital information systems in educational institutions. Despite limitations, informants expressed commitment to maximizing existing resources, emphasizing that adequate hardware is essential for effective and efficient digital administration services in Early Childhood Education schools in Rokan Hilir.

Software

Software is a vital component of information systems, functioning as programs or applications that control hardware and process data into useful information (Pratiwi et al., 2022; Stair, 1992). In several Early Childhood Education schools in Rokan Hilir Regency, software utilization varies widely; some schools use essential applications such as PMM, ARKAS, SIPLAH, and Rapor Pendidikan from the Ministry of Education, along with communication

and administrative tools like WhatsApp and Google Drive, while others rely on limited software or simple apps like CamScanner for manual processes. Informants emphasized that the success of administrative digitalization depends not only on adequate software but also on human resource competence in operating these applications. Schools with skilled staff manage digital administration more efficiently, whereas those lacking expertise often depend on external operators. These findings align with studies by Warmansyah & Maulana (2021), Haryati & Makarim (2024), and Ula & Sulanam, (2024), which highlight the importance of digital systems and training in improving administrative efficiency in Early Childhood Education institutions. Overall, adequate software and operator competence are key to successfully implementing digital administrative services in Rokan Hilir's Early Childhood Education schools, and without them, digitalization efforts will fall short of government policy objectives.

Procedures

Procedures are essential guidelines and rules for processing data to produce valid, accurate information, covering data collection, processing, and distribution, as well as operational policies and standards to maintain information quality (Pratiwi et al., 2022; Stair, 1992). In several Early Childhood Education schools in Rokan Hilir Regency, digital administrative services are supported by official procedures and guidelines, including the Early Childhood Education Learning Outcome Report Guide, PMM, ARKAS, BOSP technical instructions, and regulations such as Ministerial Regulation No. 8 of 2022 and Regent Regulations No. 76 of 2021 and No. 29 of 2024 on electronic governance. Informants reported that schools actively following these procedures perform digital administration more effectively, while those neglecting them often face reporting delays and data inconsistencies, hindering the standardization of digital services across Early Childhood Education units. This aligns with studies by Warmansyah & Maulana (2021), Haryati & Makarim (2024), Ilham & Skd (2025), and Ula & Sulanam (2024), which emphasize the importance of clear, structured procedures and continuous improvements in technical, regulatory, and organizational aspects for successful and sustainable digital administration. Despite existing challenges, informants expressed commitment to adhering to official guidelines and utilizing support services from the Education Office, highlighting that comprehensive and accessible procedures are vital for consistent and effective digitalization in Rokan Hilir's Early Childhood Education schools.

People or Human Resources

People or human resources, are a crucial component of information systems, encompassing all individuals involved in the development, management, and use of these systems, including end-users, administrative staff, software developers, IT managers, and decision-makers, whose skills and understanding directly impact data quality and decision-making outcomes (Pratiwi et al., 2022; Stair, 1992). In several Early Childhood Education schools in Rokan Hilir Regency, local government through the Education and Culture Office has actively conducted training and technical guidance on applications like Dapodik and ARKAS, though teacher participation remains suboptimal.

Schools with competent operators manage digital programs more efficiently, while those lacking skilled staff face ongoing challenges, delaying digitalization efforts expected under Ministerial Regulation No. 8 of 2022 and Regent Regulations No. 76 of 2021 and No. 29 of 2024, which emphasize the need for capable human resources in educational technology

management. This aligns with findings by Brantasari (2021), Haryati & Makarim (2024), Ilham & Skd (2025), and Ula & Sulanam (2024), who highlight that digital media training enhances educators' skills, improves administrative management, and that human resource constraints remain a barrier despite the benefits of information systems. While challenges persist, informants expressed strong commitment to maximizing existing resources and training opportunities, reaffirming that competent human resources are essential for effective and efficient digital administrative services in Rokan Hilir's Early Childhood Education institutions.

Database

A database is a structured collection of interconnected data, organized in tables and relations to store, manage, and access information efficiently within an information system (Pratiwi et al., 2022; Stair, 1992). In several Early Childhood Education schools in Rokan Hilir Regency, the use of databases for digital administration varies, with some schools successfully implementing integrated platforms like Dapodik, Rapor Pendidikan, and ARKAS for accurate and timely data reporting and financial management. However, other schools still struggle with data updating due to hardware limitations, internet issues, and unskilled personnel. Informants noted that schools routinely updating databases through digital platforms experienced fewer reporting delays and data inconsistencies compared to those relying on manual records.

This situation highlights the critical role of digital databases in supporting education administration digitalization, aligned with regulations such as Ministerial Regulation No. 8 of 2022 and Regent Regulations No. 76 of 2021 and No. 29 of 2024, mandating integrated digital data management in all educational institutions. Supporting studies by Warmansyah & Maulana (2021), Haryati & Makarim (2024), and Ula & Sulanam (2024) affirm that digital administrative systems enhance data archiving, reporting accuracy, and staff data management skills, though technical obstacles like connectivity and data update precision remain. Despite these challenges, informants expressed a commitment to improving database management and utilizing available facilities, reaffirming that well-maintained, optimized databases are a key factor in the success of digital education administration in Rokan Hilir's Early Childhood Education schools.

Data Network and Communities

Data networks and data communities are essential components in supporting digital administration systems in Early Childhood Education institutions, especially in Rokan Hilir Regency (Pratiwi et al., 2022; Stair, 1992). While schools in central areas generally have stable internet connections, those in coastal and remote regions still face access limitations, often relying on personal mobile data, which hampers the operation of digital applications such as Dapodik, ARKAS, SIPLah, and Rapor Pendidikan. The presence of data communities, including WhatsApp groups, supervised school forums, and professional organizations like IGTK and K3S, plays a significant role in facilitating information sharing, resolving network issues, and expediting data updates. Schools actively engaged in these communities manage digital data systems more efficiently, while others lag behind, facing delays and information gaps. This finding aligns with research by Brantasari (2021), Haryati & Makarim (2024), and Ula & Sulanam (2024), which emphasize that strong data network infrastructure and active communication communities are key factors for successful digital media implementation and administrative services in ECE institutions.

Based on the findings, it can be concluded that the success of digitalizing information and administrative service systems in Early Childhood Education institutions in Rokan Hilir Regency is strongly influenced by six key components: the availability of adequate hardware and software as the operational foundation, clear and accessible procedures to maintain implementation consistency, and competent human resources actively participating in training to ensure the smooth utilization of technology. Additionally, well-managed databases are essential for ensuring data accuracy, supported by reliable internet network infrastructure and active data communities that facilitate collaboration, information sharing, and quick resolution of digitalization challenges. Without synergy among these six aspects, the implementation of digitalization in Early Childhood Education would struggle to run effectively, efficiently, and in line with both regional and national government policies.

CONCLUSION

Based on the analysis of digitalization readiness in the administrative information service system for early childhood education in Rokan Hilir Regency, it can be concluded that the implementation of digital administration has generally been supported by regulations, policies, and digital platforms provided by the local government, though its application still varies across schools. Differences are evident in the availability of hardware, software utilization, and the consistency of implementing digital administration procedures. Human resource capacity remains a challenge, with many schools lacking adequately skilled administrative staff. Database management has begun to shift to digital formats but is not yet optimal due to limited infrastructure and human resources. Additionally, while data networks and communication forums have started to develop, uneven internet access continues to hinder information exchange and school participation in digital communities.

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