CLOUD COMPUTING FOR IMPROVING WORK EFFICIENCY AT THE BELIBI VILLAGE GOVERNMENT OFFICE IN THE ERA OF TRANSFORMATION

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Abstract

Digital transformation has become a crucial element in improving work efficiency within the government sector, including in remote areas such as Belibi Village, Central Kalimantan. This study aims to describe the implementation process of cloud computing, identify the challenges faced, and formulate strategies to improve work efficiency in the Belibi Village Government Office. Using a descriptive qualitative approach, data were collected through in-depth interviews and observations with village officials and community figures. The findings show that although cloud computing offers significant benefits such as efficient data storage and online collaboration, its implementation is still hindered by weak digital infrastructure, low technological literacy among staff, and the absence of formal training. Suggested strategies include improving internet access, providing supporting devices, offering technical training, and collaborating with cloud service providers. This study concludes that digital transformation in village governance requires a gradual approach and comprehensive policy support to ensure successful and sustainable implementation.

Keywords: Cloud Computing, Work Efficiency, Digital Transformation, Village Governance, Belibi Village

INTRODUCTION

Digital transformation has become an essential part of improving work efficiency and effectiveness across various sectors, including government. This transformation is not merely about digitizing processes, but also involves innovation strategies to enhance competitiveness and organizational productivity. According to (Ageng et al., n.d.), the success of digital transformation highly depends on the utilization of digital innovations that can accelerate work processes and improve operational efficiency. One of the technologies that support digital transformation is cloud computing, which enables more flexible, efficient, and secure data management. This technology can help organizations optimize resources, enhance information accessibility, and speed up decision-making processes. Therefore, the implementation of cloud computing becomes a strategic step in supporting sustainable digitalization and adapting to technological changes.

The implementation of information technology has had a significant impact across various sectors, including government village environments, where digital transformation can be applied to all aspects shifting from analog to digital. On a global scale, digital transformation is a series of ongoing changes in the current digital era, often referred to as the information age. The Village Government Office of Belibi, located in a remote area, faces challenges in adapting to the era of digital transformation to enhance work efficiency. One solution that supports the operational needs of the village government office is the implementation of cloud-based technology. According to Hadiono et al. (2020), digital transformation is a global phenomenon increasingly accelerated by technological developments and the COVID-19 pandemic.

The adoption of cloud computing can also enhance employee collaboration. With cloud-based platforms, employees can collaborate on projects and documents in real-time, reducing errors and expediting decision-making processes. According to Alam (2020), cloud computing has been recognized as one of the main computing models in recent years. It has become a major innovation with significant implications not only for internet services but also for the entire Information Technology (IT) market. Its emergence aims to optimize on-demand technology, hardware, and the provision of information as a service, achieving economies of scale in the distribution and operation of IT strategies.

According to Wagola et al. (2023), in Indonesia, cloud computing technology and digital transformation have had a significant impact on work efficiency across various sectors, including government. This technology enables operational cost savings through reduced physical infrastructure needs, such as servers and data storage spaces. Additionally, cloud computing provides easier and faster access to data, allowing government employees to access and share information in real-time from various locations. This flexibility provides great advantages in work management, especially for tasks that require cross-departmental or geographic collaboration.

The Village Government Office of Belibi, located in Belantikan Raya District, Lamandau Regency, Central Kalimantan Province, illustrates the real challenges faced by remote villages in adopting digital transformation. Belibi Village is characterized as a remote area surrounded by tropical forests, with limited transportation access, inadequate road infrastructure, and a dependence on the agricultural sector and forest products as the main source of the economy. Its distance from economic and technological centers results in very limited access to digital infrastructure, such as high-speed internet networks and modern

technological devices. As a result, the office still relies on manual processes for various essential administrative tasks, including citizen data processing, public service records, and document archiving.

In addition to infrastructure, the low level of digital literacy among employees adds another layer of complexity to the adoption of digital technology in Belibi Village. Many employees are not yet familiar with cloud technology and lack understanding of how to utilize it for operational purposes, such as data management and employee collaboration. They even struggle with basic functions of digital devices, so every effort to introduce new technologies such as cloud computing requires intensive and continuous training.

Therefore, this research is crucial to address the existing challenges in Belibi Village. Without concrete steps, the Village Government Office of Belibi will fall further behind in terms of work efficiency and service quality compared to other more technologically advanced regions. Although initial steps towards digital transformation have been taken, greater efforts are still needed to achieve optimal cloud technology implementation.

The COVID-19 pandemic has forced the Belibi Village Government to adapt to the digital era in order to maintain work efficiency and public service delivery. However, as a remote area, Belibi Village faces several challenges such as limited digital infrastructure, low technological literacy among employees, and minimal access to training or assistance related to digital technology. In this situation, village staff independently sought solutions and found cloud computing as an alternative to support administrative work. Nevertheless, this self-taught learning process is full of challenges, ranging from technical limitations to resistance to change. Therefore, research is needed to understand the implementation process of cloud computing in Belibi Village and how village staff overcome these various obstacles.

This research is expected to provide practical benefits in the form of tangible contributions to improving work efficiency at the Belibi Village Government Office through the application of cloud computing technology. By understanding the implementation process of this technology and identifying existing challenges, this study aims to generate strategic recommendations that can be applied to overcome limitations in digital infrastructure and low technological literacy in the village. The results of this study are expected to support the modernization of village government work systems through improved collaboration, operational efficiency, and more responsive, transparent, and accountable public services, thereby positively impacting development in remote areas.

REVIEW OF LITERATURE

Digital Transformation in the Government Sector

In the era of rapid digital transformation, the government sector faces significant challenges in adapting to technological changes. Digital transformation not only involves the adoption of new technologies but also changes in work methods, decision-making processes, and service delivery.

Information Technology Infrastructure in Remote Areas

A strong infrastructure supports social, economic, and governmental activities, including the application of information technology. Adequate digital infrastructure, such as stable internet connectivity and modern devices, is a key factor in the implementation of cloud computing in the government sector (Thacker et al., 2019).

Work Efficiency Through Digital Technology

According to Davidescu et al. (2020), flexibility in work time and place has a positive impact on employee satisfaction and productivity, as it allows them to manage their work time according to personal conditions and individual work rhythms.

Implementation of Cloud Computing in Government

In the digital transformation era and alongside the development of information technology, cloud computing has become one of the technological solutions widely adopted by the government sector to improve efficiency, transparency, and effectiveness in public services.

Benefits of Cloud Computing for Government

Cloud computing provides significant benefits to governments in enhancing work efficiency in the digital transformation era. According to Bania & Geradin (2024), cloud computing facilitates access to computing resources such as servers and data storage via the internet without the need for expensive physical infrastructure.

Challenges of Implementing Cloud Computing in Village Government

Cloud computing has been recognized as one of the key solutions in supporting digital transformation in the government sector. This technology enables online data storage and management, which can increase operational efficiency and reduce dependence on manual systems (Omar, 2020).

Strategies for Cloud Computing Implementation

Ali et al. (2021) identified several key strategies in implementing cloud computing, including in-depth needs analysis, development of appropriate technology infrastructure, and training and development of human resources (HR).

RESEARCH METHOD

This study examines the implementation of cloud computing in improving work efficiency at the Belibi Village Government Office, which faces challenges such as limited digital infrastructure and low technological literacy. A qualitative descriptive approach was employed to describe the application of cloud computing without manipulating the variables being studied. According to Nassaji (2020), the qualitative method is a naturalistic approach that focuses on non-numerical data to deeply and contextually understand phenomena, rather than to manipulate variables. This method emphasizes understanding processes or developmental patterns, with data obtained through interviews, field notes, observations, and other sources. In this research, the primary data consists of information related to the use of cloud computing in the village office's operations, including strategies for overcoming infrastructure limitations and digital literacy challenges, as well as its impact on work efficiency.

Data were collected through in-depth interviews and direct observation at the Belibi Village Government Office. The research subjects included staff involved in cloud computing-related operational activities and information technology experts providing technical support, selected through purposive sampling to target individuals directly engaged in managing technology in the village office. The research process involved interviews with village staff and several representatives familiar with digital transformation to gather insights into technical obstacles, strategies for improving digital skills, and the effectiveness of cloud computing in supporting office operations. The interview results were then analyzed to

produce recommendations that could help the village government office optimize cloud computing for improved work efficiency and better public service delivery in remote areas.

RESULTS AND DISCUSSION

Challenges in Cloud Computing Implementation

Based on field interviews, the challenges of cloud computing implementation in Belibi Village are closely related to unstable network infrastructure, limited supporting devices, and a lack of technical training to improve employee capacity in operating the village's digital systems. To provide a clearer and more concrete picture of the challenges faced in implementing cloud computing at the Belibi Village Government Office, the following is a summary of findings and discussions based on interview results, categorized according to the research framework. This summary includes key aspects such as infrastructure, technological devices, human resources, as well as policy and technical support.

It can be concluded that the success of cloud computing implementation in the village government environment does not depend solely on internet availability, but also on the readiness of supporting devices, human resource capacity, and the existence of adequate regulations and technical training. These challenges must become a primary concern in village digitalization planning to ensure that tech-based public services run optimally and sustainably.

Infrastructure

Cloud computing implementation at the Belibi Village Government Office faces various infrastructure challenges that affect its effectiveness. Interviews with the Secretary and Village Head of Belibi revealed that limited internet connectivity is the main obstacle in operating cloud-based systems. Slow and unstable networks frequently hinder document access and reduce work productivity. These findings align with research by Bello et al. (2021) and Golightly et al. (2022), which stated that inadequate infrastructure and weak internet connections disrupt cloud-based operations. Thus, infrastructure, especially internet connection quality and limited signal boosters, is the main constraint in applying cloud computing in Belibi.

Technological Device Limitations in Cloud Computing Use

Besides network issues, limitations in technological devices also pose major barriers to cloud computing adoption. Interview results showed that employees are using outdated and low-spec computers, which slows cloud-based application performance and occasionally prevents access altogether. The success of e-government and cloud systems heavily depends on having sufficient work devices, both in quality and quantity. Field findings indicate that limited device specs and numbers significantly hinder cloud computing optimization at the Belibi Village Office. In-depth interviews and triangulation with community leaders revealed various technical barriers impeding village administrative digitalization.

Digital Literacy

Cloud computing implementation in the Belibi Village Government Office also faces human resource (HR) and digital literacy challenges. Employees' lack of understanding of cloud technology and resistance to change are key obstacles in transitioning to a digital system. Digital literacy is a vital skill in today's technological era, involving the ability to find, evaluate, use, share, and create content using digital technology and the internet. It

includes understanding hardware and software, critical thinking, digital safety, and ethics in using online information (Reddy, Sharma, & Chaudhary, 2020).

Although most employees have basic computer skills, overall digital literacy at the Belibi Village Office remains low, especially in using cloud-based technologies. Knowledge of more complex digital features is still limited, hindering optimal system operations.

Difficulties in Adapting to New Technology

Low digital literacy not only impacts internal work processes but also affects public service quality. Inability to access data or operate digital systems leads to delays and inefficiencies. Therefore, it is clear that limited technical understanding and low digital literacy levels are real obstacles hindering successful digital transformation in Belibi's village government.

Deeply Rooted Old Habits

Long-established work habits among village staff also obstruct the adoption of digital technologies. This aligns with Ali et al. (2021), who noted that cultural shifts in government institutions often face internal resistance, especially when employees have long depended on manual systems.

Lack of Training Support

Lack of technical training and minimal assistance from relevant parties are main obstacles in improving cloud-based work efficiency. Low organizational readiness and limited technical knowledge have hindered digitalization progress despite the beginning of infrastructure development. Sani et al. (2024) found that cloud computing can significantly improve operational efficiency especially in reducing administrative work time but success greatly depends on organizational readiness, training availability, and technical skills of human resources. These findings cover basic IT understanding, adaptation to new technologies, and persistent manual work habits.

Data Security

Data security is one of the most critical issues in cloud computing implementation at the Belibi Village Government Office. Employees still lack technical understanding of data protection, and current security systems are basic, lacking proper standard operating procedures. There are also public concerns about the safety of their personal information within digital systems. Trust and HR readiness are key elements influencing the continuity of village administration digitalization via cloud technology. Interviews and literature reviews revealed various challenges in data protection—both technically and in user understanding. Low trust, limited technical knowledge, and inadequate security practices show that HR and infrastructure readiness significantly affect the success of cloud adoption.

Cloud Computing Implementation

The implementation of cloud computing at the Belibi Village Government Office has brought significant changes in employee productivity, public service delivery, and governmental transparency and accountability. With a cloud-based system, administrative tasks are completed faster, more accurately, and more efficiently. Even though Belibi residents may not understand cloud computing technically, they experience its benefits through improved and more structured services. The implementation was carried out in stages starting with identifying challenges in manual systems, selecting accessible services like Google Drive and OneDrive, and learning independently through exploration and discussion due to the lack of formal training. Limited trials were conducted before full deployment. This

approach confirms that HR readiness is essential for successful tech adoption. This aligns with Bounfour et al. (2022), who stated that digital transformation acceleration is pushing governments, including villages, to adopt cloud computing for efficiency, information access, and collaboration. Despite remaining technical challenges, cloud computing has proven to improve responsiveness and document management quality.

Increased Work Efficiency

Cloud computing allows employees to work more productively by reducing dependency on manual processes, which previously slowed workflows. With cloud systems, data and document access become faster and more flexible both in-office and remotely. This speeds up decision-making and improves staff coordination. Research by Marlin et al. (2024) supports this, stating that cloud technology use can optimize work efficiency, particularly in data management and real-time administrative reporting.

Cloud Computing's Impact on Public Services

The use of information technology in public services is a vital indicator of digital transformation success at the village government level. One tech innovation adopted by the Belibi Village Government is cloud computing, which enables efficient data storage, management, and sharing via the internet, directly impacting service speed and quality. Cloud computing also helps accelerate public services in Belibi. Although service speed is already felt by the public, staff are still gradually adapting to cloud computing. This shows that digital transformation affects not only service speed but also reflects the technological understanding dynamics among village government HR.

Improved Government Transparency and Accountability

One of the most significant impacts of cloud computing implementation at the Belibi Village Government Office is increased transparency and accountability in governance. This technology enables digital and automated record-keeping and reporting systems, centralizing previously scattered physical files into accessible, structured data. Cloud computing at the Belibi Village Office has had a real impact in three main areas: work efficiency, public services, and transparency/accountability. While the implementation process still faces some obstacles, field results show significant changes in work methods and information management in the village workplace.

Cloud Computing Implementation Strategies

This section discusses the strategies applied by the Belibi Village Government Office in implementing cloud computing and their readiness to address field challenges. Masa'd et al. (2020) emphasized that continuous tech training is essential to support effective cloud system use. Such training not only aims to enhance employee understanding of the system but also promotes optimal tech adoption. Field findings show that the need for systematic and structured training remains a challenge for Belibi. Masa'd et al. (2020) highlighted that continuous training is crucial not only for improving technical skills but also for building confidence and readiness for work system changes. A structured yet flexible approach allows employees to adapt gradually to cloud tech use. Support from mentoring systems and IT teams also helps foster a collaborative work environment.

Collaboration with Cloud Service Providers

Successful cloud computing implementation is not solely dependent on the village government's internal readiness but is also greatly influenced by external support, particularly from cloud service providers. The Belibi Village Office must form strategic

partnerships with providers like Google Drive, Microsoft OneDrive, or government-based cloud services that ensure the security, reliability, and sustainability of village digital systems. This collaboration is crucial, as village-level IT needs are often specific and require customization from providers. Field findings show that the digital transformation process in Belibi cannot be executed instantly, but requires a gradual and well-planned approach. This is considered realistic given the current state of HR still transitioning and work patterns not yet fully digital. Key informant interviews show that a gradual approach increases user comfort and readiness to adapt to cloud systems and reduces resistance to change.

Cloud computing implementation faces infrastructure challenges, limited HR competencies, a lack of provider support, and the need for a gradual digital transformation approach. Each of these challenges has applicable solution strategies, such as network upgrades, continuous training, technical partnerships, and phased adaptation. Thus, this section provides a comprehensive picture of the factors influencing successful cloud computing adoption at the village government level.

CONCLUSION

Based on the research conducted at the Belibi Village Government Office, it can be concluded that the cloud computing implementation process is still in its early stages and is being carried out gradually. This technology has begun to be used, particularly in managing administrative data and documents online, though unevenly and with various technical hurdles. Cloud computing is expected to enhance work efficiency, accelerate public services, and reduce dependence on manual systems. However, its adoption is still hindered by key factors such as unstable internet infrastructure, inadequate technological devices, and low levels of digital literacy among employees. Additionally, the absence of official training or technical guidelines has also slowed adaptation to this new system. Strategies to improve work efficiency through cloud computing include enhancing network infrastructure, providing suitable tech devices, organizing technical training, and forming partnerships with cloud service providers. A phased strategy is also an effective approach to ensure that digital transformation proceeds in a more structured and sustainable manner in the village government environment.

Recommendations

Based on the limitations mentioned above, the following suggestions may be considered by future researchers:

1. Conduct comparative studies among villages with varying levels of digital readiness to gain a broader perspective.
2. Combine quantitative approaches, such as measuring efficiency levels or user satisfaction surveys, for more comprehensive results.
3. Explore the role of digital leadership and change management strategies in supporting cloud-based digital transformation in the village government sector.

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