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OPTIMIZING THE USE OF CLOUD TECHNOLOGY IN PUBLIC SECTOR MANAGEMENT CONTROL (CASE STUDY OF E-GOVERNMENT IN BANDUNG CITY)

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ABSTRACT

This research aims to explore and analyze the optimization of cloud technology usage in public sector management control, focusing on the implementation of e-government in Bandung City as a case study. The research method used is a qualitative case study, collecting data through in-depth interviews, observations, and related document analysis. The results indicate that the application of cloud technology has brought significant benefits, including increased efficiency, accessibility, and scalability of e-government services. However, challenges related to data security and technological infrastructure limitations were also identified. Based on these findings, recommendations are provided to strengthen infrastructure, train employees, establish partnerships with the private sector, and conduct regular evaluations to enhance the application of cloud technology in e-government management in Bandung City and the public sector in general. This research is expected to provide valuable insights for the development and optimization of e-government services in various governmental contexts.

KEYWORDS *Cloud, Management, Public Sector*

INTRODUCTION

The phenomenon of cloud technology use in public sector management control has become increasingly prominent alongside the development of information and communication technology (ICT). Cloud computing transforms the internet into a central hub for user data processing, where cloud service providers facilitate user access to applications via the internet (Barus et al., 2024). Consequently, cloud technology enables public sector entities to efficiently and flexibly store, manage, and access data through the internet without requiring significant investments in physical IT infrastructure. This technology offers substantial operational efficiency,

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flexibility, and scalability, which can enhance organizational productivity and innovation (Ilahi et al., 2024). However, the implementation of cloud technology in public sector management control is still not fully optimized. Various obstacles and challenges arise in its application, including data security issues, legal uncertainties, as well as cultural and institutional challenges within public sector organizations.

The discussion on optimizing the use of cloud technology in public sector management control is important given the public sector's crucial role in maintaining societal balance and sustainability. Sholikah & Harsono (2020) also emphasize that utilizing cloud computing technology in public services can integrate data, thereby saving costs, space, and time. In the current digital era, effective use of technology in management and control is crucial for enhancing public sector performance and accountability.

Hardian (2023) in his article mentions that cloud-based auditing allows auditors to access financial data from anywhere and at any time. This solution provides real-time access to financial data and enables auditors to collaborate more effectively in overseeing the public sector. Nisaa et al., (2023) also state that technological advances in internal audit involve the application of various tools and techniques to collect, analyze, and audit data more efficiently and effectively, including the use of cloud platforms for easier data storage and security. Arif et al., (2022) conducted an analysis related to the implementation of E-Audit in Kediri Regency, which has adopted cloud accounting for financial recording. They found that this implementation can reduce the likelihood of fraud with adequate internal control, although various evaluations are still needed in its execution. Despite extensive research on cloud technology use, studies specifically focusing on public sector management control are still limited. This gap creates uncertainty in implementing cloud technology strategies that align with the unique needs and challenges of the public sector.

One of the major cities that has started implementing the Smart City concept is Bandung. This city is relatively unique in its Smart City implementation because the development of e-government in Bandung has been more massive and rapid compared to other cities in Indonesia. There are numerous reports indicating that Bandung has over 400 applications supporting e-government, which in turn support the realization of a Smart City in Bandung (Administrator Pikiran Rakyat, 2017). Various innovations and technologies, including cloud technology, are used in this e-government development.

This research is expected to provide new contributions to the understanding of how cloud technology can be optimized in public sector management control. By identifying key factors that influence successful implementation and presenting a framework that stakeholders can use to design and execute effective strategies, this research aims to be a valuable information source for practitioners, researchers, and policymakers in the public sector.

RESEARCH METHOD

The method used in this research is qualitative with a case study approach. According to Creswell in Assyakurrohim et al. (2023), a case study is defined as research where the researcher explores a specific phenomenon (case) within a particular time and activity (program, event, process, institution, or social group) and gathers detailed and in-depth information using various data collection procedures over a certain period. Case studies are useful when a researcher wants to understand a particular problem or situation in great depth and can identify cases rich in information, meaning that significant issues can be studied from several examples of phenomena, usually in the form of questions. Case studies allow for the collection of in-depth and detailed data about a specific subject. This often involves various data sources, such as interviews, observations, and documents, which help generate a comprehensive understanding.

RESULT AND DISCUSSION

Bandung City Overview

Bandung is one of the major cities in West Java, which has been administratively established since September 28, 1810. Geographically, Bandung is bordered by Bandung Regency and West Bandung Regency to the north, Bandung Regency to the south, Cimahi City to the west, and Bandung Regency to the east. Astronomically, Bandung is located between 107 degrees 36' East Longitude and 6 degrees 55' South Latitude (Pemerintah Kota Bandung, 2024).

Currently, Bandung is referred to as a Metropolitan City because it is the third-largest city in Indonesia, which also makes it the capital of West Java Province. Bandung also functions as a National Activity Center (PKN). Additionally, Bandung is classified as a Strategic National Urban Area (Bandung Basin Metropolitan Area), the second largest metropolitan area in Indonesia after the Jabodetabekpunjur Metropolitan Area. It is considered the second-largest metropolitan area due to its main routes being connected by the Purbaleunyi Toll Road and the Argo Parahyangan Train, which facilitate mobility in Bandung.

Bandung, having implemented the smart city concept since 2014 under the administration of Ridwan Kamil, who was then the Mayor, continues to develop smart city initiatives to better manage the city. The most crucial aspect of Bandung's current smart city concept is smart governance, which aims to achieve accountable, clean, and service-oriented governance (Portal Bandung, 2017).

E-Government

Conceptually, the basic idea of e-Government is to provide services electronically (e-service), such as through the internet, mobile networks, and computers, as well as multimedia. The development of e-Government involves organizing information management systems and public service processes while optimizing the use of information and communication technology (ICT) (Rusli, 2004).

Douglas Holmes, as cited in Purnawingwulan et al. (2015), defines e-Government as: “electronic government, or e-Government, is the use of information technology, in particular the internet, to deliver public services in a much more convenient, customer-oriented, cost-effective, and altogether different and better way.” This definition illustrates that online services provided by the government facilitate

citizen participation in various governmental activities. Moreover, online services help reduce costs, streamline processes, increase speed, and make processes more flexible and responsive.

Big Data and Cloud Technology

The term Big Data emerged after 2005, introduced by O'Reilly Media. However, the use of data and the need to understand it have existed for a long time. Many have tried to define Big Data, which can be summarized by the 3Vs: volume, variety, and velocity, with some adding veracity and value. Volume relates to the large or even unlimited data storage capacity, possibly up to petabytes or zettabytes; variety pertains to the types of data processed, from structured to unstructured data; velocity refers to the speed of processing data from various sources, from batch data to real-time data, while veracity and value relate to data accuracy and the usefulness of the information produced (Aryasa in Sirait, 2016).

Cloud technology has become a key element in e-Government transformation, enabling governments to provide public services efficiently, flexibly, and affordably. Cloud technology allows for the provision of online public services through IT infrastructure that can be accessed virtually. This enables the government to store, manage, and access data efficiently without relying on costly physical infrastructure. Governments can improve service accessibility for citizens, speed up decision-making processes, and enhance operational efficiency with cloud technology. Cloud systems offer benefits such as storage capacity and easy data access anytime and anywhere (Septian, 2023). Additionally, cloud technology allows for scalable services, enabling governments to adjust IT infrastructure capacity according to changing demands and needs. However, the use of cloud technology in e-Government also poses challenges, including data security and privacy issues, dependence on cloud service providers, and the digital divide among less connected communities.

Implementation of Cloud Technology in Public Sector Management Control in Bandung City

The Bandung City Government is categorized at the corporate adoption stage in adopting cloud technology, indicating that the government has begun adopting this technology more widely and systematically in its operations (Sirait, 2016). At this stage, the Bandung City Government has identified the value and benefits of cloud technology in enhancing efficiency, transparency, and the quality of public services. They have initiated cloud technology implementation in various operational aspects, such as data management, communication, and public services. Additionally, the Bandung City Government has shown a commitment to addressing challenges associated with cloud technology adoption, such as data security, privacy, and connectivity. The government has made significant investments in IT infrastructure and human resources to support cloud technology adoption. Furthermore, they are likely developing policies, procedures, and practices related to the more effective use of cloud technology. Thus, at the corporate adoption stage, the Bandung City Government has laid a strong foundation to continue developing and

leveraging the potential of cloud technology to improve public services and management in the city.

The implementation of cloud technology in public sector management control in Bandung faces several challenges that need to be addressed to achieve optimal success. One major challenge is the overall immature IT infrastructure, including uneven internet connectivity throughout the city. This can hinder effective access and use of cloud technology by various government units and departments. Additionally, concerns about data security and privacy are significant challenges, given the importance of managing sensitive government data in management control. Strong measures are needed to ensure data security and privacy protection, including strict policies, data encryption, and robust authentication systems.

However, despite these challenges, the implementation of cloud technology also opens up significant development opportunities in public sector management control in Bandung. The use of cloud technology can enhance efficiency and transparency in resource and financial management, enabling quicker and easier access to necessary data for decision-makers. Additionally, cloud technology facilitates better collaboration between government units and departments, as well as more effective communication and information exchange. By optimally leveraging cloud technology, Bandung can develop a more responsive, adaptive, and innovative management control system, improving the quality of public services and overall community welfare.

CONCLUSION

Based on the case study results on the implementation of cloud technology in public sector management control in Bandung City, it can be concluded that the use of cloud technology has brought various significant benefits. Through the utilization of cloud infrastructure, the city government has been able to enhance the efficiency, speed, and accessibility of e-government services for the public. Additionally, cloud technology enables the provision of more scalable, secure services that can be accessed from anywhere and at any time.

To strengthen the implementation of cloud technology in public sector management control, several recommendations can be considered by the Bandung City Government. These include continuously developing a reliable and secure cloud technology infrastructure to ensure the availability of e-government services and optimal data protection, conducting regular training and workshops for government employees on the use of cloud technology, and promoting partnerships with private sectors and academia to continuously develop innovative cloud-based solutions in e-government management.

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