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FACTORS INFLUENCING THE ADOPTION OF CLOUD COMPUTING SYSTEMS IN E-TOURISM

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ABSTRACT

The development of technology, information, and computers is increasingly providing convenience and comfort for users. It is no different from the innovation of the e-Government concept carried out by the government in the tourism sector (e-Tourism). This study aimed to determine the factors influencing adoption of cloud computing systems in tourism development based on technology and information (E-Tourism). The research method used is a literature study with the help of the NVivo 12 Plus analysis tool. The results show that the adoption of cloud computing systems in the development of E-Tourism is undoubtedly driven by the many advantages provided, including Ease of Access, Cost Efficiency, Flexibility in Adding Capacity, Ease of Server Monitoring and Management, Increasing Data Availability, Focus on Business Improvement and Business Development. In addition, cloud computing innovates in improving smartphone-based facilities and features. For users, the cloud system provides easy access along with GPS, a camera, a music player, a dictionary, a notepad, and a translator, which tourists need.
Keywords: Adoption, Cloud Computing System, E-Tourism

ABSTRAK

Perkembangan tehnologi, informasi dan computer semakin memberikan kemudahan dan kenyamanan bagi pengguna. Tidak berbeda dengan inovasi konsep e-Government yang dilakukan oleh pemerintah di bidang pariwisata (e-Tourism). Tujuan penelitian ini adalah untuk mengetahui factor yang mempengaruhi adopsi cloud computing system pada pengembangan pariwisata berbasis tehnologi dan informasi (E-Tourism). Metode penelitian yang digunakan adalah studi literatur dengan bantuan alat analisis Nvivo 12 Plus. Hasil penelitian menunjukan bahwa Adopsi cloud computing system pada perkembangan E-Toursime tentu didorong oleh banyaknya kelebihan yang diberikan, diantaranya Kemudahan Akses, Efisiensi Biaya, Fleksibilitas dalam Penambahan Kapasitas, Kemudahan Monitoring dan Manajemen Server, Meningkatkan Ketersediaan Data, Fokus pada Meningkatkan Bisnis dan Pengembangan Usaha. Selain itu, cloud computing berinovasi dalam menigkatkan fasilitas dan fitur berbasis smartphone. Bagi pengguna, cloud system memberikan kemudahan akses bersamaan dengan GPS, kamera, pemutar musik, kamus, notepad, dan penerjemah yang merupakan kebutuhan wisata.

Kata Kunci: adopsi, system cloud computing, e-pariwisata

BACKGROUND

(E-government) is defined as the use of information and communication technology, particularly the Internet, to improve the efficiency of government administration and provide services to the public, businesses, and others. The implementation of the e-government program must carry out several stages that must be completed to meet the stages of the program. The public demands to use information technology in government in the hope of having benefits for the government, especially local governments. People expect to use information technology as a form of public service that makes it easier for them to access various things and data they want to see at any time.

Therefore, the implementation of e-government requires sufficient human resources and experts in their fields. E-government is a replacement or enhancement to what was previously done manually. E-government is a substitute or facility that was previously done manually. However, the adoption and implementation of e-government is a challenging issue for many governments, especially at the local level, due to many factors hindering implementation. These inhibiting factors include technological, financial, and organizational constraints. These barriers have hindered the successful

Vol.8, No.2, 2022
Doi: 10.24198/cosmogov.v8i2.41553
http://jurnal.unpad.ac.id/cosmogov/index

implementation of 85% of e-government systems, particularly in developing countries. Because many factors hinder implementation, these inhibiting factors include technological, financial, and organizational constraints. These barriers have hindered the successful implementation of 85% of e-government systems, particularly in developing countries. Because many factors hamper implementation, these inhibiting factors include technological, financial, and organizational constraints. These barriers have hindered the successful implementation of 85% of e-government systems, particularly in developing countries.

Some researchers explain that in e-government, many weaknesses can trigger an obstacle, namely unclear vision and mission, unclear strategies and objectives, lack of coordination, organizational structure, and some aspects that are not adequately discussed in general and do not identify adoption problems. And implementation at the government level, especially in the central and local governments. This study aims to determine how to understand the influence of Cloud Computing adoption on the government. According to (Nurdin et al., 2011) that, adoption and implementation can be influenced by the framework created by the government (Chen, 2003) argues that integration theory is suitable for building frameworks in certain contextual and situational conditions.

The theory of effectiveness and organizational culture are adapted into the dimensions that will be integrated to explain the factors that influence the adoption of cloud computing in e-government (Zheng et al., 2013). Despite the tremendous benefits of e-government, there is growing recognition that the adoption of e-government is balanced across all public administration organizations. The fundamental mechanisms driving the adoption of e-government by public administration organizations still need to be fully understood in the available literature. This gap in the literature is especially evident in the G2G category, which supports communication and transactions among various public administration organizations. Examples of G2G include social security card systems, electronic scoring file systems, & armed forces news systems. Most current e-government research is serious about G2C or G2B adoption. Several studies have studied the adoption of G2G.

The implementation of e-government in government has areas for improvement that have affected the government's performance (Sanchez et al., 2003; Schwester, 2009). e-government promises many benefits to governments and communities. Nevertheless, many problems arise, such as technical problems conversion of e-government with politics (Puspitasari & Kurniawan, 2021; Tan et al., 2022). Despite the great benefits of e-government, some recognize that adopting cloud computing in e-government is disproportionate to public services. These weaknesses are factors that affect the running of a government. Because this form of e-government uses information technology and the lack of equality in public access is a constraint, internet and web information. Thus, the factors that influence e-government must be evaluated to improve the quality of public services.

Technology in e-government continues to innovate, such as using cloud computing systems. Cloud computing innovations in government help process, storage, and communication fast and inexpensively. The government uses cloud computing to store data-based share information (Lubis, 2016), database management, and website management (Tweneboah-Koduah et al., 2014). Adopting cloud computing in government certainly has positive and negative impacts (Wahyudin & Rahayu, 2020). The accuracy and speed in storing based data and distributing information extensively impact public services. However, the government also faces many obstacles (Mohammed et al., 2017). The obstacle lies in human resources (HR) as managers of cloud computing in government. In addition, finance is also needed as initial capital to provide a platform for the use of cloud computing (Christiani, 2018).

This study aims to determine the application of e-government theory,

Vol.8, No.2, 2022
Doi: 10.24198/cosmogov.v8i2.41553
http://jurnal.unpad.ac.id/cosmogov/index

especially to the factors influencing the adoption of cloud computing systems in developing electronic-based tourism. A lack of understanding of the adoption of cloud computing makes people less Master of Information Technology, one of which is in the form of public services. The government prepares an e-government system as a form of a facility provided to the community. Still, the public recognizes it because the public still needs to learn information technology provided by the website to find out the weaknesses and obstacles that occur when e-government is implemented in government and cloud computing adoption.

METHOD

This article is library research using references as a reference to collect, analyze and evaluate a study (Wahyudin & Rahayu, 2020). Literature relevant to the theme and sub-theme of the study is selected as a review from various sources. Articles are read and analyzed using Nvivo 12 plus with various features such as word cloud, auto code, hierarchy chart, and word frequency. (Ozkan, 2004; Setiawan et al., 2022). Literature research was chosen because it is permanent, easy to find, and can be accounted for. The purpose of the literature study is to provide information regarding current related research, including summaries and evaluations of previous research (Hariyanti & Wirapraja, 2018).

RESULTS AND DISCUSSION

Cloud computing system breakthrough in e-government

Convenient, on-demand network access for unified configuration settings of computing resources such as network, servers, media, storage, applications, and services that can be quickly set up and deployed with minimal business management or service provider relationships. According to Gong, C., Liu, J., Zhang, Q., Chen, H., & Gong (2010), ten cloud computing characteristics can be used, easy to access, virtualized, Internet-centric, many origin power, automatic adaptation, scalability, origin optimization power, pay per use, service SLA (Service Level Agreement) & infrastructure SLAs.

Five characteristics of cloud computing (A. Ashari, H. Setiawan, 2011) :

1. On-demand Self Service. Service computing capabilities and ordering systems, such as server time and network storage, are automatically determined based on the needs specified by the service provider.
2. Broad network access. Ease of network service capabilities and access through various access technology platforms such as telephones and laptops.
3. Resource pooling. Users perform multi-user instances that use computing resources that have multiple advantages to serve numerous consumers at once through dreams and physical resources that do not match the demands of consumers. Here deep customers usually need help to control or have knowledge of resources, but they can choose a position (e.g. data center).
4. Rapid elasticity. Capabilities are defined and released for a faster and more flexible response, where users, as actors, can add or subtract from the type and capacity of services. The system is ready to accommodate these changes.
5. Measured Service. Cloud computing systems that optimize resource use take advantage of the ability to measure in levels appropriate to the type of service, for example, processing, storage, bandwidth, and active user accounts.

Cloud computing systems have capabilities in terms of a network system and the latest computing technology; permanent cloud computing has advantages and disadvantages in its use (Chau, P. Y. K., & Tam, 2000), the benefits of cloud computing:

1. Ease of Access.
   This system is said to be a straightforward system in terms of accessing data or implementation. In the case of implementing this access

Vol.8, No.2, 2022
Doi: 10.24198/cosmogov.v8i2.41553
http://jurnal.unpad.ac.id/cosmogov/index

at work, usage does not require using only one personal computer or an exclusive computer because data can be accessed even if using another computer through the same server.

2. Cost Efficiency.
   This system has a relatively good advantage in the use of cloud computing. It will reduce the relative cost, especially regarding hardware usage, because it is related to using personal computer operations. Companies using cloud computing do not require fees such as electricity ports and performing device maintenance, among other things. In addition, using cloud computing for companies does not require rules for investing or spending capital expenditures and efficient use of only spending as needed.
3. Flexibility in Adding Capacity.
   Another advantage of using the cloud is its large enough capacity. The company benefits because the capacity requirement does not require a computer procurement system, which costs more and takes time. In just a matter of minutes, the required capacity is ready to use by using cloud computing.
4. Ease of Server Monitoring and Management.
   Because everything is connected via the web that consumers or customers use, cloud computing is more able to monitor and manage servers. The company only uses the dashboard to find out the status of the server globally. With the automation-tools feature still available in this system, it is possible to upgrade and manage the server until the software installation is effortless.
5. Improve Data Availability.
   The strength of cloud computing lies in how the system is built using a high-availability design. With the example of a system designed to be very sophisticated, this system is safe to be in a data center that claims to exist starting based on space, availability of electricity, and others, using adequate supporting facilities and even working 24 per day. In addition, cloud computing systems are also supported using backup devices. As a result, the ability to secure data is more remarkable, not especially if there is damage to the storage system. This system is fully redundant in terms of mandatory equipment, using basic features that give the server a larger capacity.
6. Focus on Business Improvement and Business Development.
   In terms of locus, IT companies generally spend at least 80% of their time using operations and 20% on maintenance activities for development. Of course, in terms of effectiveness and efficiency, this takes time and energy for the company because it is required to maintain the system. It is different from using a company that has used cloud computing because the maintenance process only requires a little attention because it focuses on sufficient cloud resources. In addition, companies tend to maximize work in development activities rather than maintenance.

Although this system has many advantages, permanent cloud computing has disadvantages that need attention (Chau, P. Y. K., & Tam, 2000) that is:

1. Service Level. This system needs consistent service performance based on the provider. This lack of consistency includes both data recovery and data protection.
2. Privacy. The weakness that needs attention lies in the privacy of its use. This is because, in its use, hosting can be done together, and user data will be accessible to others.
3. Compliance. This system has a risk where compliance based on the provider imposes limits on the regulations applied by the user. It impacts the deflection of data

Vol.8, No.2, 2022
Doi: 10.24198/cosmogov.v8i2.41553
http://jurnal.unpad.ac.id/cosmogov/index

ownership because it can potentially lose data ownership when it is automatically stored in the cloud.

4. Mobility Data. In the presence of data sharing between cloud services and users, they get data back one day if the user wants to carry out the termination process using cloud computing services.

Adopt cloud computing systems in the government

Cloud computing is an information technology platform that provides many benefits, such as unlimited storage capacity, unique features, elastic scalability, and lower complexity compared to traditional high-performance computing models (Abolfazli et al., 2015). Cloud computing is rapidly being adopted in various countries around the world, used for various domains such as health, education, trade, tourism, and the development of scientific works. Countries with good digital capabilities quickly adopt to save on procurement and maintenance costs and maximize the effective use of the cloud (Abolfazli et al., 2015).

European countries are rapidly maximizing the adoption of cloud computing in e-Government (Wyld & Robert Maurin, 2009). In Austria, the use of cloud computing in e-Government in law, government bureaucracy, economic development, and technology (Zwattendorfer et al., 2013). The use of cloud computing in Austria proliferates in the individual (private use), community, and public environment (Zwattendorfer et al., 2013).

In Denmark, local governments began preparing to use cloud computing in the public sector in 2009 (El-Gazzar, 2014). Google's calendar and email features have been used in schools since 2011. In addition, the government bureaucracy has used it for services, changing community services to cloud systems (Zwattendorfer et al., 2013). however, Denmark is continuing to improve its security and user privacy system.

Unlike Denmark, Germany has been using cloud computing since 2010, and the German federal government has used it as a critical strategy to advance technology and information(Hentschel et al., 2018). The use of cloud computing is rapidly and massively used in government bureaucracies and the economy, both small and medium businesses. The challenges faced by Germany in maximizing this system are data security, service quality, integration, and standardization which still need to be improved.

Countries in Asia are also rapidly adopting cloud computing in various sectors. In Malaysia, for example, cloud computing systems have become a trend since 2010-2015. Despite the multiple challenges faced, the development of the use of the cloud in Malaysia is relatively rapid. In mid-2010, Malaysians have shown interest in cloud systems. Government institutions and stakeholders in various public and private sectors carry out promotions and penetrations to develop the economy massively (Abolfazli et al., 2015).

In India, more than 150 million Primary to tertiary education students uses cloud systems for storage and learning methods. The use of cloud computing significantly impacted the development of the world of education. The most effective use of cloud technology in Indian education is a reference for other economic and tourism sectors. Malaysians also use the cloud to access information and geographic location (J. Singh & Mansotra, 2019).

Like Malaysia and India, Indonesia, with a vast population, has adopted cloud computing to maximize information dissemination and improve computers and technology. Government and private institutions are gradually migrating from manual to cloud systems. The formal and informal sectors also use the cloud to store data and quickly send and distribute data simultaneously. The education, tourism, health, economic and legal sectors are maximizing them well (Mulyono, 2018). In 2021, cloud computing users in public services will increase by 23.1% from $270 billion in 2020. This can be seen by the Indonesian people showing interest in using cloud computing (Stamford, 2021).

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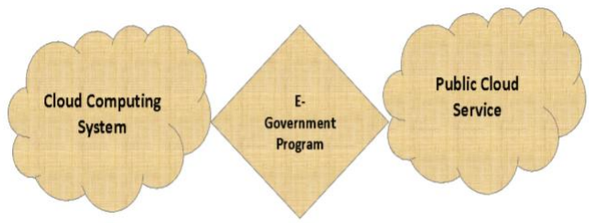
The development of cloud computing systems in various countries worldwide is overgrowing. Cloud adoption shows success in the private sector and then shifts to the public or government sector (Wyld & Robert Maurin, 2009). The benefits of cloud computing can help government organizations by using e-Government, including cost-cutting, maximizing storage, high accessibility, flexibility, and ease of access for many users.

Figure 1. Cloud computing system design in e-government (Chanchary & Islam, 2011)



The previous government's upgrading process often required more costs and sometimes took time. With the help of cloud service providers, these challenges can be reduced more efficiently. In the cloud computing model, the existing E-government system will outsource critical data and processes in the public cloud while maintaining total control centrally.

Using Cloud Computing Systems on E-Tourism

The Tourism Industry increasingly uses an existence of Cloud computing. Malaysia and Thailand have gained solid positions in the global and regional tourism market in recent years (S. Singh & Bashar, 2021). These two countries are considered the most competitive tourism markets in Southeast Asia. At least two aspects of adopting a cloud system in the tourism sector attract tourists to tourist hot spots. Second, the cloud system provides local-based pervasive services and effectively provides services to tourists (Dharmadasa & Alahakoon, 2014). Cloud computing continues to innovate to improve smartphone-based facilities and features. Smartphones have dominated because they provide user-friendly services. For tourists today, using a GPS, camera, music player, dictionary, notepad, and translator is a necessity that must be connected to activities and travel. When developing a cloud-based mobile travel system, much consideration should be given to reducing the temporal and energy overhead by leveraging solutions (Nikolskaya, 2021).

An analytical study conducted by the Software Alliance and the Asian Cloud Computing Association on cloud system readiness levels across the globe and Asia yielded that insight into cloud system adoption rates has challenges but provides many advantages. Asia, the largest continent and the most mutating of technology, has significant potential to adopt cloud technology (Abolfazli et al., 2015). Among Asian countries, Malaysia shows the most obvious interest in adopting the cloud in various sectors and is exemplary. Malaysia is ranked 13th among 24 countries ready to adopt cloud technology (Abolfazli et al., 2015).

The adoption of cloud computing in the government, along with the development of E-Government theory, helps the growth of digital-based tourism. Cloud computing seems compatible with E-Tourism to meet the public's demand for accurate and fast electronic services (Lin & Lin, 2013). Effective and timely communication between tourists, people, guides, government agencies, private institutions, and other professionals is essential for good e-tourism services. In particular, the concept of shared infrastructure and services provides the foundation for supporting the tourism service ecosystem. Emerging cloud computing technologies provide a promising approach to meeting IT needs for the collaborative and coordinated e-tourism of the future (Rajini et al., 2015).

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Tourism services will be shared and related IT services will be delivered and consumed by interconnected e-tourism users. By introducing technology infrastructure as an active service to the community. The booking and payment methods are for pampering users while eliminating tourists' worries about managing their budgets (Hamid et al., 2021; Rajini et al., 2015). In addition, shared infrastructure can simplify the sharing and governance of tourism information to better facilitate the transformation to people-centred and evidence-based services (Hamid et al., 2021).

Figure 2. The results of the Nvivo 12 plus analysis using the word cloud feature (2022)

The picture above is the result of a search article on adopting cloud computing systems in e-Tourism and has been analyzed using Nvivo 12 plus, resulting in several driving factors, namely infrastructure, technology, citizen service, benefits, digital support, and high access.

As a delivered solution, cloud computing is proven to cut costs, increase productivity, and broaden business prospects by freeing up time for users to focus on responsibilities. Users no longer must worry about data storage or loss as their files can be accessed and shared over the Internet using any Web-enabled device. In addition, the company does not need to spend money to set up the infrastructure if a cloud-based system is adopted (Mahadin et al., 2020; Schwester, 2009).

In addition, cloud computing systems dominate travellers' needs and provide easy access to some books and plan their trips. For the travel industry, cloud computing enables companies to keep up with the demands of online travel arrangements. With the mobility offered by the cloud, users can access websites or applications and order tools simultaneously. Therefore, it is not surprising that tourism organizations have also seen the benefits of exploiting cloud systems and driving the old paradigm shift toward cloud computing in the future (Rajini et al., 2015).

CONCLUSION

The development of technology, information, and computers is a good start for innovation in e-government theory. In technology-based tourism (e-Tourism), the use of cloud computing has been maximally adopted by countries around the world to innovate and provide the best service for tourists. The adoption of cloud computing systems in developing E-Tourisme is undoubtedly driven by the many advantages provided, including Ease of Access, Cost Efficiency, Flexibility in Adding Capacity, Ease of Monitoring and Server Management, Increasing Data Availability, Focusing on Increasing Business and Business Development.

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