Implementing Cloud Computing in Companies to Increase Business Efficiency

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Keywords	Abstract
Cloud Computing, Internet of Things (IoT), Company, Business Efficiency.	**Abstract.** Cloud computing has emerged as an attractive solution for companies looking to increase operational flexibility, reduce infrastructure costs, and improve business performance. Through comprehensive analysis of primary and secondary data, this research aims to evaluate the impact of implementing cloud computing in various corporate sectors. This research aims to investigate the application of cloud computing technology in a corporate environment as a strategy to increase business efficiency. This research uses a qualitative approach with descriptive methods. The research results show that the use of cloud computing services has had a significant positive impact on various business entities and organizations. The use of cloud computing helps optimize operational cost efficiency by reducing the need for expensive physical infrastructure, while providing high scalability and strong data security. Additionally, integration between cloud computing and the Internet of Things (IoT) has enabled efficient data collection and analysis remotely, facilitated effective cross-divisional collaboration, and enabled the development of complex projects. Overall, the results of this research emphasize the importance of adopting cloud computing as a crucial technological foundation for innovation and business growth in today's digital era.

1. INTRODUCTION

As a business owner in the digital era, maintaining company productivity and efficiency is the main key in maintaining and improving business (Rengganawati & Taufik, 2020). It is important to understand that company resources, including time and labor, are valuable assets that must be utilized optimally. To achieve efficiency, it is necessary to carry out an in-depth analysis of all business processes and identify areas where improvements can be made (Mavilinda et al, 2021). Proper implementation of information technology, such as integrated business management systems, automation of routine tasks, and collaboration tools, can help minimize unnecessary loss of time and resources (Ichsani et al., 2023). In addition, it is necessary to encourage the training and development of employees so that they have the necessary skills to carry out their duties more efficiently.

In addition, companies need to continuously analyze market trends and adapt to changes that occur in the business environment. Innovation and flexibility are the keys to maintaining business amidst continuous change (Ambarwati, 2021). Business owners must also actively collect feedback from customers and employees to continually improve their products or services. The use of business data and analytics can help companies identify new opportunities and understand customer preferences better (Mantik & Awaludin, 2023). Thus, awareness of the importance of productivity, efficiency, and adaptation to change are key steps to ensure long-term success in an ever-changing and fast-moving business world (Utrami, 2010).

Among the various innovations that have emerged, cloud computing has become the main support for companies in managing data and strengthening their IT infrastructure. By utilizing centralized computing resources that can be accessed via the internet, cloud computing allows companies to access data, store information, and run applications efficiently without having to rely on expensive internal physical resources (Asniar & Sari, 2015). Cloud computing has been used for approximately two decades since the early 2000s. However, data shows that the benefits of cloud computing in the form of business efficiency, budget savings, and other advantages possessed by the cloud, have not been utilized by the majority of companies that have not yet implemented cloud computing in their business (Surya, 2019). The use of cloud computing not only gives companies easy and fast access to their data, but also allows more effective collaboration among geographically localized team members (Anggeriana, 2011). With centralized data storage and easy

scalability, companies can manage and process information more efficiently, regardless of the size or scale of their business. Apart from that, cloud computing also helps companies reduce operational costs by eliminating the need to invest heavily in internal IT infrastructure that is expensive and requires maintenance (Marwi, 2021). Implementing cloud computing has become one of the key solutions for companies that want to strengthen their IT infrastructure, increase operational efficiency, and support sustainable business growth (Marwi, 2021).

In the view of many IT experts, Cloud Computing plays a crucial role in changing the information technology process and influencing the IT market significantly. The concept of Cloud Computing represents the ability to store and access data and programs via the internet from various locations, eliminating dependence on local computer hard drives (Mulyantoro, 2014). With this capability, users can access data and applications with high flexibility, not limited by physical limitations or the device used. With the flexibility and accessibility provided by Cloud Computing, businesses can increase operational efficiency, collaboration and scalability of their IT infrastructure, while enabling further innovation in the development of technology-based applications and services (Nuril'Abidah et al, 2020). The overall paradigm shift brought about by Cloud Computing has enabled companies to utilize information technology in a more adaptive, dynamic and effective way, reshaping the information technology landscape globally.

2. METHOD

This research adopts descriptive analysis with a qualitative approach, which is used to investigate social or humanitarian problems with the aim of understanding the meaning given by individuals or groups regarding the problems studied. The qualitative research process involves a series of steps, including data collection and analysis, inductive data analysis, and data interpretation. This approach does not always require quantification, as explained by Lewis (2015), and is used to understand phenomena in depth. Data collection was carried out through special research instruments, with observation and interviews being the main methods. Research findings are obtained from primary sources, which provide data directly to researchers, such as academic publications, news articles, and notes produced directly from research subjects. Thus, this qualitative approach allows researchers to gain in-depth insight into the problem under study through data obtained directly from the sources involved .

3. RESULTS AND DISCUSSION

Cloud computing is a method of delivering various services over the internet. The resources in question, for example, are applications such as data storage, servers, databases, networks, and software. Instead of storing lots of files on a hard drive or local storage on a computer or cellphone, cloud-based storage allows us to store files as long as we have access to the internet (Ikmal et al, 2021). Cloud computing is a popular option because it has many benefits, such as cost savings, increased productivity, speed, efficiency, performance and security. Therefore, it is not surprising that many companies or people use the cloud to store data (.

It is called cloud computing because information is accessed remotely in the "cloud" or virtual room. Companies that provide cloud services allow their users to store files and applications from remote servers. They can also access it as long as they have an internet connection (Heryana & Putra, 2018). This means, a user does not need to be in a specific place to get access to his files. Cloud computing can be public or private. Public cloud provides its services publicly on the internet (Ula, 2019). Meanwhile, on the other hand, private clouds only provide their services to certain people. There is also a hybrid option, which combines both public and private clouds. Apart from its wide range of services, *cloud computing* provides its users with a range of functions, such as:

a) E-mail

One of the main functions offered by cloud computing services is email. By using cloud services for email, users can access and manage their inbox from any device with an internet connection, including computers, laptops, tablets, or smartphones. Users can send, receive, and store

email messages efficiently, and with cloud-based email storage, data is not tied to one specific device. This allows users to access message history and contacts from anywhere, at any time, without worrying about losing important information. Additionally, the security provided by cloud service providers for email protects messages from security threats such as viruses and malware, giving users a sense of security in managing their business and personal communications.

b) Storage, backup, data retrieval

The second function of cloud computing services is data storage, backup and retrieval. By utilizing cloud storage, users can store various types of data, including documents, photos, videos and other files safely and efficiently. Cloud storage services provide large storage capacity and scalability that can be adapted to user needs. In addition, the automatic backup feature provided by cloud services ensures that important data will remain safe and can be accessed again in emergency situations, such as device loss or damage. With easy data retrieval capabilities, users can access their files from multiple locations and devices, providing flexibility in managing important information without binding physical boundaries. Thus, cloud-based data storage, backup and retrieval services have helped users to manage and protect their information in an efficient and reliable manner.

c) Creating and Testing Applications

The third function of cloud computing services is their ability to facilitate application creation and testing. By using a cloud environment, software developers can easily create, test, and deploy their applications without having to invest large resources in physical computing infrastructure. Through a cloud platform that provides scalable computing, storage, and networking resources, developers can test their applications in a variety of scenarios and environments without having to rely on expensive physical hardware. Additionally, the ability to provision and recall resources quickly and efficiently allows developers to better test the scalability and performance of their applications. Thus, cloud computing services have become an important foundation for innovation in application development, speeding up product launch times, and improving the quality and reliability of the resulting applications.

d) Analyze data

The fourth function of cloud computing services is their ability to analyze data efficiently. Through cloud platforms that provide large-scale computing and storage capabilities, companies can collect, store, and analyze data on a broad scale without requiring large investments in local computing infrastructure. With cloud services for data analysis, companies can identify important patterns, trends and insights in their data quickly and efficiently. This enhanced data analysis enables companies to make more accurate data-backed decisions, formulate more effective business strategies, and improve user experience. In addition, with the support of real-time data processing capabilities, cloud computing services enable companies to respond to market changes more quickly and gain a competitive advantage in a rapidly changing business environment. Thus, cloud computing services have become an important pillar in data processing, enabling companies to optimize the use of their data to make smarter and strategic decisions.

e) Audio and video streaming

The fifth function of cloud computing services is their ability to provide a reliable video and audio streaming platform. By using cloud services for streaming, content providers can broadcast multimedia content, including video and audio, to audiences directly over the internet. The service allows users to enjoy their favorite multimedia content without needing to download it in full, enabling smooth, real-time streaming. With the high scalability provided by cloud services, content providers can reach a wider audience without worrying about limited data storage or processing capacity. In addition, the reliability and quality of service guaranteed by the cloud service provider ensures a satisfactory user experience, without interruption or significant reduction in quality. Thus, cloud-based video and audio streaming services have facilitated easy access and rich multimedia experiences for users worldwide, driving the growth of the digital entertainment industry in an innovative and efficient manner.

Cloud computing, although relatively new, has attracted the interest of a wide range of business entities and organizations, from small businesses to large corporations, companies or government ministries, as well as individual users. In addition to providing secure data storage and access over the internet, cloud computing also offers a variety of additional services, including language processing, artificial intelligence, and standard business applications (Jamil et al., 2015). By using this service, users no longer need to be limited by the physical limitations of hardware such as computers and laptops, but can access and utilize various applications and services with high flexibility from various locations and devices connected to the internet (Fajrin, 2012). Thus, cloud computing has changed the way various entities work and operate, expanding the scope of information technology access and capabilities for users in various sectors and backgrounds.

Cloud computing is not a piece of technology like microchips or mobile phones. Instead, it is a system that primarily consists of three services: software-as-a-service (SaaS), infrastructure-as-a-service (IaaS), and platform-as-a-service (PaaS).

a) Software-as-a-service (SaaS) involves licensing a software application to its users. These licenses are usually provided via pay-as-you-go or on-demand methods.

b) Infrastructure-as-a-service (IaaS) involves a method for delivering files from the operating system to servers and storage, via IP-based connectivity as part of an on-demand service. So clients don't need to buy software or servers.

c) Platform-as-a-service (PaaS) is said to be the most complex. PaaS is almost similar to SaaS, but the biggest difference is that, instead of delivering software online, PaaS is actually a platform for creating software that is delivered over the internet.

Each cloud computing variant has two generally the same factors, namely the data center is located outside and must have internet to access it. Server resources in this data center are collected to create a very large platform ready to accommodate virtual services. These collected resources are organized to be flexible, so that users can access more storage space if needed. Likewise, resources that are not being used will be released back to the cloud if they are no longer needed. The use of these on-demand based resources offers almost unlimited scalability and flexibility. The reason is, your needs for cloud computing are always changing or dynamic.

Each form or variant of cloud computing services generally has two similar core factors, namely being located in an external data center and requiring an internet connection to access it. The consolidated server resources in this data center are arranged in such a way as to form a very large platform, ready to accommodate various virtual services. This resource aggregation is designed to be flexible, allowing users to access more storage space or computing capacity as they need. Meanwhile, unused resources can be released back to the cloud when they are no longer needed. This on-demand resource utilization provides a nearly unlimited level of scalability and flexibility, accommodating dynamic changes and possible growth in user needs for cloud computing services. Thus, the basic structure of cloud computing provides an efficient and dynamic way to manage information technology infrastructure needs without being tied to fixed physical or capacity constraints.

Armed with the benefits of scalability and flexibility, cloud technology is the most effective and efficient solution that can answer dynamic business needs. Here are 5 benefits of cloud computing that can increase your business productivity.

a) Cost Efficiency

One of the main attractions of cloud computing services is the operational cost efficiency that can be achieved, especially when compared to managing local or on-premises servers. Establishing a local server requires large upfront operational costs, including hardware costs, software licenses that require regular renewal, and skilled human resources to manage and maintain the server infrastructure on an ongoing basis. In sharp contrast, cloud services provide cloud computing options with a variety of configurations that can be tailored to a company's specific needs. With a wide range of CPU resources to choose from, including number of cores and RAM capacity, companies can choose an option that suits their operational needs and fits within their available budget. The monthly payment model or Pay-As-You-Go offered by cloud services also minimizes large initial capital outlays,

allowing companies to manage operational costs more efficiently while accounting for future business growth and scalability. Thus, cloud computing not only provides cost efficiencies in the short term, but also helps companies to optimize their spending as business developments and technology needs continue to change.

b) Flexibility and Scalability

The capacity and resources available through cloud services can be easily scaled according to user needs and demands, directly accommodating growth and changes in the scale of your business. For example, in a public cloud environment characterized by the characteristics of flexibility and scalability, users can easily increase server specifications and data storage capacity according to greater needs, especially in the context of disaster recovery plans (DRP) and cloud backup in situations emergency. With the ability to increase capacity and resources as needed, cloud computing provides an effective and efficient solution in managing and preparing IT infrastructure to face challenges that may occur in the future, providing the flexibility needed to overcome critical situations and maintain smooth business continuity.

c) Integrated Security Services

In terms of security, cloud infrastructure has a high level of security thanks to regular security system updates and improvements. The benefits of this integrated security system provide a sense of confidence for users of cloud computing services, because cloud infrastructure is able to protect and reduce risks arising from cyber security threats. Cloud service providers offer advanced infrastructure security and monitoring features, but security awareness should be a shared responsibility between the service provider and the user. Therefore, it is important for users to prioritize and implement proper security practices, such as strict access management, data encryption, and malware protection, to ensure that their data remains safe and secure in the cloud environment. With a comprehensive approach to cloud security, enterprises and individual users can harness the potential of this technology with complete confidence, keeping their data safe and reducing the risk from digital security threats.

d) Improved Resource Performance and Productivity

By utilizing cloud server services from a trusted cloud provider, users can get guaranteed access to system resources that are available 24 hours a day, all year round. Cloud servers provide dedicated computing resources (CPU), memory (RAM), and 24/7 technical support to meet users' business needs. Each cloud user is given virtual access to powerful and customizable resources, providing high levels of control over productivity and overall business performance. By having reliable and stable access to well-managed system resources, users can focus on growing their business without having to worry about resource shortages or possible technical obstacles. Thus, reliable cloud server services supported by trusted providers have become a profitable option for many companies, enabling them to optimize their business operations with superior performance and high levels of productivity .

e) IoT Ready

IoT (Internet of Things) has made it possible to collect significant data from internet users around the world, and this data can be integrated into business strategies to provide valuable insights. Cloud computing is the right solution for managing IoT activities according to business needs. By leveraging cloud services, software developers can store and access data remotely, facilitating secure data storage and easy access from various locations. Additionally, cloud computing enables efficient cross-divisional collaboration, allowing developers to work together on complex projects without the constraints of space and time. In this way, integration between IoT and cloud computing gives companies the opportunity to optimize the use of data generated by IoT, gain deep insights, and improve overall business performance.

4.   CONCLUSION

The use of cloud computing has provided many benefits to various business entities and organizations in various sectors. By using cloud services, users can access computing resources and data storage efficiently without being limited by the physical limitations of local hardware. Cloud

computing offers significant operational cost efficiencies, high scalability, and strong data security guarantees, enabling companies to manage their information technology infrastructure in a more adaptive and responsive manner. In addition, cloud computing also plays an important role in supporting IoT (Internet of Things) development by facilitating remote data collection and analysis, enabling effective cross-divisional collaboration and complex project development. Taking these benefits into account, it can be concluded that cloud computing has become an important foundation for growth and innovation in various business sectors, enabling companies to optimize their use of information technology efficiently and adaptively.

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