

Factors Influencing the Integration of Cloud Computing in Modern Accounting Practices in the Malaysian Accounting Sector: A Conceptual Study

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Abstract

In the dynamic landscape of contemporary business, cloud computing has become a prevalent tool for organizations to manage and store data efficiently as more organizations adopt cloud-based solutions for their IT needs. In this case, the adoption of cloud computing is beneficial not only for managing and storing data but also for implementing effective cloud accounting systems. However, amidst the transformation and benefits, adopting and integrating cloud computing in accounting practices are not without challenges. This study aims to delve deeper into these issues to investigate the key factors influencing the adoption of cloud computing in accounting, particularly in the Malaysian business landscape. The factors explore the distinctive benefits like security, cost-effectiveness and flexibility while also shedding light on the associated challenges, with a particular emphasis on security. Despite these challenges, such as security vulnerabilities, cost overruns and potential for data loss, the study asserts that the benefits of integrating cloud computing into accounting practices substantially outweigh the hurdles. Consequently, it recommends strategic steps to ensure a smooth transition to cloud-based accounting systems. These measures are critical in aiding businesses in navigating through the challenges while capitalizing on the transformative potential of cloud computing, thereby staying competitive and agile in the rapidly evolving digital era.

Keywords: cloud computing, cloud accounting, security, cost-effectiveness, flexibility

1. Introduction

In the contemporary business landscape, cloud computing has gained popularity as a preferred approach for companies seeking agility, flexibility, and cost-effectiveness. As a result, many businesses are migrating all or portions of their business processes to cloud platforms. Hence, cloud computing has emerged as the dominant ICT platform in recent years, driven by its distinctive attributes such as minimal capital investment, heightened availability and elastic scalability compared to traditional high-performance computing models (Abolfazli et al., 2015). Cloud computing is an innovative IT system and infrastructure outsourcing alternative to conventional IT Outsourcing (ITO). It allows users to access and utilize computing resources like servers, storage, and applications (Moghadasi et al., 2018). Instead of maintaining and overseeing their infrastructure, organizations can lease resources from a cloud service provider, who takes care of the hardware and software infrastructure. In this context, cloud computing has seen significant changes, like the growth of Infrastructure-as-a-Service (IaaS) and Platform-as-a-Service (PaaS). These services have expanded to include Software-as-a-Service (SaaS) solutions for various applications.

In the rapidly advancing era of digitalization, cloud computing technology has become a notable trend impacting various business domains, including accounting. Therefore, it is vital for businesses to strategically integrate this

technology into their processes, ensuring they remain competitive and stay ahead of their industry competitors. Leveraging the advantages of cloud-based accounting systems enables companies to adapt swiftly to market changes, effectively meet evolving industry demand, and maintain a competitive edge in the digital landscape.

In modern accounting practices, cloud computing is the software in which a specific business entity owns all its associated data with no ownership or management relationship with the entity responsible for inputting accounting data into the cloud (Boban et al., 2020). Besides, cloud accounting, alternatively known as cloud-based accounting, involves storing, managing, and processing a company's financial data utilizing cloud technology infrastructure (Hamzah et al., 2023). In other words, cloud accounting integrates accounting software with cloud computing, allowing the organization to access their financial data from any location and wherever they prefer.

Next, traditional accounting systems and cloud computing systems are different. Boban et al. (2020) stated that the fundamental distinction between these two accounting forms lies in the tools utilized for recording all accounting and financial data. Traditional accounting systems software is installed on a company's computer and used to maintain business books, with the primary data storage being those computers. This software operates independently of the internet, allowing offline access and control over data storage and security.

On the other hand, cloud accounting takes a different approach. It involves software and data stored on a remote server, typically owned by an IT company. It implies that companies whose accounting data is being processed must maintain direct control over the physical storage of their data. Instead, they rely on the IT company to ensure data security and accessibility. This system requires internet connectivity for access, but it also allows for real-time updates and remote accessibility, which can be a significant advantage in today's increasingly digital and mobile business environment. Despite these differences in data storage and access, both types of software, traditional accounting and cloud accounting, perform the same functions.

2. Background of Study

The widespread adoption of cloud computing is evident across various sectors, ranging from small and medium enterprises (SMEs) to government bodies and large corporations. This adoption trend is driven by Malaysia's ambition to establish itself as a high-tech nation by 2030 (Nurul Suhaidi, 2023). As reported by the Malaysian Investment Development Authority (MIDA) in 2023, this goal is part of a broader initiative known as Industry 4.0 World, which aims to transform Malaysia into a high-tech nation that leads in AI, big data analytics, automation, robotics, and IoT by 2030. Adopting cloud computing aligns with these goals, as it is a critical component of digital transformation and plays a pivotal role in developing smart cities and other high-tech applications.

In this context, the digital economy forms a significant part of Malaysia's economic structure, accounting for 23.2% of its Gross Domestic Product (GDP). This figure is projected to rise to 25.5% by 2025. Despite this, 77% of small and medium enterprises (SMEs) constitute nearly 40% of Malaysia's GDP and are still in the early stages of their digital transformation journey (Azhar Abdullah, 2023). Thus, this presents a significant opportunity for Malaysian businesses to expedite their digital adoption, driving technological innovation across all sectors.

Leveraging cloud accounting systems in Malaysia provides companies with a robust and advanced solution for effectively organizing and keeping their financial records up to date, as reported by CTN News in 2023. Furthermore, according to a recent study commissioned by Alibaba Cloud in 2023, 50% of the surveyed businesses in Malaysia intend to boost their investment in cloud computing. The survey findings also indicate that the cloud computing sector in Malaysia is expected to reach US\$3.7 billion (RM16.86 billion) by 2024. Hence, from this data, Malaysia has a significant opportunity to emerge as a leading country in digitalization, fostering further growth and advancements in its technological landscape.

3. Problem Statement

Cloud computing has emerged as a transformative force in modern accounting, revolutionizing how financial data is managed, processed, and analyzed. According to research done by Gartner Inc. in 2020, the demand for cloud services has surged due to the COVID-19 pandemic, and more companies are compelled to speed up their efforts in adopting digital technologies and capabilities in their current business processes. This research is supported by the statement by the National Technology Officer of Microsoft Malaysia, Dr Dzahar Mansor, in 2020 that he observed a sudden surge in cloud adoption during the COVID-19 pandemic and companies have to undergo digital transformation in order to stay relevant in the current evolving business landscape. As proof, there was a significant increase in worldwide spending on cloud services, with a rise of 37% in the first quarter of 2020 and an additional growth of 18.4% in 2021. As a follow-up, Gartner, Inc. predicts that global end-user spending on public cloud services will experience a growth of 21.7%, reaching \$597.3 billion in 2023, according to its latest forecast.

Adopting cloud computing is necessary for companies seeking to remain relevant in the evolving business landscape. Despite its myriad benefits to modern accounting practices, a critical challenge persists. Some organizations need to refrain from using cloud computing due to the challenges associated with adoption, hindering them from fully embracing the transformative potential of cloud technologies. Cheong (2015) stated that despite the anticipation and projections suggesting a rise in cloud technology adoption rates, the actual level of acceptance could be much higher, particularly in developing nations such as Malaysia. In addition, PwC Middle East also reported that only 3% of Qatar's private sector has adopted cloud solutions, even though a significant 76% of businesses are aware of the benefits provided by cloud technologies. In this regard, adopting cloud computing has become essential for companies striving to stay competitive and relevant in the rapidly changing business environment.

Their concern for the hesitation in embracing cloud technology in accounting processes is driven by various factors, with one primary consideration related to the risk associated with cybersecurity threats such as data breaches or hacking. This statement can be supported by the "Cloud Vision 2020" survey by LogicMonitor in 2018, which highlighted that 66% of IT professionals see security as a huge problem when using cloud technology. Moreover, the PwC 2024 Global Digital Trust Insights- Malaysia report further emphasizes the significance of this concern, where cloud security is identified as the primary cyber risk concern for almost half of global respondents. Hence, these two findings illuminate that the prominent issue deterring the acceptance of this technology is the potential security risk, which is a significant concern in areas like accounting, where data and information are susceptible. The fear of compromising the integrity and confidentiality of financial data in the event of a security breach is a significant barrier to adopting cloud computing in accounting. Hence, businesses must ensure that their selected cloud accounting service implements robust security protocols, as events like unauthorized access may lead to monetary losses and damage the company's reputation (Ca et al., 2023).

Other than that, a considerable gap between awareness and actual implementation in leveraging the advantages of cloud services also contributes to the reluctance towards adopting cloud computing in accounting processes. The study conducted by Tarmidi et al. in 2014 reveals that a significant portion, with two-thirds of the survey respondents, needs to gain awareness of cloud computing. While 30% of the respondents claim familiarity with cloud computing, only 7% assert being very knowledgeable about it. Despite the widespread adoption of cloud computing in 2023, the persistent gap between awareness and implementation remains a relevant concern in adopting cloud computing in accounting processes. This is further affirmed by findings from the PwC 2024 Global Digital Trust Insights - Malaysia report, which states that cloud technology is currently outside the top priority for Malaysian organizations. Hence, the need for more understanding of the benefits of cloud computing signifies a crucial obstacle as businesses consider integrating cloud technology into their accounting practices. Due to the potential risks involved, businesses may be reluctant to adopt technologies they need to understand, particularly technologies associated with their financial operations entirely.

Therefore, the primary objective of this study is to emphasize that the adoption of cloud computing in accounting processes is influenced by several factors that can yield substantial benefits. Despite the challenges and concerns, it is crucial to highlight that the advantages of integrating cloud technology into accounting practices far outweigh the potential drawbacks. By leveraging cloud computing, organizations can achieve many critical benefits for staying competitive in the rapidly evolving business landscape. This study aims to shed light on these benefits and encourage more organizations to overcome the hurdles and embrace the transformative potential of cloud computing in their accounting processes.

4. Gap of Research

Despite similar studies in cloud accounting adoption businesses, such as the one centred in Indonesia, a distinct gap in the research landscape is specific to Malaysia. This gap lies in the two countries' differing economic, cultural, technological, and business environments. The study titled "Factors Affecting Cloud Accounting Adoption in SMEs" by Hamzah et al. (2023) is centred around Indonesia, and the respondents belong to that demographic. Hence, it examines the unique challenges and opportunities within the Indonesian market. Meanwhile, our study targets a gap in research by shifting the focus to the distinct scenario within Malaysia. Our research considers Malaysia's unique socio-cultural, economic, and technological factors, aiming to provide insights and solutions directly relevant to the Malaysian market. Our research delves into the distinctive factors and obstacles impacting the adoption of cloud computing within the accounting sector in Malaysia, drawing upon local statistics and data. Therefore, the distinct geographical focus of these two studies underscores the importance of region-specific research in understanding and addressing the unique challenges and factors influencing cloud technology adoption in various accounting environments.

5. Factors Influencing the Integration of Cloud Computing in Modern Accounting Practices

As modern accounting practices adapt to a rapidly changing environment, incorporating cloud computing has proven innovative and complex. Companies eager to utilize the advantages of cloud technology often find themselves navigating a challenging maze of issues, impacting a smooth transition to cloud-based accounting processes. The research conducted by Boban et al. (2020) identifies certain disadvantages of using cloud accounting, including the risk of poor internet connection affecting access to cloud data, potential loss of control, and security concerns. Efosa et al. (2022) also underscore these drawbacks, emphasizing the necessity of a consistent internet connection and the heightened risk of security threats associated with cloud technology. However, despite these challenges, businesses must overcome them and adapt to the dynamic landscape of digital transformation. The benefits of incorporating cloud computing into modern accounting practices often outweigh the drawbacks, providing companies with innovative solutions for improved accessibility, scalability, and collaboration in their financial processes. Therefore, this study suggests three key aspects, security, cost-effectiveness, and flexibility, that characterize the factors expected to contribute to adopting cloud computing in modern accounting practices.

5.1 Security

Security in cloud computing encompasses the strategies and procedures put in place to protect data, applications, and infrastructure within cloud environments, aiming to prevent unauthorized access, data breaches, data loss, and other malicious activities (Ethan & Khan, 2023). In this context, many businesses perceive security in cloud computing as a significant challenge, hindering the full adoption of cloud technologies. This perception is mainly due to misconceptions surrounding the security of cloud environments. However, it is essential to note that public cloud service providers invest heavily in their security infrastructure, often exceeding the capabilities of individual companies or government departments.

As per a report from PwC Middle East in 2022, transitioning to the cloud not only maintains but significantly enhances security measures. This is primarily because cloud service providers have invested in advanced security protocols and technologies, ensuring that data stored in the cloud is protected against threats. For instance, Microsoft allocates over \$1 billion annually towards cybersecurity for their Azure cloud platform, effectively repels 7 trillion cyber threats daily. Similarly, in recent years, Alphabet's Google Cloud platform has added dozens of new security features related to its cloud applications. One is Access Transparency, a cloud security service that logs the details of when Google employees interact with a user's data.

In this regard, Boban et al. (2020) and Efosa et al. (2022) have acknowledged the security robustness of cloud-based applications. According to Boban et al. (2020), many servers for cloud applications offer comprehensive security measures, and compared to local software, network-based applications are often equally, if not more, secure with similar or enhanced internal control mechanisms. Moreover, Efosa et al. (2022) assert that financial information is well-protected through cloud accounting. People often think that data stored on a single computer is safer, but the risks of manual methods should be considered. Traditional accounting systems store data in a dedicated folder or hard drive. However, storing accounting data on a single device makes it susceptible to significant security risks. If the computer is compromised, the company risks losing all the data.

Security concerns significantly shape firms' decisions regarding migrating accounting systems and data to the cloud. Ali et al. (2023) investigated the factors influencing cloud computing adoption in small to medium-sized enterprises (SMEs), highlighting that security concerns did not significantly correlate with cloud computing adoption.

However, a study by Nagahawatta et al. (2021) highlights that security factors heavily influence the trust and confidence of accounting firms in cloud computing solutions. They found that cloud security trust and threats are major issues in a cloud environment. Additionally, Aldahwan and Ramzan (2022) investigate the relationship between various factors and employees' experiences adopting community cloud computing, highlighting security concerns as a significant influencing element. This is similar to Ogunlolu and Rajanen (2019), who mentioned that security is one of the vital factors influencing the adoption of cloud computing. Muhammad and Bazzi (2022) highlight the importance of evaluating the security levels of cloud computing to protect sensitive financial information and emphasize the need to enhance cloud security measures to mitigate risks and safeguard financial data stored and processed in the cloud.

In summary, the relationship between security factors and the integration of cloud computing in modern accounting practices underscores the importance of prioritizing security considerations throughout the adoption lifecycle. By addressing security concerns proactively, accounting firms can maximize the benefits of cloud technologies while mitigating risks and ensuring the confidentiality, integrity, and availability of financial data.

5.2 Cost Effectiveness

Cloud computing has been a game-changer in accounting, offering considerable cost savings compared to traditional on-premises software accounting systems. Initially, cloud accounting reduces the substantial upfront costs associated with on-premises software. Traditional software systems require significant capital investment in purchasing the software and investing in compatible hardware, servers, and the physical space to house them. In contrast, cloud accounting services usually operate on a subscription-based model, where businesses pay monthly or yearly, spreading the cost over time. Hence, there are considerably lower costs associated with hardware and software, network administration, and overall IT operations (Boban et al., 2020).

Moreover, according to the study done by Ca et al. (2023), with cloud-based accounting software, vendors offer continuous support, upkeep, and updates to guarantee optimal system performance, enhanced security, and compliance with regulatory changes. This eliminates the need for ongoing maintenance and upgrade costs with on-premises systems. Businesses consistently have access to the most up-to-date software versions, as updates and enhancements are typically included in the cloud service package at no extra cost. Moreover, in the event of technical glitches or system failures, the responsibility falls on the service providers, not the businesses. This setup significantly reduces potential downtime and support expenses, ensuring users benefit from the latest features and improvements without dealing with manual software upgrades.

Therefore, as a result, businesses can redirect their resources to other critical areas that require more attention and investment because another significant area of cost saving is the reduced requirement for internal IT support. Since cloud service providers manage most technical issues, companies can minimize IT personnel costs. This can free up internal IT resources to focus on strategic, revenue-generating initiatives rather than handling routine maintenance tasks. A traditional accounting system encompasses a high maintenance fee over time. This is because the software becomes obsolete as time passes, necessitating regular updates to remain current and efficient. Hence, it is not just the initial cost that impacts the budget but also the recurring expense of keeping the system updated.

Ali et al. (2023) investigated the factors influencing cloud computing adoption in small to medium-sized enterprises (SMEs) in Somalia. They found that cost savings significantly influenced cloud computing adoption in SMEs, while cost-effectiveness did not significantly correlate with cloud computing adoption. Meanwhile, Niyi et al. (2022) assessed the effect of adopting cloud computing on the efficacy of accounting practices in Nigeria. They found that cost-effectiveness exhibited a significant negative relationship with adopting cloud computing. This is supported by Ogunlolu and Rajanen (2019), who mentioned cost-effectiveness as one of the factors influencing adoption.

Additionally, Zhou et al. (2022) emphasize how cloud computing promotes the openness and sharing of information resources, leading to cost savings in accounting information construction. Zhang (2023) highlights the cost optimization benefits of efficient task scheduling in cloud environments, demonstrating the potential for minimizing costs through effective resource allocation. In conclusion, integrating cloud computing into modern accounting practices is fundamental and has important implications for the organization's cost-effectiveness. It offers scalable and economical computing resources, optimizes resource allocation, and diminishes reliance on extensive on-site infrastructure. This cost-efficient strategy enhances the efficiency and sustainability of accounting practices in the digital era.

5.3 Flexibility

Cloud computing has revolutionized industries globally, with accounting being no exception. The various features provided by this modernized approach, most notably its flexibility, have significantly reshaped traditional accounting techniques. One critical factor that has facilitated the integration of cloud computing in contemporary accounting is its scalability. According to the case study done by Kemski and Nyberg (2014), cloud-based accounting systems allow businesses to scale their operations and storage needs effortlessly to support their growth. For instance, during significant business expansion or peak seasons, the capability to scale up quickly to meet increasing computational or storage demands is invaluable. Conversely, resources can be scaled back during long periods, leading to cost savings. Hence, this feature eliminates the need for businesses to invest in expensive hardware or software upgrades every time they need to expand their accounting capacity.

Remote accessibility is another factor that plays into the allure of cloud computing for today's accountants. This feature enables accountants to perform their tasks from any location, provided they can access an internet-connected device. This feature has proven particularly influential in adopting cloud-based accounting systems, especially given the shift towards remote work due to the COVID-19 pandemic. Dashika Gnaneswaran, Communications Lead at Microsoft Malaysia, spoke in 2020 about the rising adoption and implementation of cloud technologies among

Malaysian enterprises. Ganeswaran pointed out that, although the transition towards cloud-based solutions had begun before the COVID-19 outbreak, the pandemic significantly accelerated the process.

In this context, before the pandemic, many companies operated on a traditional office-based model. However, as COVID-19 spread worldwide, lockdowns and social distancing measures meant workforces had to adapt swiftly to remote working to ensure business continuity. With its need for accurate, real-time information, accounting encountered a unique set of challenges in this new environment. Traditional accounting systems, which often operate on physical servers on business premises, are typically designed for something other than remote access. This physical server model poses many hurdles for accountants working remotely, including limited accessibility, data security risks, and version control issues. Cloud computing solved these problems by ensuring secure remote access to accounting systems and data. In conclusion, cloud computing has markedly transformed the accounting industry, offering flexibility, scalability, and remote accessibility. These factors have become crucial, particularly in the wake of the COVID-19 pandemic, as businesses worldwide have had to adapt rapidly to remote working.

Ali et al. (2023) emphasized that cloud computing offers the benefits of flexibility, which influences its adoption in SMEs. Additionally, Chang et al. (2019) highlight that the synergy of flexibility enhances cloud absorptive capacity, leading to knowledge accumulation and improved firm performance. Furthermore, Jensen (2013) highlights how cloud services are delivered remotely through a network, emphasizing the benefits of accessibility and efficiency, representing flexibility in federal information technology reform management. Moreover, the accessibility and mobility provided by cloud-based solutions foster a more agile and collaborative work setting, enabling accountants to operate efficiently from any location (Atadoga et al., 2024).

Therefore, the relationship between flexibility and integrating cloud computing in modern accounting practices is pivotal and offers several advantages for accounting firms seeking to adapt to dynamic business environments and evolving technological landscapes. This adaptability and flexibility prove especially advantageous for accounting firms, allowing them to tailor their computing resources to varying workloads or seasonal requirements.

6. Conceptual Framework

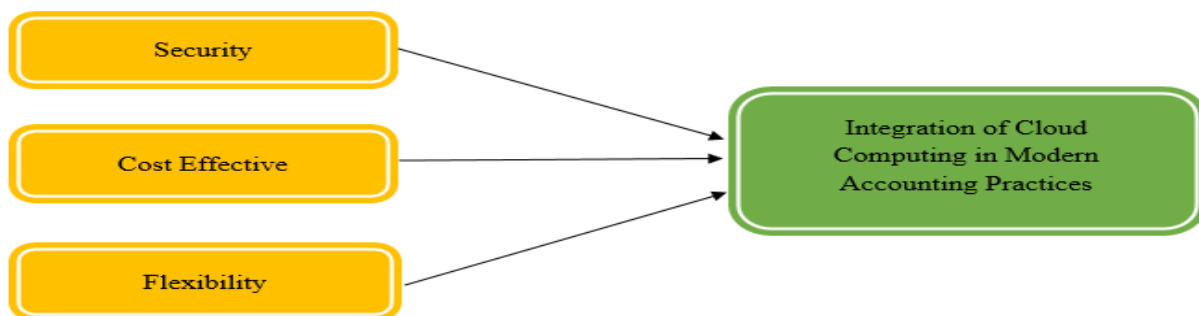


Figure 1. The proposed Conceptual Framework for Factors Influencing the Integration of Cloud Computing in Modern Accounting Practices

Figure 1 illustrates the factors that significantly impact the integration of cloud computing into contemporary accounting methods. It aims to deliver a holistic understanding of how security, cost-effectiveness, and flexibility interconnect and influence the destination of cloud computing adoption within modern accounting practices. This visual representation fosters clarity and illuminates the intimate relationships between these critical factors and the potential for successful cloud computing integration. Clearly illustrating these relationships, Figure 1 highlights potential strengths and pitfalls in cloud computing adoption. It supports businesses in better understanding how to address these issues and capitalize on the potential benefits.

7. Conclusion

In the rapidly advancing era of digitalization, the adoption of cloud computing has emerged as a significant trend, especially in sectors like accounting. Embracing cloud technology catalyzes businesses' digital transformation journey and offers significant benefits such as cost savings, enhanced security, and flexibility. However, despite the compelling benefits, some organizations still need to be apprehensive about adopting cloud technology due to cybersecurity threats, lack of awareness about the advantages of cloud technology, and control over their data. Nonetheless, it is evident that the advantages of integrating cloud technology into accounting practices far outweigh

these challenges. This study holds considerable implications for a few key stakeholders in this context. It provides businesses with a deeper understanding of the benefits and challenges associated with cloud computing, thereby equipping them to make well-informed decisions when transitioning their accounting processes to the cloud.

Next, insights from this study could also aid cloud service providers in understanding and addressing the barriers and apprehensions that businesses might have about adopting cloud technology. Incorporating cloud computing into contemporary accounting practices presents various advantages, yet it also entails certain drawbacks that need consideration. The limitations include security concerns, data privacy and compliance challenges, downtime and connectivity issues and hidden costs associated with data transfer, storage, and additional services. These challenges highlight the importance of carefully considering the risks and challenges of using cloud computing in modern accounting practices.

Lastly, this study could provide invaluable guidance to government bodies and regulatory institutions in formulating and amending policies, regulations, and frameworks that facilitate the smoother adoption and integration of cloud computing in various sectors. In conclusion, addressing the challenges associated with cloud technology adoption can allow businesses to leverage significant benefits and contribute to more comprehensive and impactful interventions by cloud service providers and regulatory authorities. Further exploration in this realm can pave the path for transitioning towards a more digitally advanced and agile business environment.

8. Recommendation

Considering the challenges and opportunities highlighted in this study, the following recommendations can be made to businesses, cloud service providers, and regulatory bodies. Firstly, businesses should consider investing in credible and secure cloud service providers in the face of rising digital transformation. Making informed decisions when selecting a provider, factoring in their market reputation, the robustness of security protocols, and quality of customer service, can pave the way for a smooth transition and instil confidence in cloud technology.

Secondly, it is pivotal for government bodies and regulatory institutions to devise clear, comprehensive policies surrounding adopting and utilizing cloud technology. These regulations should promote the paradigm shift towards digital transformation and address critical apprehensions of businesses surrounding security, data privacy and associated challenges, thereby creating a conducive environment for broader acceptance of cloud technology.

Thirdly, cloud computing is a pivotal platform for seamless information transmission across nations, offering unparalleled scalability, accessibility, and cost-efficiency. Hence, it would be beneficial to examine the transmission and sharing of information among nations (Guo, 2017). By harnessing cloud-based solutions, nations can leverage advanced technologies, foster innovation, and facilitate global collaboration, thereby driving economic growth, enhancing societal connectivity, and promoting inclusivity on a national and international scale.

Lastly, for businesses, rather than undergoing an abrupt, complete shift to cloud-based accounting systems, it may be more beneficial to adopt a phased strategy. Initiating the transition with non-critical processes can allow users to become familiar with the new system without being overwhelmed. This approach can facilitate a gentle transition, enhance user acceptance rate, and ensure business operations proceed with minimal disruption. Thus, a comprehensive strategy that considers these factors can maximize the benefits of cloud technology and minimize the risks and hurdles, leading to successful digital transformation.

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