

CLOUD COMPUTING ADOPTION: THE FINANCIAL IMPACTS ON SMEs IN FOOD INDUSTRY

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ABSTRACT

With increasing demand and technological advancements, there is a growing interest in applying cloud computing among SMEs in this industry. SMEs are attracted to use cloud computing due to its benefits, as it lowers entry costs and offers advanced computer applications. The current landscape of this industry is crucial for manufacturers to improve operations, cater to diverse consumer preferences, and stay competitive in the market. Thus, the study aims to investigate the financial impacts of cloud computing adoption among the SMEs in food industry. This conceptual paper highlights three financial impacts on the SMEs: (1) reduced maintenance overhead and staffing costs, (2) enhanced agility and security; and (3) quantified business outcomes. This paper provides better understanding on the financial impacts of cloud computing adoption in SMEs.

Keywords: Cloud computing; adoption; SMEs; food industry; financial impacts

1. INTRODUCTION

1.1 Cloud Computing

Cloud computing is a revolutionary technology that has transformed the way businesses and individuals' access, store, and process data and applications. It involves the delivery of computing resources over the internet, eliminating the need for physical hardware and allowing users to access these resources on-demand. Major cloud service providers, such as Amazon Web Services (AWS), Google Cloud Platform (GCP), Microsoft Azure, and others, offer a wide range of services to cater to businesses of all sizes and industries (Forbes, 2023).

There are three types of cloud computing, namely IaaS, PaaS and SaaS (Hussin et al, 2019). Infrastructure as a Service (IaaS) provides virtualized computing resources over the internet. It allows users to rent virtual machines, storage, and networking infrastructure on a pay-as-you-go basis. Platform as a Service (PaaS) provides a complete development and deployment environment in the cloud. It offers a platform that includes operating systems, development frameworks,

databases, and middleware. PaaS allows developers to focus on building applications without worrying about the underlying infrastructure and its management. Software as a Service (SaaS) delivers software applications over the internet on a subscription basis. In this model, the software is hosted and maintained by the service provider, and users can access it through a web browser without the need for local installation or management.

One of the major trends in cloud computing for 2023 is the rise of the citizen developer. This concept empowers individuals without coding backgrounds to connect popular APIs and create customized automation, fostering greater innovation within organizations. Additionally, better integration of Artificial Intelligence (AI) and Machine Learning (ML) in cloud services is expected. AI and ML services have become more cost-effective, allowing businesses to manage vast amounts of data and improve productivity in various sectors. Cloud computing is also anticipated to play a critical role in ensuring business resilience and security, prompting increased investment in cloud security and resilience to protect against cybersecurity threats (Khanzode & Sarode, 2020).

1.2 Financial Impacts of Cloud Computing on SMEs Food Industry

1.2.1 Reduced Maintenance Overhead and Staffing Costs

Cloud computing adoption plays a significant role in helping businesses, particularly small and medium-sized enterprises (SMEs), reduce maintenance overhead and staffing costs. Traditionally, businesses that managed their own IT infrastructure were required to make substantial investments in hardware, software, and skilled human resources to operate and maintain on-premises systems. This involved not only the upfront cost of purchasing servers and networking equipment but also ongoing expenses related to regular maintenance, software updates, data backups, and troubleshooting. Furthermore, businesses needed to employ dedicated IT staff or entire teams to manage these functions, leading to high operational expenses, particularly for smaller firms with limited budgets.

By transitioning to cloud computing, businesses can substantially minimize these costs. Cloud service providers take on the responsibility for maintaining, upgrading, and securing the IT infrastructure. This eliminates the need for businesses to maintain in-house servers or hire extensive IT personnel to handle routine maintenance and updates. Instead, companies pay a subscription fee for cloud services, which typically covers infrastructure management, data security, backups, and system upgrades. As a result, SMEs can reallocate financial resources that would otherwise be spent on hiring IT specialists or maintaining costly equipment, allowing them to focus on their core competencies, such as product development or customer service.

Scholarly studies have reinforced these benefits. For instance, a study by Park and Jeong (2023) highlighted that cloud computing reduces operational complexity and lowers IT maintenance costs by transferring responsibility to the service provider. Their research emphasized that this shift not only cuts direct staffing expenses but also minimizes the hidden costs associated with IT system downtime and technical disruptions. Similarly, research by Sharma et al. (2023) found that SMEs adopting cloud solutions experience reduced overhead in maintaining IT infrastructure, allowing them to operate with leaner teams while still enjoying high-quality IT services.

Moreover, cloud computing offers automated updates and security patches, which further reduce the need for in-house expertise to manage these tasks. According to Al-Omari and Sandhu (2024), cloud solutions enhance operational efficiency by ensuring that systems remain up-to-date without

manual intervention, which mitigates risks associated with outdated software and security vulnerabilities. This automation allows businesses to operate with fewer technical staff and decreases the burden on existing personnel.

1.2.2 Enhanced Agility, Security, and Compliance

Cloud computing adoption significantly enhances business agility, security, and compliance, offering strategic benefits that extend beyond simple cost savings. In today's fast-paced and competitive business environment, the ability to adapt quickly to changes is crucial for survival, especially for SMEs. Cloud computing supports agility by providing businesses with flexible and scalable resources on demand (Sahed et al., 2020). Instead of going through lengthy procurement processes to acquire new hardware or software, companies can easily scale their computing resources up or down according to changing needs through cloud platforms. This flexibility allows businesses to respond quickly to market trends, customer demands, and operational challenges. For example, in the food industry, where seasonal demand fluctuations are common, cloud services enable businesses to adjust their operations rapidly without incurring additional capital expenditure.

In addition to enhancing agility, cloud computing strengthens organizational security. Modern cloud service providers invest heavily in state-of-the-art security infrastructure, including advanced encryption methods, automated threat detection, and regular security updates (Akinade et al., 2025). These security measures are often more sophisticated and up-to-date than what most SMEs can afford to implement on their own. By adopting cloud solutions, businesses can leverage these high-level security protocols to protect sensitive data, including customer information, financial records, and intellectual property. Moreover, cloud platforms offer robust disaster recovery solutions, ensuring that data is regularly backed up and can be quickly restored in the event of a cyberattack, system failure, or natural disaster. This reduces the risk of data loss and ensures business continuity, which is especially critical for industries where data integrity and availability are paramount.

Compliance with industry standards and regulatory requirements is another area where cloud computing delivers substantial benefits. Businesses operating in regulated sectors, such as food production or healthcare, must adhere to strict guidelines regarding data management, privacy, and operational transparency. Cloud providers are typically well-versed in compliance requirements across various industries and offer solutions designed to help clients meet these standards. Features such as automated audit trails, secure data storage, and regular compliance updates ensure that businesses remain aligned with current regulations (Tao et al., 2021). This is particularly beneficial for SMEs, which may lack the internal expertise to navigate complex regulatory environments independently. As a result, cloud adoption reduces the compliance burden on businesses while providing assurance to customers, partners, and regulators.

1.2.3 Quantified Business Outcomes

The adoption of cloud computing has a significant impact on the ability of businesses, particularly SMEs, to quantify their business outcomes more effectively. Cloud computing provides access to advanced analytical tools, real-time data, and automated reporting systems that enable businesses to measure and monitor their performance with greater accuracy and precision. These capabilities are especially beneficial for SMEs that may previously have lacked the resources or technological infrastructure to conduct detailed performance analysis. By leveraging cloud-based solutions, businesses can track key performance indicators (KPIs) related to sales, production, customer engagement, and financial management more efficiently and in real-time (Liu & Wang, 2022).

One of the primary ways cloud computing enhances the quantification of business outcomes is through its integration of data analytics and business intelligence (BI) tools. Cloud platforms often come equipped with features that allow for the seamless collection, processing, and analysis of vast amounts of data from various sources within the organization. This real-time access to data supports more informed and timely decision-making. For example, a food SME can use cloud-based analytics to monitor supply chain efficiency, track customer preferences, and analyze sales trends, all of which contribute to a clearer understanding of operational performance and profitability. These insights enable businesses to make data-driven decisions, optimize processes, and forecast future performance with a higher degree of confidence.

Moreover, cloud computing simplifies the process of generating reports and dashboards, which are essential for evaluating business performance. Automated reporting reduces the time and labor required to compile performance data manually, allowing management to focus on strategic decision-making rather than administrative tasks. With cloud-based tools, businesses can easily visualize their financial performance, track progress toward organizational goals, and identify areas requiring improvement (Qin & Qin, 2021). This capacity for continuous performance monitoring is crucial in highly competitive industries where rapid adjustments may be necessary to maintain market relevance and profitability.

Furthermore, cloud computing enables businesses to benchmark their performance against industry standards more easily. With access to cloud-based benchmarking tools, companies can compare their KPIs with those of competitors or industry averages, providing valuable context for interpreting their own results. This comparative analysis helps organizations set realistic goals, identify best practices, and understand their market position more clearly.

2. CONCLUSION

Cloud adoption brings significant financial impacts to SMEs in three key areas. First, it helps reduce maintenance overhead and staffing costs by eliminating the need for extensive on-premises infrastructure and minimizing IT personnel requirements through automation and managed services. Second, cloud solutions offer enhanced agility and security, enabling SMEs to scale resources on demand, respond quickly to market changes, and leverage advanced security tools that would otherwise be too costly or complex to manage independently. Finally, cloud adoption allows for quantified business outcomes by providing real-time data analytics and performance metrics, helping SMEs measure financial performance, improve decision-making, and drive more predictable business growth. Collectively, these impacts enable SMEs to operate more efficiently, competitively, and sustainably in the digital economy.

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