Examining the Impact of Cloud Computing on Organizational Performance: A Systematic Literature Review

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Abstract: Cloud computing has taken a pivotal role in modern business operations, offering convenient and flexible access to IT resources. Accordingly, this study investigates the impact of cloud computing on organizational performance. A systematic literature review identified 31 relevant papers. The analysis underscores the diverse benefits of cloud computing adoption across various facets, including financial and product market performance, organizational agility, productivity, innovation, sustainability, and supply chain performance. This review further discusses challenges and gaps, highlighting the need for future research in this area.

1 INTRODUCTION

Cloud computing is a model that enables remote and dynamic access to computing resources such as networks, servers, storage, and applications (Mell and Grance, 2011). The concept of cloud computing has gained considerable traction in the last two decades, with companies like Amazon, Microsoft, and Google launching their own cloud services (Surbiryala and Rong, 2019). Cloud providers generally offer IT services through service models like *Infrastructure-as-a-Service* (IaaS), *Platform-as-a-Service* (PaaS), or *Software-as-a-Service* (SaaS) (Hentschel and Leyh, 2018), characterized by varying degrees of user control over IT resources. In addition to these traditional service models, new and more specific models such as *Function-as-a-Service* (Cloudflare, 2024) or *Database-as-a-Service* (IBM, 2024) have emerged over time. Cloud computing continues to grow in importance for the success of organizational operations and is projected to be a business necessity by 2028 (Gartner, 2023a). Already valued at about 590 billion dollars, the cloud computing market as a whole is forecasted to more than double in size within the next eight years (Fortune Business Insights, 2024). Given the significance of cloud computing, it is unsurprising that numerous studies investigate various aspects of this paradigm. These studies include examinations of cloud computing adoption in specific countries (Alshamaila et al., 2013; Kumar et al., 2017) or industries (Alkhater et al., 2018; Ooi et al., 2018), factors influencing the adoption of cloud computing technologies (Arvanitis et al., 2017; Makena, 2013; Oliveira et al., 2014), and existing challenges (Bello et al., 2021; Tabrizchi and Kuchaki Rafsanjani, 2020). Furthermore, it is crucial to investigate how the proclaimed advantages (e.g., convenient and flexible access to IT resources) particularly contribute toward enhancing business performance, as organizations are unlikely to shift their business practices and adopt new technologies if they cannot expect tangible benefits.

Firm performance, closely related to organizational effectiveness (Richard et al., 2009), can be understood as the measurement to gauge how well an organization is achieving its intended objectives (Etzioni, 1964). The positive influence of new IT developments on the effectiveness of enterprises has already been investigated and confirmed for concepts such as big data (Müller et al., 2018). Therefore,

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the goal of this research is to examine the benefits of adopting cloud computing and assess their significance in enhancing organizational operations. This is captured by the following research question (RQ):

RQ: How can cloud computing influence organizational performance?

As a result, this article provides value for both theory and practice. Researchers in the field gain an overview of related works, possible gaps, and challenges. Practitioners can learn about the benefits of cloud computing adoption and mediating factors. For this purpose, a systematic literature review (SLR) is performed, focusing on empirical studies. The methodology is detailed after presenting the theoretical background of cloud computing in the upcoming section. Subsequently, the findings of the literature review are analyzed in Section 4 and summarized in Section 5. The paper concludes with the limitations and suggestions for future research directions.

2 THEORETICAL BACKGROUND

The National Institute of Standards and Technology (NIST) defines cloud computing as a model that enables "ubiquitous, convenient, on-demand network access" (Mell and Grance, 2011) to shared configurable computing resources, which can be acquired rapidly and decommissioned with limited management effort and interaction with the service provider. The term cloud is commonly used as a metaphor for a provider offering IT services via the Internet. Toward this objective, cloud computing has adopted the core principles from previous leading-edge trends and approaches such as Application Service Providing and Grid Computing (Hentschel and Leyh, 2018). A key fundamental technology for cloud computing is virtualization which allows the consolidation and abstraction of physical hardware. In the context of cloud computing, a provider's offerings are often denoted as service models, which are mainly differentiated by the degree of responsibility taken by the service provider and consumer, respectively. Typical examples are IaaS, PaaS, and SaaS (Mell and Grance, 2011). While the latter model allows consumers to use a standardized application running on managed cloud infrastructure (Hentschel and Leyh, 2018), IaaS gives users the responsibility over operating systems, select networking components, and storage (Mell and Grance, 2011). Moreover, a cloud can be hosted in different forms. Here, the NIST mentions private cloud, community cloud, public cloud, and hybrid cloud. The chosen deployment model depends on the application scenario and especially the requirements for scalability, security, and pay-per-use. The cloud characteristics, namely on-demand self-service, broad network access, resource pooling, rapid elasticity, and measured service (Mell and Grance, 2011) suggest that cloud can act as the remedy for the storage and computing bottlenecks caused by the increased digitalization of modern society (Hentschel and Leyh, 2018). As a matter of fact, through the various financial, operational, and strategic potentials for organizations, cloud computing has become the backbone of many enterprises and their IT infrastructure. Accordingly, Gartner classified the role shift of cloud toward a "business disruptor" (Gartner, 2023b). Despite the also existing risks associated with cloud computing, such as misuse of data, vendor lock-in (Hentschel and Leyh, 2018), and potentially high costs, especially for sophisticated and fully-managed services such as Google Cloud's Vertex AI, the spending on cloud services has continually grown over the past years (Gartner, 2023b). Accordingly, investigating the concrete impact of cloud computing on organizational performance is necessary to understand and contextualize these developments.

3 METHODOLOGY

A SLR refers to the systematic, explicit, and reproducible method for identifying, evaluating, and synthesizing the existing body of completed and recorded works by researchers, scholars, and practitioners (Fink, 2010). Hence, it requires a consistently methodical approach (*systematic*) in the execution, an *explicit* description of the process and how the results were derived to ensure that other individuals can achieve the same results with the same procedure (*reproducible*) (Okoli, 2015). For this purpose, the guidelines for conducting an SLR of Okoli (2015) are followed. As captured by the RQ, the objective is to examine the impact of cloud computing on firm performance (*identify the purpose*). In addition, the taxonomy presented by Cooper (1988) can further categorize the scope of an SLR. Because of this SLR's thematic orientation, the focus is on *research outcomes* and *practices or applications*. Additionally, the goal is to summarize the findings, aligning with the *integration (generalization)* category. The review strives for a *neutral representation*. Although there are limitations regarding the scope in terms of selected databases, an *exhaustive* coverage is attempted by incorporating citation search and citing all included papers of the review in the paper (Cooper, 1988). In the analysis, a *conceptual* organization is

Table 1: Categorization according to the literature review taxonomy by Cooper (1988).

Characteristic	Categories			
Focus	Research outcomes	Research methods	Theories	Practices or applications
Goal	Integration		Criticism	Identification of central issues
Perspective	Neutral representation		Espousal of position	
Coverage	Exhaustive	Exhaustive with selective citation	Representative	Central or pivotal
Organization	Historical	Conceptual		Methodological
Audience	Specialized scholars	General scholars	Practitioners or policymakers	General public

employed by sorting the discussion based on content groups. The intended audience comprises *specialized scholars* in cloud computing and *practitioners* interested in the field. The described taxonomy is depicted in Table 1.

Given the large number of scientific publications about cloud computing, it is essential to establish clear criteria to define which works are relevant for answering the RQ. Therefore, inclusion and exclusion criteria have been defined to support the selection of relevant works (*apply practical screen*), as can be seen in Table 2. If a publication meets all inclusion criteria and none of the exclusion criteria, it will be considered for closer examination in the next filtering stage.

Table 2: Inclusion and Exclusion Criteria.

Inclusion Criteria	Exclusion Criteria
A paper must either be published in a conference proceeding or a journal.	A paper is a literature review itself.
A paper examines how cloud computing influences the performance of an organization.	A paper's methodology is not empirical.
A paper is written in English or German.	

Other literature reviews and non-empirical studies have been omitted from this review. The rationale behind this decision lies in the study's primary focus on examining the empirically measured benefits of cloud computing adoption. To identify relevant literature, three databases were selected: Scopus, Springer Link, and IEEE Xplore. This selection was motivated by the premise of maintaining a manageable scope while accessing a broad range of scholarly sources. For example, Scopus is an abstract database referencing other full-text repositories. The use of boolean operators and keywords is essential in navigating the scientific databases (Okoli, 2015). Table 3 displays the search strings used and the number of initial results per database (*search for literature)*. Due to differences in the search functions, the query applied for Scopus and IEEE Xplore deviates slightly from the search term used with SpringerLink. For the latter, the results were further limited to research articles and conference papers to balance the scope.

The initial keyword search yielded 1394 papers. Following this, the filtering process according to the PRISMA guidelines began (Page et al., 2021). First, any duplicates were removed. For the first screening phase, the titles and abstracts of the publications were evaluated. Afterward, the set of remaining papers was skimmed to assess eligibility. Moreover, at the end of this step, both forward and backward searches were executed (Webster and Watson, 2002). The added publications from the citation search and the remaining articles were examined in detail. The described filtering stages are summarized in Figure 1. In the end, 31 papers were included, providing the foundation for the *extract data* step (Okoli, 2015). Only two publications obtained their knowledge from case studies. Two other studies utilized secondary data analysis. The remaining 27 papers relied on information gathered from surveys, interviews, and questionnaires, categorized as primary data analysis in this paper. The full set of included publications, sorted by release date, is listed in Tables 4 and 5.

4 ANALYSIS

The next phase of the SLR is synthesizing the insights from the filtered papers (*synthesize studies)*. The analysis of the articles is structured based on the aspects connected to organizational performance and effectiveness. According to Richard et al. (2009), organizational performance mainly focuses on financial performance, product market performance, and shareholder return, while organizational effectiveness also includes internal performance measures (e.g., more efficient or effective operations). However, as this distinction is not clear across management research

Table 3: Initial Results (17th January 2025).

Database	Search String	Number of Results
Springer Link	”cloud computing” AND (”enterprise performance” OR ”firm performance” OR ”business performance” OR ”organisation performance” OR ”organization performance”)	**869**
IEEE Xplore | Scopus	”cloud computing” AND (”enterprise performance” OR ”firm performance” OR ”business performance” OR ”organisation performance” OR ”organization performance” OR ”company performance” OR ”organizational performance”)	**248** | **277**

(Richard et al., 2009), both types of performance measures will be considered.

4.1 Financial Performance

The scope of organizational performance can encompass financial performance aspects such as ”profits, return on assets, return on investment, etc.” (Richard et al., 2009). Positive aspects in this direction resulting from cloud computing are revealed by multiple studies (Schniederjans and Hales, 2016; Khayer et al., 2020a; Dong and Salwana, 2022; Mousa et al., 2024). Chen et al. (2022) and Abdalla et al. (2024) identified profitability enhancements, the former study especially for the manufacturing domain and smaller firms. Apart from a better return on assets and investments, Khayer et al. (2023) highlight increased revenue, profit margins, and corporate growth. Schniederjans and Hales (2016), Jones et al. (2019), Alasady et al. (2023), and Abdalla et al. (2024) further mention the reduction of (operational) costs, for example by cloud-enabled human resource management (Abu-Darwish et al., 2022; Dong and Salwana, 2022). A similar observation is made for SaaS, a specific service model (Loukis et al., 2019). Comparable results originate from a case study around a cloud manufacturing service platform for small and medium-sized enterprises (SMEs) where development and production costs were halved (Song et al., 2014). Finally, another focused investigation found financial performance gains in relation to cloud. Jayeola et al. (2022) suggest that cloud ERP implementation mediates the positive impact of top management support on change management on financial performance and directly enhances it by improving operational benefits.

4.2 Product Market Performance

According to Richard et al. (2009), shifts to metrics such as sales and market shares are categorized under the broader concept of product market performance. Some studies suggest sales growth through the adoption of cloud computing (Schniederjans and Hales, 2016; Khayer et al., 2023). A reason for this might be cloud-enabled improvements to product or service quality as outlined by Jones et al. (2019); Loukis et al. (2019), and Khayer et al. (2023). In the case of Loukis et al. (2019), this finding constitutes the result of SaaS-infused innovations. Moreover, the increase in product sales is often accompanied by better market shares (Khayer et al., 2023). Specifically, firms in the service industry and companies of larger scale see greater increases in market value (Chen et al., 2022).

4.3 Internal Performance

The majority of reviewed publications identify performance improvements through cloud computing adoption that cannot be attributed to financial or product performance. Instead, the performance gains address internal outcomes which, in turn, ultimately contribute to enhanced firm outcomes.

4.3.1 Flexibility and Organizational Agility

A significant number of papers underline the positive influence of cloud computing on organizational flexibility or agility, for example Bruque-Cámara et al. (2016); Alasady et al. (2023); Khayer et al. (2023), and Syairudin and Nabila (2024). In the context of cloud, both are broad constructs that can be interpreted manifold and relate to flexibility in payment (pay-per-use) (Khayer et al., 2020a; Yao and Azma, 2022), the easy scalability of IT resources (Khayer et al., 2020a; Zou and Jian, 2022), flexibility in human resources (Jones et al., 2019; Liu and Darbandi, 2022), strategic agility (Mousa et al., 2024), and agile organization forms (Willcocks et al., 2013). This can extend to customer agility, too (Liu et al., 2018). Khayer et al. (2021) highlights that factors like firm size, age, and industry do not massively affect performance improvements through enhanced organizational agility. Next to tactical agility and strategic benefits such as device and location independence, flexible work practice advancements are also found in the literature (Jones et al., 2019). This further plays a role in the investigation of Islam and Naseem (2023),

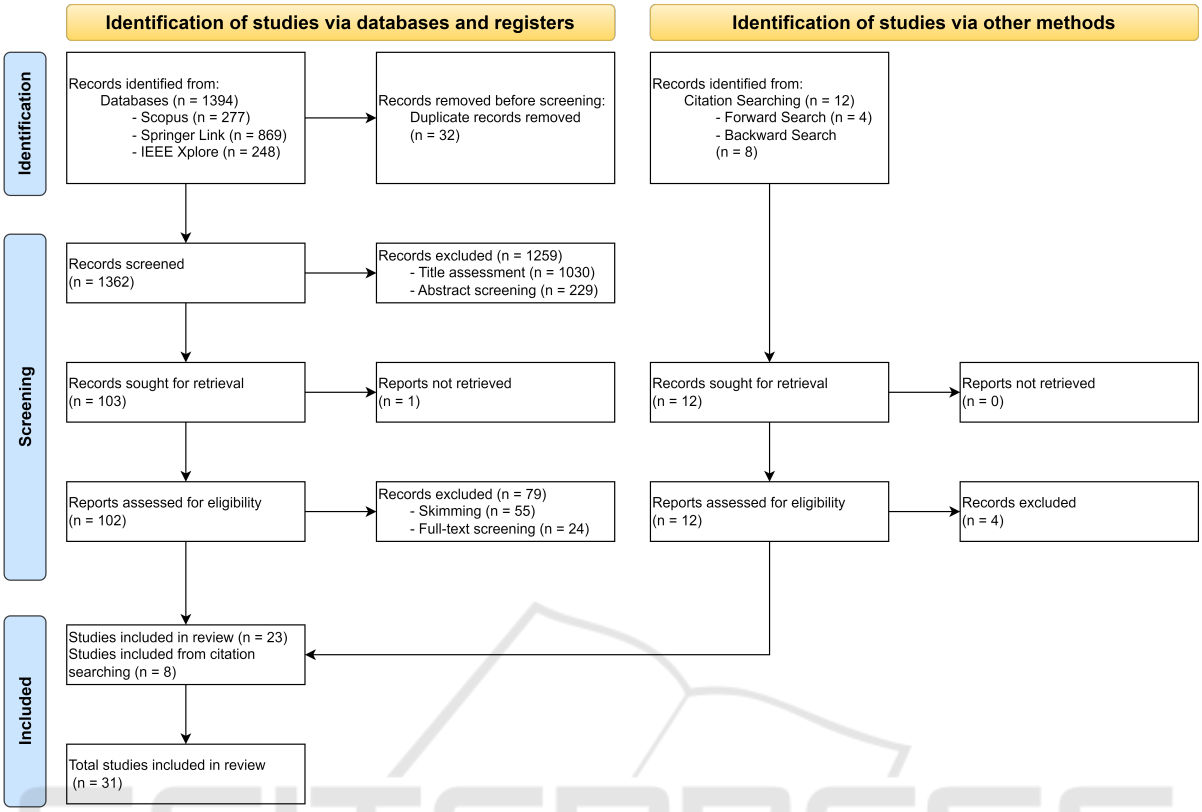

Figure 1: Search process, according to PRISMA guidelines (Page et al., 2021).

where the impact of Industry 4.0 tools (AI, big data, cloud computing, IoT) on organizational performance is examined. The results indicate that especially AI and cloud computing enhance organizational performance, with agility and remote work serving as mediators. A related concept is organizational mindfulness, referring to an organization's flexibility and reliability in enacting organizational routines (McAvoy et al., 2013). Findings imply that adopting cloud computing fosters organizational mindfulness, which in turn positively impacts firm performance (Oredo and Dennehy, 2023).

4.3.2 Human Resources and Productivity

Under this category, the articles that observed performance enhancements related to an organization's personnel are discussed. As improvements in this area can be tightly connected to the broader concept of productivity, papers focusing on this aspect are also included here. Furthermore, flexibility, which was discussed in the previous subsection, is potentially tied to human resources (HR) and productivity, too. As cloud computing facilitates access to sophisticated and scalable IT resources, outsourcing IT infrastructure allows firms to focus on core business activities (Gupta et al., 2020; Khayer et al., 2020b,a; Mousa et al., 2024), which could help with boosting economic efficiency and productivity. An improvement in productivity through cloud computing adoption is also found by Syairudin and Nabila (2024). Likewise, Yao and Azma (2022) detected that cloud availability and payment flexibility positively impact human resource productivity. As a matter of fact, cloud computing can improve productivity both directly and indirectly by enabling other technologies (e.g., machine learning, big data) (Katz et al., 2024). While the former is more prominent in smaller firms, larger enterprises are better able to utilize the indirect benefits. A case study from manufacturing showcased several benefits of cloud-based services such as enabling fast searches for resources and reliable partners, customizing and optimizing business processes, and evaluating partners, ultimately contributing to a reduction of the development cycle (Song et al., 2014). Additionally, SaaS solutions were found to be beneficial in increasing the quality of the electronic support of operations and processes (Loukis et al., 2019).

Cloud computing significantly improves human resources and support systems (Dong and Salwana, 2022; Sawangwong and Chaopaisarn, 2023). The literature mentions enhanced talent management and

Table 4: Overview of selected papers, part 1.

Title	Reference	Method	Source	Document Type
Cloud Computing as Innovation: Studying Diffusion	(Willcocks et al., 2013)	Primary Data Analysis	Springer Link	Conference Paper
Common engines of cloud manufacturing service platform for SMEs	(Song et al., 2014)	Case Study	Springer Link	Journal Paper
Cloud computing, Web 2.0, and operational performance	(Bruque Cámara et al., 2015)	Primary Data Analysis	Scopus	Journal Paper
Supply chain integration through community cloud: Effects on operational performance	(Bruque-Cámara et al., 2016)	Primary Data Analysis	Forward Search	Journal Paper
Cloud computing and its impact on economic and environmental performance: A transaction cost economics perspective	(Schniederjans and Hales, 2016)	Primary Data Analysis	Backward Search	Journal Paper
Understanding the effect of cloud computing on organizational agility: An empirical examination	(Liu et al., 2018)	Primary Data Analysis	Backward Search	Journal Paper
Risks and rewards of cloud computing in the UK public sector: A reflection on three Organizational case studies	(Jones et al., 2019)	Case Study	Springer Link	Journal Paper
Determinants of software-as-a-service benefits and impact on firm performance	(Loukis et al., 2019)	Primary Data Analysis	Scopus	Journal Paper
Cloud computing adoption and its impact on SMEs' performance for cloud supported operations: A dual-stage analytical approach	(Khayer et al., 2020a)	Primary Data Analysis	Scopus	Journal Paper
Examining the impact of Cloud ERP on sustainable performance: A dynamic capability view	(Gupta et al., 2020)	Primary Data Analysis	Backward Search	Journal Paper
Lean Production implementation, Cloud-Supported Logistics and Supply Chain Integration: interrelationships and effects on business performance	(Novais et al., 2020)	Primary Data Analysis	Scopus	Journal Paper
Understanding cloud computing success and its impact on firm performance: an integrated approach	(Khayer et al., 2020b)	Primary Data Analysis	Scopus	Journal Paper
The adoption of cloud computing in small and medium enterprises: a developing country perspective	(Khayer et al., 2021)	Primary Data Analysis	Scopus	Journal Paper
Assessing the impact of cloud-based services on the talent management of employees	(Liu and Darbandi, 2022)	Primary Data Analysis	Scopus	Journal Paper
Estimating the impact of cloud computing on firm performance: An empirical investigation of listed firms	(Chen et al., 2022)	Secondary Data Analysis	Backward Search	Journal Paper
Do cloud-based enterprise resource planning systems affect the productivity of human resources in the COVID-19 era?	(Yao and Azma, 2022)	Primary Data Analysis	Scopus	Journal Paper

enhanced HR efficiency via increased flexibility, timeliness, availability, lower costs, and ease of use (Liu and Darbandi, 2022). According to Abu-Darwish et al. (2022), the impact of talent management on competitive advantage is mediated by cloud computing. Additionally, cloud-based human resource management results in positive effects on financial performance (Dong and Salwana, 2022). Apart from better team performance, expert cloud systems also support employee creativity through effective quality management, HR management, job management, and robust, flexible, and scalable IT resources (Zou and Jian, 2022).

4.3.3 Innovation

Four papers identify advantages in innovation through the adoption of cloud computing (Khayer et al., 2020a), for example, by enabling experimentation with lower risk and costs (Mousa et al., 2024). In addition to operational benefits, Loukis et al. (2019) state improvements that include rapid and low-cost electronic enablement of innovations in a firm's processes, products, and services. Nevertheless, the study focuses on the SaaS service model and mentions that operational benefits are shown to have a greater impact on firm performance than innovational

Table 5: Overview of selected papers, part 2.

Title	Reference	Method	Source	Document Type
Does cloud computing improve team performance and employees' creativity?	(Zou and Jian, 2022)	Primary Data Analysis	Forward Search	Journal Paper
The impact of cloud-based human resource and supply chain management systems on the performance of multinational organizations	(Dong and Salwana, 2022)	Primary Data Analysis	Scopus	Journal Paper
The mediating role of cloud computing in the relationship between talent management and competitive advantages	(Abu-Darwish et al., 2022)	Primary Data Analysis	Backward Search	Journal Paper
The Nexus between Top Management Support on Change Management, Cloud ERP Implementation, and Performance of SMEs	(Jayeola et al., 2022)	Primary Data Analysis	Scopus	Journal Paper
Exploring the Role of Organizational Mindfulness on Cloud Computing and Firm Performance: The Case of Kenyan Organizations	(Oredo and Dennehy, 2023)	Primary Data Analysis	Springer Link	Journal Paper
Mediating role of cloud of things in improving performance of small and medium enterprises in the Indian context	(Narwane et al., 2023)	Primary Data Analysis	Scopus	Journal Paper
Nexus between Iraqi SMEs cloud computing adoption intention and firm performance: moderating role of risk factors	(Alasady et al., 2023)	Primary Data Analysis	Scopus	Journal Paper
Role of Industry 4.0 tools in organizational performance of the IT sector	(Islam and Naseem, 2023)	Primary Data Analysis	Scopus	Journal Paper
The impact of applying knowledge in the technological pillars of Industry 4.0 on supply chain performance	(Sawangwong and Chaopaisarn, 2023)	Primary Data Analysis	Scopus	Journal Paper
Understanding the Effects of Alignments between the Depth and Breadth of Cloud Computing Assimilation on Firm Performance: The Role of Organizational Agility	(Khayer et al., 2023)	Primary Data Analysis	Scopus	Journal Paper
Cloud Computing and firm performance: a SEM microdata analysis for Israeli firms	(Katz et al., 2024)	Secondary Data Analysis	Scopus	Journal Paper
Development Model of Cloud Computing Adoption for Industrial 4.0 Implementation Strategy for Improve MSMEs Performance	(Syairudin and Nabila, 2024)	Primary Data Analysis	Scopus	Conference Paper
Enhancing Efficiency: The Impact of Cloud Computing Adoption on Small and Medium Enterprises Performance	(Abdalla et al., 2024)	Primary Data Analysis	Scopus	Journal Paper
The Impact of Cloud Computing Adoption on Firm Performance Among SMEs in Palestine	(Mousa et al., 2024)	Primary Data Analysis	Scopus	Journal Paper
The impact of cloud computing on supply chain performance: the mediating role of knowledge sharing in utilities and energy sectors	(Fraihat et al., 2024)	Primary Data Analysis	Forward Search	Journal Paper

advantages. Willcocks et al. (2013) identified three types of innovations enabled by cloud computing: IT operational innovations, business process innovations, and market innovations, ultimately leading to more agile and innovative organizational forms.

4.3.4 Sustainability

The importance of sustainability has been widely acknowledged in today's society. The impact of cloud computing on organizations' environmental performance has been examined in two of the analyzed studies. Cloud computing reduces energy consumption, the use of hazardous materials, and waste generation. It also enhances environmental management through real-time data and efficient resource utilization (Schniederjans and Hales, 2016). Similarly, Gupta et al. (2020) show that cloud ERP systems improve environmental performance by reducing processing time and resource wastage. Apart from the ecological pillar, the sustainability concept further consists of social aspects. On this note, Gupta et al. (2020) also found social performance benefits from improved social networking. The study also finds that firm size has a limited effect on social perfor-

mance and that the type of cloud service and offering does not impact sustainable performance. From the economic perspective, sustainability also includes risk management to mitigate the effects of disruptive events. On this note, strategic benefits of cloud encompass increased resilience and in case of outages, tactical advantages such as improved business continuity and disaster recovery (Jones et al., 2019).

4.3.5 Supply Chain Performance

Numerous studies have investigated the effect of cloud computing specifically on supply chain performance improvements. Fraihat et al. (2024) find a strong relationship between cloud computing adoption and supply chain performance, highlighting benefits such as enhanced visibility, coordination, data transfer, decision-making, and efficiency. Moreover, cloud computing fosters a culture of knowledge sharing which constitutes a significant mediator in the relationship to supply chain performance (Fraihat et al., 2024). Amongst others, improved knowledge sharing is also identified as a benefit in the study of Sawangwong and Chaopaisarn (2023), where the impact of Industry 4.0 technologies, including cloud computing on supply chain performance is analyzed. Furthermore, cloud-based supply chain management positively impacts marketing and collaborative performance (Dong and Salwana, 2022).

Cloud-supported logistics enhance lean production, which then positively affects business performance more than lean production alone (Novais et al., 2020). Additionally, cloud-supported logistics improve supply chain integration capabilities, such as physical, information, and financial flow integration, which also positively impacts business performance (Novais et al., 2020). This observation also holds true according to Bruque Cámara et al. (2015), where the findings show that cloud computing facilitates effective and quick supply chain integration, leading to improved efficiency, better supplier-customer interaction, and shortened lead times. Cloud computing improves operational performance only when it enhances supply chain integration. A subsequent study confirms the beneficial impact on the integration of informational and physical flows in the supply chain for a specific cloud deployment model. Community cloud computing mainly enhances inventory management, real-time data sharing, and coordination between supply chain partners, leading to better operational performance (Bruque-Cámara et al., 2016). A similar conclusion is made by Narwane et al. (2023), who particularly explore the mediating role of Cloud of Things (CoT) on performance. The findings indicate that CoT increases information transparency within the supply chain and leverages big data analytics to enhance performance. CoT adoption also boosts operational performance, including quality control, smart equipment maintenance, and process monitoring.

5 DISCUSSION

After extracting and analyzing the benefits of cloud computing in improving organizational performance from the literature, this section is dedicated to the summary and discussion of the obtained results. In the first subsection, additional emphasis is placed on the research context and methodologies in the reviewed papers.

5.1 Research Context and Methodologies

The vast majority of papers utilized interviews, surveys, and questionnaires to gather data regarding the effects of cloud computing adoption (primary data analysis). Regarding the target group of respondents, almost half of the 27 studies in this category explicitly focus on SMEs (e.g., Khayer et al. (2020b)). Other specific domains are the private health sector (Abu-Darwish et al., 2022), finance (Zou and Jian, 2022), manufacturing (Jayeola et al., 2022), logistics (Novais et al., 2020), and the utilities and energy sector (Fraihat et al., 2024). Dong and Salwana (2022) address multinational organizations. In terms of respondent target group, Schniederjans and Hales (2016) mention IT and supply chain professionals, while Willcocks et al. (2013) queried business and IT executives as well as technology vendors. Furthermore, not all articles investigated the impact on organizational performance through cloud computing in general. Two studies included cloud under the umbrella of Industry 4.0 technologies (Islam and Naseem, 2023; Sawangwong and Chaopaisarn, 2023). Loukis et al. (2019) concentrated on the service model SaaS while Bruque-Cámara et al. (2016) emphasized the community cloud. Other research was limited to specific cloud technologies such as cloud-based supply chain management (Dong and Salwana, 2022) and HR (Dong and Salwana, 2022; Zou and Jian, 2022), cloud ERP (Gupta et al., 2020; Jayeola et al., 2022), and CoT (Narwane et al., 2023). Notably, one study particularly surveyed firms that are using Alibaba cloud services (Liu et al., 2018).

25 of the 27 studies captured under primary data analysis explicitly limited their investigation to a specific region. Among these, most of the papers focus

on countries on the Asian continent (19). While a wide variety of countries are covered, China has the most mentions here (5). Only one research consists of respondents from Africa (Kenya) (Oredo and Dennehy, 2023). Dong and Salwana (2022) addressed a multi-national population whereas Willcocks et al. (2013) do not specific any regional restrictions. However, unexpectedly, very few of the reviewed papers focussed their examinations on the European (5, Dutch and Spain) and the North American market (only 1 (Schniederjans and Hales, 2016)). Moreover, the number of respondents is generally high but varies drastically between the articles. The minimum number of samples can be found in the Chinese bank-centered study of Zou and Jian (2022) (50), the maximum is present in the investigation of Alasady et al. (2023) (396) that explore the effect of cloud computing in Iraqi SMEs. Most studies boast respondents in the range of 201-250 (median: 247), resulting in a mean value of 236 (standard deviation: 103.77). For the data analysis of the responses, almost all researchers applied Structural Equation Modeling in some form.

Two studies utilized a case study approach to examine the impact of cloud computing on organizational performance. Song et al. (2014) perform this while designing and developing a prototype cloud manufacturing service platform for SMEs. The case study of Jones et al. (2019) explores the implementation of cloud computing within three UK local government authorities through observation and interviews with key organizational figures. This is the only article that examines the utilization of cloud computing in the public sector. The two remaining articles are categorized under secondary data analysis, referring to studies that did not perform the original data collection themselves. Chen et al. (2022) focus on worldwide listed firms that adopted cloud services between 2010 and 2016. Data were gathered from client announcements on the S&P's Capital IQ Platform, supplemented by information from company websites, technical reports, and news media. Firms that adopted cloud services (treatment group) were compared with a matched set of firms that did not adopt cloud services (control group) to control for potential confounding factors. Katz et al. (2024) examine the economic effects of cloud computing on Israeli firms. Here, data were collected by the Central Bureau of Statistics of Israel, which conducted surveys on ICT use and cyber protection in business during 2020, resulting in a sample size of approximately 2,000 firms from various sectors.

5.2 Results

The SLR showed that the impact of cloud computing on organizational performance is multifaceted. This section seeks to answer the RQ by summarizing the most important aspects of the identified studies. First of all, financial performance gains through cloud computing adoption were detected in the form of increasing revenues and profitability (Khayer et al., 2023), and better return on assets and investments (Schniederjans and Hales, 2016; Khayer et al., 2020a; Dong and Salwana, 2022; Mousa et al., 2024). Additionally, the reduction of costs was highlighted on multiple occasions (Schniederjans and Hales, 2016; Jones et al., 2019; Abu-Darwish et al., 2022; Dong and Salwana, 2022; Alasady et al., 2023; Abdalla et al., 2024). Nevertheless, while cloud computing can reduce investment costs and capital commitment regarding the IT infrastructure (Hentschel and Leyh, 2018), it should be noted that the use of cloud services is not necessarily cheap, especially for more sophisticated tools (e.g., in machine learning). Hence, the selection of a cloud-based solution should always be carefully evaluated based on appropriate criteria (Hentschel and Leyh, 2018).

Cloud computing adoption can positively influence aspects related to product market performance. This includes sales growth (Schniederjans and Hales, 2016; Khayer et al., 2023), better product or service quality (Jones et al., 2019; Loukis et al., 2019; Khayer et al., 2023), and enhanced market shares (Khayer et al., 2023) and value (Chen et al., 2022). Apart from this, the majority of findings rather indicate internal performance improvements through the cloud, which in turn can then contribute to general organizational performance boosts. For example, organizational agility is significantly improved, making companies more flexible (Liu et al., 2018; Alasady et al., 2023; Oredo and Dennehy, 2023) and enhancing operational and customer agility (Liu et al., 2018). This increased agility boosts firm performance (Khayer et al., 2023, 2021), playing a mediating role between cloud computing and organizational performance (Islam and Naseem, 2023). According to the fundamental literature, this is directly tied to the cloud computing characteristics (Mell and Grance, 2011) which allow flexible and demand-oriented scaling of IT infrastructure with reduced administration and maintenance effort (Hentschel and Leyh, 2018).

HR involves the factor of flexibility as well, facilitated by the location-independent access to computing resources (Hentschel and Leyh, 2018) which can result in HR productivity improvements (Yao and Azma, 2022). Additionally, outsourcing IT infras-

tructure to cloud providers allows firms to focus on core business activities (Gupta et al., 2020; Khayer et al., 2020b,a; Mousa et al., 2024), boosting general productivity directly or indirectly by enabling technologies like big data and machine learning (Katz et al., 2024). Furthermore, the use of cloud computing can provide benefits in innovation (Willcocks et al., 2013; Loukis et al., 2019; Khayer et al., 2020a; Mousa et al., 2024), since advanced technologies have become accessible, allowing for competitive advantages and the development of new business areas (Hentschel and Leyh, 2018). Consequently, the time-to-market for innovations can be reduced.

Cloud computing's positive impact on sustainability is proclaimed by leading to more efficient resource consumption, lower waste, and better environmental management (Schniederjans and Hales, 2016; Gupta et al., 2020). While this is plausible on an organizational level, and cloud computing facilitates access to intelligent technologies that can support sustainability matters in various facets, it remains questionable whether cloud computing can be regarded as ecologically beneficial on a global scale. Despite the improvements to resource utilization through the abstraction of hardware via virtualization, the enormous data centers of cloud providers require significant environmental resources (e.g., electricity, cooling) (Katal et al., 2023). This is further aggravated by the general tendency of the increased need for processing capacity due to the emergence of technologies such as AI.

Finally, cloud computing offers benefits for the supply chain. It improves supply chain integration (Novais et al., 2020; Bruque Cámara et al., 2015; Bruque-Cámara et al., 2016), which enhances operational performance. Overall supply chain performance can be boosted through improved visibility, communication across the network (Fraihat et al., 2024), and increased efficiency (Sawangwong and Chaopaisarn, 2023). In manufacturing, better partner evaluation, resource allocation, and production efficiency are noted (Song et al., 2014). Apart from all the positive effects of cloud computing adoption, potential risks should be investigated as well. This discussion already brought up possible issues regarding cost and sustainability. Additionally, Yao and Azma (2022) raise concerns about cloud privacy and security. Thus, in the past, policies, laws, or a lack of trust in the public cloud have led to companies adopting a private or hybrid cloud strategy (Hentschel and Leyh, 2018). Another drawback constitutes the danger of vendor lock-in effects.

6 CONCLUSION

Cloud computing has attracted considerable interest, bringing attention to the question of how cloud computing adoption can influence organizational performance. By conducting an SLR, 31 empirical studies investigating this relationship have been identified and analyzed to provide an answer to this query. While cloud computing can improve financial and product market performance, most of the extracted benefits relate to internal performance measures, namely organizational agility, productivity, innovation, sustainability, and supply chain performance, which in turn will impact firm outcomes. Surprisingly, only a minority of studies focussed on cloud computing adoption in Europe and North America. Furthermore, while numerous articles concentrated on SMEs, merely one paper considered the public sector. These observations offer substantial capabilities for future research. To strengthen the obtained results, the inclusion of additional databases could yield a broader range of relevant studies. Moreover, this study primarily focused on the improvements that cloud computing brings to organizational performance. However, potential drawbacks and challenges should not be overlooked. For example, factors such as the costs of cloud computing, failed implementation strategies, the impact on the environment on a global level, security concerns, and compliance issues were not investigated. A balanced examination that also considers these detriments would provide a more holistic understanding of the impact of cloud computing on organizations. On this note, conducting more case studies on cloud computing adoption could provide detailed, contextualized examples of cloud computing implementation and its effects. Case studies can offer insights into specific organizational contexts, revealing practical challenges and strategies that may not be captured in broader surveys or secondary data analyses.

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