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# CLOUD COMPUTING IN BANKING SYSTEM

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***Abstract***

*This article examines the cloud in the banking sector by providing significant operational efficiency, cost savings, and flexibility. Substantial synergies exist in controlling operational risks when these technologies are used together. This study uses a literature review of relevant articles from 2013 to 2024. We conclude that the cloud is appropriate because the agility and flexibility in cloud services allow banks to scale their operations quickly, adapt to market changes, and respond to customer needs more effectively. Enhanced Customer Experience by leveraging cloud technology can offer more innovative and customer-centric services, increasing customer satisfaction and loyalty. Overall, the results show that the cloud is a transformative force in the banking sector, enabling institutions to navigate the complexities of a rapidly evolving financial landscape. With proper planning and a deep understanding of the risks and benefits, banks can leverage this technology to achieve their business goals.*

**Keywords:** ***Cloud Computing, Banking, Operational Efficiency, Financial Technology, Digital Transformation***

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## INTRODUCTION

The rapid development of information and communication technology in the digital era impacts people's information needs. Information is a daily commodity for people who carry out various activities, and others. Various types of documents, forms, and storage media have changed to facilitate the storage, management, retrieval, and dissemination of information (Elzamly et al., 2016). Business is a system consisting of various elements, such as people, capital, technology, and information, which work together to achieve certain goals. Financial statements are a source of information and also a means of communication for parties inside and outside the company. The financial statements themselves consist of the Statement of Financial Position (Balance Sheet), Income Statement, and Cash Flow Statement. Financial statements are also an important tool for management to make decisions, both operational and investment. Statement of Changes in Capital, and Notes to Financial Statements. Accounting services are much more important to the success of the company (Bodemer, 2024). Accounting systems record, analyze, monitor, and evaluate financial transactions, tax records, and other company information. Manual accounting makes retrieving financial data slow and tedious. Commercial companies cannot operate manual accounting systems or keep no records. Today's efficient accountants work online. They conduct important business online. Accounting organizations can simplify client contact and improve internal procedures using e-business (Ahmad, 2024). This research aims to summarize the literature on cloud computing in the banking sector. The banking sector is at the starting point of a technological revolution,

spearheaded by the integration of Artificial Intelligence (AI) and Cloud Computing technologies. This merger promises to redefine the traditional banking paradigm, optimize operations, enhance security, and personalize the customer experience (Rieger et al., 2013).

Cloud computing has been one of the most significant technological innovations in recent years, especially in the banking sector. With the increasing demand for faster and more efficient services, banks around the world have started to turn to cloud-based solutions to improve their operations and customer experience (Ghule et al., 2014). Cloud computing offers various advantages, including cost savings, flexibility, and the ability to adapt quickly to market changes (Vinoth et al., 2022).

This research begins with a literature review on cloud computing with a specific focus on the banking industry. Then proceed with a description of each, followed by an explanation of the research method, presentation of results, limitations, and conclusions.

## LITERATURE REVIEW

Tabel 1. Tinjauan Literatur

| No | Author | Tahun | Judul |
|---|---|---|---|
| 1 | Shahla Asadi; Mehrbakhsh Nilashi; Abd Razak Che Husin; Elaheh Yadegaridehkordi | 2017 | Customers perspectives on adoption of cloud computing in banking sector |
| 2 | Maoyong Cheng a; Yang Qu a; Chunxia Jiang; Chenchen Zhao (Cheng et al., 2022) | 2022 | Is cloud computing the digital solution to the future of banking? |
| 3 | Abdelrafe Elzamly; Burairah Hussin, Samy Abu Naser, Khalid Khanfar, Mohamed Doheir, and Ali Selamat, and Abdullah Rashed (Elzamly et al., 2016) | 2016 | A New Conceptual Framework Modelling for Cloud Computing Risk Management in Banking Organizations |
| 4 | Philipp Rieger; Heiko Gewald; Bernd Schumacher (Rieger et al., 2013) | 2013 | Cloud-Computing in Banking Influential Factors, Benefits and Risks from a Decision Maker's Perspective Completed Research Paper |
| 5 | Oliver Bodemer (Bodemer, 2024) | 2024 | Revolutionizing Finance: The Impact of AI and Cloud Computing in the Banking Sector |
| 6 | Ranjit Bose, Xin (Robert) Luo, Yuan Liu (Bodemer, 2024) | 2013 | The Roles of Security and Trust: Comparing Cloud Computing and Banking |
| 7 | Lucian Alexandru, Razvan Daniel Zota, Radu Constantinescu (Alexandru et al., 2013) | 2013 | An Analysis of the Romanian Internet Banking Market from the Perspective of Cloud Computing Services |
| 8 | AHMAD Y. A. BANI AHMAD (Ahmad, 2024) | 2023 | Firm Determinants that Influences Implementation of Accounting Technologies in Business Organizations |

| No | Author | Tahun | Judul |
|---|---|---|---|
| 9 | Lăzăroiu, G, Bogdan, M, Geamănu, M, Hurloiu, L, Ionescu, L, & Ștefănescu, R. (Lăzăroiu et al., 2023) | 2023 | Artificial intelligence algorithms and cloud computing technologies in blockchain-based fintech management |
| 10 | Dr. Sheel Ghule, Ms. Rupali Chikhale, Mr. Kalpesh Parmar (Dr. Sheel Ghule, Ms. Rupali Chikhale, 2011) | 2014 | Cloud Computing in Banking Services |
| 11 | S. Vinoth, Hari Leela Vemula, Bhadrappa Haralayya Pradeep Mamgain, Mohammed Faez Hasan, Mohd Naved (Vinoth et al., 2022) | 2021 | Application of cloud computing in banking and e-commerce and related security threats |
| 12 | Gousia Habib, Sparsh Sharma, Sara Ibrahim, Imtiaz Ahmad, Shaima Qureshi and Malik Ishfaq (Habib et al., 2022) | 2022 | Blockchain Technology: Benefits, Challenges, Applications, and Integration of Blockchain Technology with Cloud Computing |
| 13 | Sridhar Madasamy Principal Solutions Architect, Aquilanz (Madasamy & Aquilanz, 2023) | 2024 | THE EVOLUTION OF CHATBOTS: CLOUD AND AI SYNERGY IN BANKING CUSTOMER INTERACTIONS |

## RESEARCH METHODS

This research uses a descriptive design with a literature review approach to analyze the application of cloud computing in the banking sector. The research focus includes the benefits, challenges, and implications of cloud computing technology in improving banking efficiency and innovation. The research population includes articles, journals, and scientific publications related to cloud computing in the banking sector during the period 2013-2024. The sample was purposively selected with relevance criteria, including articles published in indexed journals or academic books, and written in English or Indonesian. Data was collected through searching academic sources such as Google Scholar, ResearchGate, and other databases. Selected articles were analyzed based on abstracts, keywords, and main content using thematic content analysis, which grouped the data into the themes of cloud computing benefits, challenges, and implementation. The results of the analysis are presented descriptively to provide an overview of the implementation of cloud computing in banking as a reference for the development of more innovative and efficient financial technology.

## RESULTS AND DISCUSSION

### Benefits of Cloud Computing in Banking

1. Cost Savings

   One of the key benefits of cloud computing is significant cost savings. By using cloud services, banks can turn large capital expenditures into smaller, sustainable operational costs (Ghule et al., 2014). It reduces the need for large investments in new hardware and software, allowing banks to choose the services they need based on a pay-as-you-go model (Vinoth et al., 2022).

2. Agility and Business Focus

   Cloud computing enables banks to have a faster product development cycle, which supports a more efficient response to customer needs (Ghule et al., 2014). With cloud infrastructure available on demand, banks can shift focus from IT issues to core financial services, improving operational efficiency (Vinoth et al., 2022).
3. Business Sustainability

   Cloud computing also improves business sustainability by providing better data protection, fault tolerance, and disaster recovery (Ghule et al., 2014). Cloud service providers are responsible for managing the technology, which allows banks to get a higher level of data protection compared to traditional solutions (Vinoth et al., 2022).
4. Green IT

   By switching to the cloud, banks can reduce their carbon footprint. Cloud computing enables more efficient use of resources and reduces energy consumption associated with physical infrastructure (Ghule et al., 2014). This is in line with the global trend towards sustainability and environmental responsibility in business (Vinoth et al., 2022).

**Challenges in Cloud Computing Implementation**

While there are many benefits, banks moving to cloud computing also face a number of challenges. Issues such as data security, regulatory compliance, and standard interoperability must be considered before moving to the cloud (Ghule et al., 2014). In addition, banks must ensure that they have the right strategies in place to manage the risks associated with using cloud services (Vinoth et al., 2022).

**Risk Management in Cloud Computing**

Risk management principles have been introduced in cloud computing to help document, anticipate certain risks, and manage them to ensure successful execution of work (Elzamly et al., 2016). Cloud is a more complex environment with further concerns such as risk, trust, ecological efficiency, security. Due to the involvement of cloud risk management in monitoring the success of software projects, analyzing potential risks, and making decisions on what to do about potential risks, risk management is considered as planned risk control. In addition, risks are uncertainties that can have negative or positive effects on the fulfillment of project objectives (Rieger et al., 2013).

Cloud computing competes with computing, software, data access, and storage services that may not require end-user knowledge of the physical location and configuration of the system providing the service. In addition, they focus on mobile cloud computing interaction systems consisting of multiple mobile devices and cloud computing facilities (Ghule et al., 2014). The goal of cloud risk management is the identification and recognition of risks at an early stage and then actively change the course of action to reduce and alleviate cloud computing risks. In the process of understanding the factors that contribute to the success of cloud computing, risk management is becoming increasingly important. Today, cloud computing risk management has become a common practice among leading successful banking organizations. In an ever-increasing effort to improve development processes and security, recent research has pointed out the risk areas of cloud computing. The cloud is also growing in popularity. The solution allows customers to operate cloud-based business applications and store data permanently on remote servers.

Risk management helps project managers and teams to make better decisions to mitigate cloud computing risks (Elzamly et al., 2016). Integrating a cloud computing risk management model is considered a new phenomenon in banking organizations, which requires cloud computing managers and developers to be involved in the project from the concept phase to the risk mitigation phase. This study presents a new framework that models risk management for successful cloud

computing in banking organizations. The purpose of this study is to propose a new conceptual framework that models cloud risk management in banking organizations.

Artificial Intelligence, by its very nature, refers to machines programmed to mimic human intelligence of learning, reasoning, and self-correction. When applied to banking, AI transforms data into insights, automating and improving decision-making processes Cloud Computing, on the other hand, offers scalability and flexibility of computing resources over the internet, facilitating the storage, processing, and management of large data sets easily and efficiently (Rieger et al., 2013).

The banking sector, traditionally characterized by its conservative approach to innovation, now recognizes the urgent need to adapt. The integration of AI and Cloud Computing not only streamlines operations but also significantly reduces costs, enhances security measures, and improves customer satisfaction (Madasamy & Aquilanz, 2023).

The introduction of Artificial Intelligence (AI) and cloud computing has marked the latest development phase in the evolution of banking technology. The main reason for using cloud computing is the perceived financial benefits. Financial considerations, rather than strategic aspects, seem to be the main drivers of the decision towards cloud computing (Bose et al., 2013).

**Operational Efficiency in Banking Services**

Cloud Computing Applications This research highlights that cloud computing provides high-quality and low-cost internet services, which are increasingly adopted by e-commerce businesses to maximize practical value. Security Risks Identified, This article discusses various security threats associated with cloud computing, namely Network security risks and data security vulnerabilities that arise from the use of virtual environments. The complexity brought about by virtualization, which can negatively impact security if not properly managed. Reliance on trust mechanisms by consumers, as they have limited control over cloud resources (Vinoth et al., 2022).

The need for Proper Planning emphasizes the importance of proper planning and awareness of emerging risks, threats, and vulnerabilities to ensure the successful adoption of cloud computing in various organizations. This article does not present a formal hypothesis, it effectively outlines the dual nature of cloud computing's impact on banking and e-commerce providing benefits while necessitating careful consideration of security challenges (Lăzăroiu et al., 2023).

The cloud is often used in various business and military environments to assist with data storage management. Heterogeneous cloud environments are filled with various hardware and software components purchased from various suppliers. This can lead to incompatibilities and security weaknesses in the system. Security assurance of information transmission between and within clouds and information management seems to be a significant issue. The use of blockchain technology is not limited to the realm of cryptocurrencies; it also has the potential to open new doors for business digitization (Habib et al., 2022).

**Cloud Security and Trust in Banking**

The challenge of trust in the cloud is not entirely dependent on the technology. Banks are trusted not only for their security, but also for being reliable. Customers can easily deposit, access, send and withdraw money at any time. Even if the bank faces a threat, users are still guaranteed to get their money back.

Currently, trust in the cloud is low because it does not provide adequate security and guarantees. For example, users have no control over their data, do not know the exact location of their data, and the lack of clear security guarantees are the main reasons for this distrust. To gain consumer trust, cloud providers need to provide better transparency and increase user control over their data and processes.

The characteristics of the cloud will increase service elasticity, where users will get the same response time quickly even if service demand is high. In addition, users will receive security services because cloud service providers must comply with existing legal and regulatory standards. Bank service costs can also be made as efficient as possible so that banks no longer need to make capital

investments in. Banks will only be able to use the required capacity on a pay-as-you-go model (Alexandru et al., 2013).

The fintech-based banking sector integrates blockchain technology across digital finance, cryptocurrency, transaction services, and loan risk management, leading to innovative economic growth (Lăzăroiu et al., 2023).

Security of cloud-based applications and data requires careful planning and resources. Cloud providers have a competitive advantage when it comes to security, as they can spread the cost of security among many customers, thus enabling greater investment in various security solutions. For example, they can employ a team of security patch specialists to reduce the vulnerability period. In addition, they also have a better ability to recruit and hire trained system experts (Bose et al., 2013).

## CONCLUSIONS

Cloud computing has revolutionized the way banks operate, providing them with tools to increase efficiency, reduce costs, and improve customer experience. Although challenges remain, the benefits offered by cloud computing make it an attractive option for banks looking to remain competitive in an ever-changing market (Ghule et al., 2014; Vinoth et al., 2022). Agility and Flexibility in cloud Services gives banks the ability to quickly scale their operations, adapt to market changes, and respond to customer needs more effectively. Enhanced Customer Experience i.e. by leveraging cloud technology, banks can offer more innovative and customer-centric services, thereby increasing customer satisfaction and loyalty. Disaster Recovery and Security, the Cloud offers robust backup solutions and security measures, ensuring that banks can maintain business continuity and protect sensitive data. Overall, the results show that cloud computing is a transformative force within the banking sector, enabling institutions to navigate the complexities of the rapidly evolving financial landscape. With proper planning and a deep understanding of the risks and benefits, banks can leverage this technology to achieve their business goals.

## REFERENCES

Ahmad, A. Y. A. B. (2024). Firm Determinants that Influences Implementation of Accounting Technologies in Business Organizations. *WSEAS Transactions on Business and Economics*, *21*, 1–11. https://doi.org/10.37394/23207.2024.21.1

Alexandru, L., Daniel, Z., & Constantinescu, R. (2013). An Analysis of the Romanian Internet Banking Market from the Perspective of Cloud Computing Services. *Procedia Economics and Finance*, *6*(13), 770–775. https://doi.org/10.1016/s2212-5671(13)00201-3

Bodemer, O. (2024). Revolutionizing Finance: The Impact of AI and Cloud Computing in the Banking Sector. *TechRxiv*, 1–8.

Bose, R., (Robert) Luo, X., & Liu, Y. (2013). The Roles of Security and Trust: Comparing Cloud Computing and Banking. *Procedia - Social and Behavioral Sciences*, *73*, 30–34. https://doi.org/10.1016/j.sbspro.2013.02.015

Cheng, M., Qu, Y., Jiang, C., & Zhao, C. (2022). Is cloud computing the digital solution to the future of banking? *Journal of Financial Stability*, *63*, 101073. https://doi.org/10.1016/j.jfs.2022.101073

Elzamly, A., Hussin, B., Naser, S. A., Khanfar, K., Doheir, M., Selamat, A., & Rashed, A. (2016). A new conceptual framework modelling for cloud computing risk management in banking organizations. *International Journal of Grid and Distributed Computing*, *9*(9), 134–154. https://doi.org/10.14257/ijgdc.2016.9.9.13

Ghule, S., Chikhale, R., & Parmar, K. (2014). Cloud Computing in Banking Services. *International Journal of Scientific and Research Publications*, *4*(6), 1–4.

Habib, G., Sharma, S., Ibrahim, S., Ahmad, I., Qureshi, S., & Ishfaq, M. (2022). Blockchain Technology: Benefits, Challenges, Applications, and Integration of Blockchain Technology with Cloud Computing. *Future Internet*, *14*(11), 1–22. https://doi.org/10.3390/fi14110341

Lăzăroiu, G., Bogdan, M., Geamănu, M., Hurloiu, L., Ionescu, L., & Ștefănescu, R. (2023). Artificial intelligence algorithms and cloud computing technologies in blockchain-based fintech management. *Oeconomia Copernicana*, *14*(3), 707–730. https://doi.org/10.24136/oc.2023.021

Madasamy, S., & Aquilanz, L. L. C. (2023). The Evolution of Chatbots: Cloud and Ai Synergy in Banking Customer Interactions. *Journal of Emerging Technologies and Innovative Research*, *10*(10), i127–i137.

Rieger, P., Gewald, H., & Schumacher, B. (2013). Cloud-computing in banking influential factors, benefits and risks from a decision maker's perspective. *19th Americas Conference on Information Systems, AMCIS 2013 - Hyperconnected World: Anything, Anywhere, Anytime*, *15*(17), 728–739.

Vinoth, S., Vemula, H. L., Haralayya, B., Mamgain, P., Hasan, M. F., & Naved, M. (2022). Application of cloud computing in banking and e-commerce and related security threats. *Materials Today: Proceedings*, *51*(8), 2172–2175. https://doi.org/10.1016/j.matpr.2021.11.121