SYSTEMATIC LITERATURE REVIEW OF CLOUD COMPUTING ADOPTION

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Abstract - In the current rapidly growing digital era, cloud computing is a technology that plays a significant role in digital transformation in various industrial sectors. This study conducts a comprehensive literature review to identify and analyze the challenges and benefits of cloud computing adoption, with the aim of providing guidance for organizations in maximizing the benefits and overcoming the obstacles in implementing this technology. Using the literature review (SLR) method, this research collects and analyzes 25 studies published between 2020 and 2024 that address cloud computing adoption in various industry sectors. The research results are expected to provide comprehensive insights for practitioners and researchers regarding the factors that influence cloud computing adoption decisions, as well as offer recommendations for more effective and efficient implementation.

Keywords - Cloud Computing, Systematic Literature Review (SLR), Technology Adoption.

I. INTRODUCTION

In today's rapidly growing digital era, cloud computing is a technology that plays an important role in digital transformation in various industrial sectors such as education, healthcare, banking, and manufacturing. In various countries including Indonesia, the adoption of cloud computing has shown a significant impact on these sectors, especially in improving operational efficiency and organizational competitiveness. For example, in the education sector, cloud computing enables easier access to learning resources through e-learning platforms and digital libraries. In the banking sector, this technology is used to improve operational efficiency and data security, while in the manufacturing sector, cloud computing supports supply chain optimization and information technology infrastructure transformation. This research focuses on the regional context in Indonesia, with the aim of understanding the adoption of cloud computing in these industry sectors, thus providing more specific guidance for organizations in the region.

While the adoption of cloud computing offers various benefits, such as cost efficiency, flexibility, and scalability, organizations face significant challenges in the adoption process. Key challenges include issues of data security, privacy, regulatory compliance, and integration with existing systems. However, little research has comprehensively explored how organizations overcome these barriers, particularly in industrial sectors in Indonesia. This gap suggests the need for further research to identify inhibiting factors and strategies that can help organizations leverage cloud computing effectively. Therefore, this research seeks to fill the

gap by examining the challenges and benefits of cloud computing adoption through a systematic approach.

This research uses the Systematic Literature Review (SLR) method, which is considered the most appropriate method to review cloud computing adoption compared to other methods such as surveys or case studies. SLR allows researchers to systematically collect, analyze, and synthesize relevant studies, providing a comprehensive and unbiased view of trends, key findings, as well as existing gaps in the related literature. This method is superior because it provides broad and in-depth coverage, incorporating various perspectives from different sectors and geographical areas, which ultimately provides more valid and reliable results to formulate strategy recommendations for organizations in adopting cloud computing.

II. LITERATURE STUDIES

In conducting a literature study that presents cloud computing technology adoption as the topic, the systematic literature review (SLR) was employed as a systematic approach. Systematic literature review (SLR) is a transparent and replicable review method that provides a comprehensive, unbiased, and valid assessment of the literature state in a specific field.

A. Research Questions

This study aims to answer the following research questions:

RQ1: In what sectors is cloud computing applied?

RQ2: Why do companies choose cloud computing over on-premise services?

RQ3: What are the differences in cloud computing adoption between large and small companies?

B. Search Process

In this study, the research journals used as references are searched from Google Scholar (https://scholar.google.com/) which were published between 2020 – 2024. The keywords used are "Adoption of Cloud Computing" or "Utilization of Cloud Computing". Google Scholar was chosen because it provides open access to a wide range of scholarly articles from various disciplines, including journals, theses and technical reports. In addition, the platform supports broad keyword searches, making it easier to identify studies relevant to the topic of cloud computing adoption.

However, to ensure a broader and more diverse coverage of the literature and improve the credibility of the search results, we realized the importance of using several other academic databases that are more focused on technology and engineering publications. Therefore, in this study, we also included searches in leading databases such as IEEE Xplore, Scopus, and SpringerLink. These databases were chosen because they provide access to high-quality publications that are frequently used by researchers in information technology and computing. Thus, this approach ensures that the analyzed literature includes the most relevant and up-to-date research in cloud computing adoption across different industry sectors.

C. Inclusion and Exclusion Criteria

This stage is carried out to identify the data that meets the eligibility criteria to be used in research.

D. Quality Assessment

The Quality Assessment stage is conducted to find data evaluated under the predetermined quality assessment criteria.

QA1: Is literature related to cloud computing adoption published in 2020-2024?

QA2: Does the journal discuss the application of cloud computing in various sectors?

QA3: Does the journal discuss factors influencing the decision to adopt cloud computing?

Each journal will be given a score for QA1, QA2, and QA3.

Y: Yes

N: No

III. RESULT AND ANALYSIS

A. Quality Assessment Result

TABLE I

QUALITY ASSESSMENT RESULT

10	Author	Title of the Journal	Year	Q1	Q2	Q3	Result
1	[1]	Adopsi Cloud Computing Dalam Perencanaan Dan Pengembangan Bisnis Usaha Kecil Menengah (UKM)	2024	Y	Y	Y	✓
2	[2]	Analisis Implementasi Software As a Service Pada Industri Perhotelan Daerah Bali	2020	Y	Y	Y	✓
3	[3]	Analisis Kinerja Basis Data Terdistribusi Dalam Lingkungan Cloud Computing	2024	Y	Y	Y	✓
4	[4]	Analisis Performansi Dan Efisiensi Cloud Computing Pada Sistem Perbankan	2020	Y	Y	Y	✓
5	[5]	Evaluasi Implementasi Sistem Informasi Manajemen Berbasis Teknologi Cloud Computing pada Usaha Kecil dan Menengah (UKM)	2024	Y	Y	Y	✓
6	[6]	Factors Influencing The Adoption Of Cloud Computing Systems In E-Tourism	2022	Y	Y	Y	✓
7	[7]	Faktor-Faktor Penentu Yang Mempengaruhi Adopsi Cloud Computing Di Indonesia	2023	Y	Y	Y	✓

8	[8]	Faktor-Faktor yang Mempengaruhi Adopsi Cloud oleh Instansi Pemerintah: Tinjauan Pustaka Sistematis	2021	Y	Y	Y	✓
9	[9]	Implementasi Cloud Computing Technology dan Dampaknya Terhadap Kelangsungan Bisnis Perusahaan Dengan Menggunakan Metode Agile dan Studi Literatur	2020	Y	Y	Y	✓
10	[10]	Implementasi Cloud Computing Berbasis Software as a Service (SaaS) Menggunakan OwnCloud Untuk Pengolahan Data Mahasiswa Sistem Informasi UINSU	2023	Y	Y	Y	✓
11	[11]	Manajemen dalam Konsep dan Prinsip Pengelolaan Pendidikan menggunakan Komputasi Awan	2022	Y	Y	Y	✓
12	[12]	Manfaat Digital Ekonomi Terhadap Peningkatan Pemasaran Produk di Indonesia Menggunakan Metode Cloud Computing	2021	Y	Y	Y	✓
13	[13]	Manfaat Teknologi Cloud Computing Untuk Institusi Perguruan Tinggi	2023	Y	Y	Y	✓
14	[14]	Pemanfaatan Cloud Computing untuk Smart Digital Library dan Personal Branding pada SMKN 1 Padang Cermin	2023	Y	Y	Y	✓
15	[15]	Pemanfaatan Google Earth Engine Untuk Identifikasi Perubahan Suhu Permukaan Daratan Kabupaten Buru Selatan Berbasis Cloud Computing	2023	Y	Y	Y	✓
16	[16]	Pemanfaatan Teknologi Cloud Computing Dalam Reformasi Birokrasi Guna Mewujudkan Kejaksaan Yang Profesional, Komunikatif Dan Akuntabel	2020	Y	Y	Y	✓
17	[17]	Pemanfaatan Teknologi Cloud Computing Untuk Efektivitas Kebijakan Work From Home	2021	Y	Y	Y	✓
18	[18]	Penelitian Cloud computing pada Industri, Pendidikan, Kesehatan, Transportasi, dan Perbankan	2023	Y	Y	Y	✓
19	[19]	Penerapan Aplikasi Cloud E-Learning Di SMA PGRI Kudus	2020	Y	Y	Y	✓
20	[20]	Penerapan Cloud Computing Pada Transportasi Umum untuk meningkatkan Minat Masyarakat Berbasis IOT	2023	Y	Y	Y	✓
21	[21]	Peran Teknologi Cloud Computing Dalam Transformasi Infrastruktur TI Perusahaan:	2024	Y	Y	Y	✓

		Studi Analisis Implementasi Di Industri Manufaktur					
22	[22]	Peran Teknologi Cloud Computing Dalam Meningkatkan Efisiensi Dan Keamanan Proses Akuntansi: Tinjauan Terhadap Perubahan Paradigma Dalam Manajemen Data Keuangan	2024	Y	Y	Y	✓
23	[23]	Perancangan Cloud Computing Dalam Pengelolaan Infrastruktur Teknologi Informasi Berbasis Roadmap Cloud Computing Adoption (ROCCA)	2020	Y	Y	Y	✓
24	[24]	Perceived Usefulness, Perceived Ease of Use, Facilitating Condition, Social Influence, and Personal Innovativeness of Accounting Students Cloud Computing Adoption	2022	Y	Y	Y	✓
25	[25]	Transformasi Digital: Teknologi Cloud Computing dalam Efisiensi Akuntansi	2024	Y	Y	Y	✓

B. RQ1: In what sectors is cloud computing applied?

TABLE II

CLOUD COMPUTING IMPLEMENTATION FIELDS

No	Field	Journal	Amount
1	Education	[10], [11], [13], [14], [18], [19], [24]	7
2	Business	[1], [5], [9], [12], [17], [18], [21]	7
3	Banking	[4], [18]	2
4	Transportation	[18], [20]	2
5	Health	[18]	1
6	Hospitality	[2]	1
7	Government	[8], [16]	2
8	Environment	[15]	1
9	Accountancy	[22], [25]	2
10	Technology	[3], [7], [23]	3
11	Tourism	[6]	1

Based on Table II, cloud computing is most adopted in the business and education sectors. The adoption of cloud computing in the business sector includes IT infrastructure transformation, operational efficiency improvement, and supply chain optimization. Cloud computing is also beneficial in business planning and development, reducing operational costs, and increasing efficiency. The adoption of cloud computing in the education sector is by improving the quality of learning through better access to educational resources; migrating student data storage; and implementing e-learning, digital libraries, and digital classes.

C. RQ2: Why do companies choose cloud computing over on-premise services?

Based on an analysis of the 25 journals listed in Table I, the reason why companies choose cloud computing over on-premise services is that it can reduce the high initial investment required for hardware and software so that companies are free to use the services they pay for

through a licensed model based on usage only. As a result, operational costs are greatly reduced. Cloud services also offer higher levels of flexibility and scalability companies with fewer long-term commitments could increase their computing capacity as needed without major changes to the physical infrastructure.

Generally, service providers have resources to implement advanced security measures, including data encryption and strict access protocols which are more efficient than the security systems that small or medium businesses can implement. Cloud computing also improves operational efficiency through IT process optimization that reduces the need for human resources for routine tasks and the use of computing resources optimization dynamically. Cloud computing reduces the energy costs typically required to run an on-premises data center because the provider manages a more energy-efficient data center.

In addition, cloud computing promotes more rapid innovation and development by providing a flexible environment for application development and testing without the high cost of additional infrastructure. All in all, cloud computing offers a more economical, flexible, secure, and efficient solution than on-premise services making it an enticing option for organizations across industries.

D. RQ3: What are the differences in cloud computing adoption between large and small companies?

Considering the analysis of the 25 journals, several aspects of differences in cloud computing adoption in large and small companies were drawn in Table III.

TABLE III
THE DIFFERENCES IN CLOUD COMPUTING ADOPTION
BETWEEN LARGE AND SMALL COMPANIES

No	Aspects	Large Companies	Small Companies
1	Scale and Complexity of the Infrastructure	More complex and established IT infrastructure to build and manage private clouds for full control.	Prefer public cloud or hybrid cloud services to reduce initial investment costs in IT infrastructure.
2	Data Security	Implement stringent data security measures with complex encryption and security protocols.	Face challenges in implementing complex security protocols due to limited budget and resources, thus relying on cloud service providers for security.
3	Costs and Financing Models	Invest significant funds in cloud infrastructure and use a long-term subscription payment model.	Use a pay-as-you-go payment model that is flexible and fits within the budget to reduce operational costs.
4	Flexibility and Scalability	Utilize the scalability of cloud computing to manage large and diverse workloads and to support global operations.	Utilize the scalability of cloud computing to adjust computing capacity according to business growth, allowing capacity to increase as needed.
5	Implementation and Technology Utilization	Employ an experienced IT team to manage and optimize cloud technology internally and also to develop custom applications.	Rely on ready-made solutions and SaaS (Software as a Service) applications that are easy to implement without requiring in-depth technical expertise.

E. Future Research

Reviewing the analysis of 25 journals concludes that research on cloud computing adoption currently focuses on cloud computing applications in various sectors, the advantages and challenges of cloud computing adoption, cloud computing financing models, and the impact of cloud computing on IT infrastructure.

For future research regarding cloud computing, several topics could be references for future research such as how to develop complex data encryption with easy implementation in systems for large and small companies or an analysis of real-time traffic management systems using IoT to optimize traffic flow. Collaboration between cloud computing integration with IoT and AI could also be a reference for new research to build innovations in various sectors such as education, health, transportation, and industry as well.

In addition, research on developing flexible and customizable cloud computing-based business models for SMEs, as well as evaluating the impact of cloud computing adoption on environmental sustainability and energy efficiency in data centers are also crucial to be studied. Investigating the blockchain technology application in cloud computing to improve data security and transparency, as well as a study of government regulations and policies influences on cloud computing adoption in different countries to provide valuable insights for decision-makers. The development of innovative cloud-native applications and the cost-benefit analysis of migration to cloud computing in various industrial sectors could also be proposed as topics for further research. By focusing on these topics, future research could make significant contributions to overcome the challenges and take advantage of the opportunities that cloud computing offers.

IV. CONCLUSION

This research has conducted a systematic literature review (SLR) of 25 journals that discuss the adoption of cloud computing in various industry sectors. Based on the analysis conducted, several main conclusions can be drawn. First, cloud computing offers a number of significant advantages such as cost efficiency, flexibility, and scalability, easy accessibility, increased security, operational efficiency, increased innovation, and competitive advantage. Several studies highlight improved operational efficiency and reduced costs as key benefits, especially in the manufacturing and education sectors. In the manufacturing sector, cloud computing helps optimize supply chains and allows companies to respond more quickly to market changes. In the education sector, cloud computing adoption expands the accessibility of educational resources and improves the efficiency of data management.

In addition, data security is also one of the main benefits of cloud computing adoption. Studies in the accounting and finance industry show that cloud computing enables more secure data storage as well as fast data recovery capabilities in case of failure. In the government sector, the implementation of encryption and strict access monitoring is proven to improve data security.

However, the adoption of cloud computing also faces significant challenges, such as data security and privacy issues, especially in sectors that handle sensitive information such as finance and government. Some organizations still face challenges related to compliance with strict regulations and security standards. In addition, the process of migrating and integrating cloud computing with existing IT infrastructure is often complex and requires high technical expertise, especially in companies with large infrastructures. Small and medium-sized

enterprises also face barriers in terms of initial investment and limited skills to effectively manage cloud computing.

Differences in cloud computing adoption between large and small enterprises were also identified. Large enterprises tend to have a more complex and mature IT infrastructure, with the ability to implement strict data security measures and invest large funds in cloud infrastructure. Meanwhile, small companies rely more on public cloud or hybrid cloud services to reduce initial investment costs and rely on flexible pay-as-you-go payment models.

Overall, cloud computing provides a more economical, flexible, secure, and efficient solution than on-premise services, making it an attractive option for many organizations in various industries. With the ability to reduce initial infrastructure costs, provide flexible payment models, and improve operational efficiency through IT process automation, cloud computing allows companies to focus on innovation and product development without being burdened by maintaining physical infrastructure. In addition, with higher levels of data security and the ability to adjust computing capacity as needed, organizations can be more responsive to market changes and dynamic business demands. Nonetheless, organizations need to consider existing challenges, such as data security and system integration issues, to maximize the benefits offered by cloud computing. These advantages make cloud computing a strategic solution that can help organizations improve their competitiveness in the ever-evolving digital era.

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