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The Impact of Cloud Computing on the Growth of Technology Startups

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ABSTRACT

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This study focuses on the Impact of Cloud Computing on the Growth of Technology Startups. Using the Systematic Literature Review (SLR) approach, this study analyzed 95 articles from various academic sources such as Google Scholar. The collected data was extracted using tools such as Publish or Perish. to filter articles relevant to this topic. The results of the study indicate that the adoption of cloud computing provides the flexibility and scalability that are much needed by startups to face market dynamics. In addition, cloud-based services enable better collaboration and accelerate product time-to-market. This study highlights the importance of an effective cloud computing implementation strategy to maximize its positive impact on the growth of technology startups.

Cloud Computing, Technology Startup, Startup Growth, Technology Innovation, Systematic Literature.

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INTRODUCTION

In the digital transformation era, cloud computing, including technology startups, has become one of the most influential technologies in shaping the modern business ecosystem (Blichfeldt & Faullant, 2021). Cloud computing offers an internet-based infrastructure that enables flexible access to data, storage, and applications without requiring large investments in hardware or internal IT resources. With scalability, cost efficiency, and remote collaboration, cloud computing has created great opportunities for startups to compete in an increasingly competitive global market (Hirenkumar Kamleshbhai Mistry, 2024). Technology startups, which generally have limited resources, often face challenges in managing complex and expensive IT infrastructure (Ladyka Febby Olivia, 2024). The presence of cloud computing not only reduces entry barriers for innovation but also allows startups to operate more agilely, increasing focus on product and service development (Afriadi Syahputra, 2024). In addition, cloud computing opens up opportunities for startups to access

advanced technologies such as big data analytics, artificial intelligence (AI), and the Internet of Things (IoT), which were previously only available to large companies (Eviyanti Br. Barus, 2024).

However, despite its significant benefits, the adoption of cloud computing also presents a number of challenges. Startups often face risks related to data privacy, dependence on service providers, and ongoing costs for subscriptions (Resnawita, 2024). On the other hand, the lack of technical knowledge and cybersecurity can also be a barrier to effective adoption. Therefore, a deeper understanding of the positive and negative impacts of cloud computing is important for startups to design the right adoption strategy (Wulan, 2024). This article aims to explore how cloud computing affects the growth of technology startups, covering the benefits offered, challenges faced, and implications for business sustainability and innovation. With a Systematic Literature Review (SLR) approach, this study will identify key trends, case studies, and practical insights that are relevant to startup development in the digital era.

RESEARCH METHODE

This study applies the Systematic Literature Review (SLR) method. Data collection method by analyzing, and identifying all relevant findings (Riadi and Jakarta, 2022). Systematic Literature Review is used by searching the database online. The basic data of this study uses Google Scholar Sinta Kemendikbud and many other journal references can be used for Literature Review. Based on the results of the system literature review To conduct a review of the research, there are several stages carried out, namely:

1. Planning the Review

Planning the Review is the initial process step in preparing and selecting topics to be discussed or researched. Using a formula to answer the answer. And determining the Systematic Literature Review Protocol Criteria to be used.

2. Conducting

After collecting several scientific articles that match the research topic. These articles are then compared by applying filters or relevant keywords or similar alternative synonyms and performing data extraction in presenting data compared to drawing conclusions and answering research questions (Research Question/RQ) (Herlina and Yacob, 2022).

3. Report Preparation

Prepare a report on the results of the Systematic Literature Review. This report is expected to be able to provide answers to the questions raised in the Research Question (RQ).

In this study, the title of the System Literature Review article is The Impact of Cloud Computing on the Growth of Technology Startups. The basis for selecting this object is how the role of cloud computing impacts the growth of technology startups. Research Question is the process of determining research questions that are made based on the selected hat. The Research Question used is:

RQ1: What are the methods used for Technology Startup Growth?

RQ2: What is the role of Cloud Computing in Technology Startup Growth?

The data collection method uses online data searches using Publish or Perish to search for Relevant Literature by entering keywords or filters, namely:

a. Cloud Computing* AND Startup Growth*

b. AND Cloud Technology* OR Innovation in Entrepreneurship *

Use of the * sign to display all data according to keywords against all data as well as the use of hyphens and to connect the first word to the next. This is so that the search is not separated according to desire. Determination of criteria needs to be done in the System Literature Review process. This is useful for determining whether the source or data found is suitable for use in research or not. The criteria used in this study to state whether the source data obtained is feasible are;

- Reference data searched from 2023 - 2025;
- Publish or Perish as a reference for a search engine for relevant journals or articles;
- Articles available in reputable journals or national and international conferences;
- Articles discussing Cloud Computing in the Growth of Technology Startups.

In the data collection process, researchers use the Publish or Perish tool as a data source search engine tool. The data searched for are journals and articles. Synthesis data aims to display the distribution of data according to the specified topic. The process of this section aims to sort all articles obtained accurately and also obtain information from the article. In the process of collecting and integrating data or about the research topic, Microsoft Excel is used. Overall, the systematic steps (Adawiyah and Veri2024) taken in this study can be seen from the flow chart image.

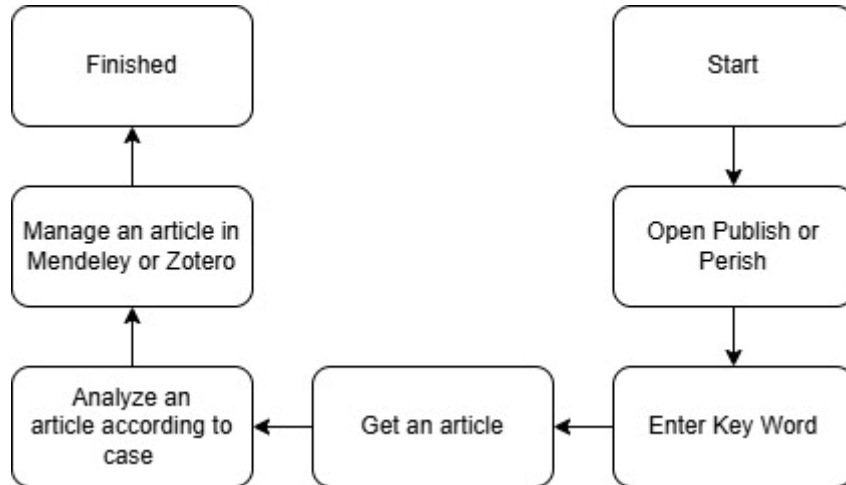


Figure 1.
Flow Chart SLC

RESULT AND DISCUSSION

From the search results of Publish or Pherish data, 95 articles were obtained from the search engine that were relevant to the filters and provisions used by the researcher. These results were stored in the form of ris data and CSV data to be processed using VOSviewer. After the data was entered into Excel, the data was then processed with a pivot data table with publisher output data, and how many journals were published in the year can be seen in Table 1.

Table 1.
Publisher Data and Year of Publication

Publisher	Year						Grand Total
	2019	2020	2021	2022	2023	2024	
academia.edu	1	1					2
ajmsjournal.org		1					1
api.taylorfrancis.com					1		1
arxiv.org	1						1
books.google.com	1						1
cell.com					1		1
centuryscipub.com						1	1
direct.mit.edu					1		1
dl.acm.org		1	1				2
Elsevier	5	3	1	2	1		12
emerald.com		1	1	1	1	1	5
fepbl.com						2	2

growingscience.com						1	1
HeinOnline				1			1
ieeexplore.ieee.org		2			1		3
inderscienceonline.com		1					1
injm.com					1		1
International Journal of Science and ...						1	1
iopscience.iop.org		1					1
journal.pandawan.id					1		1
journals.sagepub.com	1			2	1	1	5
mckinsey.com	1						1
mdpi.com	1		2			1	4
nature.com		1					1
nber.org		1					1
papers.ssrn.com		3		1	2		6
par.nsf.gov					1		1
pdfs.semanticscholar.org							
publications.aaahq.org		1					1
pubsonline.informs.org					1		1
research.cbs.dk			1				1
researchgate.net		4		2		1	7
search.proquest.com						1	1
Springer	3	2	1	1			7
Taylor & Francis	2	1	1	2		1	7
taylorfrancis.com			1				1
telkomnika.uad.ac.id		1					1
usenix.org	1						1
Wiley Online Library		1	3	1		1	6
wsj.westscience-press.com					1		1
(blank)						1	1
Grand Total	17	26	12	13	14	13	95

Next, the graphic results from 95 CSV data are the year of publication of articles and journals from the data.

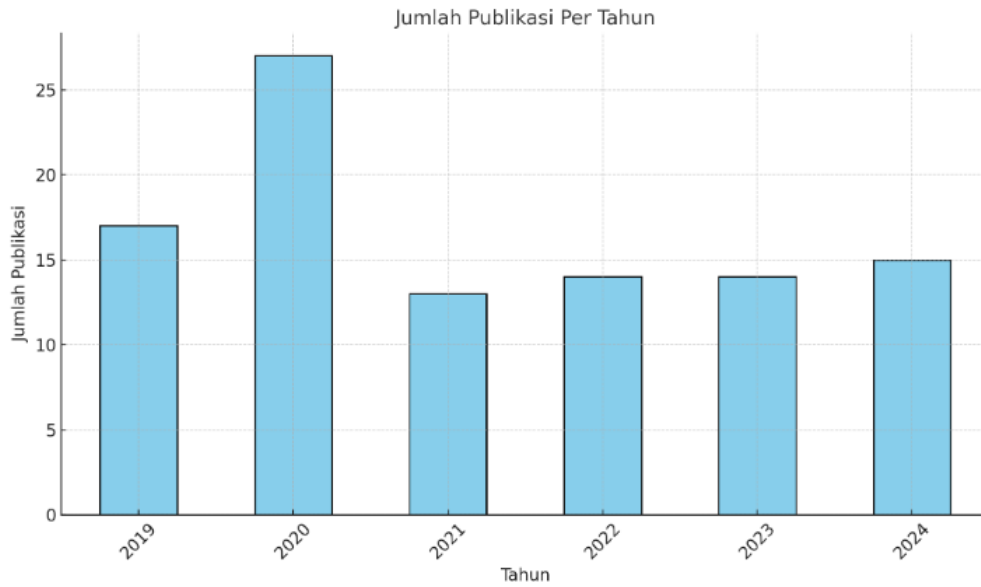


Figure 2.
Results of the Year of Publication Graph

Based on the results of the research conducted, 95 metadata references were obtained which were used by the author as basic materials in writing this journal.

Table 3.
Journal Article Search Results

No	Name/Year	Title	Method	Journal
1	Abigail Chivandi & Thembelani Mlilo, 2024	Cloud Computing and Mobile Technologies as a Marketing Strategy towards Innovation and Business Growth among Small Tourism Enterprises	Systematic Literature Review (SLR)	Athens Journal of Tourism
2	Eviyanti Br. Barus, Kristin M Pardede, Jelita Ananda	Transformasi Digital: Teknologi Cloud Computing dalam Efisiensi Akuntansi	Systematic Literature Review (SLR)	Jurnal Sains dan Teknologi

No	Name/Year	Title	Method	Journal
	Putri Br. Manjorang, 2024			
3	Shehu Abdulwaha b, Etemi Joshua Garba and Mohammed Bashir Ribadu, 2024	Driving Digital Innovation and Growth: Empowering Tech Startups Through Cloud Computing in Nigeria	Systematic Literature Review (SLR)	Bima Journal of Science and Technology
4	Novi Hardiansya h, 2024	Strategy to Minimize Digital Technology Startup Failure	Descriptive Analysis	Digital Business Journal
5	Wulan, Hadita , Achmad Fauzi , Ajeng Maharani Putri, Fika Fitriyani , Rini Astriyani , Vina Arisana , Yuyun Indah Cahyani_20 24	Threat and Risk Review on Internet of Things Security System, Based on Cloud Computing in ECommerce Use and Strategic Plan	The method used in this article is the Narrative Policy Framework (NPF) method to analyze policies related to personal data protection and qualitative analysis using the Literature Review and	Journal of Entrepreneurship and Multi Talent (JKMT)

No	Name/Year	Title	Method	Journal
			Systematic Literature Review (SLR) methods.	
6	Hirenkumar Kamleshbhai Mistry, Chirag Mavani, Amit Goswami, Ripalkumar Patel_2024	The Impact Of Cloud Computing And Ai On Industry Dynamics And Competition	Systematic Literature Review	Educational Administration: Theory and Practice

After extracting the Excel data, the researcher created a Biographical mapping of the data from the research data obtained from publish or refine using VOSviewer by filtering and adjusting the search according to the key data that has a relationship between the keys, as can be seen in Figure 3.

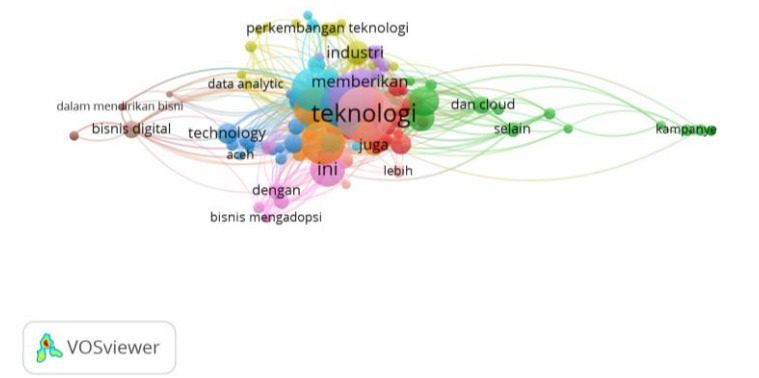


Figure 4.
Visualization of VOSviewer Network

Furthermore, the researcher also made Bioliografic results with VOSviewer without a network which can be seen in Figure 4.

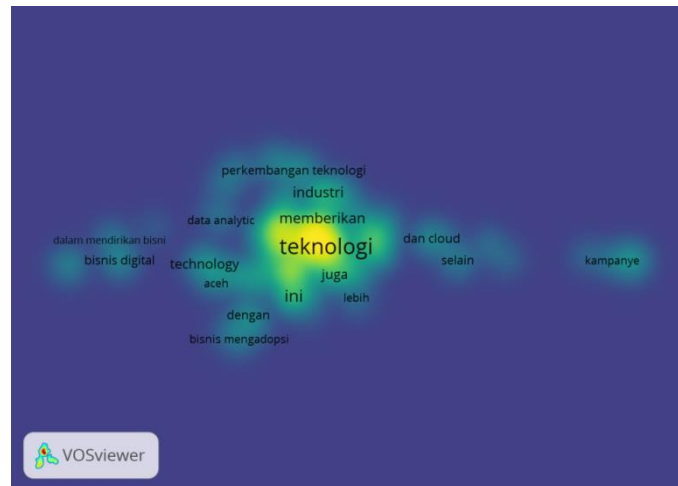


Figure 5.
VOSviewer Visualization

After the mapping of research methods is carried out, the research question (Research Question 1) can be answered using several methods, namely: Systematic Literature Review Method, Qualitative Descriptive,. Based on the analysis of journal sources, it is concluded that cloud computing has a significant influence on various aspects of technology startup growth. The main factors that influence this impact are:

1. Operational Efficiency

- Computing allows startups to reduce significant initial and operational costs through a pay-as-you-go model. This provides startups with the flexibility to utilize technology resources as needed without the need for large investments in IT infrastructure.
- Studies [Reference] show that startups that adopt cloud computing are able to save up to 40% of their operational costs compared to traditional infrastructure models.

2. Scalability and Flexibility

- With cloud computing, startups can increase or decrease resource capacity dynamically according to market demand. This allows startups to respond quickly to market changes without significant operational disruption.

3. Access to Advanced Technologies

- Cloud-based technologies provide access to advanced services such as big data analytics, artificial intelligence (AI), and the Internet of Things (IoT). This enables startups to create innovative products and services that can increase their competitiveness in the global market.

4. Global Team Collaboration

- Cloud services support cross-location collaboration by providing a platform that facilitates real-time communication, data sharing, and

project management. This increases teamwork efficiency and accelerates the product development cycle.

5. Business Sustainability

- With cloud computing, startups can focus on their core business innovation without being burdened by infrastructure management. This creates opportunities to improve long-term business sustainability.

CONCLUSION

The adoption of cloud computing has been shown to contribute significantly to the growth of technology startups through reduced operational costs, increased efficiency, and accelerated innovation. This technology allows startups to access computing resources that were previously only accessible to large companies, creating wider opportunities to compete in the global market. However, the successful implementation of cloud computing requires careful strategic planning, including the selection of appropriate cloud services and data security management. Thus, startups that are able to optimize cloud technology can leverage its potential to achieve sustainable growth and better face future challenges.

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