The Implementation of Cloud Accounting in Indonesia: A Bibliometric Analysis

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Abstract
This research adopts a bibliometric analysis approach to investigate the development of Cloud Accounting implementation in Indonesia in the 2018-2023 time period. Data was obtained via Google Scholar using keywords related to "Cloud Accounting in Indonesia". Search results were exported and analyzed using VOSViewer software to identify patterns, trends, and contributions of related researchers, journals, and conferences. The analysis involves mapping the distribution of keywords, researcher collaboration, annual publication evaluation, and article citation mapping. The research results show an exponential growth in researchers' interest in implementing Cloud Accounting in Indonesia. The increasing number of publications, peaking in 2023 with 147 publications, reflects the relevance of this topic in academic literature. Keyword analysis illustrates the shift in research focus from traditional aspects to "Cloud Accounting Adoption" and "SMES". Research collaborations indicate active research groups, while journal analysis identifies influential academic platforms. Research themes that have not been widely explored, such as "Cloud Computing" and "Cloud Accounting Systems", represent future research opportunities. These findings provide in-depth insight into the implementation of Cloud Accounting in Indonesia, supporting academic and practical understanding in the context of the adoption of this technology.
Keywords: Bibliometrics, Cloud, Accounting, Computing, Indonesia.

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1. Introduction

The advent of information and communication technology in the digital age has revolutionized business models globally. Cloud computing is a significant technological advancement that enhances business efficiency and productivity (Winda, 2020). Cloud computing enables companies to securely store, efficiently manage, and conveniently access data via the Internet, eliminating the requirement for substantial investments in IT infrastructure. A significant utilization of cloud computing in the corporate realm is Cloud Accounting, which entails conducting the accounting process online through cloud services (Deswanto, 2021).

Indonesia is an emerging nation with a vibrant and swiftly expanding commercial market. Indonesian companies are increasingly adopting technology solutions like Cloud Accounting in response to global demands and growing business complexity (Thomas, 2021). Despite the growing interest in Cloud Accounting, there is a lack of a comprehensive study on the implementation and adoption of this technology in Indonesia. Cloud Accounting has become an essential component of the accounting industry's transformation in Indonesia. Cloud Accounting enables users to efficiently handle and retrieve financial data through the internet, thanks to the swift advancements in technology, particularly in cloud computing innovation (Farida, 2022). Since the early 2010s, this technology has revolutionized the operational practices of companies in Indonesia.

Cloud Accounting allows users to conveniently access their financial data at any time and from any location, eliminating the necessity for significant investments in specialized software, servers, and high-performance computers (Dewiyanti & Wijaya, 2022). Small businesses, which are the primary recipients of this technology, benefit from lower costs through subscription fees tied to hosting contracts. Within a dynamic business setting, the convenient accessibility and adaptability of this system enable companies to focus on expanding their operations without being burdened by laborious administrative tasks (Kharisma, 2022). The significance of implementing a financial bookkeeping system within a company, particularly for Small and Medium Enterprises (SMEs), is undeniable. By implementing an effective bookkeeping system, companies can accurately compute, regulate, and oversee all of their financial transactions (Setiawan et al., 2022). Nevertheless, numerous small and medium-sized enterprises (SMEs) previously neglected financial bookkeeping as a result of the intricate nature of conventional accounting. Cloud Accounting addresses this issue by offering a more intuitive and cost-effective resolution, enabling small and medium-sized enterprises to enhance their financial administration.

In addition to the private sector, the public sector in Indonesia has also implemented Cloud Accounting technology as a component of its digital transformation (Hasibuan et al., 2023). According to a survey conducted by PwC, 80% of companies in Indonesia utilize cloud technology to enhance their IT operations, while approximately 19.4% of companies have transitioned to public cloud services (Pradesa et al., 2023). According to Wiyanto (2023), the public sector has embraced Cloud Computing with a 67% adoption rate. This technology has proven to be advantageous in improving operational processes and efficiency. The adoption of Cloud Accounting has not only revolutionized financial management for companies but has also acted as a catalyst for substantial digital transformation across multiple sectors in

Indonesia. This technology enables businesses in Indonesia to swiftly adjust to the dynamic business landscape, thereby fostering economic growth, particularly for small and medium enterprises (SMEs), and bolstering Indonesia's standing in the global digital era (Rahmania & Heriyani, 2019).

Bibliometric analysis is a research method that uses bibliographic data to examine scientific research patterns and trends. It plays a crucial role in understanding the intricacies of implementing Cloud Accounting in Indonesia. Bibliometric studies are essential in this context as they provide a crucial means of analyzing the progress of literature, identifying research patterns, and evaluating collaborations among researchers and affiliated institutions (Xu et al., 2021).

This study aims to comprehensively examine the literature on the implementation of Cloud Accounting in Indonesia using bibliometric analysis. Our objective is to investigate the impact of scholars, cutting-edge research, and current trends on the implementation of Cloud Accounting in the Indonesian business sector. Through a comprehensive understanding of the current knowledge base, we can discern areas where research is lacking, investigate untapped opportunities for collaboration, and gain a thorough understanding of how Cloud Accounting technology is revolutionizing the accounting industry in the country (Deswanto, 2021). This research aims to offer comprehensive insights to researchers and academics, as well as practical guidance to business professionals and policymakers, regarding the adoption of Cloud Accounting as a crucial tool for enhancing the competitiveness and sustainability of the Indonesian economy in the digital era.

2. Research Methods

This study utilizes a bibliometric analysis methodology to comprehend the progression of Cloud Accounting implementation in Indonesia from 2018 to 2023. This methodology enables us to discern patterns and trends in the pertinent scientific literature, as well as assess the contributions of associated researchers, journals, and conferences. Data will be acquired through the Google Scholar platform (scholar.google.com) by employing keywords associated with the implementation of Cloud Accounting in Indonesia. A possible keyword to be utilized is "Cloud Accounting in Indonesia". The collected data will comprise the title of the article, the name of the author, the name of the journal or conference, the year of publication, and the number of citations.

The search results obtained from Google Scholar can be exported in either CSV or Excel format to facilitate subsequent analysis. Relevant data will be extracted and organized based on research requirements. The acquired data will be imported into VosViewer software to conduct a comprehensive bibliometric analysis (Donthu et al., 2021). The analysis process entails identifying the most prevalent keywords in the relevant literature. This will offer a comprehensive understanding of the primary research focus in the implementation of Cloud Accounting in Indonesia. Investigating the potential for cooperation among researchers in the field of Cloud Accounting in Indonesia. This will facilitate the identification of active research groups and promote substantial inter-researcher collaboration. Provide a list of journals or conferences that regularly publish articles on the implementation of Cloud Accounting in Indonesia (Setiawan et al., 2022). This analysis offers valuable insights into the most influential academic platforms in this particular field. Analyze the patterns in the annual publication count. This elucidates the progression of researchers' fascination with this subject matter

throughout the years. Mapping the distribution of citations for pertinent articles. This offers valuable understanding regarding the impact and significance of these works within the broader academic literature.

The findings of the bibliometric analysis will be thoroughly interpreted to acquire a profound comprehension of the implementation of Cloud Accounting in Indonesia. Conclusions will be derived from these findings, and the practical implications and future research directions will also be examined. This research is anticipated to make a substantial contribution to the academic and practical comprehension of the implementation of Cloud Accounting technology in Indonesia.

3. Results and Discussion

3.1. Research result

This study examines the patterns in the growth of publications pertaining to the adoption of cloud accounting in Indonesia between 2018 and 2023. The data utilized for this analysis was obtained from Google Scholar (scholar.google.com). During this specific period, we have discovered a cumulative 147 scientific articles that explore the application of cloud counting techniques in Indonesia.
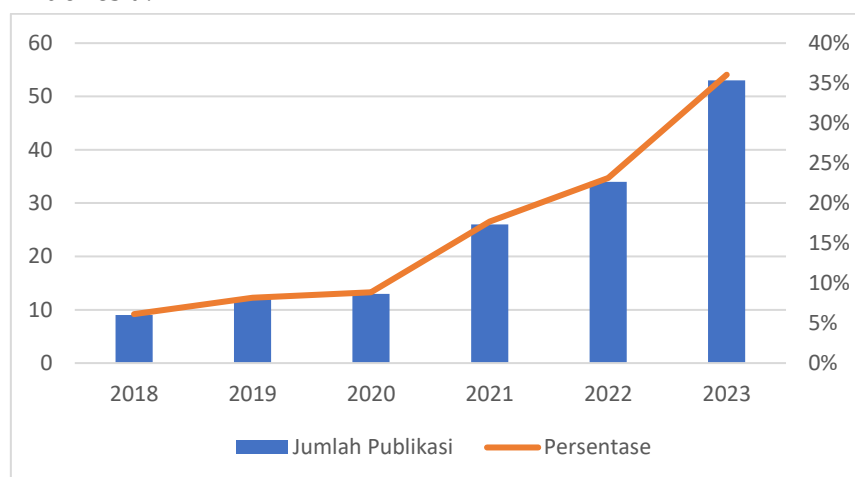
Figure 1. Number of Publications and Percentage per Year Cloud Implementation in Indonesia

Figure 1 displays data regarding the quantity of publications pertaining to the adoption of cloud accounting in Indonesia over a span of six years, ranging from 2018 to 2023. Based on the figure, there was a notable rise in the number of publications regarding the adoption of Cloud Accounting in Indonesia between 2018 and 2023. During the year 2018, the number of publications was limited to just 9, representing approximately 6% of the total publications for that time frame. In 2019, the number of publications rose to 12, accounting for 8% of the total. In 2020, there were 13 recorded publications, accounting for 9% of the total number of publications. Nevertheless, in 2021, there is a notable milestone with 26 publications accounting for 18% of the overall total. This figure demonstrates the growing fascination of researchers with the adoption of Cloud Accounting in Indonesia. In 2022, there were 34 publications, accounting for 23% of the total publications during that period. The apex is anticipated to transpire in 2023, with a total of 53 publications, constituting an exceptional proportion of 36% of the overall publications.

Based on this data, it can be inferred that researchers' enthusiasm for adopting Cloud Accounting in Indonesia has shown significant acceleration. The progressive rise in the

number of publications over the years highlights the significance of this subject in scholarly literature. Notably, in 2023, there was a peak in research interest, accounting for 36% of the total publications during the 2018-2023 timeframe. This indicates the acknowledgment of the significance of Cloud Accounting in the process of business transformation in Indonesia. It also demonstrates that this subject continues to be pertinent and is experiencing rapid growth among researchers at present.

Research articles published in journals indexed by Google Scholar are frequently cited by other researchers in their studies. A higher number of citations or quotations from an article indicates that the research findings are extensively utilized as references in other research. The search results obtained through the use of PoP (Publish or Perish) indicate that the articles under investigation have received a total of 147 citations from a sample of 200 journals examined, spanning the period from 2018 to 2023. Table 1 displays the articles with the greatest number of citations.

Table 1. Top Articles List

No.	Cites	Authors	Title	Year	ECC	Cites Per Year	Cites Per Author
1	26	Hamundu, FM, Husin, MH, Baharudin, AS, & Khaleel, M.	Intention to adopt cloud accounting: A conceptual model from Indonesian MSMEs perspectives	2020	26	8.67	9
2	26	Berto MW, Imam B., Syarifa H, Dewie SA, Aang K, Satria FP, Puti S., and Ninditya N.	Training and Assistance Model for Preparing Cloud-Based Financial Reports for MSME Players	2019	26	6.50	5
3	20	Nur Restu Amalia Salam & Syaiful Ali	Determining factors of cloud computing adoption: A Study of Indonesian Local Government Employees	2020	20	6.67	10
4	15	Yeney Widya Prihatiningtias, Maudina Rahma Wardhani	Understanding the effect of sustained use of cloud-based point of sales on SME performance during the COVID-19 pandemic	2021	15	7.50	8
5	14	Qurotul Aini, Anoesyirwan, and Yuliana	Effect of Cloud Accounting as Income Statement on Accountant Performance	2020	14	4.67	5
6	14	Faustina Gunadi, Septian Rheno Widianto	Comparison of Data Warehouse Cloud Computing Using Conventional-Based Cryptography	2020	14	4.67	7
7	12	Andi Setiawan, P Praptiningsih, N Matondang	Literature study about cloud accounting	2020	12	4.00	4
8	5	Arief Fahrezi, Nadya Apriliani, Nur Ajijah, and Didi Juardi	Data and Transaction Security in Utilizing Cloud as a Service	2022	5	5.00	1
9	4	Sulina Zebua and Rindang Widuri	Analysis Of Factors Affecting Adoption Of Cloud Accounting In Indonesia	2023	4	4.00	2
10	4	Titis Wahyuni	Why Should MSMEs Adopt Accounting Applications with Cloud Computing? The Reality of MSMEs in Depok, West Java	2018	4	0.80	4

The table provides a concise overview of ten scientific articles concerning the adoption of Cloud Accounting in Indonesia. It includes details such as the number of citations (Cites), author, article title, year of publication, citations per year (Cites Per Year), and citations per author (Cites Per Author). The article titled "Intention to Adopt Cloud Accounting: A Conceptual Model from Indonesian MSMEs Perspectives" authored by Hamundu, Husin, Baharudin, and Khaleel in 2020, garnered a total of 26 citations, averaging 8.67 citations per year and 9 citations per author. The article titled "Training and Assistance Model for Preparing Cloud-Based Financial Reports for MSME Players" authored by Berto, Imam, Syarifa, Dewie, Aang, Satria, Puti, and Ninditya in 2019, garnered 26 citations. This translates to an average of 6.50 citations per year and 5 citations per author. Additional data illustrates the quantity and dispersion of references for other articles, offering an insight into the influence and prevalence of each article within the scholarly literature. The examination of this table offers a comprehensive understanding of the individual articles' impact on research in the field of Cloud Accounting in Indonesia within the specified time frame.

The researchers obtained a total of 165 articles from their analysis. The subsequent step involved utilizing VOSViewer software to visually explore the 147 articles. Bibliometric approaches can be used to quantify changes and shifts in knowledge domains within this context. Knowledge mapping, a visualization technique in the field of bibliometrics, enables researchers to comprehend the structure and patterns within a scientific domain. Furthermore, the adoption of cloud accounting in Indonesia through the binary approach yields a total of 635 terms or words, with a requirement of at least two instances for each word. Subsequently, a total of 66 words that satisfied the criteria for relevance were chosen, and subsequently categorized into 4 clusters that were deemed pertinent.
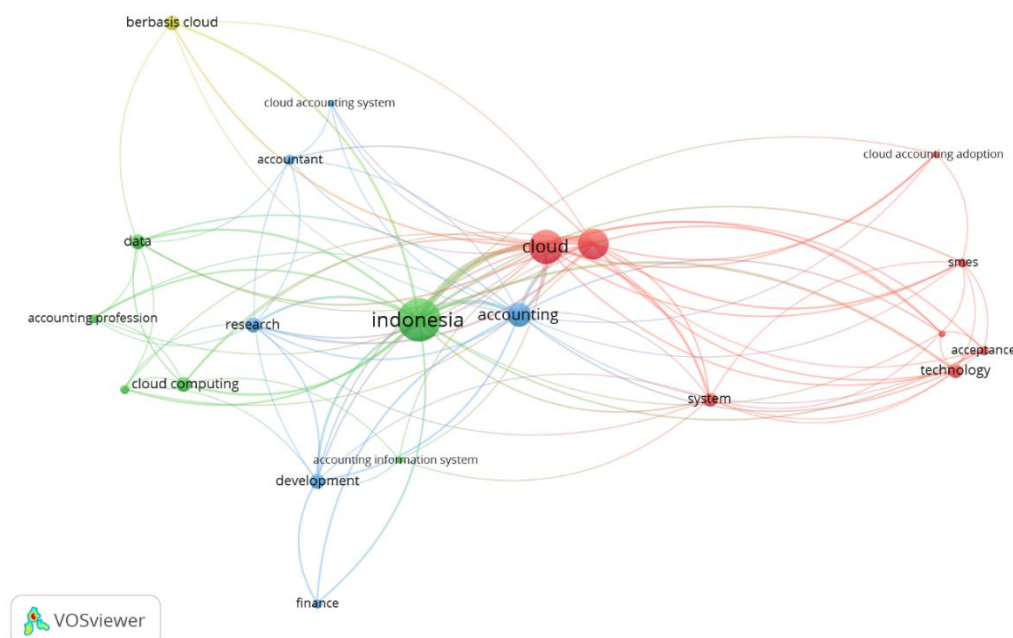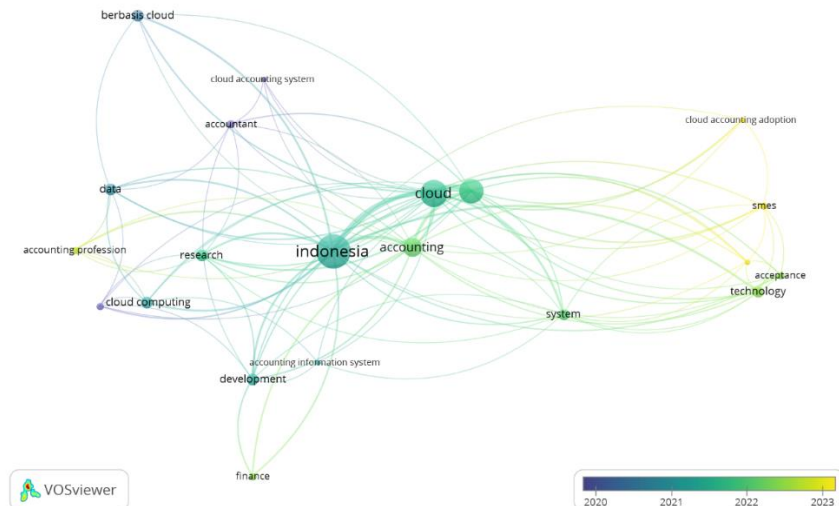

Figure 2. Network VisualizationImplementation of Cloud Accounting Indonesia
**Table 2**. Network Map ClusterImplementation of Cloud Accounting Indonesia based on Keywords

No.	Cluster Color	Keywords
1	Red	Cloud, System, Technology, Acceptance, SMES, Cloud Accounting Adoption, Financial Management, Cloud Accounting

2	Green	*Cloud Computing, Data, Indonesia, Accounting Profession, Accounting Information, Accounting Application*
3	Blue	*Accountant, Accounting, Cloud Accounting System, Development, Finance, Research*
4	Yellow	*Cloud-Based*

Figure 3. Overlay VisualizationImplementation of Cloud Accounting in Indonesia

In Figure 3 above, there is data about the keywords that appear along with the overlay visualization. The yellow area indicates keywords related to recent publications, indicating that the keywords cloud accounting adoption and SMES come from articles that were recently published, around 2023. This reflects changes in terms over time, where the keywords used to be related to Accountants and Accounting in 2020, have changed to focus on Cloud keywords.
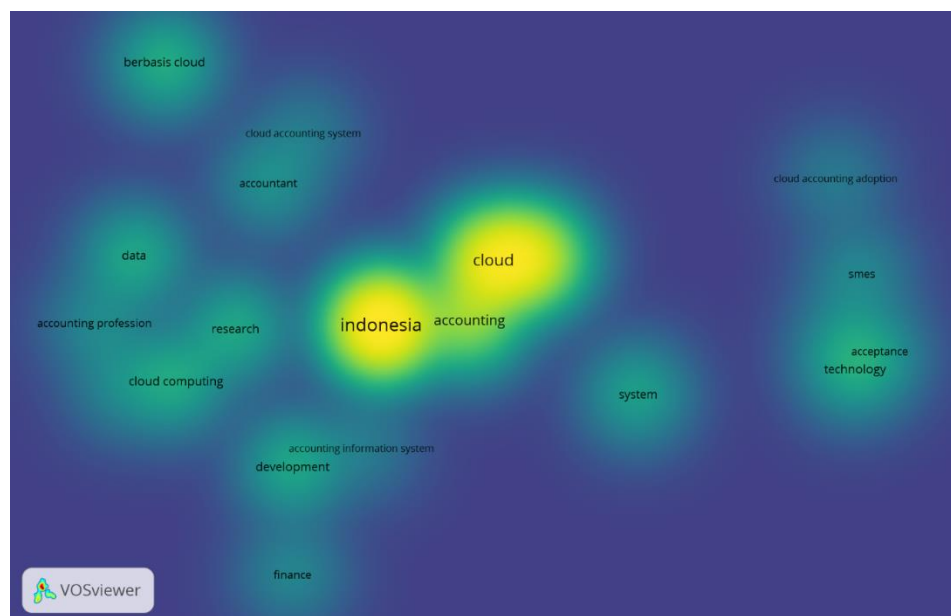
Figure 4. Density Visualization Startup Financing Model in Indonesia

The results from the VOSviewer software in Figure 4 show the level of density in research themes. In this image, the density of the research theme is marked in bright yellow. The brighter the colors of a theme, the more research has been done on that theme. Conversely, the duller the color of a theme, the less frequently it is researched. Themes with colors that

tend to be dull, such as "Cloud Computing," "Cloud Accounting System," "Cloud Accounting Adoption," "Accounting Profession," "Accounting Information System," "Development," "Finance," and "SMES, " are themes that have not yet been explored much in research. Therefore, these themes can be used as references for further research.

3.2. Discussion

The analysis of the findings from this study offers a comprehensive understanding of the patterns and changes in the adoption of Cloud Accounting in Indonesia from 2018 to 2023. This research examines the progression of publication numbers that indicate researchers' interest in a particular topic by gathering and analyzing data from Google Scholar. The initial image reveals a substantial and progressive growth in research interest over the years. In 2023, there will be a significant surge in research interest, with 53 publications, accounting for 36% of the total publications during that time. This study reinforces the assertion that Cloud Accounting is a crucial factor in the process of business transformation in Indonesia. Furthermore, there is a growing interest in research on this technology, as awareness of its significance increases.

Bibliometric analysis entails conducting in-depth exploration by utilizing the VOSViewer software. This analysis involves examining keywords extracted from the gathered articles to create clusters and uncover connections among research topics. The cluster visualization results reveal that the topics of "Cloud Computing," "Accounting Profession," and "Development" have not been extensively explored in research, suggesting the need for further investigation in these areas.

The overlay visualization emphasizes the shifts in research focus over time. The overlay image reveals a shift in the prominence of keywords in recent publications. Specifically, the terms "cloud accounting adoption" and "SMES" have gained more prominence, replacing the previous emphasis on keywords like "Accountant" and "Accounting" in 2020. This modification signifies the evolving requirements and preferences of researchers, as well as the adjustment to the most recent advancements and trends in the Cloud Accounting field.

Furthermore, by employing density visualization, it was discovered that there exist several research areas that have not yet received extensive investigation, including "Cloud Computing," "Cloud Accounting Systems," and "Accounting Information Systems." These themes present substantial research prospects for further exploration, considering the limited research intensity in this context.

In summary, this research offers a comprehensive and intricate comprehension of the adoption of Cloud Accounting in Indonesia. These findings are beneficial not only for academics and researchers in this field but also for business practitioners and policymakers. They offer valuable insights for adopting Cloud Accounting technology to enhance operational efficiency and effectiveness across various industrial sectors in Indonesia.

4. Conclusion

This study delves into the comprehensive analysis of the trajectory of publications pertaining to the adoption of Cloud Accounting in Indonesia, spanning from 2018 to 2023. The data we obtained from Google Scholar indicates a substantial increase in researchers' inclination toward this subject. The upward trend in the number of publications over the years, reaching its highest point in 2023 with 147 publications, provides evidence of the growing significance of Cloud Accounting in the Indonesian business landscape. Our

bibliometric analysis, which involved utilizing VOSViewer software for visualization, unveiled distinct patterns in research emphasis throughout the given timeframe. The results of our research emphasize the evolving patterns in keyword usage, indicating a departure from conventional terms like "Accountant" towards a more targeted emphasis on "Cloud Accounting Adoption" and "SMES." In addition, we have discovered themes that have not been thoroughly explored yet, such as "Cloud Computing" and "Cloud Accounting Systems," which suggest promising prospects for future research.

This study highlights the importance and necessity of gaining a deeper understanding of the consequences and significance of implementing Cloud Accounting in Indonesia. Given the rapid growth of this technology, it is crucial to conduct ongoing research and development to facilitate sustainable business transformation in the digital age. These findings establish a crucial basis for future researchers, business practitioners, and policymakers to delve deeper into the complete capabilities of Cloud Accounting in enhancing accounting systems and enhancing business performance in Indonesia.

References

Aini, Q., Anoesyirwan, A., & Ana, Y. (2019). Effect of Cloud Accounting as Income Statement on Accountant Performance. Aptisi Transactions on Management (ATM), 4(1), 13–21. https://doi.org/10.33050/atm.v4i1.920

Deswanto, SEV (2021). Monograph: Cloud Accounting User Performance. books.google.com. https://books.google.com/books?hl=en&lr=&id=_fBEEAAAQBAJ&oi=fnd&pg=PP1&dq=cloud+accounting+di+indonesia&ots=5S-tOkHbdd&sig=xYs-4M6atG-_ZQwKMhjaiUKNSzc

Dewiyanti, S., & Wijaya, W. (2022). (SAKU) MSME Accounting System: Simple Cloud Accounting System Model as a Strategy for Optimizing Preneur Village Development. … National Seminar on Accounting …. http://conference.um.ac.id/index.php/nsafe/article/view/2349

Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & … (2021). How to conduct a bibliometric analysis: An overview and guidelines. Journal of Business…. https://www.sciencedirect.com/science/article/pii/S0148296321003155

Fahrezi, A., Apriliani, N., Ajijah, N., & Juardi, D. (2022). Data and Transaction Security in Utilizing Cloud as a Service. Journal of Education and Counseling, 4(4).

Farida, N. (2022). Application of Utaut on Interest in Using Cloud Accounting Applications in MSMEs in the Fashion Creative Economy Sector in the City of Yogyakarta. … Cloud Accounting in the MSME Sector …. http://eprints.mercubuana-yogya.ac.id/id/eprint/17361/

Gunadi, F., & Widianto, SR (2020). National Seminar on Computer Technology & Science (SAINTEKS) Comparison of Data Warehouse Cloud Computing Using Conventional-Based Cryptography (LIKMI College of Information and Computer Management, Ed.). National Seminar on Computer Technology & Science (SAINTEKS).

Hamundu, FM, Husin, MH, Baharudin, AS, & Khaleel, M. (2020). Intention to Adopt Cloud Accounting: A Conceptual Model from Indonesian MSMEs Perspectives. The Journal of Asian Finance, Economics and Business, 7(12), 749–759. https://doi.org/10.13106/jafeb.2020.vol7.no12.749

Hasibuan, R., Ilyas, M., Hertati, L., Saputra, E., Lestari, BAH, & ... (2023). Accounting System. books.google.com. https://books.google.com/books?hl=en&lr=&id=ReGlEAAAQBAJ&oi=fnd&pg=PA1&dq=cloud+accounting+di+indonesia&ots=wtf0s-a2Wz&sig=yB9--INqKJ0_319ukPU9vCl5WnY

KHARISMA, D. (2022). Determinants of MSMEs' Interest in Using Cloud Accounting in Yogyakarta. dspace.uii.ac.id. https://dspace.uii.ac.id/handle/123456789/39011

Pradesa, E., Syahrani, T., & Sakti, RE (2023). Digital Transformation Adoption of Software as a Service Cloud Accounting Services by MSMEs. ECOMBIS REVIEW: Journal…. https://jurnal.unived.ac.id/index.php/er/article/view/3949

Prihatiningtias, YW, & Wardhani, MR (2021). Understanding the effect of sustained use of cloud-based point of sales on SME performance during the COVID-19 pandemic. The Indonesian Accounting Review, 11(1), 33–46.

Rahmania, D., & Heriyani, FE (2019). Effectiveness of Preparing Financial Reports Using Sleekr Accounting. Progress…. http://proceedings.itbwigalumajang.ac.id/index.php/progress/article/view/198

Salam, NRA, & Ali, S. (2020). Determining factors of cloud computing adoption: A study of Indonesian local government employees. Journal of Accounting and Investment, 21(1), 312–333.

Setiawan, A., Darmastuti, D., Maulana, A., & ... (2022). Financial Reporting Training Using Cloud-Based Applications for MSME Actors in Cipayung District. E-Amal: Journal…. https://stp-mataram.e-journal.id/Amal/article/view/1584

Setiawan, A., Praptiningsih, P., & Matondang, N. (2020). Literature Study on Cloud Accounting. EQUITY, 23(2), 189–200. https://doi.org/10.34209/equ.v23i2.2236

Thomas, T. (2021). Risk Frequency in Cloud Accounting and Risk Mitigation Strategy. repository.podomorouniversity.ac.id. http://repository.podomorouniversity.ac.id/id/eprint/456

Wahyuni, T. (2018). Why Should MSMEs Adopt Accounting Applications with Cloud Computing? The Reality of MSMEs in Depok, West Java. KnE Social Sciences, 3(11), 1399. https://doi.org/10.18502/kss.v3i11.2858

Wibawa, BM, Baihaqi, I., Hanoum, S., Ardiantono, DS, Kunaifi, A., Persada, SF, Sinansari, P., & Nareswari, N. (2019). Training and Assistance Model for Preparing Cloud-Based Financial Reports for MSME Players. In Journal of Community Service-LPPM ITS (Vol. 3, Issue 3).

Winda, J. (2020). Determinants of MSME Actors on the Shopee Marketplace in Using Cloud Accounting. scholar.unand.ac.id. http://scholar.unand.ac.id/59197/

Wiyanto, H. (2023). Intention to Use Cloud Accounting Systems among SMEs in Indonesia: Conceptual Framework of the Unified Theory of Acceptance and Use of Technology (UTAUT …. Labs: Business and Management Journal. https://labora.ac.id/ojs/index.php/bisnis /article/view/48

Xu, Z., Wang, X., Wang, X., & Skare, M. (2021). A comprehensive bibliometric analysis of entrepreneurship and crisis literature published from 1984 to 2020. Journal of Business Research. https://www.sciencedirect.com/science/article/pii/S0148296321004616

Zebua, S., & Widuri, R. (2023). Analysis Of Factors Affecting Adoption Of Cloud Accounting In Indonesia. Journal of Theoretical and Applied Information Technology, 101(1), 89–105.

Zebua, S., & Widuri, R. (2023). Analysis Of Factors Affecting Adoption Of Cloud Accounting In Indonesia. Journal of Theoretical and Applied Information Technology, 101(1), 89–105.