

Evolution and Dynamics of Technology Based Accounting Information: A Bibliometric Study

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Article Info

Article history:

Received April, 2024

Revised April, 2024

Accepted April, 2024

Keywords:

Technology-based accounting information systems
bibliometric analysis
VOSViewer

ABSTRACT

This bibliometric study delves into the evolution and dynamics of technology-based accounting information systems (AIS), exploring the intersection of technological advancements and accounting practices. The integration of technology in accounting has catalyzed significant transformations, reshaping how financial data is managed, analyzed, and reported. Through a comprehensive analysis of 780 publications spanning from 1977 to 2024, this research uncovers key trends, influential works, and emerging themes in the field of technology-based AIS. Utilizing bibliometric techniques such as co-citation analysis and network visualization, the study provides insights into the collaborative landscape, thematic clusters, and temporal trends within the domain of technology-based AIS research. The findings shed light on the evolution of AIS research, highlighting the increasing relevance of emerging technologies such as artificial intelligence and blockchain, while also identifying potential areas for future investigation.

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1. INTRODUCTION

In the contemporary landscape of business, technology has become an indispensable force driving transformation across various sectors, notably in the realm of accounting information systems [1], [2]. The integration of technology in accounting practices has not only streamlined processes but also revolutionized the way financial data is collected, analyzed, and reported [3], [4]. This evolution has led to a significant shift in the dynamics of accounting information, prompting researchers and practitioners alike to delve deeper into understanding its trajectory and implications [5].

The advent of technology-based accounting information systems marks a

pivotal moment in the history of accounting, promising efficiency, accuracy, and accessibility like never before [5]. From the introduction of basic software for bookkeeping to the emergence of sophisticated artificial intelligence-driven platforms, the journey of technological evolution in accounting has been both rapid and transformative [6], [7]. Such advancements have not only empowered organizations to enhance their financial reporting capabilities but have also raised pertinent questions regarding the implications of these technologies on traditional accounting practices and the broader financial ecosystem [8], [9].

Despite the strides made in integrating technology into accounting practices, there remain gaps in our understanding of the evolutionary patterns and dynamics shaping technology-based accounting information systems [5], [10]–[13]. This lacuna underscores the need for comprehensive bibliometric studies to map the landscape of research in this domain, identify key trends, and ascertain the trajectory of scholarly inquiry. By conducting an in-depth analysis of existing literature, this research endeavors to address critical research gaps, thereby contributing to a more nuanced understanding of the evolution and dynamics of technology-based accounting information systems.

Amidst the rapid proliferation of technology-based solutions in accounting, there exists a pressing need to systematically examine the body of literature surrounding this phenomenon. The sheer volume of research output makes it challenging for scholars and practitioners to discern key trends, identify seminal works, and understand the overarching themes shaping the evolution of technology-based accounting information systems. Consequently, there is a pronounced gap in our knowledge regarding the dynamics driving this evolution, necessitating a focused bibliometric study to unravel the complexities inherent in this domain.

The primary objective of this research is to conduct a comprehensive bibliometric analysis of the literature pertaining to technology-based accounting information systems. By employing bibliometric techniques, the study aims to delineate the evolutionary trajectory of research in this field, identify influential works and authors, and discern emerging trends and research gaps. Through this endeavor, the research seeks to contribute to a deeper understanding of the evolution and dynamics of technology-based accounting information systems, thereby informing future research agendas and practical applications in the realm of accounting and finance.

This research holds significant implications for both academia and practice in

the domain of accounting information systems. By providing a systematic overview of the existing literature, the study offers valuable insights into the evolution and dynamics of technology-based accounting information systems. These insights can inform researchers about the prevailing trends, gaps, and opportunities for further inquiry, while also guiding practitioners in leveraging technology to enhance their accounting processes and financial reporting practices. Ultimately, the findings of this research are poised to catalyze advancements in both scholarly discourse and practical applications, driving innovation and efficiency in accounting practices in the digital age.

2. LITERATURE REVIEW

Technology-based Accounting Information Systems (AIS) leverage advancements like data visualization, Blockchain, IoT, Cloud Accounting, and Big Data to enhance accounting processes [9], [14], [15]. These systems aid in managing finances, preparing reports, and integrating business data, ultimately improving business efficiency [16]. They also play a crucial role in decision-making by providing relevant and quality information for optimal resource allocation and utilization [17]. In the context of small accounting firms, emerging technologies challenge and reconfigure the co-production of accounting services, influencing relationships between accountants and clients. The adoption and application of AIS, especially in developing countries like India, can lead to resource mobilization, sustainable development, and digital objectives. Overall, technology-based AIS offer opportunities for enhanced management, decision-making, and service provision in the accounting domain.

3. METHODS

3.1 Data Collection

The data for this bibliometric study will be sourced from scholarly databases such as Crossref and Google Scholar. These databases offer comprehensive coverage of peer-reviewed journals, conference

proceedings, and scholarly publications in the field of accounting information systems. The search will be conducted using relevant keywords and phrases such as "technology-based accounting information systems," "digital accounting," and "information technology in accounting." Additionally, Boolean operators will be employed to refine the search queries and ensure the inclusion of relevant literature

3.2 Inclusion Criteria

The inclusion criteria for selecting studies will be defined to ensure the relevance and quality of the data. Only peer-reviewed articles, conference papers, and review papers published in English will be considered for inclusion. Moreover, studies must explicitly focus on technology-based accounting information systems or related topics such as digital accounting, accounting software, and information technology in accounting. Publications dating from 1977-2024 will be included to capture recent developments and trends in the field.

3.3 Data Analysis

Bibliometric analysis will be conducted to analyze the retrieved literature systematically. The selected publications will be imported into bibliometric software such as VOSviewer for analysis. Bibliometric techniques, including co-citation analysis, bibliographic coupling, and co-authorship analysis, will be employed to identify patterns, relationships, and trends within the literature. Visualization techniques such as co-citation maps and network analysis will be utilized to illustrate the interconnections among authors, journals, and research themes.

3.4 Metrics

Various bibliometric indicators will be utilized to assess the impact and significance of publications within the field. Key metrics such as citation counts, h-index, and journal impact factors will be analyzed to evaluate the influence and visibility of individual studies and journals. Additionally, co-citation analysis will be employed to identify seminal works and influential authors within the field. By employing these metrics, the study aims to provide a

comprehensive overview of the scholarly landscape surrounding technology-based accounting information systems.

4. RESULTS AND DISCUSSION

4.1 Data Metrics

Table 1. Research Data Metrics

| | |
|-------------------------------------|---------------------|
| Publication years: | 1977-2024 |
| Citation years: | 47 (1977-2024) |
| Papers: | 780 |
| Citations: | 146363 |
| Cites/year: | 3114.11 |
| Cites/paper: | 187.64 |
| Cites/author | 83316.15 |
| Papers/author | 423.50 |
| Authors/paper: | 2.34 |
| h-index: | 185 |
| g-index: | 352 |
| hI,norm: | 131 |
| hi,annual: | 2.79 |
| hA-index: | 50 |
| Papers with ACC \geq 1,2,5,10,20: | 771,746,582,395,191 |

Source: Publish or Perish Output, 2024

This table provides key bibliometric metrics summarizing the scholarly output and impact of publications in the field of technology-based accounting information systems from 1977 to 2024. Over this period, a total of 780 papers were published, accumulating a remarkable 146,363 citations, with an average of 187.64 citations per paper. The citations per year stand at an impressive 3,114.11, reflecting the sustained interest and impact of research in this domain over time. The h-index, a widely used measure of research impact, is calculated at 185, indicating that 185 papers have each received at least 185 citations. Additionally, the g-index, a variation of the h-index considering the distribution of citations across papers, is determined to be 352. These metrics underscore the significant scholarly contribution and influence of research in technology-based accounting information systems. Furthermore, the table provides insights into the collaboration dynamics within the field, with an average of 2.34 authors per paper and an average of 423.50

papers per author, highlighting the collaborative nature of research endeavors in this interdisciplinary domain. Finally, the distribution of papers based on their citation counts (ACC) demonstrates the impact threshold for various levels of scholarly recognition, with the majority of papers receiving at least one citation and a substantial

proportion achieving higher levels of citation impact. Overall, these metrics provide a comprehensive overview of the scholarly landscape and impact of research in technology-based accounting information systems, affirming its significance and influence in academia and beyond.

4.2 Top Cited Documents

Table 2. Top Cited Documents

| Citation | Authors | Title |
|----------|---------|--|
| 7651 | [18] | Cost accounting: A managerial emphasis, 13/e |
| 2912 | [19] | INFORMATION TECHNOLOGY FOR MANAGEMENT, (With CD) |
| 2865 | [20] | Measure costs right: make the right decisions |
| 2752 | [21] | The Concept of Information Overload-A Review of Literature from Organization Science, Accounting, Marketing, MIS, and Related Disciplines (2004) The Information ... |
| 2728 | [22] | The stock market valuation of research and development expenditures |
| 2481 | [23] | Accounting Information Systems Australasian Edition |
| 2460 | [24] | Value-relevance of nonfinancial information: The wireless communications industry |
| 1810 | [25] | VAIC™—an accounting tool for IC management |
| 1791 | [26] | Information technology effects on firm performance as measured by Tobin's q |
| 1769 | [27] | Accounting information systems |

Source: Publish or Perish Output

4.3 Network Visualization of Themes

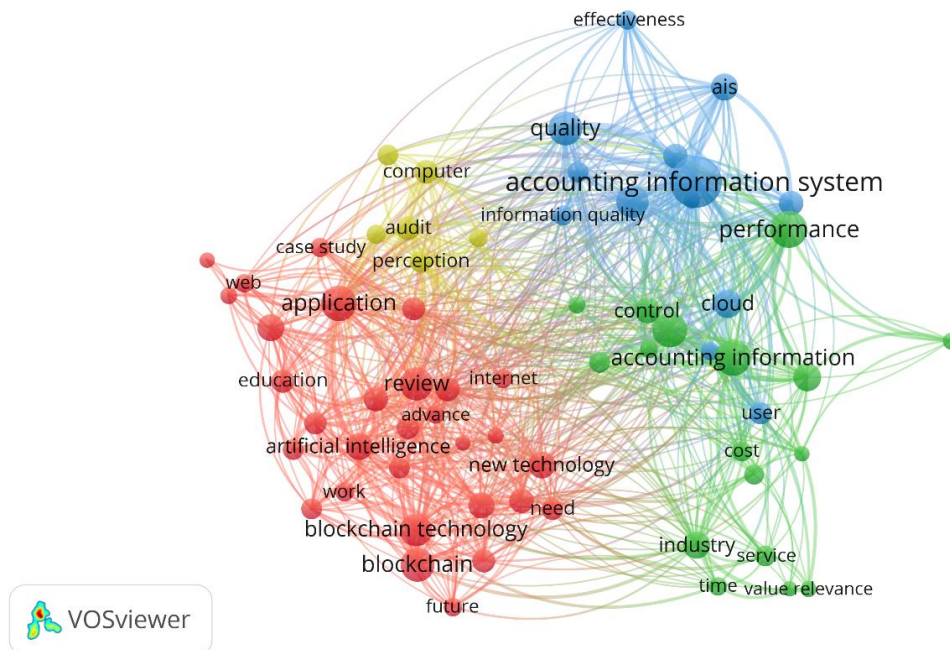


Figure 1. Thematical Clusterization
Source: Data Analysis Result, 2024

In this network visualization, each node (circle) represents a unique term, and the lines between the nodes (edges) represent the strength of the relationship between the terms, often based on co-occurrence in the literature. The size of each node often indicates the frequency of the term's occurrence, while the colors typically represent different thematic clusters or groups of closely related terms. From the figure, we can discern several clusters, each corresponding to a different thematic area.

1. **Red Cluster:** This seems to focus on the application of new technology in different areas like education, web, case study, blockchain, artificial intelligence, and future. The prominence of terms such as "application," "education," "blockchain," and "artificial intelligence" suggests a focus on the practical uses of emerging technologies in various fields.
2. **Green Cluster:** This cluster includes terms related to accounting information systems, such as "accounting information," "cost," "user," "industry," "service," and "cloud." This implies a focus on the

financial and user aspects of information systems, possibly exploring the economic and practical impact of these systems in businesses.

3. **Blue Cluster:** Central terms here are "accounting," "information system," "quality," "performance," and "control." This cluster seems to revolve around the quality and performance aspects of information systems in accounting, including their design, implementation, and audit.
4. **Yellow Cluster:** Contains terms like "computer," "internet," "review," "advance," and "new technology." This could indicate a focus on the technological advancements and reviews of computer-related technologies and the Internet.
5. **Connecting Terms:** The terms that have connections across clusters, such as "information quality" and "effectiveness," suggest overarching themes that are relevant across different areas of research within this field.

4.4 Overlay Visualization

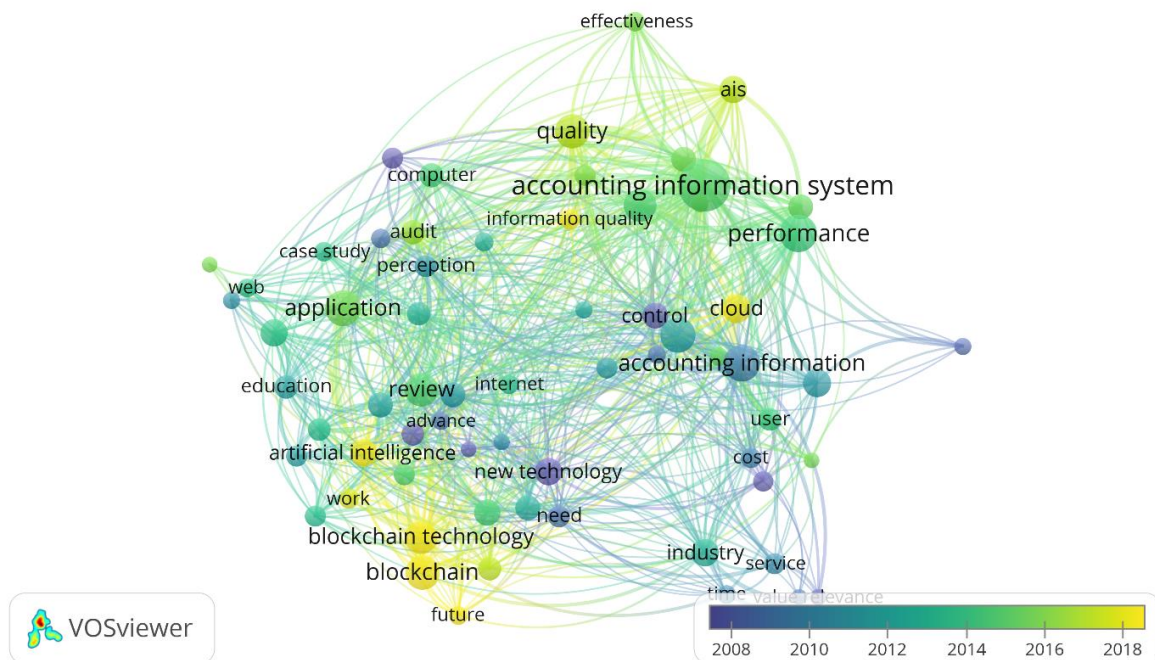


Figure 2. Overlay Visualization
Source: Data Analysis Result, 2024

The figure 2 above seems to be another bibliometric network visualization, which in this case includes a temporal overlay indicated by the color gradient at the bottom of the image. This gradient represents the years in which the research relating to the terms was published. In such visualizations, the color of each term node corresponds to the average year of publication of papers in which that term appears. The terms with a blue or purple hue correspond to topics that were more prevalent in earlier years, indicated by the beginning of the color gradient scale (around 2008). These might be foundational topics or technologies that were highly relevant in the past but have since become established and are no longer at the forefront of current research. These terms are colored in various shades of green, which indicates that they correspond to research that is more central in the timeline (approximately around 2010-2014). These could be topics that have seen sustained interest over the years or that have developed over time. Terms that appear in yellow correspond to the most recent research trends (towards 2018). These are the hot topics or emerging technologies and ideas that have been gaining attention in the latest research.

With the terms "artificial intelligence" and "blockchain" showing up in green and

yellow, it indicates these areas have been of growing interest in more recent years and are likely to be current hot topics. The central cluster with terms like "accounting information system," "quality," and "performance" show varying colors, suggesting sustained interest and development over a range of years. However, terms like "cloud" appearing in yellow-green suggest a more recent focus on the intersection of cloud computing and accounting systems. Terms such as "web," "review," "advance," and "internet" appear in a range of colors from blue to yellow, indicating ongoing research interest and evolving studies over the years. The blue and green nodes in this area suggest that these were key topics in the earlier years but have likely evolved as the technology has matured.

Based on this visualization, one could conclude that while foundational concepts in technology and its applications have been established for some time (evidenced by the blue and green nodes), there is a notable trend towards increasing focus on the implications of newer technologies like AI and blockchain. These trends are typical of a field that is influenced by rapid technological advancements, where newer concepts quickly become central to research and discussion.

Heatmap of Term

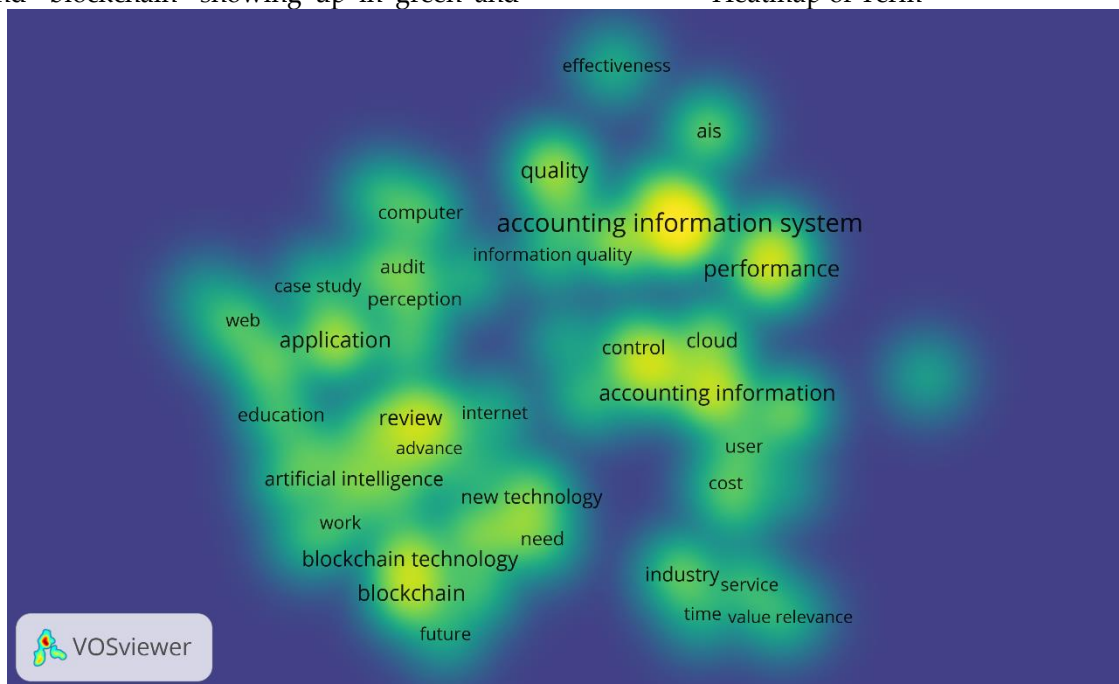


Figure 3. Density Visualization

Source: Data Analysis Result, 2024

In density visualizations, the brighter areas typically represent topics that have been extensively researched or that have a strong presence in the literature, reflecting common or well-established areas of study. Conversely, the less bright or darker areas could represent emerging topics, niche areas, or gaps in the literature that may offer opportunities for future research. From the image, the less bright areas (shown in darker blue) may indicate future research opportunities or under-explored topics in the field.

1. Blockchain and Future: The terms "blockchain" and "future" appear in a darker region, suggesting that while there is some established research, there may be new and unexplored aspects of blockchain technology, especially concerning future developments, that could represent a fertile ground for future studies.
2. New Technology and Review: The term "new technology" is in a darker

zone, indicating potential for more in-depth research into the latest technological advancements. Similarly, the term "review" may suggest an opportunity for systematic reviews or meta-analyses in areas that have not been fully synthesized in the literature.

3. Artificial Intelligence and Work: The terms "artificial intelligence" and "work" also appear in a darker shade, which might signal an opening for more studies on the impact of AI on the workforce or how AI is transforming various industries and professions.
 4. Case Study and Perception: Located in a less bright area, these terms might point to a need for more qualitative research or case studies to better understand perceptions of technology, particularly in fields that have not been as heavily explored.
- Author Collaboration

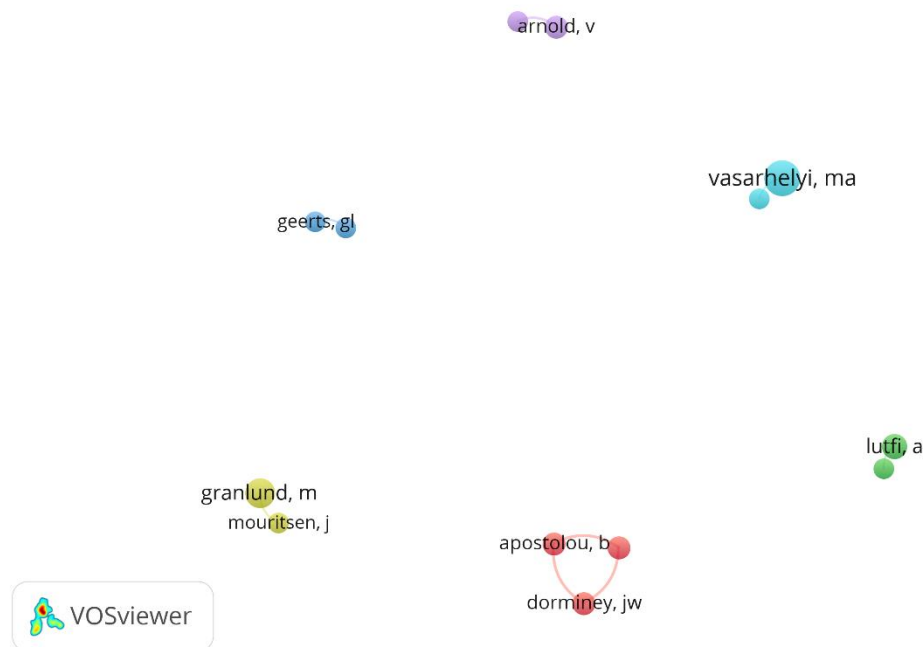


Figure 4. Author Collaboration Network
Source: Data Analysis Result, 2024

The figure seems to depict a co-authorship network, which is a type of visualization that shows the collaborative

relationships between researchers based on joint publications. Nodes (circles) represent individual authors. The size of a node may

indicate the number of publications or the level of involvement of an author within the network. Edges (lines), which are absent in this case, would normally connect authors who have co-authored works, and the thickness of these lines might represent the number of publications co-authored. Colors of nodes often represent different clusters or groups of authors who are closely connected through collaboration.

5. CONCLUSION

The series of visualizations from VOSviewer offer a multifaceted view of a particular field of academic research. The first visualization presents a thematic clustering of topics, highlighting how concepts like artificial intelligence, blockchain, and accounting information systems are interconnected within the research landscape. The second visualization introduces a

temporal layer, revealing how the prominence of these topics has evolved over time, with more recent trends favoring cloud technology and the practical applications of AI. The third visualization identifies the density of research, where the less illuminated areas suggest potential for future investigation, particularly in emerging or under-represented areas such as the implications of new technology in work and education. Lastly, the fourth visualization purports to depict a collaboration network, but the absence of visible connections between researchers suggests a lack of collaborative ties within the dataset or a possible visualization error. Together, these visualizations underscore a dynamic and evolving research field, marked by the advent of transformative technologies and a potential undercurrent of isolated or non-collaborative research activity.

REFERENCES

- [1] R. Pura, "Effects of Auditor Competence, Information Technology, Accounting Information Systems and Organizational Commitment on Auditors' Performance at The State Audit Agency, In South Sulawesi," *Sci. Res. J.*, vol. 5, pp. 16–22, 2017.
- [2] S. Supriyadi, S. Mulyani, H. Suharman, and T. Supriadi, "The Influence of Business Models, Information Technology on the Quality of Accounting Information Systems Digitizing MSMEs Post-COVID-19," *J. Sist. Inf.*, vol. 18, no. 2, pp. 36–49, 2022.
- [3] A. Othman and L. Owen, "Adopting and measuring customer service quality (SQ) in Islamic banks: a case study in Kuwait finance house," *Int. J. Islam. Financ. Serv.*, vol. 3, no. 1, pp. 1–26, 2001.
- [4] S. Bawaneh, "Securing Information Technology for Banks and Accounting Information Systems," *Int. J. Appl. Eng. Res.*, vol. 13, no. 6, pp. 3291–3300, 2018.
- [5] M. Al-Okaily, A. F. Alkhwaldi, A. A. Abdulmuhsin, H. Alqudah, and A. Al-Okaily, "Cloud-based accounting information systems usage and its impact on Jordanian SMEs' performance: the post-COVID-19 perspective," *J. Financ. Report. Account.*, vol. 21, no. 1, pp. 126–155, 2023.
- [6] D. H. Syah and A. El Karen, "An Analysis of Determinants Of E-Commerce-Based Accounting Information Systems Adoption on the Performance of Millennial MSME in Medan City," *J. Ekon. Bisnis Dan Kewirausahaan*, vol. 11, no. 2, pp. 179–196, 2022.
- [7] T. Erawati, S. Ayem, and R. A. Tahu, "The Influence Of Personal Engineering Capabilities, Education And Training, And The Advance Of Information Technology On The Effectiveness Of Accounting Information Systems (Case Study On Msmes In Yogyakarta)," *J. Ilmu Manaj. Profitab.*, vol. 6, no. 1, pp. 116–121, 2022.
- [8] P. Q. Huy and V. K. Phuc, "Accounting information systems in public sector towards blockchain technology application: the role of accountants' emotional intelligence in the digital age," *Asian J. Law Econ.*, vol. 12, no. 1, pp. 73–94, 2021.
- [9] A. Najafi, S. Soleimanpur, and Z. Morady, "The Impact of Information Technology Methods on Accounting Information Quality: Empirical Evidence From Iran," *J. Inf. Organ. Sci.*, vol. 46, no. 1, pp. 63–77, 2022.
- [10] D. G. Abraham, G. M. Dolan, G. P. Double, and J. V Stevens, "Transaction security system," *IBM Syst. J.*, vol. 30, no. 2, pp. 206–229, 1991.
- [11] J. E. B. Neto and R. D. Colauto, "INSTITUTIONAL THEORY: A BIBLIOMETRIC STUDY IN ANNALS OF CONGRESS AND SCIENTIFIC JOURNALS," in *7^o CONTECSI-International Conference on Information Systems and Technology Management*, 2015.
- [12] N. H. Sophia, "The influence of e-commerce business developments and technology-based accounting information systems on the need for e-commerce audit services," *Indones. Account. Res. J.*, vol. 10, no. 4, pp. 112–120, 2023.
- [13] B. Santoso, T. Hikmawan, and N. Imaniyati, "Management information systems: bibliometric analysis and its effect on decision making," *Indones. J. Sci. Technol.*, vol. 7, no. 3, pp. 583–602, 2022.
- [14] B. L. Handoko, J. Enrico, and Raymond, "Factors That Influence MSMEs to Adopt Technology-Based Accounting

- Information Systems," in *Proceedings of the 2023 7th International Conference on E-Commerce, E-Business and E-Government*, 2023, pp. 203–207.
- [15] R. Zheng, "Construction Research of Accounting Information System Based on Data Visualization Technology," in *Proceedings of the International Conference on Information Economy, Data Modeling and Cloud Computing, ICIDC 2022, 17-19 June 2022, Qingdao, China*, 2022.
- [16] A. Mir and M. Naskar, "Accounting Information System in Digital India and its Applicability in Resource Mobilization," *Adv. Bus. Informatics Empower. by AI Intell. Syst.*, pp. 34–47, 2023.
- [17] G. Jemine, F.-R. Puyou, and F. Bouvet, "Technological innovation and the co-production of accounting services in small accounting firms," *Accounting, Audit. Account. J.*, vol. 37, no. 1, pp. 280–305, 2024.
- [18] C. T. Horngren, *Cost accounting: A managerial emphasis*, 13/e. Pearson Education India, 2009.
- [19] E. Turban, D. Leidner, E. McLean, and J. Wetherbe, *INFORMATION TECHNOLOGY FOR MANAGEMENT, (With CD)*. John Wiley & Sons, 2008.
- [20] R. Cooper and R. S. Kaplan, "Measure costs right: make the right decisions," *Harv. Bus. Rev.*, vol. 66, no. 5, pp. 96–103, 1988.
- [21] M. J. Eppler and J. Mengis, "The Concept of Information Overload-A Review of Literature from Organization Science, Accounting, Marketing, MIS, and Related Disciplines (2004) The Information Society: An International Journal, 20 (5), 2004, pp. 1–20," *Kommun. im Wandel Beiträge aus 10 Jahren= mcminstitute*, pp. 271–305, 2008.
- [22] L. K. C. Chan, J. Lakonishok, and T. Sougiannis, "The stock market valuation of research and development expenditures," *J. Finance*, vol. 56, no. 6, pp. 2431–2456, 2001.
- [23] M. Romney, P. Steinbart, J. Mula, R. McNamara, and T. Tonkin, *Accounting Information Systems Australasian Edition*. Pearson Higher Education AU, 2012.
- [24] E. Amir and B. Lev, "Value-relevance of nonfinancial information: The wireless communications industry," *J. Account. Econ.*, vol. 22, no. 1–3, pp. 3–30, 1996.
- [25] A. Pulic, "VAIC™—an accounting tool for IC management," *Int. J. Technol. Manag.*, vol. 20, no. 5–8, pp. 702–714, 2000.
- [26] A. S. Bharadwaj, S. G. Bharadwaj, and B. R. Konsynski, "Information technology effects on firm performance as measured by Tobin's q," *Manage. Sci.*, vol. 45, no. 7, pp. 1008–1024, 1999.
- [27] J. A. Hall, *Accounting information systems*. South-Western Cengage Learning, 2011.