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(Research) Article

Blockchain Auditing in the Last Decade: A Bibliometric Analysis of Global Research Trends

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Abstract: The usage of blockchain has increased around the world over the years. It has become widely used in various sectors that need transparency, such as accounting, business, and auditing. Blockchains are gaining more popularity after being applied as a system for digital asset ownership, such as cryptocurrency and NFTs (Non-Fungible Tokens). This growing trend of blockchain is followed by the increasing trend of research regarding it in the last decade. Blockchain has the potential to revolutionize the auditing sector and enhance economic accountability due to its decentralized system. Therefore, research regarding blockchain applications in auditing is becoming an important topic. This study adopts a qualitative approach by using datasets retrieved from the Scopus website, from the search result of blockchain auditing, with a total of 1228 articles that were published in the last decade (2015-2025). Furthermore, this study also uses several software programs as data processing tools, such as R Studio, VOSViewer, and Publish or Perish. This study aims to understand the research trend regarding blockchain auditing in the last decade and highlight its implications for the auditing and economic sectors.

Keywords: Accounting; Auditing; Blockchain; Economics; Financial.

1. Introduction

Blockchain has become a growing trend in the digital sector around the world over the past few years. It gains even more popularity after the trend of digital assets, such as cryptocurrency and NFTs (Non-Fungible Tokens). Furthermore, the COVID-19 pandemic forces the digital transformation in many sectors, including the auditing sector. This sudden and large digital transformation increases the popularity of the blockchain even more. Blockchain is a term that refers to a chain of blocks that store information with digital signatures in a decentralized and distributed network, which makes transactions more secure (Monrat et al., 2019). It allows users to make and verify transactions immediately without the need for a central authority (Niranjanamurthy et al., 2019).

Blockchain is widely used in various sectors that need transparency, one of which is the auditing sector. Audit is an economic term that refers to a process or activity that is established by the government or organization to store accounting and financial records of an organization (Milojević et al., 2018). It is performed to ensure the truth of the presented financial reports. Auditing is a labor-intensive work that requires a balance between efficiency and cost-effectiveness (Guo et al., 2025). This means that the auditing process requires many resources, such as labor, time, and costs. Blockchain has the potential to revolutionize the auditing sector due to its decentralized system (Guo et al., 2025). This increases the transparency of the financial reports and allows the auditing process to become more efficient.

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The application of blockchain in the auditing sector also supports achieving the Sustainable Development Goals (SDGs), especially SDG 8: Decent Work and Economic Growth. By increasing efficiency and reducing fraud in financial reporting, blockchain auditing can foster a fairer business environment and strengthen investor confidence. Companies that adopt transparent reporting systems are more likely to attract foreign investment and improve their competitiveness in global markets. This creates positive spillovers for job creation, productivity, and sustainable economic growth.

Globally, different areas have taken diverse approaches to blockchain auditing. The European Union has made investments in pilot projects and legal frameworks, such as investigating the use of blockchain technology in anti-fraud and tax reporting systems. China has invested heavily in blockchain technology for both public and private applications, such as supply chain transparency, tax audits, and customs declarations. Strong participation has also been seen in the US, particularly from big audit companies like the "Big Four," which have been experimenting with blockchain-based assurance services. Blockchain technology is still in its experimental stage and has not yet been widely adopted in poorer nations. This variation in adoption between nations is a reflection of institutional capacity and regulatory backing in addition to variations in technology readiness.

The usage of blockchain in the auditing sector in Indonesia has not been widely applied in the public sector, like in other countries; it is mainly in the private sector, such as startups and private accounting or auditing firms. While in the public sector, the government shows an interest in blockchain applications for government procurement, tax, and registry audits, but the realization is still on hold. This lack of applications is most likely due to the lack of knowledge and skill of the auditors and other professionals regarding blockchain technology. The lack of detailed regulations regarding blockchain in Indonesia also adds to the reasons blockchain has not been widely adopted. The unclear regulation frameworks created legal uncertainty regarding the blockchain auditing.

This study aims to understand the research trend regarding blockchain applications in the auditing sector in the last decade (2015-2025). The datasets are obtained from a systematic literature search using one database (Scopus), which was performed to identify articles on barriers to blockchain auditing applications. Additional studies were included through the manual search on the relevant topic and reference list checking. This study aims to identify the research trend regarding blockchain auditing around the world in the last decade (2015-2025), which could be a milestone in blockchain auditing applications, especially in Indonesia.

2. Literature Review

A blockchain could be defined as a digitalized public ledger that is filled with the recording of all the digital transactions in a chronological order and stored in a distributed manner across the network, which is accessible to anyone who is connected to the network (Niranjanamurthy et al., 2019). This makes blockchain different from the traditional methods, where blockchain allows peer-to-peer transfer of digital assets without any intermediaries (Monrat et al., 2019). It is decentralized, public, and permission-free, enabling anyone to view or even participate in the ledger (Han et al., 2023).

The concept of blockchain actually existed in the early 90s, when Stuart Haber and W. Scott Stornetta created the concept of a timestamp that could not be changed by anyone. This concept of technology became the basis for the development of Bitcoin in 2009, which was modified to become more secure and could store more data. The method used is in the peer-to-peer network application or a series of interconnected computer networks to verify transaction data (YUDIARTHA et al., 2024).

While auditing is a series of processes that is taken to ensure the reliability of the financial report by a firm, this is to prevent the existence of abuse and illegal appropriation in the financial reporting (Milojević et al., 2018). Audit is very important for storing accounting and financial records of an organization. Audit plays a vital role in an organization's financial monitoring and reporting system, as it can ensure that

the financial statements of the organization follow the standard and that all of the information provided is true and valid (YUDIARTHA et al., 2024).

With the growth of blockchain technology, it is being applied to the financial and accounting sectors, including the auditing sector. This is because blockchain auditing allows every transaction to be permanently recorded in a digital ledger that is transparent, which the authorities can also access (YUDIARTHA et al., 2024). This increases the efficiency, accuracy, and reliability of the auditing process. The blockchain usage in the auditing process could minimize fraud and conduct audit trails (Huy & Phuc, 2025).

3. Research Method

The process began with a search of the dataset of articles in the Scopus database, and then the evaluation of the documents was divided into three pages, as shown in Figure 1. The first phase is searching for the articles based on the criteria in the Scopus database; we could mention this phase as a data collection phase. The second phase is exporting the documents that were obtained from the first phase to the R Studio and VOSViewer software for bibliometric analysis of publications, authors, countries, institutions, journals, and areas. The third phase is the data analysis to identify the research development of the discussed theme, which is blockchain auditing in the last decade (2015-2025).

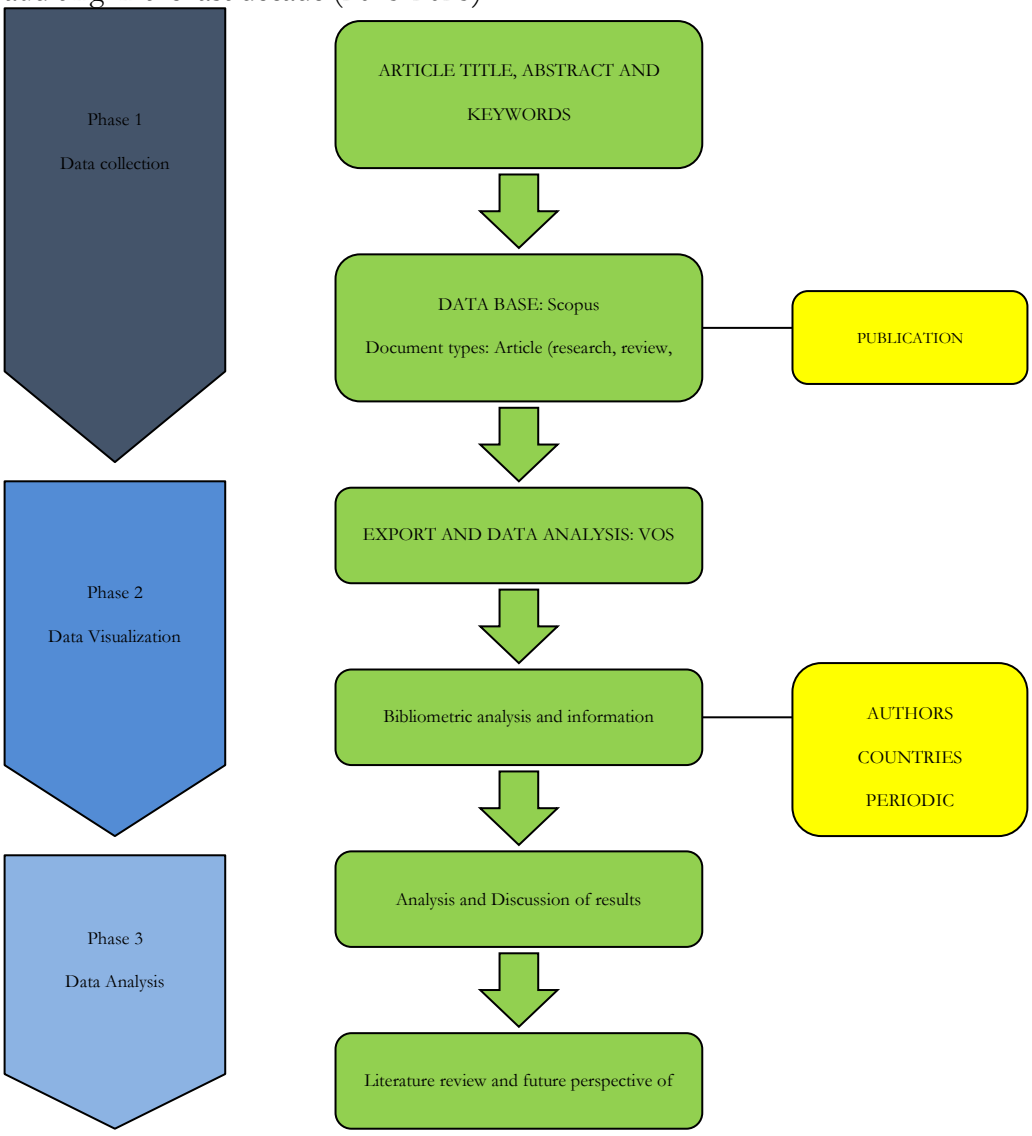

Figure 1. Methodology phases applied in the research.
Source: processed by the author

The study used the bibliographic information from the Scopus database between 2015 and 2025. The sampling technique used in the study was a total sampling technique. The variables that were analyzed are the title of publication, author, abstract, keywords, publication year, publisher journal, type of publication, and affiliation. The search results were downloaded using the Scopus export tool in CSV format and then uploaded into the R Studio and VOSViewer software. The mapping of the keyword used keyword co-occurrence analysis as the unit of analysis in the VOSViewer.

4. Results and Discussion

Figure 2 below provides the main information overview of research outputs spanning from 2015 to 2025. It includes articles from 362 sources with a total of 1228 documents, with a high annual growth rate in publications of 67,9%. The data analysis involves a total of 5341 authors, all of whom are collaborative multi-authorship research (no single-authorship), with a portion of 22,15% of them involved in international co-authorship, and the average number of co-authors in one document is 11 authors. This indicates the research topic is highly collaborative. From the articles, the total of 5730 is obtained as the unique keywords used, and references of 8226 cited. On average, the documents are 2,75 years old, which indicates that the publications are relatively recent and up-to-date. And each document has a total of 18,02 citations on average.

Figure 2. Main information overview .
Source: R Studio (processed by the author)

From the figure above, we can get the information that the topic discussed (blockchain auditing) is a relatively new topic in the research, but the annual growth rate of 67,9% shows that the research regarding the topic is still developing until now. The number of 5730 unique keywords obtained from the articles shows that the topic has a broad range and research focus.

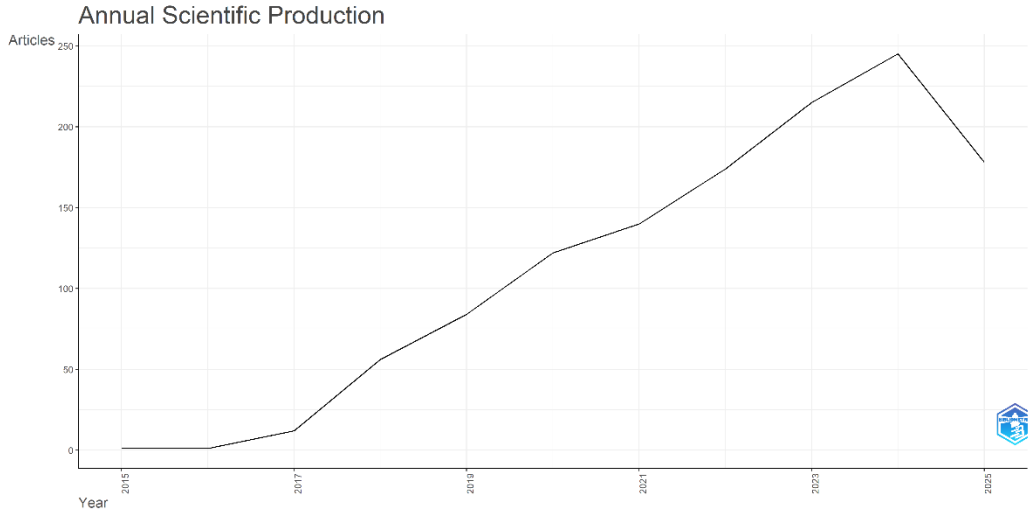

Figure 3. Annual Scientific Production.
Source: R Studio (processed by the author)

The figure above shows that the annual scientific production of the topic is experiencing a clear growth and maturation. In the early years (2015-2016), the publication production was still very limited, with an article per year, which suggests that the topic was still in the formative stage. The growth started in 2017, when the number of publications started to rise, and continues until it reaches the peak in 2024 with a total of 245 articles per

year. This represents the high trend of the research production regarding the topic, which indicates its importance in academic research. However, the figure shows that it is experiencing a decrease in 2025, with an amount of 178 articles. This could be because of the incomplete indexing, which means that many articles that are scheduled for publication later in the year may still be in process and have not been indexed in the Scopus database.

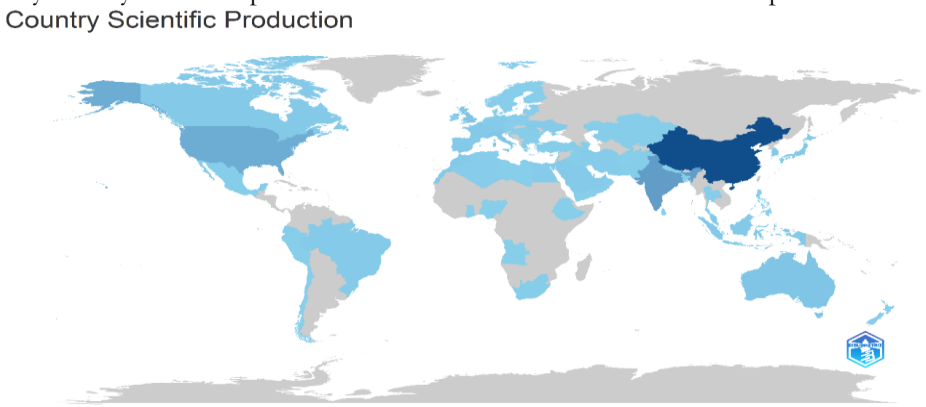

Figure 4. Country Scientific Production.
Source: R Studio (processed by the author)

The geographic distribution of research production highlights significant disparities across countries. China stands out as the biggest contributor in the research, as indicated by the darkest shade of blue, with a frequency of 1717 times. This shows China's large-scale investments in research and development of blockchain auditing. Besides China, the other technology giant in Asia, which is India, also shows a major contribution in the research, with a frequency of 630 times. While on other continents, such as the American continent, the United States of America is the biggest contributor to research in the region, with a frequency of 423 times. In Europe, the United Kingdom dominates the research contribution with 118 times.

Besides those countries, the emerging contributions also could be observed in South America, North Africa, West Asia, Australia, and even Southeast Asia. In Southeast Asia itself, Malaysia holds the title as the major contributor of the region and the tenth position in the world, which is 53 times. This shows Malaysia's effort in the research of blockchain auditing in the country. While Indonesia is emerging behind Malaysia and in 17th position in the world, which occurs 46 times. Compared to Malaysia, Indonesia is falling behind with a slight gap, which could be because of the structural challenges, such as lower research funding, language barriers, fragmented institutions of research, and the lack of support from the government for research regarding blockchain auditing.

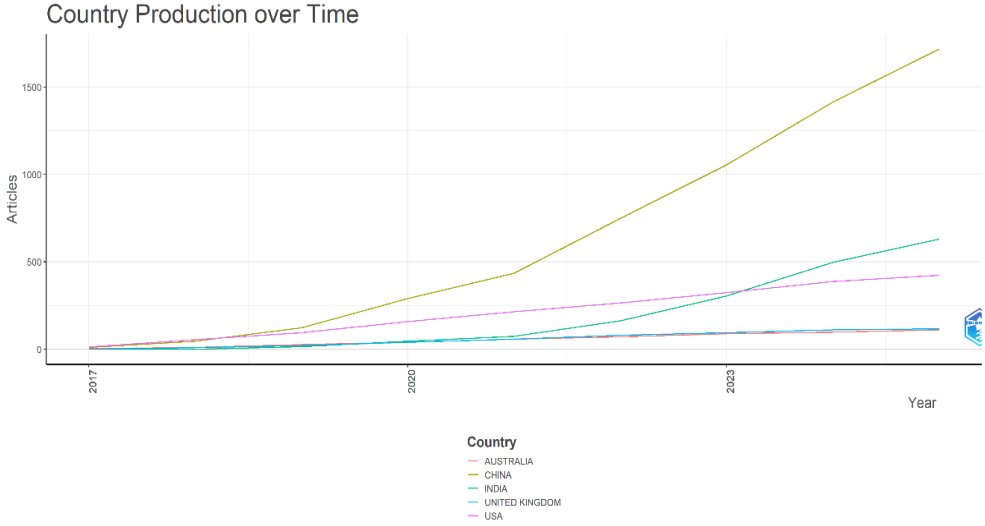

Figure 5. Country Production Over Time.
Source: R Studio (processed by the author)

The figure above shows how each country's research production has changed over the years. This graph only shows the top 5 contributing countries, of which China is leading far ahead of the other countries. The research growth of China has been constantly progressive over the years, reaching its peak in 2025. While India in its early years walked along with the UK and Australia, until in 2021, it rose massively, leaving them and even overtaking the USA by 2023. This shows that these two technology giants of the world give much support and effort in the development of blockchain auditing.

The USA itself has recorded consistent growth over the years, which indicates that the USA focuses more on the maturity of research ecosystems rather than rapid expansion. A similar case could be observed in the UK and Australia, which recorded consistent growth but comparatively slower trajectories.

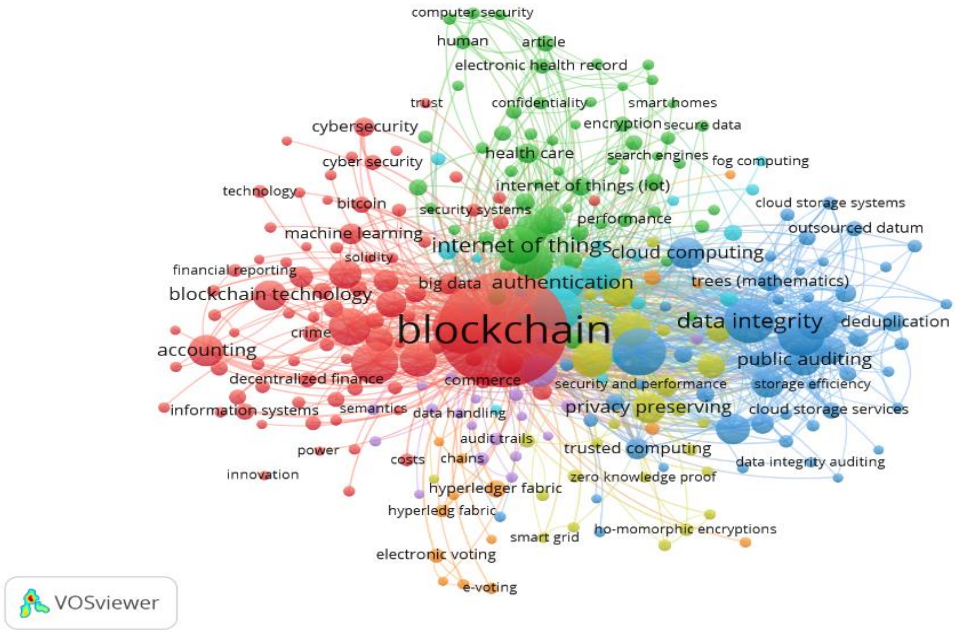

Figure 6. Keyword co-occurrence network visualization.
Source: VOSViewer (processed by the author)

The keyword co-occurrence network presented in the figure above shows that the blockchain auditing research is embedded in broader technological and interdisciplinary contexts. The size of the nodes represents how frequently the term shows up in the studies; the bigger the node, the more frequently the term shows up. While the line connecting the nodes with each other represents that the term is frequently co-occurring in the studies. While the "blockchain" keyword becomes the central node, it indicates that all the other keywords are linked to it. The nodes are color-coded based on the cluster group of the words.

The red cluster is a group of words in the financial technology field, shown by the existence of words such as "auditing", "accounting", and "blockchain technology". This cluster relates to the applications of blockchain to the accounting and auditing sector. The blue cluster is a group of words in the data integrity and public auditing field, shown by "data integrity", "public auditing", and "cloud storage systems". This cluster mainly relates to the blockchain application in ensuring data reliability through the auditing process. The yellow cluster is filled with words related to privacy and cryptographic assurance, as shown by "privacy preserving", "trusted computing", and "cryptography". This cluster relates to the privacy protection of sensitive information, while still allowing independent verification in the blockchain auditing application. While the green cluster is a group of words in the Internet of Things (IoT) and its application in the health sector, shown by words "internet of things", "healthcare", and "electronic health care". This cluster shows that blockchain auditing has become an interdisciplinary topic, not only in the financial and accounting sectors.

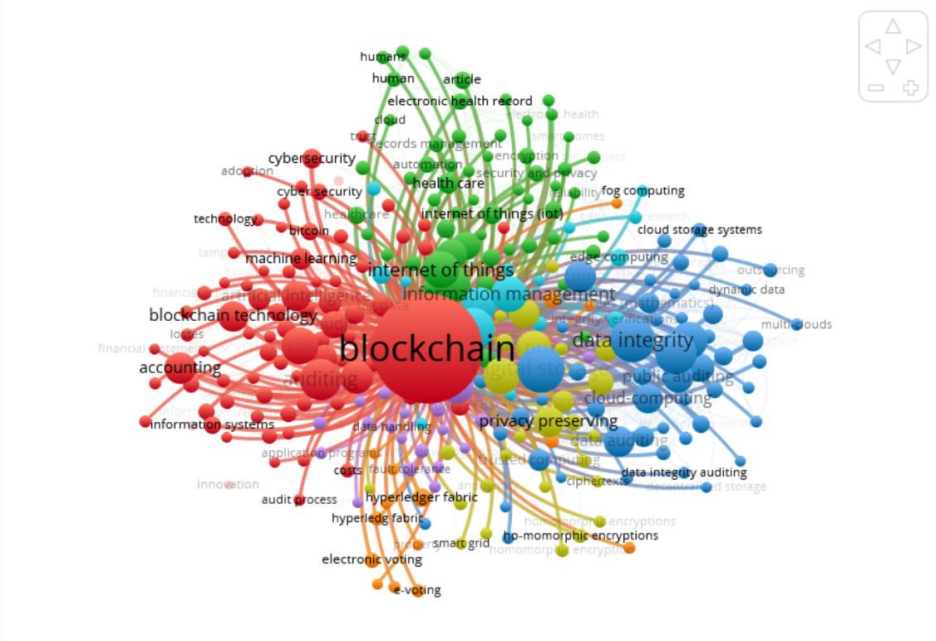

Figure 7. Network visualization of the term "blockchain".
Source: VOSViewer (processed by the author)

The figure above is the network visualization of the term "blockchain", which is the central and biggest node. This indicates how frequently the "blockchain" term occurs in the research. This indicates that the term "blockchain" becomes the central keyword, which has a strong connection to almost every other keyword in every cluster. This shows that the research regarding blockchain is applicable across disciplines.

The connection of the term "blockchain" with the red sector means that the research about blockchain is applied to the accounting and auditing field. While the connection between the term "blockchain" and the blue cluster indicates that the research regarding blockchain relates to the application of blockchain to the establishment of data integrity. The "blockchain" term also connects to the green sector, which indicates that the research regarding the blockchain relates to its application in every discipline, such as health. Furthermore, the "blockchain" term also has a linkage with the yellow cluster, which is filled with a group of technical words, such as "privacy preserving", "homomorphic", and "smart grid". This linkage shows that the research regarding blockchain frequently relates to overcoming the data privacy issue. Lastly, the term "blockchain" is also connected to the orange cluster, such as words "hyperledger fabric" and "electronic voting", which shows that the research regarding the blockchain also relates to its application to other things, including e-voting.

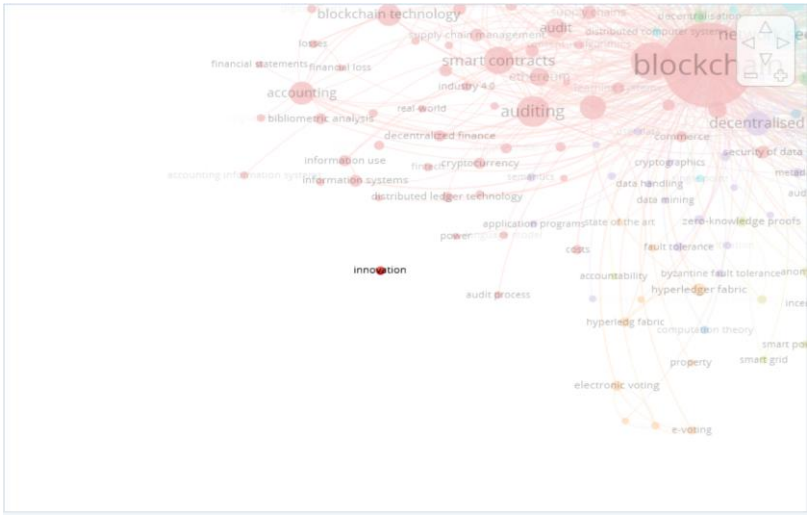

Figure 8. Network visualization of the term "innovation".
Source: VOSViewer (processed by the author)

Derived from the figure above is the network visualization of the term "innovation", which does not have a linkage with any of the other keywords. This could indicate that the term "innovation: does not frequently co-occur with blockchain auditing in the research. Furthermore, the term "innovation" is too broad, as it is a general concept that could be applied to many fields, while the most frequent co-occurring terms in the blockchain auditing research is technical words, such as "blockchain", "auditing", "network security", and "digital storage".

Furthermore, the isolation of the term "innovation" could also indicate that the term is an underexplored area. While most of the studies in the blockchain auditing research focus on the technical mechanism, such as "data integrity", "internet of things", "cryptography", and "cloud auditing". As a result, it ignores the socio-economic impacts on the research, including the policy, regulatory, and even application innovation of blockchain auditing. This becomes the opportunity for future research regarding the topic (blockchain auditing) that focuses on the innovation in the application of blockchain auditing. For example, innovation in audit practice, such as blockchain auditing, could change the audit methods from the traditional audit process to continuous auditing or AI-assisted blockchain auditing.

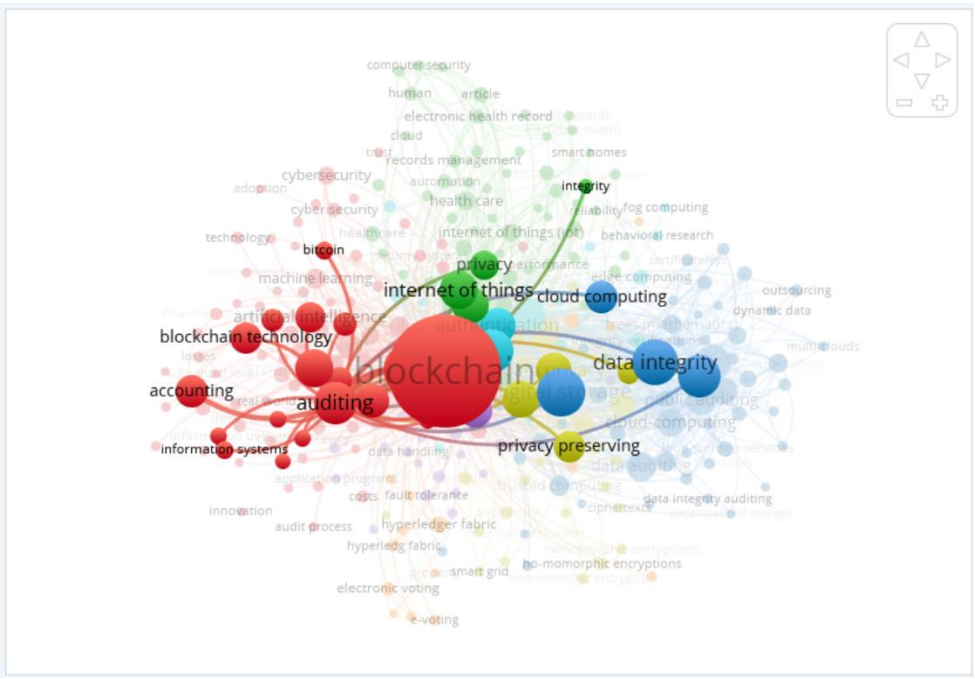

Figure 9. Network visualization of the term "auditing".
Source: VOSViewer (processed by the author)

The image above shows the co-occurrence visualization of the term "auditing", which shows that auditing has become one of the central thematic clusters within blockchain research. Auditing has a strong connection with other keywords in the red cluster, which is in the financial technology field, such as "accounting", "blockchain technology", and "information system". This indicates that the research regarding blockchain auditing primarily occurs within the financial and accounting domains, where transparency, traceability, and fraud prevention are critical.

Besides financial applications, "auditing" also links to the broader technological fields, as shown by the connection to the blue and yellow cluster words, such as "data integrity", "privacy preserving", and "cloud computing". This connection indicates that blockchain auditing is increasingly being researched as part of digital assurance. Which means that blockchain could transform the auditing process to be safer, transparent, and reliable.

The network visualization above also shows that the "auditing" is connected to some words in the green cluster, which are "privacy", "internet of things", "security", and "integrity". This connection shows that blockchain auditing also plays a huge role as a mechanism of digital trust establishment. For example, blockchain allows auditing to ensure accountability of data flows between devices, which in the end could mitigate the risks of manipulation or unauthorized access.

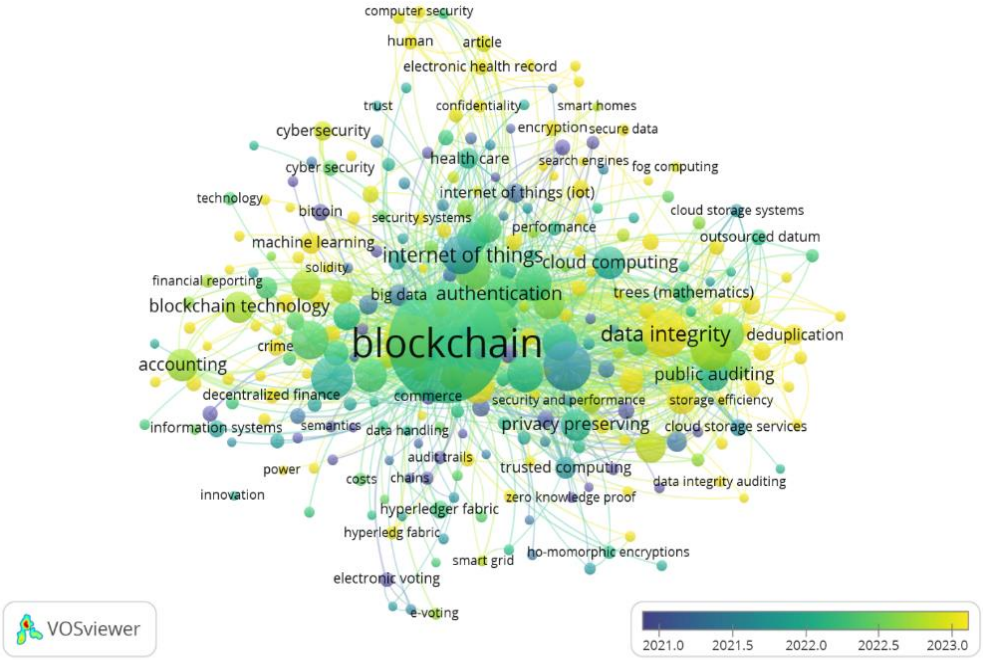

Figure 10. Overlay visualization co-occurrence.
Source: VOSViewer (processed by the author)

The figure above shows the overlay visualization of co-occurrence terms. The size of the nodes represents how frequently the terms show up in the studies; the bigger the node, the more frequently the term shows up in the studies. The line connecting the nodes to each other represents that the terms frequently co-occur. The color of the nodes represents the recency of the term in the studies. It is taken by the average of the terms present in that period. The color bar at the bottom provides the timeline ranging from 2021 to 2023, which is detailed from the darker shade (dark blue, purple and light blue), which represents earlier terms, to the lighter shade (teal, green, and yellow), which represents more recent terms.

Obtained from the visualization, the main node, which are "blockchain" and "auditing", has a similar shade of the node, which is teal. This indicates that these terms occur more frequently in the range between the last half of 2021 and the first half of 2022. This indicates that the terms "blockchain" and "auditing" occur more frequently in the research after the COVID-19 pandemic, which is mainly due to the huge digital transformation during the COVID-19 pandemic. This encourages studies about the blockchain application in auditing that could help the digital transformation of the auditing process. Terms in a similar timeline, such as "access control", "data privacy", "cryptography", and "cloud computing".

While there are many terms that appear relatively earlier, which are in the color of darker blue or purple. Terms like "bitcoin", "security and privacy", and "consensus algorithms", which, on average, occur in publications between 2020 and 2021. This indicates that the early research about blockchain auditing mainly focuses on the foundational aspect. For example, the "bitcoin" term indicates that the early research regarding blockchain auditing related to the blockchain application in the cryptocurrency, which is bitcoin. A similar case with the other terms, such as "security and privacy" and "consensus algorithms", indicates that it focuses more on the foundational mechanism of the blockchain application in the auditing process.

Furthermore, the relatively recent terms, which are in the colors of light green and yellow, such as "data integrity", "cloud computing", "decentralised", and "smart contract", which range from the last half of 2022 to 2023 and above. This indicates that the recent studies regarding blockchain auditing focus more on the maturity of the blockchain auditing application. This is intended to make blockchain auditing become more mature and ready to be applied in the real world. This indicates that the recent studies focus on the preparation of the blockchain auditing application.

5. Conclusions

This study analyzed the development of research regarding blockchain auditing in the last decade, ranging from 2015 to 2025, using the bibliometric analysis method. The finding shows that the blockchain auditing topic is still a relatively new topic, but it is experiencing a rapidly growing field, with an annual growth rate of 67,9%. The research regarding this topic is highly collaborative, with all of them having multi-authorship. With a portion of 22,15% of them being international co-authorship, and the average number of co-authors in one document is 11.

From the analysis, it was derived that Indonesia is falling behind in the research contribution regarding the blockchain auditing topic, with the 17th position in the world, and second position in the Southeast Asia region. This indicates the lack of effort that Indonesia has put into the research regarding the topic. This could be caused by the lack of support that the government gives or the existence of structural challenges, such as a lack of research funding, language barriers, and fragmented research institutions.

Derived from this result, the government of Indonesia should increase its support for research on this topic. First of all, the government of Indonesia should increase its support for the funding of research regarding blockchain auditing. Besides that, the government should make a structural revitalization of the research institution, such as establishing interdisciplinary research centers in the universities, so that the research is not focused on one discipline. Also, the government should establish training programs for auditors, accountants, and IT professionals in the blockchain auditing tools and applications. Furthermore, due to the highly collaborative research topic, Indonesia should strengthen the research collaboration, especially with the other country that has a bigger contribution to the blockchain auditing research. Malaysia should be the best option, as it has a similar background and condition of blockchain auditing, but has a bigger contribution to blockchain auditing research. Collaboration could also engage the private sector and startup firms, as many of them have applied blockchain auditing earlier. Lastly, the government should establish clear regulations regarding blockchain auditing, which would create legal certainty that encourages the faster application of blockchain auditing.

The keyword "innovation" appears isolated in the network visualization, suggesting that the research regarding blockchain auditing is still limited to its application. This creates a gap in the innovation context of blockchain auditing in the research. This could become an opportunity for future research to explore blockchain auditing not only as a technical solution but also as an innovation in governance, policy, and organizational practices. For example, as the integration with AI, ESG (Environmental, Social, and Governance) auditing, and integration to the SDGs.

The results indicate three major phases in the evolution of the topic. The first phase is the early phase that was dominated by the foundational issues, such as Bitcoin, security, privacy, and consensus algorithms. The second stage focused more on the blockchain application in the auditing and accounting sector. And lastly, the third phase, which is the most recent phase, focused on the maturity development and real-world application of blockchain auditing.

Overall, this study shows that blockchain auditing has transitioned from being a niche concept into a global research trend with broad implications for accounting, auditing, data governance, and digital trust systems. Future studies regarding the topic should integrate socio-economic perspectives to complement the dominant technical focus.

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