The Impact of Artificial Intelligence on Accounting

Gabriela Stafie and Veronica Grosu

Abstract Innovation technology is changing many aspects of our lives. We live in a time of great transformation that predicts that in the coming years, every aspect of human life will be influenced by artificial intelligence. The phenomenon of robotics is a vast one, with popularity in all fields of activity, as the business world tends towards globalization, and the Internet is progressing at a rapid pace and the flow of information becomes particularly flexible, which makes us witness rapid digitization. of the whole society. Accounting professionals need to turn innovative solutions such as artificial intelligence and automation into opportunities, not threats … new technologies will make life easier. Blockchain is an innovative form of application of information technology in the Internet age, seen as a distributed "registry" defined by decentralization, immutability and transparency. The application of the blockchain in accounting is a topical issue, as it is a common accounting record and it is expected that its application could bring significant changes in the practical work of accountants. Therefore, the main objective of this paper is to analyze the existing literature on the importance of cognitive technologies and the possible impact on accounting, from a bibliometric perspective. The bibliometric analysis is carried out both chronologically and geographically with the support of the Web of Science (WoS) and Scopus database. VOSviewer software was used to process the data, with the aim of providing a comprehensive picture of how cognitive technologies are of interest to academic researchers and accounting practitioners.

Keywords Digital accounting · Artificial intelligence · Blockchain · Bibliometric analysis · Web of Science · VOSviewer

G. Stafie (✉) · V. Grosu
Department of Accounting, Auditing and Finance, Faculty of Economics, Administration and Business, Ștefan Cel Mare University, Suceava, Romania
e-mail: gabi_stafie@yahoo.com

V. Grosu
e-mail: veronica.grosu@usm.ro

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1 Introduction

Accounting has appeared since ancient times, with the advent of writing in the Sumerians, in the years 3000 BC. At that time, people reflected aspects of their daily lives through cave drawings: notches on the bones or walls of caves, engravings on pieces of wood, knotted strings of different colors, notes on clay tablets or papyrus, with which people the ancients wrote down how many animals they hunted and how many they ate, how many skins they skinned and how many clothes they wore. With the advent and use of pieces of papyrus for the recording of commercial transactions, although more detailed, they encountered an obstacle in the development of accounting by the lack of a general unit of measurement for all traded goods. The most important contribution to the evolution of accounting at that time belongs to the Greeks, who began using foreign exchange coins in 600 BC.

Accounting began to materialize as a science in 1494, with the publication of the first book of accounts in Venice by the mathematician Luca Paciolo, "Summa de arithmetica, geometria, proportioni et proportinalita" (All about arithmetic, geometry and proportions), a work that marked the official consecration of the science of accounting. In the ninth book entitled "Double entry accounting treaty", he describes for the first time the defining feature of accounting. In Paciolo's view, accounting is "a set of principles and techniques for the double-entry recording of a merchant's assets and all of his business, in the order in which they are conducted," defining the double entry in terms of the equation of exchange between wealth and capital. respectively what I possess and what I owe.[1]

Accounting, an important component in social practice, has evolved and developed depending on the economic evolution, and as a science it has distinguished itself by exercising its functions. A particularly suggestive characterization of the functionality of accounting was left to us 100 years ago by the well-known scientist Johann Friedrich Schär noting a motto in his work "Buchhaltung und Bilanz": "Accounting is the impartial judge of the past, the necessary guide of the present and the indispensable counselor of the future".[2] Today, through the automation and computerization of the accounting activity, the working techniques have reached a high level of improvement. identified for a long time. It has now become a wide-ranging technique for gathering and processing information, which has managed to detach itself from the simple contemplation of the past and which strives, through scientific methods, to encompass the future evolution of economic activity.[3]

Accounting has been directly affected by the advancement of information technology (IT), starting with general accounting software, used in stock records, employees, followed by the development and introduction of Company Resource Planning (ERP) systems, and reaching the sphere of cognitive technologies, such as machine learning (ML), process automation through robotics (RPA), information storage in the cloud, associated with elements of artificial intelligence (AI).

[1] Demetrescu (1972).

[2] Schär (1914).

[3] Kraft von Taun (1967).

The Internet and related information technologies such as cloud, blockchain, and AI services, associated with web-based business models such as online platforms, are leading to its fourth economic revolution.

Although double-entry accounting has been used for over 600 years, the digital age marked by disruptive technologies using blockchain and financial technology (FinTech) has led to the birth of a promising new method of accounting: triple entry accounting.

In this context, the work the impact of artificial intelligence on accounting has as a starting point the technological progress, in general, and the accelerated introduction of automation in the accounting, in particular. The changes suffered by the accounting will bring changes in the way of keeping the accounting, reason for which a series of questions have arisen: What will be the accounting in the future?, What accounting methods will be used? Following the emergence of these dilemmas, the purpose of this article is to analyze the progress made in the field of accounting, the impact of the accelerated penetration of information technology and the identification of possible future trends in the context of the digitalization of accounting. The paper aims to analyze emerging technologies that enter the field of accounting, a topic of great interest to both practitioners and academics.

In order to achieve the proposed goal, the following objectives have been set:

- Objective 1—analysis of the evolution of accounting and changes over time through the implementation of cognitive technologies such as AI and Blockchain;
- Objective 2—bibliometric analysis and the current state of research on the penetration of cognitive technologies in the field of accounting, in the period 2015–2021.

The research methodology consists of collecting data with a predominant focus on the challenges facing accounting today and moving from a traditional accounting based on double entry to a triangular accounting called the Triple-Entry method. We also analyzed the literature on the topic: future accounting, focusing on the key concepts of Accounting Digitalization, Artificial Intelligence, Blackchain and their impact on the future of accounting, using as databases the Web of Science platforms. The bibliometric analysis was carried out both chronologically and geographically using VOSviewer and Bibliometrix information processing.

The results obtained from the analysis and interpretation of the information, present the ways in which the accounting activities are or can be subjected to the automation process by robotization, as the AI platforms have the ability to analyze data and establish connections between them. It also determines whether the security benefits of blockchain technology are fully available and provide security in the accounting framework. These results can be applied both to professional accountants, as partners of AI and blockchain users in economic and cyber security, and to professional and accounting regulatory bodies. The study contributes to improving knowledge about the potential of emerging technologies for accounting services.

2 Literature Review

AI is considered a "technology of the future" that has the ability to stimulate intelligent behavior in machines and perform cognitive functions that, until recently, were considered specific only to the human mind: perception, learning, creativity, interactivity, reasoning, problem solving. AI aims to mimic human intelligence as much as possible with the help of technology. The most commonly accepted definition of AI belongs to scientist John McCarthy, "it is AI when a machine behaves in a way that can be considered intelligent, if it were human."[4] The traditional model of an information system is criticized because it leads to a narrow view of the role of information systems (IS) in organizations. Instead, the modern view takes into account neglected functions, such as memory, communications, control, self-regulation, maintenance, self-testing, and other logical functions with which the organization's information system is equipped as an artificial and intelligent system.[5] Before computerization, when accounting data was stored on paper, preparing the necessary analyzes and forecasts for clients was a difficult and time-consuming process for professional accountants. Computerization has largely relieved accountants of the burdens of small and repetitive tasks, and has led to the development of computerized accounting through computer systems capable of providing real-time information to customers.[6]

The ability of professional accountants to use advanced computer technology is considered relevant both to their clients and to society at large. Accounting productivity can be increased by computerization, with the effect of increasing the quality of information provided to their customers.[7] Amplified technological change and a rapid pace of development will lead to profound changes in the labor market. The accounting activity, influenced by the impact of technology, invites the accountant to rethink his activity and leads to the creation of digital accounting platforms. Professional accountants, as information providers and risk assessors, need technology to increase the efficiency and effectiveness of their tasks.

In recent years, there have been many concerns that automation and digitization could lead to a jobless future, fueled by studies conducted for the US and Europe which claim that a substantial proportion of jobs pose a "risk of computerization". According to a study conducted in 2013 by Frey and Osborne from Oxford University, which analyzed the influence of computerization on the labor market in 702 occupational fields, they found that in the next 10–20 years, 47% of all jobs in the US are at risk. high to be adversely affected by automation. According to the same study, professionals whose occupation is "accounting records, accounting and auditing" have an automation risk of up to 98%.[8] Their study has provoked other researchers to this subject, and has raised various controversies, especially the fact that an important series of accounting works are difficult to computerize.

[4] McCarthy (1995).

[5] Gigch and Moigne (1990).

[6] King et al. (1990).

[7] Wilson and Sangster (1992).

[8] Frey and Osborne (2013).

The Internet and related information technologies such as cloud, blockchain, and AI services, combined with web-based business models such as online platforms, are rapidly transforming the digital economy and industry (now in its fourth revolution—Industry 4.0) and researchers have expressed concern about the future of the accounting profession.[9] Some questions are: how can professional accountants add value to organizations and where can accountants work. "These changes [AI, machine learning, automated robotic processes, etc.] are redefining and expanding the role of accountants and increasing our skills such as data analysis, data visualization, storytelling and strategic management more important than ever."[10]

Research to analyze the benefits of artificial intelligence in accounting and financial reporting processes has shown that cognitive technologies significantly reduce the time required to perform certain accounting activities, reduce the number of errors, improve the real-time reporting process,[11] helps to monitor in real time the assets and stocks, facilitates the audit missions and contributes to obtaining financial predictions with a higher degree of accuracy.[12]

Studies show that every business is influenced by information technology, and companies that can't keep up with technological development will disappear over time. Professional accounting services, more than in other fields, can improve their performance by using AI systems. In addition, as AI systems and machine learning applications evolve and enter the accounting business, they can increase the credibility of the accounting profession and streamline the business at much lower costs.

For a better understanding of the evolution over time, of the interest of practitioners and researchers on technological progress in accounting, we considered necessary a meta-analysis that can be viewed in Table 1, query based on the correlation: artificial intelligence—blockchain.

As we can see from Table 1, emerging technologies have gradually entered accounting, and have provided opportunities for the double-entry accounting system to be extended to triple-entry records. In Inghirami's[13] opinion, the blockchain, together with the distributed register, contributed to the modeling of the Internet in one of its values. It should be noted that blockchain is an accounting technology based on decentralized and distributed data for information consultation, without allowing the possibility of copying or modifying data. This prompted Faccia & Petratos[14] to claim that blockchain is the leading distributed registry technology capable of providing automation, transparency, trust, accountability and immutability to users.

[9] Moll and Yigitbasioglu (2019).
[10] Bhimani and Willcocks (2014).
[11] Kokina and Davenport (2017).
[12] Stanciu and Rîndaşu (2020).
[13] Ingrirami (2018).
[14] Faccia and Petratos (2021).

Table 1 Meta-analysis of the literature on cognitive technologies: AI and Blockhain

Year	Author	Publication title	Impact on research	
			Artificial intelligence (AI)	Blockchain
2015	Dirican, C	*The Impacts of Robotics, Artificial Intelligence On Business and Economics*	The impacts of AI in economics and business bring a number of benefits, such as: calculated production costs in real time, transmission of information to customers in real time, maximizing sales and delivery hours through robotics in distribution channels, companies will could manage profitability and risk more effectively	
	Monaco, J	*Identifying Bitcoin users by transaction behavior*		It associates Bitcoin digital currency with blockchain technology, favoring transactions with them. The study indicates an inherent lack of user anonymity by exploiting patterns in long-term Bitcoin transactional behavior
2016	Palade, D.P	*Impactul tehnologiilor informaționale asupra sistemelor de contabilitate*	Information technology is an advantage in the business world, which adds value to the organization by increasing productivity in the market. Traditional accounting has evolved into modern IT-based accounting	
	Deloitte	*Blockchain Technology A game-changer in accounting?*		Blockchain technology can be the next step in accounting progress by offering the ability to record transactions in a common register. With this application, cryptographically distributed and sealed transactions cannot be falsified or deleted. This can be compared to notary verification, only digitally
2017	Kokina, J., Davenport, T	*The Emergence of Artificial Intelligence: How Automation is Changing Auditing*	AI is the necessary element to ensure that the most complex modern accounting rules are implemented correctly. This is especially true when accounting interacts with increasingly sophisticated capital market activities	

(continued)

Table 1 (continued)

Year	Author	Publication title	Impact on research	
			Artificial intelligence (AI)	Blockchain
	Vasarhelyi, M.A	*Toward Blockchain-Based Accounting and Assurance*		Although technology has advanced, accounting methods have remained double entry. With the advent of blockchain technology and implementation in accounting, it ensures the verification and provision of real-time data and the emergence of a new concept of accounting through triple entry. However, blockchain technology is developing and experimenting, but it is expected to be as revolutionary as the Internet
2018	Marshall, T.E., Lambert, S.L	*Cloud-Based Intelligent Accounting Applications: Accounting Task Automation Using IBM Watson Cognitive Computing*	Proposes building a cloud-based accounting application using AI-based machine learning. It presents the impact of automation on the accounting profession and the creation of new opportunities offered by the development of technological innovation	
	Zheng, Z., Xie, S., Dai, H., Chen, X., Wang, H	*Blockchain challenges and opportunities: a survey*		Blockchain benefits from a number of benefits, such as decentralization, auditability, persistence, anonymity, and immutability. Blockchain applications have a wide range of uses, from cryptocurrency transactions, to financial services, risk management, the Internet of Things, to public and social services. The blockchain is recognized for its decentralized infrastructure and the nature of peer-to-peer transactions. However, much research on blockchain is associated with Bitcoin, but blockchain can be implemented in a variety of areas

(continued)

Table 1 (continued)

Year	Author	Publication title	Impact on research	
			Artificial intelligence (AI)	Blockchain
2019	Peng, Y., Chang, J.S		Accounting practitioners believe that AI will replace manual accounting work, routine and repetitive tasks. Some accounting practitioners claim that they have the ability to cope with the emergence and implementation of AI in accounting and are willing to continue their professional development and are not afraid that they could be replaced. On the other hand, there are accounting practitioners who feel threatened by the level of development of AI because they are not sufficiently prepared to face the new challenges	
	Moll, J., Yigitbasioglu, O	*The role of internet-related technologies in shaping the work of accountants: New directions for accounting research*		There is a need to study the new accounting technologies used in business administration and to establish the new skills and competencies needed by professional accountants to add value to organizations. Access to distributed registries, blockchain applications and big data supported by cloud and AI-based analytics tools will greatly automate decision-making within organizations. These technologies can significantly improve financial visibility

(continued)

Table 1 (continued)

Year	Author	Publication title	Impact on research	
			Artificial intelligence (AI)	Blockchain
2020	Stanciu, V., Rîndaşu, S-M	*Sustainable Professional Training – Challenges and Solutions in Emerging European Countries*	The innovative technologies presented in the study, namely blockchain registries, AI and big data processes, have the ability to stimulate increased transparency in the business environment, to ensure the correct registration of resources and to strengthen the trust of the social environment. Some technologies are considered emerging, while other technologies have already entered the accounting system, which requires the acquisition of new computer skills and competencies by professional accountants	
	Pugna, I.B., Duțescu, A	*Blockchain—the accounting perspective*		Although today, blockchain technology is one of the most revolutionary, in order to be used in accounting, it needs a technical improvement. Blockchain is still an "immature" subject, remaining at the level of experimental theory. With its maturation, the potential for progress of industries and even the economy begins, thanks to the integration of complementary technologies such as the Internet of Things and AI
2021	Faccia, A., Petratos, P	*Blockchain, Enterprise Resource Planning (ERP) and Accounting Information Systems (AIS): Research on e-Procurement and System Integration*	Electronic transactions and IT can improve AIS operations in blockchain and DLT applications. FinTech could become a leader in transforming and integrating IT into various management services and applied sciences. DLT, decentralized finance (DeFi) and FinTech can facilitate the incorporation of AIS and ERP systems into blockchain technology, providing important benefits in the productivity, efficiency and security of organizations	Blockchain is considered the leading distributed registry technology (DLT) and its applicability in various fields is constantly changing, so updating with the latest technologies and applications is essential

(continued)

Table 1 (continued)

Year	Author	Publication title	Impact on research	
			Artificial intelligence (AI)	Blockchain
	Pedreño, E.P., Gelashvili, V., Nebreda, L.P	*Blockchain and its application to accounting*		Blockchain needs technical improvement and development in order to be implemented in accounting and to produce significant transformations in the traditional system. Certainly, blockchain, is an accounting technology, because the data are not only archived, but are also settled and sorted dynamically, and can be viewed with economical content. Its applicability in accounting will follow the same path as the other technologies, which have evolved from the beginning to its implementation

Source Author's own processing

Table 2 Data collection methodology

	Web of science database	
Topic	• Artificial Intelligence • Blockchain	
Inclusion criteria	• Works between 2015 and 2021; • Research areas: business finance, business, economics, management;	
Exclusion criteria	• All other research areas; • For the relevance of the results, to the topic "artificial intelligence", only those documents were selected that had a *perfect match*	
Result	Artificial intelligence	42
	Blockchain	1235
Total articles		1277

Source Author's own processing

3 Research Methodology

In recent years, researchers' attention to digital transformations in the economic field has grown at a rapid pace due to emerging technologies, which has led them to focus on specific topics such as: artificial intelligence, blockchain, process automation by robotics, digital transformation, smart technology,[15] etc. This article aims to examine the concept of digital accounting, focusing on how emerging technologies will revolutionize the field of accounting. As a research method, a bibliometric analysis of the specialized works from the Web of Science (WoS) database, internationally recognized and ensures a high quality of the works, was performed.[16]

3.1 Data Collection

To perform the bibliometric and mapping analysis we used as search terms: "artificial intelligence" and "blockchain". The criteria for filtering the data were: the period 2015–2021 and research areas relevant to the paper, as we can see in Table 2.

[15] Garanina et al. (2021).

[16] Mongeon and Paul-Hus (2016).

Table 3 Top 5 publication sources

Web of science database	No. articles
Technological Forecasting and Social Change	43
IEEE Transactions on Engineering Management	35
Education Excellence and Innovation Management	21
Journal of Risk and Financial Management	17
Technology Innovation Management Review	15
Total articles	131

Source Author's own processing

3.2 Data Analysis and Interpretation

Bibliometric analysis is a working technique through which we can spatially represent different relationships between keywords, domains, documents or authors[17] and is used in various fields to relate hidden elements such as hidden topics or themes.[18]

After collecting the data, the papers were processed using the VOSviewer program to represent the main clusters and the significant links made up of the keywords in these papers. Thus, figures were made that represent the main clusters in our selection of works, then analyzed and discussed. We also used the Bibliometrix program to map the main research topics in a two-dimensional four-dimensional diagram for the WoS platform, after which a series of conclusions were drawn based on them.

3.3 Results and Discussions

The articles studied on the WoS platform come from 438 scientific journals. In Table 3 the first 5 journals are presented, which published a total of 131 articles, representing 29% of the entire selection. The dominant topic of these journals is blockchain technology. These journals can also be found in the Journal Citation Report (JCR) and Scimago.

The journals with the highest H index are: Technological Forecasting and Social Change (H-Index de 121) and Ieee Transactions on Engineering Management (H-Index de 89), being the most relevant to the subject approached. We can observe the evolution of the number of scientific papers in the period 2015–2021 (see Fig. 1). With regard to WoS articles, we see an annual increase of 95.6%, which was normal, there is currently a great deal of interest in emerging technologies, especially Blockchain, and in the expected effects of the implementation and development of these technologies.

[17] Small (1999).

[18] Huang and Chang (2014).

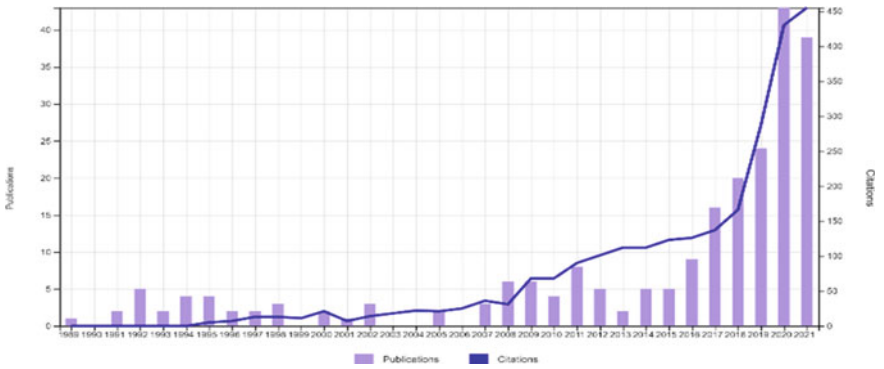

Fig. 1 Evolution of the number of published works. *Source* Author's own processing

Fig. 2 Production of scientific documents on the WoS database. *Source* Author's own processing

We notice that the number of works is increasing, being influenced by the process of digital transformation, and by the fact that emerging technologies are beginning to make their presence felt more and more.

Depending on the country of origin, the situation of the number of articles published on WoS (see Fig. 2).

Most of the scientific papers in our selection from the WoS from 2015 to 2021 were written in the U.S. with 942 works, followed by China with 585 and Great Britain with 441 works. These results confirm the great interest of the world's major economic powers in emerging technologies, with the emergence and use of Blockchain technology being of significant importance, a conclusion reached by other researchers.[19]

With the help of the VOSviewer program, we made a map of the keywords from the specialized works on WoS with the topic "artificial intelligence" and "blockchain". In order to investigate the main research perspectives in the analysis performed, a

[19] Secinaro et al. (2021).

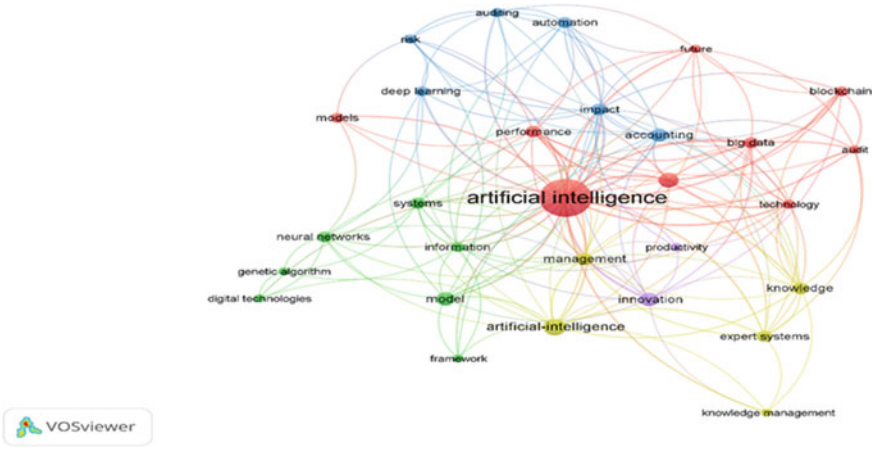

Fig. 3 Artificial intelligence links from the WoS database. *Source* Author's own processing in VOSviewer

keyword research was performed. Following the processing of selected data from ISI WoS using the VOSviewer program, 29 terms were obtained that reached the threshold of at least 5 frequencies (see Fig. 3).

We notice that the network made groups the terms into 5 clusters according to their relevance, and their frequency is highlighted by the size of the circles. The first cluster, but also the most important cluster consists of 9 items and is focused on artificial intelligence, including terms: models, performance, machine learning, big data, technology, future, blockchain, audit. We note that artificial intelligence is closely related to future technologies such as big data and machine learning, blockchain. At the same time, as a result of the implementation of these technologies, an increase in performance is expected; the word performance is close to the center of the network and has links to many other terms, even outside the cluster. Cluster 2 consists of 7 items and has as its theme information in general, how it will be transformed or processed, the terms being: neural networks, framework, genetic algorithm. Cluster 3 consists of 6 items, with accounting as the theme. As we can see in the picture, the terms of this cluster: impact, automation, deep learning auditing are actually the description of the impact that artificial intelligence will have on accounting. Cluster 4 focuses on knowledge and consists of 4 items. The last cluster consists of only 2 items, and has as its theme innovation and productivity, the way society will be revolutionized.

The colors of the words indicate the cluster they belong to, and the size of the sphere shows us their number of occurrences (see Fig. 4). We see in this figure a division into 9 clusters of WoS documents. The keywords with the most appearances of the keywords being blockchain with 869 appearances, followed by bitcoin with 227 appearances, technology 187 appearances, management 106 appearances and artificial intelligence 129 appearances. We can also see that in addition to having

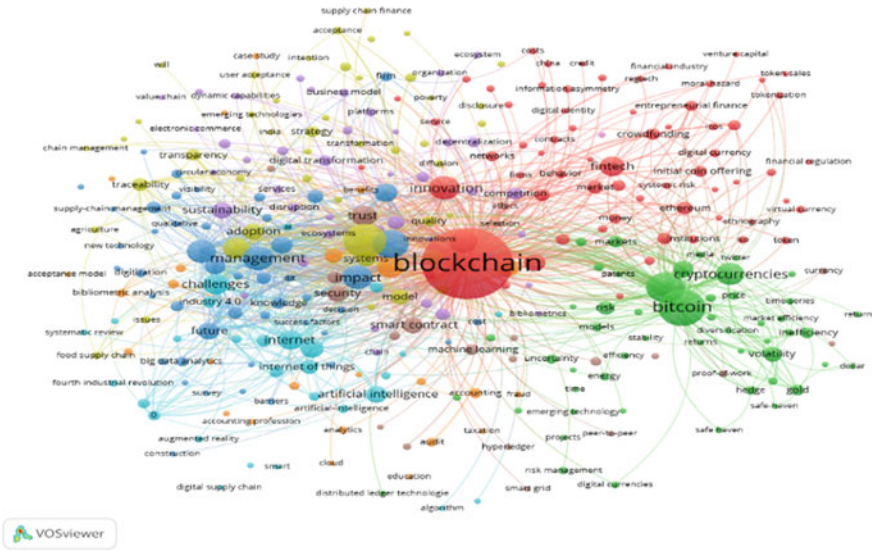

Fig. 4 Production of scientific documents on the WoS database. *Source* Author's own processing in VOSviewer

the most occurrences, the word blockchain is fixed in the middle of the map, which indicates the significant importance of this technology for other research topics.

The most common keywords are related to cognitive technologies, especially blockchain, which shows that researchers consider emerging technology to be the engine of evolution in accounting. We also notice that most words that revolve around words with many occurrences refer to the challenges or applicability of the first ones. At the same time, we notice the existence of a small group of words that benefit from a large number of occurrences, but the vast majority, however, have little connection, often only with the words in the cluster in which they are part, and a small number of occurrences. The word technology also has a high centrality and forms strong links with all clusters (see Fig. 5).

It is noted that among the links of the keyword technology there are strong links with the words: challenges, management, innovation, impact, which demonstrates, once again, the interest of researchers in the impact of these technologies in the future of accounting. There are also strong links between the internet of things and blockchain technology. The Internet of Things is the technology of using the Internet to connect different devices, services, etc., thus forming a network of objects.

For a better understanding of the clusters we opted for their representation with the help of two two-dimensional diagrams, respectively the centrality and density of Callon[20] (see Fig. 6). Centrality indicates the interaction between discovered networks, and density indicates the strength of the network within it, that is, the keywords that are part of the topic.

[20] Callon et al. (1991).

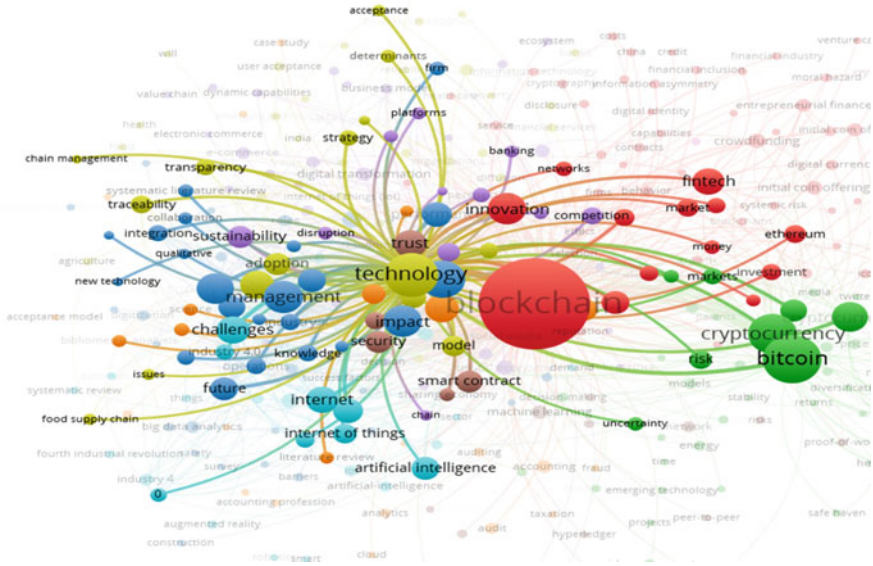

Fig. 5 Technology links from the WoS database. *Source* Author's own processing in VOSviewer

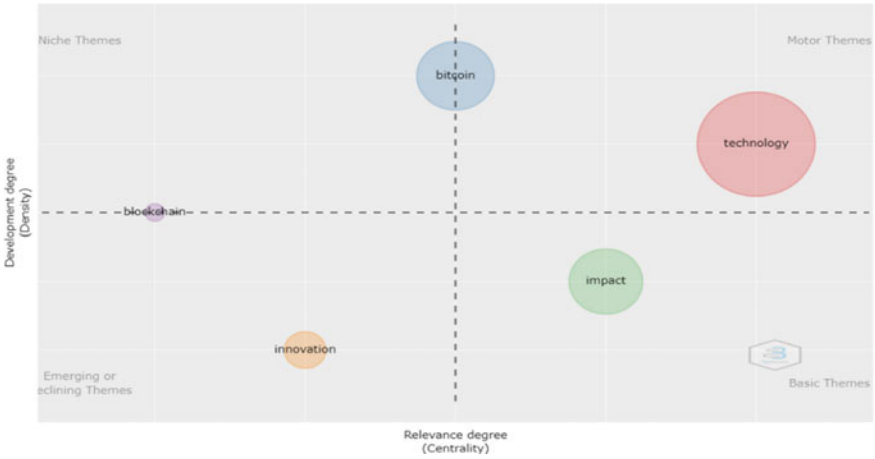

Fig. 6 Theme of works from the WoS database. *Source* Author's own processing in Bibliometrix

The diagram is divided into 4 quadrants according to the centrality and density of the themes. In the upper left quadrant, we will find "niche themes", ie those themes that have a low centrality, but with well-developed internal connections and a high density. As we can see, the themes that are part of this quadrant are: bitcoin and blockchain. The theme of bitcoin has strongly developed internal links, and this indicates that those plus keywords that are part of the theme are very common together.

When we take a look at the keywords plus in this topic, we can say that this is of particular interest to investors in the capital markets, discussing the market, economy, volatility, risk, etc. However, regarding the centrality of the topic, we see that it is in the middle of the diagram, indicating an average centrality, which means that this topic is sometimes found in other research topics, there are external links with other topics. The blockchain theme is found in the niche theme quadrant, with a high density but a low centrality, because even though this technology has major implications, researchers are more interested in the implications and impact of this technology, not the blockchain itself. This will change when the implications and impact of these new technologies are explored and quantified by researchers, the discussion migrating to the blockchain itself, on the development of this technology and the services it offers. The themes in the upper right quadrant are known as motor themes and have well-developed links, both internal and external, ie high centrality and density. These are particularly important for the field of research, benefiting from a great interest of researchers. The theme of technology is part of this dial, indicating that technology and its implications have aroused great interest from researchers as they want to address the implications and challenges of future technology development, aiming to establish a framework for the use of emerging technologies and developing effective methods. adaptation of these emerging technologies in the current environment. In the lower right quadrant, we have the basic topics, which are important but not sufficiently developed, with poorly developed external links. The impact theme is classified as basic theme, and indicates that most of the plus keywords that are part of this theme are common in others, due to the high centrality. This high centrality is due to the fact that many researchers are interested in the impact, performance and integration of various technologies, these terms being brought very often in scientific papers. In the last quadrant, the one on the bottom left, there are themes with poorly developed and marginal links, in our case we find the theme innovation is located in this quadrant. This topic is an emerging one, in today's competitive environment, innovation being extremely important for the well-being of economic entities.

4 Conclusions

When the concept of the modern world is mentioned, we tend to imagine a world in which technology is as essential as air, being present everywhere, helping and guiding people whenever this need arises. This is very close to materializing, and its key driver is the process we call digital transformation. This process will involve a fundamental change in the way economic entities operate on a daily basis. Moreover, it will involve a cultural change that will force economic entities to challenge the traditional way of doing business. In this sense, this paper supports researchers, but also stakeholders in the future of accounting, outlining the general direction of research topics, thus disclosing new developments and applications in this field, most focused on Blockchain technology.

Following the review of the literature and the bibliometric analysis carried out in this paper, we noticed that blockchain technology enjoys a great interest from researchers, who are focused on its challenges and applicability in accounting. Many of them consider this technology to be the future of accounting. This interest in the applicability of blockchain technology is even more evident in WoS research topics, with clusters discovered few in number (interest centered on a few research niches), and keywords plus most appearances referring directly to the technologies of the future. We believe that in the near future these research topics, in terms of emerging technologies, especially blockchain technology, will become extremely important, both for researchers who will focus on the different ways in which these technologies will be able to add value., but also for practitioners who will need to adapt and learn how to use them. Knowledge of these research directions is extremely important, helping professionals to be prepared for the changes that will occur in the field of accounting in the near future, these research topics actually shaping the future of accounting. Blockchain is considered a new technology, but built on existing technologies such as the Internet, private key cryptography, and the protocol that governs stimulation. Together, they lead to a secure process that facilitates digital transactions without the involvement of a third party. In other words, blockchain is an alternative accounting model.

In general, existing studies on blockchain technology and its use in business, especially in the field of accounting, although limited, nevertheless offer prospects for the future. In the near future, blockchain technology will have the capability to integrate the Internet of Things, artificial intelligence and other emerging technologies to provide superior services to organizations. However, the blockchain is still in the experimental technology phase, being applied in some areas on a small scale.

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