

ORIGINAL RESEARCH PAPER

THE IMPACT OF NEW TECHNOLOGIES ON THE CONNOTATION OF AUDIT PROFESSION

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ABSTRACT

Blockchain is increasingly conquering the finance sector. Blockchain technology enables a decentralized, distributed registry with durable and traceable data access in real time. Due to this, business processes are transforming.

Currently the work of an auditor is predominantly retrospective and focuses on the accuracy and consistency of a company's financial statements. Real-time data accessibility would alter this.

The purpose of this paper is to understand how digital revolution affects audit profession. In this regard, the focus is emphasized fresh possibilities and associated difficulties.

Research published in financial journals provide the foundation of this paper and shows, that many companies are consulting firms such as the Big Four KPMG or Deloitte on the potential impact of technological advances. There are preparations and accompaniments for the implementation of new technologies. Besides the literature review, a quantitative content analysis is elaborated.

The analysis indicates, that well-known auditing firms and companies are actively investigating blockchain and are already launching the first initiatives to implement the new technologies. The relevance of Blockchain is noticeable present. However, there are uncertainties about the current legal framework and the rapid pace of change due to digital revolution. Thus, this research can add new dimensions on audit profession and, particularly, express the benefits and opportunities of Blockchain as part of the auditing process.

Keywords: digitization, Blockchain, audit profession, accounting

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I. INTRODUCTION

With the rise of new technologies like blockchain, traditional audit services are being challenged and compelled to reconsider their practices. Since it is already assumed that blockchain will have an impact on a variety of economic sectors and their business processes, this will result in a new auditing foundation in the future. What makes it so intriguing for the auditing profession is that this innovation has the potential to free up resources to dedicate to greater detail in the auditing process itself. Manipulations comparable to those in the Wirecard scenario could become obsolete or be drastically reduced. Current events such as the still ongoing scandal regarding the Wirecard Group are probably the best known and most recent examples of failed financial management. However, prior to this crisis, the media wrote positively about Wirecard. According to experts, the company had outstanding staff, a solid business model, cutting-edge technology, and adequate resources to ensure a bright future (Kleine Zeitung, 2021). This type of statements about the once wealthy financial services provider are no longer common. The company declared bankruptcy in 2021. Accounting fraud is alleged to have occurred. Balance sheets were fabricated with fictitious sales to get larger bank loans and reflect a greater market value.

Subsequently, the company's auditor received criticism too. There have been questions over whether the annual audit should have caught the balance sheet's manipulation.

Advancing digitalization and developments, such as blockchain, can create the possibility to provide considerable benefits in situations like these. Presently, the auditors' abilities are limited. The auditor is reliant on the standard and volume of the paperwork that the client provides. Of course, any evidence the auditor thinks relevant for a proper audit or for the purpose of a diligent audit may be requested from the legal representatives (IWP & KWT, 2022), but if these are falsified, there is a residual risk that the auditor will not recognize the falsification despite excellent expertise. The unchangeable access to real-time data enabled by blockchain technology is redefining the audit profession's options. Fresh chances are provided, while on the other hand uncharted threats arise. Hence, audit profession needs to actively adapt and change.

Since the introduction of blockchain and the growing understanding of its applicability to several processes in various industries, auditing and the auditor's role have particularly come into attention (EY Americas, 2019). Especially when there is constant discussion about how this technology has the potential to transform and modify many industries (Was sind die Chancen und Risiken der Blockchain?, n.d.). Real-time reporting, immutability, traceability, and many other features of blockchain technology make this system appealing to this segment of the business. Numerous of these advantages could facilitate the audit process and permit the auditor to concentrate on pertinent areas of the audit (Garinina et al., 2021). Which would significantly increase the quality of these processes and make them more accurate (Abdennadher et al., p.56). This, in turn, would have the advantage of preventing economic events like 2008 from occurring, because visibility would be available in many ways (Tapscott, & Tapscott, 2016, pp.151-152). It should be noted that this is not only about the audit process, but also about the customers' new business models. Knowledge of new business models, which are becoming increasingly relevant, is rising to the forefront, and posing a challenge for auditors. Understanding and creativity in relation to this innovation are becoming more and more essential to the assessor's duties. Furthermore, the significance of these technology advancements is not missed on the world's active auditing groups (Blockchain and its potential impact on the audit profession, n.d.). This is evident from the fact that collaboration is being entered into with huge technology behemoths to research and acquire knowledge in this area. This is exemplified by the collaboration between KPMG and Microsoft. The goal is to combine the experience of both organizations to investigate future potential and areas of application (KPMG And Microsoft Announce New Blockchain Nodes, 2017). This also emphasizes the significance and seriousness of potential impending blockchain reforms.

Thus, the current state of information leads to the basic hypothesis of this study, which is that Blockchain will simplify auditing work and gain greater significance in this area. The purpose of this paper is to investigate in the various economic implications of digitalization on the audit profession and consequently, highlight current technology trends like Blockchain. The first part focuses on a literary review and description of blockchain technology and the accounting field. Following that, the methodology of applied quantitative research is explained. The fourth part summarizes the findings

followed by a discussion section. The presentation of findings includes an interpretation of the quantitative research and an analysis of the Big Four's stances on this issue. A conclusion forms the last section.

II. LITERATURE REVIEW

i. The present scope of audit profession

The framework requirements for auditors' activities in Austria are regulated by the *Wirtschaftsstreuhandberufsgesetz*. Auditors occupy an official position, which they qualify for by passing the auditor exam (*Wirtschaftsprüfer*, n.d.). An auditor's duties include auditing the annual and consolidated financial statements of a company to establish their legality and consistency. An assessment of the proper accounting is made, and it is ensured that the assets, financial situation, and earnings situation as they are presented in the annual report also accurately reflect the facts (Löffelholz, 2010). The International Financial Reporting Standards (IFRS) and Austrian company law (UGB) are central to the audit (Schula, 2022).

Legal representatives of a corporation must provide the auditor access to go into the company's books and records, as well as its assets and liabilities. Any evidence the auditor thinks relevant for a proper audit or for the purpose of a diligent audit may be requested from the legal representatives (IWP & KWT, 2022). The auditor is required to provide a written report detailing the audit's findings.

"The Supervisory Board and shareholders rely heavily on the auditors' work as a source of information and assurance of accurate financial reporting and information. But that's not all. In their work, auditors should also have knowledge of a company's economic development in addition to meeting all legal criteria, helping the supervisory board in its endeavors and best assist the supervisory board in fulfilling its role and obligation!" (Androsch, 2022).

Statements like these highlight the arduous nature of an auditor's job.

However, an auditor's abilities are limited. Auditors are obligated by their risk analysis to audit those areas in which there is a major misstatement in an organization's financial statements. Because, as previously stated, the audit of annual financial statements is not a thorough audit, there is always

a residual risk that the audited annual financial statements may also contain inaccuracies (IWP & KWT, 2022). Additionally, the yearly financial statement audit is not a management audit. It is not the auditor's responsibility to determine, if a business choice was or is correct, or whether management's behaviour complies with certain principles of economy, expediency, and so on. An essential aspect of boundaries in the preparation of the annual financial statements is the further development of a company. The primary concept of accounting is that the reporting company will remain in existence. This is the foundation upon which accounting is based ("going concern") (Androsch, 2022). The auditor must decide whether to continue the entity. Being able to assess this is particularly challenging when businesses are struggling, and the economy is unstable. The auditor needs to challenge if the management's conclusions have been formed in an understandable manner and must deal extensively with those conclusions. He himself does not, however, make a going-concern prognosis as part of the financial statements' examination (IWP & KWT, 2022). This implies that the auditor's reliance on the accuracy of the data and information supplied to him for his work is constant. Due to the historical nature of his work, it is only partially possible to predict the future, even though this would be extremely helpful in today's rapidly changing world.

Legislation, case law, computer technology, international accounting standards, and auditing standards are all continually changing, posing new challenges to auditors. High levels of dedication, adaptability of thought, and innovation are necessary for their professional work. As a result, the economy values them as valuable partners (IWP & KWT, 2022).

The economic, social, and private spheres are all undergoing a profound structural change due to the digital revolution. This development has an impact on the auditing profession (Ziegler et al., 2018). Although there may be new company sectors where auditors can offer guidance, the audit itself is changing because of digitalization. Digitalization is accompanied by the concepts of big data, cloud computing, cyber security, remote audit, and continuous audit. Traditional auditing and modern information technologies will invariably coexist.

ii. Blockchain's Effect on the Auditing Profession

Since the emergence of cryptocurrencies, blockchain is a new technology that has gained increasing popularity (Martino, 2021, p.33). The introduction of a decentralized network that permits a variety of transactions independent of third-party interference. Which can have a favourable effect on costs, processing times, transparency, and public confidence in businesses (Ferri et al., 2021). By going deeper into this advancement, it has been feasible to better appreciate the capabilities of this innovation. Very immediately, it became apparent that this technology could do much more than facilitate transactions. The peer-to-peer-based decentralized system can be used to transfer a variety of assets (Martino, 2021, pp.15-16). In addition, with the possibility of processing business agreements and conditions digitally and automatically via smart contracts (Atanasovskil & Toceva, 2022, p.277).

Everything occurs within a structure of blocks and chains. Inputs and transfer activities are arranged into blocks and linked together to form a chain. Each movement contains a time and date stamp, allowing for an accurate chronology. The present cryptography, as well as validation through a consensus process of all network allowed parties, assure the system's integrity. Access is granted to a database where all transaction operations may be tracked, with the restriction that they cannot be deleted. This then serves as a type of digital manual, with copies distributed to everyone on the network (Lardo, 2022, p.205). Furthermore, the entire process occurs in real time, ensuring that insight is always readily available. Consequently, it is equally intriguing for the auditing procedure and its exporters (Abdennadher et al., 2022).

Blockchain's initial concept is to represent a network by connecting all financial systems. This would make this discussion regarding the auditing profession obsolete. As a connected, decentralized network throughout the financial systems would render this redundant (Loitz, 2018). Since this innovation is still in its infancy and current procedures require a human stamp of approval, it is vital to be aware of its progress. It is already expected that accounting firms and their auditors would encounter a variety of challenges relating to blockchain technology. The emphasis today is not only on an auditor's field of operation, but also on his customers' prospective alterations. Companies are undergoing transformation and new business models are

emerging due to digitalization and blockchain development (Chartered Professional Accountants of Canada & American Institute of CPAs, 2017). In the future, networked and overlapping enterprise systems, as well as a plethora of interfaces, such as with a regulator, are achievable and realistic. As a result, it is expected that an auditor and his institute will possess distinct knowledge and abilities. Specialist expertise alone will not suffice. A combination of expertise and understanding of digital technologies will be required (Loitz, 2018). On the one hand, audits can thus be conducted in a much more independent and understandable manner; on the other hand, auditors' training and career notions will need to be modified. In addition, it is anticipated that many auditing-related tasks will be performed automatically (Chartered Professional Accountants of Canada & American Institute of CPAs, 2017, p.15). This will result in changes to audit processes and their respective sections. Interfaces and places where discretionary decisions exist will be emphasized. Due to the fact that many tasks will only be completed digitally, systems will be audited. A accuracy and trust check will be feasible only by a human, especially when it comes to changing, for example, a blockchain technology within a firm (Blockchain – was heißt das für die Abschlussprüfung?, n.d.; Loitz, 2018). Similarly, there may be a shift in reporting. The elimination of the financial data valuation margin will have a favourable impact. The use of a standard approach would allow for improved data analysis and increased traceability (Blockchain and its potential impact on the audit profession, n.d.). The audit's scope of tasks would enable an attention on relevant and critical positions. As this is frequently not achievable due to the amount of testing conducted today. However, this will also eliminate the reconciliation audit, reducing the auditor's workload (Chartered Professional Accountants of Canada & American Institute of CPAs, 2017, p.11). It is also possible to envisage displaying the exam results using blockchain. Thus, it would also allow viewing by any authorized person, without possible manipulation or inaccuracy (Tiron-Tudor et al., 2021, p.490).

It is evident that many are still hesitant to make definitive statements regarding the anticipated change in this field. Despite this, various projects and studies have already been conducted in this area. Particularly prevalent at top accounting companies (Wu et al., 2019, p.19). Since Deloitte, PWC, and KPMG consider that dealing with this field of development in good time and acquiring knowledge is beneficial. Especially considering that

the currently accessible advances reach a broad spectrum and can consequently have an effect everywhere. Therefore, awareness of technology advancements like blockchain is inevitable (Was sind die Chancen und Risiken der Blockchain?, n.d.; Time for trust, n.d.; Blockchain, n.d.).

III. Research Methodology and Design

i. Objective and research question

There is increasing awareness of blockchain in relation to auditing. The research in this article assumes that new technologies will have a substantial impact on an audit profession. Based on a traditional literature assessment, the existing scope of audit activities is compared to potential blockchain-related modifications and outlined. The aim is to add new dimensions to the enlightenment of auditors and to demonstrate the associated benefits.

The primary research questions “Is academic literature addressing blockchain in the context of auditing more frequently through the last ten years?” and “Do academics recognize the need for an auditor to deal with the blockchain issue?” accompany the entire research process and constitute as the foundation for this article’s techniques section.

The emphasis of the technique section has been on a quantitative literature review. The goal is not to delve into detail about the subject, but rather to highlight the current state of development in this area. Given that it is frequently stated in numerous papers that this technology is still in the research phase and that assumptions are frequently available in the auditing field, it seems reasonable to examine the quantitative growth of the publications. In addition, the goal is to provide a comprehensive overview of the auditing profession and all connected areas, including accounting, auditing, and digitalization developments in this industry.

ii. Clarification of the evaluation method

This paper used a quantitative research approach. Following the completion of the classical literature search, the literature selected for this purpose was categorized, tagged, and interpreted. Particularly, the reference books utilized, were categorized in accordance with their original information source. According to physicist Wilhelm Fucks, this strategy is founded on the concepts and methods of quantitative content analysis (Aichele, 2005).

For the analysis, the Google Scholar, Pro Quest, and Scopus databases were employed. The key justification for using Google Scholar was the ability to declare in a broad, global sense that the topic is present in research. Pro Quest and Scopus were supposed to supplement this by highlighting specifics as well-founded and highly regarded databases.

Since 2008 many articles often focus on blockchain and cryptocurrencies. Therefore, the technique part concentrates on the previous fourteen years. In detail the following periods consisted for the evaluation:

- 2008 – 2012
- 2013 – 2017
- 2018 – 2022

Initially, categories were formed, which were used to search the databases for the number of hits on scientific work. The categories chosen include the major keywords and topic blocks that appear most succinctly and frequently in the literature on which this article is based. The frequent mention in connection with the topic of audit and blockchain led to the assumption that it is precisely these selected keywords that best summarize the literature. The following keywords have been outlined to evaluate the corresponding hit rate according to literature available for this purpose:

Table 1:
Keywords

Blockchain
Cryptocurrency
Distributed Ledger Technology
Industry 4.0
Blockchain and Accounting
Blockchain and Auditing
New regulations and challenges in auditing
New technology in auditing
New required knowledge in auditing
New consulting fields in auditing

Following that, a codebook based on these categories was produced. To address our study

topic, the relevant categories were arranged in a table by relevancy.

Table 2:
Code Book

0	Blockchain
1	Cryptocurrency
2	Distributed Ledger Technology
3	Industry 4.0
4	Blockchain and Accounting
5	Blockchain and Auditing
6	New regulations and challenges in auditing
7	New technology in auditing
8	New required knowledge in auditing
9	New consulting fields in auditing

Each Article shall be classified in the corresponding category if it mentions overall information to the chosen category.

Examples:

	Record	Justification
0	"Enabling privacy and leakage resistance for dynamic blockchain-based access control systems"	This article should be categorised as "Blockchain" because it gives information to Blockchain relevant impacts.
1	"Hybrid gated recurrent unit bidirectional-long short-term memory model to improve cryptocurrency prediction accuracy"	This article should be categorised as "Cryptocurrency" because it gives information how to deal with Cryptocurrencies in the Blockchain system.

2	"A Design Model of Copyright Protection System Based on Distributed Ledger Technology"	This article should be categorised as "Distributed Ledger Technology" because its title shows that the article is based on the distributed ledger technology.
3	"Supply chain management and industry 4.0: A theoretical approach"	This article should be categorised as "Industry 4.0" because it is obvious that the topic deals with the implications of this time age.
4	"Intelligent matching: Supply chain management and financial accounting technology"	This article should be categorised as "Blockchain and Accounting" because the title of the paper itself shows that it deals with new forms of the supply chain due to Blockchain and their impact on Accounting.
5	"The Impact of Blockchain Technology on Internal Auditing in the Financial Sector"	This article should be categorised as "Blockchain and Auditing" because the title of the paper summarizes the category we build.
6	"The emergence of audit data analytics in existing audit spaces: findings from three technologically advanced audit and assurance service markets"	This article should be categorised as "New Regulations and challenges in auditing" because it analyses the impact and challenges on audit profession due to new possibilities on the market.
7	"The transformation to data analytics in Big-Four financial audit: what, why and how?"	This article should be categorised as "New Technologies in auditing" because the content shows that the paper deals with the possibilities of data analytics in audit profession.

8	"Understanding the internal audit function in a digitalised business environment?"	This article should be categorised as "New required knowledge in auditing" because the article's title shows that it deals with the impact of digitalization on auditing and the therefore necessary knowledge.
9	"The aim of this paper is to introduce use of artificial intelligence in audit and accounting, with an emphasis on currently trending blockchain technology. Due to its innovative character, this field is constantly changing, with the biggest companies investing enormous amounts of capital to achieve wide use of artificial intelligence in audit and accounting."	This article should be categorised as "New consulting fields in auditing" because the sentence out of the abstract of this article reveals that auditors are investing a lot of money in finding out what new business areas blockchain technology can generate.

Using the codebook, the respective keywords were entered into the search engines of Google Scholar, Pro Quest and Scopus and the respective hits were counted. More detailed information on the results can be found in the results and discussion part.

IV. Results

As stated in the previous chapter, the quantitative research for this work was conducted using the Google Scholar, Pro Quest, and Scopus databases. The period 2008–2022 was analysed.

Furthermore, the hypothesis that blockchain will simplify audit work and gain significance in this field was investigated.

Primarily, Google Scholar was used for the initial search by number of articles. This is because this search engine exposes general publications of all quality levels. This can provide a more accurate picture of the mood about this topic, because the

quality of an article indicates nothing about the general public's interest in this topic. There were no limitations on the search. Publications of all genres, as well as those written in German and English, were desired.

The compilation of the results generated the following records:

Table 3:
Google Scholar

Keyword	2008–2012	2013–2017	2018–2022
Blockchain	1700	50600	161000
Cryptocurrency	311	6820	47900
Distributed ledger technology	4880	8720	17500
Industry 4.0	7480	13900	18400
Blockchain and Accounting	3540	8630	18500
Blockchain and Auditing	52	1010	16300
New regulations and challenges in auditing	18000	18200	17100
New technology in auditing	56000	78000	55800
New required knowledge in auditing	27400	26700	18600
New consulting fields in auditing	15700	17100	17100

The results clearly show that the number of published papers related to blockchain is steadily increasing. If you find only a few hits in 2008, you already get over a hundred thousand findings in today's 2022.

The next step was to conduct a Proquest database search. Proquest is a well-known database that is particularly useful for dissertations in the United States. Whoever obtains the chance to publish there has unquestionably produced work of the highest tier. The intention was to contrast Google Scholar's findings with those of a smaller database that only publishes chosen articles. The search was unrestricted in this case as well, and

the analysis covered all results, including literature in both English and German.

The following results were outlined:

Table 4:
Pro Quest

Keyword	2008-2012	2012-2017	2017-2022
Blockchain	0	4995	68874
Cryptocurrency	4	2287	33741
Distributed ledger technology	3632	4822	10922
Industry 4.0	41335	58481	3809904
Blockchain and Accounting	0	555	24720
Blockchain and Auditing	4052	172	3890
New regulations and challenges in auditing	75329	9998	41965
New technology in auditing	243851	14585	187726
New required knowledge in auditing	87163	11851	43498
New consulting fields in auditing	62283	5106	43356

In the third stage the database Scopus was scoured. Like Proquest, Scopus is a highly declared publication platform that only accepts scientific papers of high quality into its repository. A comparison to the hits of Proquest should be found, in order to underpin the findings with another well-founded source. The following objectives were achieved:

Table 5:
Scopus

Keyword	2008-2012	2012-2017	2017-2022
Blockchain	4	1637	81289
Cryptocurrency	3	570	15426
Distributed ledger technology	69	519	14251

Industry 4.0	30	2803	11840
Blockchain and Accounting	0	88	6253
Blockchain and Auditing	0	37	3541
New regulations and challenges in auditing	1424	2851	5177
New technology in auditing	5834	10555	20135
New required knowledge in auditing	275	524	919
New consulting fields in auditing	213	379	539

Looking at the results the picture painted by the literature review is confirmed. The academic community is increasingly associating the auditing field with blockchain, and it is undoubtedly extremely up to date.

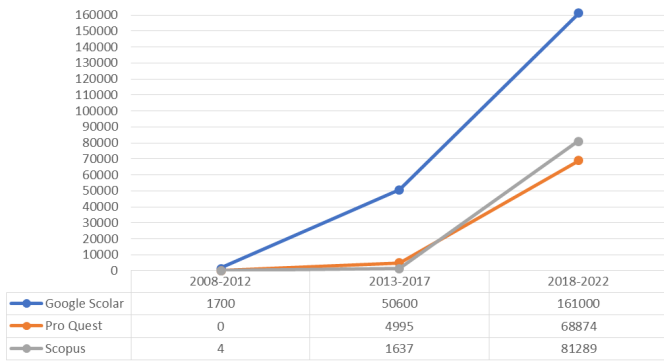
The last phase was to focus on material issued by one of the Big 4 accounting firms to reinforce the results of the quantitative content analysis with specific qualitative reasons. The Big Four companies are KPMG, PWC, Deloitte and Ernst & Young. Their publications on the overall topic of blockchain, as well as auditing, were examined. Since it was discovered in general research on blockchain and auditing that the Big 4 are heavily active in this sector. In addition, they would be profoundly affected by such a change, so it is of major importance to understand their perspective and efforts in this area. Notably, the investigation and publication of the Big Four must be conducted differently due to the fact that their databases and input options, such as years, are distinct. Specifics are provided in the various findings.

Looking at the Google Scholar results, it became clear what the literature already revealed: the accounting profession has always been and continues to be a changing profession. New legal situations require new knowledge and bring forth new fields of consulting. This result was also shown by the categories "New regulations and challenges in auditing", "New technology in auditing", "New required knowledge in auditing" and "New consulting fields in auditing". Even before the publication of the first literature on blockchain in 2008, there is

already a large amount of technical literature in the databases examined on these categories. Google Scholar is a very broad database, with Pro Quest and Scopus providing only selected articles. This is also shown by the number of hits found. Nevertheless, the trend is clear and can be seen throughout all systems. The technical literature on auditing connected to blockchain is steadily growing when viewed over time. It is evident that the scientific community anticipates a shift in the auditing profession as a result of the new technology.

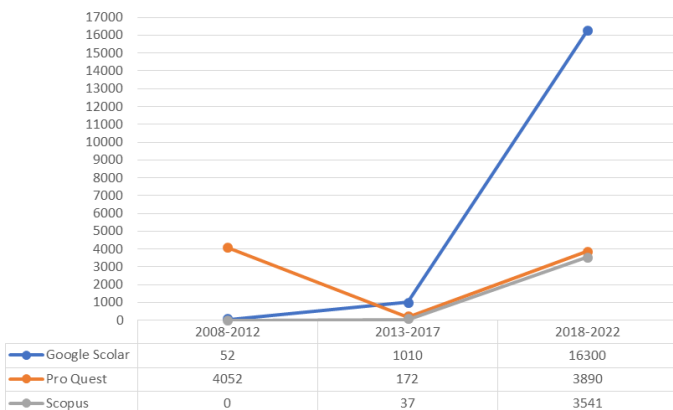
The following image emerges when the Blockchain category is examined in detail across all time periods:

Figure 1:
Blockchain



The graph demonstrates how the issue of blockchain is constantly becoming more prominent in the literature and is receiving more attention. Therefore, it is possible to expect that the auditing process will be significantly impacted by the blockchain technology. Analyzing the category "Blockchain and Auditing" reveals a similar pattern.

Figure 2:
Blockchain and Auditing



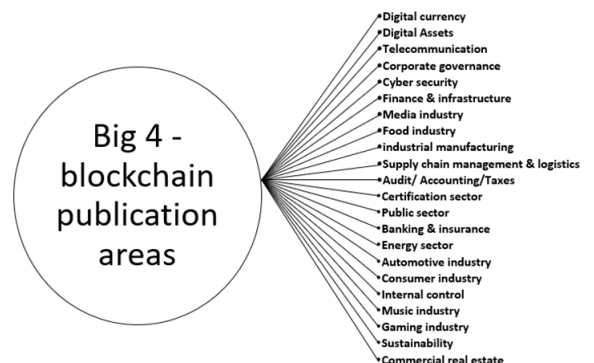
The amount of literature that is available grows yearly. Pro Quest is an exception for the years 2013-2017, but this may be due to a lack of high-quality articles submitted to the database. The quantitative content analysis on which this paper is based confirms the hypothesis, that academic literature addresses blockchain in the context of auditing more frequently through the last ten years. According to the data, the question "Do academics acknowledge the need for an auditor to deal with the blockchain issue?" can also be answered positively. However, articles written by the Big 4 on the study question were examined in a subsequent phase in order to be able to add qualitative statements to this.

This can be a clear indicator that the auditing profession's relevance in this sector has expanded. As stated in the fifth section, this is consistent with the involvement of the Big Four in this topic and their publications in various economic areas.

V. An overview to the Big4's perspective on blockchain technology and auditing

Numerous sectors of the industry, including the four largest accounting firms, have realized the disruptive potential of blockchain technology. These organizations have several initiatives happening around the world and provide their clients with diverse blockchain services to develop experience. Beginning with cryptocurrencies and progressing to the potential applications of blockchain technology itself. (Bajpai, 2017). In addition, they wish to enhance knowledge and confidence in this technology and its potential applications. The rationale for devoting so much attention to this topic is the early awareness that this innovation will have a significant impact on audits. It is acknowledged that auditors will require knowledge of these new company models for future auditing methods (CNN,2021).

Figure 3:
Blockchain-related publications of the Big Four



When analysing the Big Four and their current publications in the subject of blockchain, it is possible to discern their involvement in numerous economic sectors. The figure below depicts the issues on which these auditing firms can inform and advise their clients in this regard. These attempts can be viewed as an indication that accounting firms take this innovation and its potential to disrupt numerous industries seriously and wish to alert their clients in a timely manner. Moreover, this may already be an indicator of how the auditing profession will evolve, as some predict that it will expand beyond general business analysis (Loitz, 2018).

Focusing exclusively on the auditing industry as a whole and analysing the Big Four separately reveals the following:

- **Deloitte:**

Analysing the Deloitte contributions from Germany and the United States on their website in regard to auditing, it is noted that Blockchain progress will have an impact on auditing. Deloitte explicitly states that blockchain will have an impact on many industries, altering modern accounting, but that competent accounting and the creation of legally compliant financial statements will continue to be required. Especially considering that faith in the accuracy of business data is essential for functioning capital markets. They consider the auditor's examination to be essential and independent of technology. They perceive the change in auditing activities primarily in the automation of numerous laborious and time-consuming preparation stages. In addition, an examination of blockchain technology and its modes of operation will be required. The activity will consist of examining certain protocols and standards of the selected blockchain. As a result of this assessment and the auditor's participation, a certain level of assurance should arise (Blockchain – was heißt das für die Abschlussprüfung?, n.d.). In the future, Deloitte anticipates that auditors will not only conduct spot checks, but will also have access to real-time data and a holistic perspective. They are also aware that the needs for the auditing profession will evolve, demanding the development of new training courses. It is also noted that a distinct emphasis has been placed on transformation in the auditing area, and hence investments in this field are being made (Neue Technologien in der Wirtschaftsprüfung und ihre Auswirkungen auf das Berufsbild, n.d.).

Furthermore, Deloitte Germany provides its clients with dedicated blockchain technology centers of excellence. In this context, they have offerings for all industries and hence aim to be involved in the development of various blockchain approaches. Similarly, in the United States, there is the Deloitte Blockchain Lab offering. It is intended to assist businesses in adopting blockchain and all of its benefits and prospects. Additionally, it should make it easier to determine priorities and remove the uncertainty that comes with the unknown (Deloitte Blockchain Labs, n.d.).

- **KPMG:**

KPMG, like Deloitte, provides information about blockchain, including potential applications, possibilities, and hazards. Furthermore, they advertise the availability of several blockchain solutions. To assist their clients, in particular, in the areas of audit, internal control, cyber security, and risk management, in order to develop necessary mitigation measures during process adaptation (KPMG, 2021, p.3). A thorough understanding of blockchain, as well as cryptocurrencies, is provided. These provide insight into the blockchain selection process, as well as controls, strategic alignments, and risk management (Blockchain and risk, n.d.).

Moreover, it is intriguing that KPMG works so closely with a market dominating giant like Microsoft. It is recognizable that, they try to combine auditing skills with technological know-how to generate the greatest blockchain understanding and provide suitable support. As with all other accounting giants, the objective here is to assist with all currently accessible technology, such as cloud computing and artificial intelligence (KPMG and Microsoft, n.d.).

- **EY:**

Ernst & Young gives a similar vision for blockchain usage. By providing information for a variety of economic segments, it is possible to foresee a shift in the future severity of blockchain technology. Further, with the EY Blockchain Analyzer effort, this accounting company has made an initiative in the auditing industry. With this initiative, launched in 2018, EY aims to keep pace with the rapid evolution of the blockchain field and improve the auditing process for itself and its clients. The objective is to adapt audits in an innovative manner to catch up with customers and their modified business models. For the development itself, worldwide

experience and blockchain technology were joined to produce a workable solution for future audits and confidence. This blockchain application should be included into the transaction verification auditing process. This is to establish a new method for auditing, as well as regulatory compliance and reporting (Curtis, 2018).

• PWC:

PricewaterhouseCoopers illustrates a comparable picture. Similarly, there is a vast array of information in several economic areas associated with blockchain technology. According to their website, 47 publications on blockchain technology were published in the last year. In addition, they predict this development will accelerate the expansion of the economy and industries. According to PWC, experts think that this technology will be adopted by the majority of firms worldwide within the next couple of years (Blockchain ist Einsatzbereit ,n.d.). However, PWC itself already offers three blockchain solutions. The Smart Trace, Smart Credentials and Halo solution. Innovative solutions for the simplified management of third parties, the provision of credentials in real time, and the verification of ownership and custody of a blockchain's tokenized securities (Unsere Blockchain Lösungen, n.d.).

VI. Discussion

The analysis of this paper demonstrates an increasing correlation between the audit profession and Blockchain. It supports the fundamental hypothesis that Blockchain will simplify auditing work and gain greater significance in this area. The increasing number of publications in reputable, peer-reviewed journals such as Scopus confirms the academic community is progressively associating the occupation of auditors with Blockchain technology. The same argument is made by Deloitte Germany and United States (Deloitte Blockchain Labs, n.d.). In its publications, the auditing company emphasizes that the Blockchain progress will have a significant impact on the auditor's possibilities regarding examination activities. In line with the hypothesis, it became apparent that the audit profession has always been and continues to be a changing profession. KPMG endorses this view and promotes the further training of employees with regard to new technologies enormously. (KPMG and Microsoft, n.d.). For the auditing industry to be competitive and continue to provide high-quality services, a firm's ability to acquire and apply technological knowledge will become increasingly im-

portant. Collaborations between companies like KPMG and Microsoft provide evidence for this claim (KPMG and Microsoft, n.d.). The group accompanies its clients through implementation processes and stands out above all for insights into the blockchain selection process, as well as cryptocurrencies. This assistance might offer them with knowledge of new business concepts, hence creating benefits. According to Deloitte, new business models will be crucial to future financial reporting, making their comprehension a requirement (Blockchain and its potential impact on the audit profession, n.d.). The data in the literature review contribute to a clearer understanding of how the dependence between auditors and their clients will change (IWP & KWT, 2022). The auditor will be more independent based on the information provided by his client. Blockchain technology not only allows for real-time data access, but it also ensures that data cannot be modified. This benefit is also emphasized by PWC, which also provides cutting-edge options for credentialing in real-time. The organization is convinced that this technology will be adopted by the majority of companies worldwide (Unsere Blockchain Lösungen, n.d.).

Finally, it is obvious that the transformation in the auditing industry has not yet developed a definite trend (Chartered Professional Accountants of Canada & American Institute of CPAs, 2017, p.14). Similarly, experience with blockchain technology is currently quite limited and has substantial growth potential (Deloitte, 2016, p.5). For example, Deloitte provides modification suggestions but no defined framework or definite process processes (Blockchain – was heißt das für die Abschlussprüfung?, n.d.). EY's explanation of the procedures in this sector demonstrates that these advancements still have promise. According to EY, the development is continuously monitored and adjustments are being made as necessary (Curtis, 2018).

The results might suggest that the annual audit will become much simpler and the auditor's work may become less important. The opposite is the case, the auditing activities and daily challenges will change. In particular, the new business models emerging as a result of new technologies promise exciting workdays for auditors in the future (IWP & KWT, 2022). Organizations like the Chartered Professional Accountants of Canada and the American Institute of CPAs have expressed the view that new technology make obsolete resource-intensive preparatory processes, allowing more time

and attention to be devoted to auditing essential transactions (Chartered Professional Accountants of Canada & American Institute of CPAs, 2017, p.11).

Moreover, the exact process and practical approach are not quite clearly worked out. Conducting a more extensive content analysis of such an audit process and developing a detailed strategy for future interactions between the business and the auditor would be advantageous. This paper is limited by its quantitative examination of whether the relevance and significance of blockchain in auditing is discernible. The Big Four were utilized to provide qualitative support for the quantitative findings, but not to assist determine future activities.

VII. Conclusion

In conclusion, it is evident that Blockchain is gaining more and more importance in the field of auditing. In particular, Big 4 firms are informing and supporting Blockchain strategies in a variety of business segments. It is important to emphasize that they are aware that the auditing sector will be affected by the change brought about by blockchain technology. The Big 4 uniformly hold the view that the auditing profession will change, and new activities will be added. However, they are certain that the auditing field itself will not become redundant, but that new areas of consulting will be opened up. The quantitative content analysis also shows that, measured in numbers, the publications and thus the scientific interest in the development of the accounting profession in connection with this innovation is steadily increasing. This confirms the fundamental assumption that the auditing profession is about to undergo a transformation. The direct impact of new technologies such as blockchain on the accounting profession has been sufficiently researched. The real-time collection of vast amounts of data enabled by Blockchain is poised to transform the auditing profession. However, it would be interesting to find out how the actual audit procedures of a group audit are changing. Larger data volumes not only mean the advantage of obtaining more information, but also a limitation in that not every single data record can ever be analysed by a human being. This is exactly where the further research of this article will start and go through the process of a group audit step by step in order to find out which audit procedures will be relevant in the future.

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