

Big Data Challenges and Opportunities for Accounting and Auditing

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Abstract: With the proliferation of big data across various industries, the accounting profession has been profoundly impacted by the vast amount of data and its unique characteristics. It is crucial for accountants and auditors to comprehend the big data landscape to effectively carry out their roles. The objective of this paper is to introduce the concept of big data and discuss its distinctive characteristics, as well as the opportunities and challenges it presents in the realm of accounting and auditing. The findings of this study demonstrate that in the realm of financial accounting, big data presents an opportunity for more objective assessments of fair values. Furthermore, in the field of auditing, big data facilitates substantiating management assertions and enhances the auditor's opinion, audit report, and overall audit quality. Finally, this study opens avenues for extensive research in the realm of big data's impact on the accounting profession.

Keywords: Big Data, Accounting, Auditing, Opportunities and Challenges.

1. INTRODUCTION

The significance of data as a valuable resource and a pivotal element for business growth and competitive advantage across various markets is widely acknowledged. The continuous expansion and complexity of datasets have rendered traditional databases and tools, such as spreadsheets, insufficient for comprehensive analysis. Consequently, the overarching concept of "big data" has emerged on the macro level of information and communication. This concept has garnered considerable attention from researchers in diverse scientific disciplines, primarily due to its profound impact on data-related areas, including data analysis. The term "big data" encompasses the exceptional scale and speed at which data is generated through electronic transactions, user interactions on websites, textual information, social media activities, photos, videos, and numerous other sources. Forward-thinking companies have recognized that effectively harnessing big data can yield valuable insights about their customers. Through the utilization of suggested priorities in internet browsers, websites, environmental factors (e.g., weather), and social media trends, companies can forecast their customers' purchasing patterns and ultimately enhance customer satisfaction ([Brown-Liburd, Issa, & Lombardi, 2015](#)). Big data emerges within a technological landscape where nearly everything can be digitized, measured, recorded, and transformed into data. This real-time process can include a multitude of events simultaneously, encompassing numerical data, text, images, audio, and videos obtained from diverse sources, consequently necessitating substantial storage capacity. This review aims to introduce the opportunities and challenges that big data has introduced in the domains of accounting and auditing, resulting from transformative shifts in the business environment and the distinctive features of big data. The subsequent sections will first introduce the concept of big data and its characteristics, followed by an exploration of the changes that big data has brought about in various facets of the accounting profession.

2. THEORETICAL FRAMEWORK

A. Big Data concept

Big data encompasses an extensive and voluminous collection of data that cannot be logically analysed using traditional database management systems or software programs. This collection comprises both structured and predominantly unstructured data, including email texts, social media messages, and phone call records ([Bose, Dey,](#)

[& Bhattacharjee, 2023](#)). The term "big data" is associated with massive, heterogeneous, and independent data sources. These characteristics pose a significant challenge for organizations relying on traditional data management mechanisms for storing and processing such vast databases. Consequently, there is a need to introduce new models and reevaluate existing systems for managing and processing big data. In the era of electronic and digital advancements, there is an overwhelming flood of data generated by countless users worldwide. These data differ in nature, originating from various sources and taking different forms. The term big data encompasses various technologies, such as cloud computing, which is a computing model based on computer networks, like the Internet. Cloud computing provides a novel approach to the supply, consumption, and delivery of computing services using the network. The input to big data systems includes sources incorporated from different websites, social networks, satellite images from traffic flow sensors, audio sensors, bank transactions, and more.

B. Characteristics of Big Data

One common term in the realm of big data is "dirty data", which refers to incorrect data repeatedly observed in a database. Big data can be examined and discussed from various perspectives, with the most prevalent being the five characteristics known as the 5Vs: volume, velocity, variety, veracity, and value ([Osman, 2019](#)). These five features provide useful lenses for comprehensively understanding the nature of big data and exploring patterns for its utilization. The following is a brief explanation of these features:

Volume: The data generated from diverse sources today is exceptionally large, often exceeding terabytes and exabytes, making it impractical to store and analyse using traditional databases and tools. This substantial amount of data is referred to as big data, with high volume being a primary characteristic.

Velocity: The rapid rate at which data is generated is a significant driver for the existence of big data. The electronic and digital world continually expands at this pace of data production, necessitating processing paces that match the high rate of data creation.

Variety: Data obtained from different sources exhibit diverse natures. For instance, structured data is associated with e-commerce websites, semi-structured data with web server reports, and unstructured data, such as audio, video, and images, with social media platforms. Hence, big data can be classified into three categories based on its diversity: structured, semi-structured, and unstructured.

Veracity: Due to the high speed of data generation, there is often insufficient time to clean the data before its utilization. Collecting data from multiple sources and employing them for business decision-making requires a mechanism to handle imperfect data. Consequently, the combination of accurate, ambiguous, and correct data is considered big data.

Value: The processing of vast amounts of data with high speed and variety offers a new approach to big data analysis, resulting in the creation of significant value. The integration of different types of data and their utilization for extracting new insights and gaining a competitive advantage demonstrates the value of big data.

It is worth mentioning that some studies focus on three main characteristics of big data (volume, velocity, and variety), while others consider four characteristics by including veracity and correctness.

C. Application of big data in different scientific fields

The concept of big data has been used in various fields and disciplines. For instance, big data finds application in marketing to effectively reach prospective customers, while in political science, it aids in studying the voting population. In the realm of sports, big data analysis enables the evaluation of teams and players. Moreover, it plays a vital role in national security by identifying potential threats and hazards. In fields such as biology, big data is utilized to study DNA, whereas in law enforcement, it aids in identifying crime suspects. Additionally, big data is employed in public health to detect and study infectious diseases. It even contributes to the development of securities laws by organizations such as the SEC, helping identify various behaviours, including insider trading and accounting fraud ([Staff, 2014](#)). Today, big data and business analysis have penetrated almost all aspects of the basic decision-making of companies. For example, a large company may process more than one billion data points per day to understand the competitive environment in which it is present ([Griffin & Wright, 2015](#)). In the field of marketing, the use of big data is on the agenda of senior managers of large commercial companies. In fact, they are trying to find a way to make

money from big data. Also, marketers are collecting information obtained from the way of life of individuals to draw a complete picture of each customer's behaviour and achieve their decision-making pattern. One of the fields in which significant effects have occurred due to the application of big data is the field of accounting and auditing.

D. Use of big data in accounting and auditing

Big data is considered as a great revolution in the world of business because it enables organizations to have a valuable insight to a large amount of data available to them.

Big data has affected almost every aspect of the accounting profession and is rapidly becoming the main focus point for professional accountants (regardless of their specialization) ([Cokins, 2013](#); [Janvrin & Watson, 2017](#)). Big data provides opportunities to increase audit quality and accounting information quality. Along with the improvement of technological capabilities, the profession has also expanded and developed itself by incorporating new non-financial data sources. For example, data obtained from Twitter and other sources related to social media can predict the amount of demand for products, increase in product yield, or decrease in inventory value. Information related to the weather can be compared with sales in geographic areas, or it can predict spending patterns and unexpected profits; Searching the content of electronic documents such as email can help companies in identifying their deviations from predetermined policies ([Cao, Chychyla, & Stewart, 2015](#); [Sathiyarayanan & Turkay, 2017](#)).

E. Big data in financial accounting

Financial reporting has adopted fair value ([Lee & Park, 2013](#)). The Financial Accounting Standards Board and the International Accounting Standards Board have made many efforts to converge the generally accepted accounting principles (GAAP) and the International Financial Reporting Standards (IFRS). There have been many discussions about the efforts made. For example, one of the key differences in accounting application is fair value for property, machinery, and equipment; In this way, according to IFRS, the application of the fair value approach and revaluation of the mentioned fixed assets is allowed, but accounting principles require that these assets are reported at historical cost and the use of fair value except for certain cases (such as loss of assets) is prohibited. In case of loss of assets, the accounting principles of each of the assets affected by the loss are re-evaluated so that their value becomes equivalent to the reduced value due to the loss ([Zhuang, 2016](#)). In the meantime, big data can help to identify differences between fair value accounting raised in international financial reporting standards and accounting principles and help in creating a global and coordinated set of accounting standards, which in this process, big data requires the use of software programs on the Internet. The function of these programs is to collect information to help evaluate assets whose value is difficult to determine, which is continuously done with automated Internet searches. In fair value accounting in the field of estimation, the software programs search all the information available on the websites to make the estimation of fair values more objective and visible, and in this case is that subjective judgments are reduced in accounting estimates of fair value ([Warren, Moffitt, & Byrnes, 2015](#)).

F. Big data in management accounting

Management accounting refers to the use of information produced by accounting records to help managers to perform their duties. An important task of management accountants is to create a system that can align and adapt the predetermined goals in the organization with management and employee's behaviour. This system is known as "management control system" ([Malmi & Brown, 2008](#)). One of the management control systems that aligns criteria with goals is the balanced scorecard, which was presented by Kaplan and Norton in 1996. This system identifies financial and non-financial criteria for the behaviour of management and employees of an organization so that their performance aligns with the goals of the organization. As a result, the balanced score card and other management control systems identify the positive and negative behaviours of the management and reward the management to implement the positive cases and avoid the negative cases.

In the meantime, big data can play a role in management control systems through discovery of behaviours related to specific goals, which leads to the creation of responsible performance criteria. For example, the balanced scored card collects data in four areas: financial, customer, internal processes and learning and growth. In each of these areas, big data seeks to identify new behaviours that affect the results of the respective goals. Using the Internet and browsing websites at work is related to learning and growth goals, internal e-mails may be related to the effectiveness

of internal processes as well as the quality of customer service. Customer service quality may also be related to audio files obtained from customer phone calls.

In general, big data analysis can help to discover important criteria included in management control systems. Big data may provide solutions to discover new motivational criteria and identify traumatic cases. Learning relational rules is a technique to discover correlation relationships in large datasets such as the relationship between good management performance and various variables. Finally, for management accountants who use big data with the required expertise, they must first understand the data and then extract, transform, and analyse it. Since it has been proven that the accumulated data, are easily used in various activities of the organization to achieve advantages and benefits, management cannot ignore large data sources. ([Warren et al., 2015](#)).

G. Big data in auditing

In auditing, big data can extract more data from the ongoing auditing process and create a better understanding of audit client. In consulting services, big data helps to monitor and improve the organization's performance and creates analytical models to support a diverse set of products and improve the organization's operations. In the tax field, big data provides opportunities for easy performance analysis. Also, big data can prove management's assertions about financial statements such as "existence" and "valuation" and provide more documentation to improve the auditor's confidence level regarding these statements. Since the accounting profession is moving towards the use of fair value models, managers' valuation assertion is also increasing in this direction. Since the performed evaluations are subjective and judgmental and require a lot of quantitative and qualitative data to be proven, big data can help auditors to facilitate the process of proving valuations ([Warren et al., 2015](#)). Hence, big data helps auditor express his opinion and prepare the audit report, thereby increasing the quality of the audit.

3. OPINIONS ABOUT BIG DATA IN ACCOUNTING AND AUDITING

As mentioned earlier, big data has gained influence in various business sectors and has also created completely different approaches for understanding and reporting organizations information at the field of accounting and audit. Of course, due to its different nature, big data does not prevent the use of traditional accounting and audit procedures that were used in this profession until now. In the meantime, the question that arises is what are the threats and opportunities facing the accounting profession due to the changes that have occurred? To find the answer to this question, academic experts and business experts have presented different interpretations in their research. The interpretations presented in the research introduce practical solutions so that the accounting profession and the field of big data can better serve companies, stakeholders, and the public. It is expected that the mentioned interpretations can help to create a healthy discussion space related to the topic of big data and achieve a key goal, i.e., reduce the existing gap between theory and practice in the field of big data. The highlights of the research and the interpretations presented in them are presented below:

1. [Vasarhelyi, Alles, and Kogan \(2018\)](#) believe that big data changes people's perception of information. Big data refers to the fact that companies can utilize real time analysis, while this ability in traditional accounting and auditing only relies on structured data and summaries of periodic reports. Although during the past 50 years, researchers have relied on structured databases, the capital market data during the next 50 years will be significantly different. Analysis of unstructured data, such as social media, credit card registrations, website content, media, and audio-visual streams, can significantly influence business decisions.

2. [Warren et al. \(2015\)](#) state that big data affects the design and functioning of management control systems because it seeks to identify behaviours that are related to the organization's goals. On the other hand, they believe that Productivity goals in the organization are achieved by adopting big data. They state that vast data sources such as climate projects, websites, census data and macroeconomic data improve the organization's budgeting process. On the other hand, big data and its data analysis may lead to the elimination of differences between accounting principles and international financial reporting standards, and hence moving towards a global accounting system with fair value accounting as the cornerstone of this system.

3. [Kraheil and Titera \(2015\)](#) believe that the current accounting and auditing standards are guided in the wrong direction by emphasizing presentation, collection, and sampling. They state that collection and discretionary allocations in inflexible financial statements were done in the past only because of high transfer costs and low speed

of data collection. They also state that the "event theory" in accounting, which was abandoned about 50 years ago, will be more defensible in the big data environment.

4. [Alles \(2015\)](#) concludes that auditors can use big data in proportion to the extent of the employer's use of it. Also, auditors and auditing standards, like adopting organizational resource planning system that makes many changes in the structure and framework of the company, should be very likely to accept big data through the employer pressures.

5. [Cao et al. \(2015\)](#) present some ideas regarding how big data can help the auditing profession. For example, the existence of a data analysis system for information related to the capital market and stock market, financial reporting requirements and audit duties are among the things that show how auditors use big data techniques and analysis systems. Audit firms use big data to assess the risk of lawsuits as a key element in determining the audit fee.

6. [Brown-Liburd et al. \(2015\)](#) by stating the challenges facing the audit profession in the field of big data, discusses about how big data can affect the quality of auditors' judgments. Since auditor comments on the financial statements and the internal control system of the company in the auditing process, he should be careful about the biases in the processing of the data and the limited awareness of humans when faced with a huge amount of information. The researchers state that more research should be done to understand the effects of moving from traditional audit processes to using big data.

7. [Zhang, Yang, and Appelbaum \(2015\)](#) provide a broader perspective on the four primary characteristics of big data, namely volume, velocity, variety, and veracity. They emphasize that the accuracy and correctness aspect present the most significant challenge for auditors. Factors such as data diversity (variations across data from various sources), data accuracy and correctness (alterations made to the data), and data accumulation are among the issues that could drive auditors to adopt big data techniques.

Examples of opportunities and challenges arising from the utilization of big data can be observed in various scientific fields. In accounting and auditing, big data presents numerous prospects for advancement. Specifically, within the auditing profession, the following opportunities have been created due to the influence of big data:

Enhanced identification and evaluation of risks associated with accepting and continuing audit engagements, such as risks of bankruptcy or high-level management fraud.

Improved detection and assessment of risks pertaining to fraudulent misrepresentation in financial statements, leading to the implementation of fraud tests based on the identified risks.

Utilization of advanced analytical techniques to address misrepresentation cases, driven by the auditor's evaluation of associated risks.

Application of comprehensive analytical methods towards the end of an audit, aiding auditors in forming a conclusive judgment on the consistency of financial statements with their understanding of the examined business entity.

While big data has presented opportunities in the accounting profession, it has also brought forth certain challenges. The effective implementation of big data analysis necessitates individuals proficient in data analysis and adept at utilizing appropriate software and hardware resources. Consequently, the auditing profession encounters a range of problems and challenges when dealing with big data analysis.

The first challenge lies in the need to modify existing auditing practices. Instead of relying on limited amounts of data from small, well-structured databases, and focusing on causal relationships, auditors must adapt to large, unstructured databases with substantial amounts of messy data, requiring the identification and utilization of different types of relationships.

The second challenge emerges from the computational demands posed by the vast volume of big data. Traditional analytical techniques employed in the audit process are often inadequate for handling big data. Auditors have two options for data analysis: the first involves applying simpler analytical techniques that require fewer computational resources, while the second entails selecting a subset of data that can be effectively analysed using available tools. Complex analyses can be conducted by carefully choosing valuable subsets of data from big data sources.

The third challenge involves privacy concerns associated with the use of big data. Analysts may require access to confidential business information beyond what auditors typically receive, and some may even seek to utilize data from

previous auditors. Incorporating such sensitive and confidential information into big data applications poses a challenge for auditors.

In summary, big data presents significant opportunities for improvement in the accounting and auditing profession. However, it also introduces challenges related to changes in auditing practices, computational demands, and privacy considerations, which auditors must address to effectively leverage the potential of big data.

A. The role of big data in continuous audit

Continuous audit is an approach that allows for the simultaneous preparation of an audit report and the provision of assurance, either concurrently with the occurrence of an event or shortly thereafter, by automatically identifying errors and misrepresentations ([Groomer & Murthy, 2018](#)), or by monitoring the existing control layers within an organization ([Vasarhelyi et al., 2018](#)). In the context of big data, continuous auditing requires access to a larger volume of relevant information and its processing. However, two key characteristics of big data, namely volume and high speed, have created disparities between the data analysis utilized in current audit systems and the requirements posed by big data analysis in continuous auditing. The following gaps have been identified, emphasizing the consistency of data, accuracy and correctness of data, identification and accumulation of data, and data confidentiality ([Zhang et al., 2015](#)):

Data consistency: With the presence of vast data from multiple sources in big data, conflicts between them inevitably increase. Therefore, the new approach of continuous auditing in the realm of big data necessitates examining the relationships between data and ensuring their homogeneity.

Data accuracy: In the auditing field, the lack of accuracy and correctness in data is often linked to manipulated and incomplete information. In the big data environment, the challenge lies in identifying the elements associated with data accuracy and correctness, as this difficulty can render certain data useless for audit analysis purposes. This, in turn, increases audit risks in the context of big data and continuous auditing. Traditional methods of verifying data correctness are not applicable in the domain of big data auditing. Solutions to address data correctness issues need to be developed to enhance the effectiveness of continuous management monitoring.

Data identification: Data identification involves determining the quantity and type of accounts in accounting books and is connected to records that link separately registered information within a business unit. Structured data is relatively easy to identify, but in big data audits, where a substantial portion of the data is unstructured, identification becomes challenging. For instance, it is straightforward for a continuous audit system to identify the revenue obtained from a specific sale, but automatically relating this information to the associated sales and unstructured text-based information presents difficulties.

Data accumulation: Conducting continuous audits on big data necessitates significant computational resources. The presence of scattered and numerous databases may result in the utilization of unstable models for audit analysis, thereby reducing the auditor's ability to discover and diagnose ([Eulerich & Kalinichenko, 2018](#)). Consequently, collecting, summarizing, and simplifying data for continuous audits of big data becomes necessary.

Data confidentiality: Certain data cannot be publicly disclosed due to its sensitive nature. In the realm of big data, it is possible for some confidential data to be released externally, and depending on the existing relationships between the data, it can become linked with other information, becoming available to the public at high speed. Hence, preserving the confidentiality of big data becomes crucial to maintain the organization's brand reputation and competitive advantage.

These gaps and challenges have significantly impacted continuous audits, resulting in the examination of heterogeneous and conflicting data, incomplete and disorganized data in various formats, and with diverse indicators.

4. EMPIRICAL STUDIES ON BIG DATA ROLE IN ACCOUNTING AND AUDITING

In a study conducted by [Salijeni, Samsonova-Taddei, and Turley \(2019\)](#), the integration of data analysis and big data (BDA) in auditing was investigated. The researchers interviewed individuals with experience and expertise in the development, implementation, and evaluation of the impact of integrating data analysis techniques and big data in auditing. The aim was to provide an overview of the changes brought about in auditing through the utilization of these two techniques. Three key aspects were emphasized: the effect of integrating data analysis techniques and big data on the relationship between auditors and clients, technological consequences in the implementation of the audit

process, and common challenges related to the application of data analysis and big data in the field of auditing. The research findings indicate that the role of auditors in the technical advancement of the audit field is evaluated in two ways: examining audit process improvement and analysing the fundamental relationship between auditors and clients. Understanding the role and significance of auditing in business administration is crucial.

In another research study by [Zhu \(2019\)](#), the focus was on determining whether access to alternative data can enhance stock price awareness in the capital market and help establish order among company managers. Alternative data refers to big data obtained from sources other than reports or financial statements. Two sources of alternative data were utilized in this study: data related to customer transactions obtained from marketing analytics and data from search panels, as well as satellite images recorded by traffic cameras capturing cars in customer parking lots, which can be used to assess customer buying behaviour. The research findings demonstrate that access to alternative data, such as customer transactions and satellite images, leads to increased price awareness. This observed effect primarily relates to knowledgeable and experienced investors who actively seek access to alternative databases. Therefore, the improvement in price awareness is associated with companies whose informed investors have a strong desire to access company information.

[Cockcroft and Russell \(2018\)](#) conducted a study exploring the opportunities for research and study in the application of big data in the fields of accounting and finance. Their review aimed to present an overview of big data research in the fields of information systems, accounting, and finance, while also highlighting areas for future research in accounting and finance. The researchers examined articles published between 2007 and 2016. Their findings indicate that credit models in customer service industries and banking, customer analysis, trading signals, and fraud prevention were the main areas of interest among researchers in the field of big data.

In their research, [Villa, Sharairi, Navarrete, and Sancho \(2021\)](#) focused on the impact of big data and data analysis in the accounting profession. They covered three main areas: evaluating the role of technology in accounting, privacy preservation in the realm of big data, and the relationship between individuals and big data. These topics were studied within the contexts of financial accounting and management accounting, accreditation services, and education and research. The research findings demonstrate that big data presents new risks, opportunities, and challenges across all regions and fields of the accounting profession. While the automation of accounting in the era of big data poses a threat to employment, it also opens new job opportunities and avenues for growth. Big data prompts auditors to reassess audit procedures and explore how accountants can utilize big data to provide new opportunities for organizations, thereby increasing the strategic role of the accounting function.

[Appelbaum, Kogan, and Vasarhelyi \(2017\)](#), in their research on modern audit performance in the context of big data application, highlighted the unlimited opportunities available to independent auditors and the necessity of utilizing advanced analysis. The study findings indicate that big data and business analytics have significantly transformed the business environment and the capabilities of business processes. As big data expands within the business environment, organizational performance undergoes changes, business capabilities increase, unrelated business functions decrease, and overall processes accelerate. The researchers assert that similar changes should also occur in the realm of independent audit and accreditation. They argue that existing laws should be adapted, and the provision of audit services should evolve accordingly to align with the advancements brought about by big data.

In another study by [Appelbaum \(2016\)](#), the focus was on highlighting reliable audit evidence obtained from the realm of big data. The findings reveal that as big data proliferates across various industries and areas of business, auditors face an increasing need to evaluate the reliability of big data, particularly data originating from external sources beyond the company. Consequently, in an entrepreneurial environment driven by big data, auditors may be required to identify secure and trustworthy sources of data.

[Cao et al. \(2015\)](#) defined big data as the process of handling, cleansing, transforming, and modelling vast amounts of data to uncover useful patterns of information. They examined the opportunities and challenges that big data presents in the accounting profession, aiming to provide a comprehensive overview of the significant developments occurring in this field. The investigation revealed examples of opportunities created for the accounting profession, such as identifying and assessing the risks associated with audit engagements and detecting incorrect financial statements, as well as the need to transform the traditional auditing model, automate accounting operations, perform complex calculations, and address privacy protection challenges.

[Warren et al. \(2015\)](#) investigated various types of big data, including audio-visual files and text data, and highlighted the improvements and advancements occurring in the fields of financial accounting and management accounting through the utilization of big data. Their findings indicate that big data has led to the development of effective management control systems and budgeting processes in management accounting, while enhancing the quality and relevance of accounting information in financial accounting.

[Vasarhelyi, Kogan, and Tuttle \(2015\)](#), focusing on the general framework of big data in the accounting profession, explored the relationships between structured data obtained from organizational resource planning systems and unstructured and semi-structured data derived from the business environment. They discussed the sources, utilization, and challenges posed by big data in the realms of measurement and auditing, concluding that both academia and professionals in the accounting field recognize the valuable benefits of big data while acknowledging the inevitable challenges and obstacles that arise in its implementation. Moreover, accounting students can enhance their future career prospects by acquiring knowledge related to big data issues.

5. CONCLUSION

Advancements in technology have led to an immense influx of data, broadening the definition of "data" itself. While data was once exclusively generated by humans and organized in structured formats, it now encompasses structured, semi-structured, and unstructured data, giving rise to the concept of big data across various scientific and business fields. Big data is characterized by its five distinct features: volume, speed, diversity, accuracy, and value.

The findings of this study demonstrate that the accounting profession is one of the domains significantly impacted by the expansion of big data, presenting both opportunities and challenges. Among the opportunities created for accountants and auditors through big data is the enhancement of auditing quality and the quality of accounting information. Additionally, big data can align the behaviour of managers and employees with predetermined organizational goals. In the field of auditing, big data provides extensive information that assists auditors in substantiating management claims and improving their opinions and audit reports.

However, along with these opportunities, big data also poses a series of challenges for accountants and auditors. These challenges include the need to redefine the traditional auditing model for dealing with financial statements, performing complex and extensive calculations, and addressing the confidentiality of big data. Moreover, big data introduces gaps between traditional data analysis in current continuous auditing practices and the analytical requirements of big data continuous auditing. These gaps present challenges for continuous auditors, such as managing and processing large volumes of heterogeneous and unorganized data.

In conclusion, big data plays a crucial role in various aspects of the accounting profession, including asset valuation, accuracy and completeness of accounting records, objective accounting estimates, transparency of financial reporting, convergence of accounting standards, and the efficiency and effectiveness of auditing. Based on the findings of this study, it is recommended that academics, as trainers and professors, review the accounting and auditing curriculum to equip future professionals with the necessary skills for working with big data in the accounting field. Researchers also bear the responsibility of analysing big data sets and producing results that demonstrate the contribution of big data to organizational performance and decision-making. Furthermore, they should elucidate how the advantages and benefits of big data can be effectively communicated to company managers, stakeholders, and the public to foster a comprehensive understanding of its significance.

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