The big data and accounting in the era of a pandemic: A desk research perspective

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ABSTRACT

Is it possible for businesses to establish accounting procedures to make the most of big data and gain a competitive intelligence advantage in order to endure and thrive in a COVID-19 environment? This paper employed a desk research or systematic literature review approach to explore the difficulties and potential benefits of big data analytics for businesses during and after the COVID-19 pandemic. The study reveals that the most effective way to manage fluctuating consumer demand and potential losses is to have a plan in place for handling critical situations. Again, big data is viewed as an intangible asset that can be utilised to plan for and implement important contingencies that will increase a company's chances of surviving a pandemic. This study clearly demonstrates that incorporating big data into accounting methods, such as recording, measuring, valuation, risk assessment, materiality, intelligence, audit, and reporting, can enhance competitive intelligence, leading to new forms of trust and responsibility, and ultimately, effective internal governance. This study contributes to accounting research by presenting new and important insights into how accountants perceive the applications, opportunities, and challenges of big data beyond the COVID-19 pandemic. It provides an in-depth examination of the predictive analytics of big data as an intangible asset from an accounting perspective. This research includes policy and expert recommendations for developing new accounting perspectives on big data analytics to ensure organisations' financial viability throughout and beyond the COVID-19 situation.

Keywords: Accounting, Big Data Analytics, COVID-19, Intangible Assets, Intelligence

I. INTRODUCTION

The massive surge in internet service access was a direct result of the COVID-19 pandemic and the global lockdown conditions. For example, global giants such as Amazon, AliExpress, Google, and Microsoft all reported an unprecedented increase in online activities and ordering for goods and services. This inevitably led to the hiring of more workers in order to service the huge volumes of customer demand. Several sources and methods at varying depths contributed to the emergence of business data. Due to the specific requirements of handling terabytes, petabytes, and even zettabytes of data, methods for managing this quantity of information are evolving (Panneerselvam et al., 2015). The accounting industry will experience both immediate and long-term effects from the widespread use of data analytics and big data, both of which will benefit from the incorporation of corporate data (Vasarhelyi et al., 2015). To develop a deeper understanding of their audience, national health authorities, internet platforms, social media, and virtual enterprises all primarily rely on big data (Mesa, 2019; Arnaboldi et al., 2017; Janvrin & Watson, 2017). To aid in decision-making, businesses generate a plethora of data, both structured and unstructured, that is infeasible to manage using conventional data management systems. To aid businesses in analysing and gaining insights related to decision-making processes, data analysis software is necessary (Ranjan & Foropon, 2021; Janvrin & Watson, 2017). Organisations, regulators, and individuals all face new challenges as a result of the generation and use of big data in informing decision-making (Zarsky, 2016). Increased ties between big data and cutting-edge technology (Hintze et al., 2017). Now, the size of large data sets exceeds ten zettabytes (10 billion terabytes) and doubles every two years. Therefore, many corporations face substantial ethical and accountability difficulties due to the production and use of big data. The efficiency, security, and privacy of all users and massive data brokers could not be guaranteed by current accounting methods alone (Dillard & Vinnari, 2017).

Few studies have examined the potential benefits of integrating big data into accounting and other business processes (Fiorini et al., 2018). In addition, both the theory and practice of studying big data are in their infancy, and

the field is still relatively fragmented (Frizzo-Barker et al., 2016). To help organisations thrive through and beyond the COVID-19 conditions, this study aims to overcome this knowledge gap by proposing an accounting paradigm that treats big data as an intangible asset. In light of this, the paper's findings contribute to the academic and professional literature on improving accounting methods to handle big data within the accounting process. As a first step, we aim to gain a crucial understanding of accounting for intangible assets, including the predictive analytics of big data. Second, our research investigates how accounting procedures can utilise big data to generate competitive intelligence in response to the COVID-19 pandemic. The third objective is to learn more about utilising big data to enhance accounting procedures and governance. Finally, we conducted a thorough evaluation of an accounting paradigm that treats big data as an intangible asset and utilises it to help firms navigate the COVID-19 pandemic and beyond.

We base our study on integrating the frameworks provided by Theodorakopoulos, et al. (2024), Al-Htaybat, et al. (2017), and Cockcroft and Russel (2018) to determine the advantages and disadvantages of utilising big data in corporate reporting, accounting, and finance. We build on the work of Al-Htaybat and Alberti Alhtaybat (2017), which was presented within the context of corporate governance reporting, and isolate the key ideas behind applying big data to accounting within this context. Our research aims to determine how companies may best prepare for and recover from COVID-19 by leveraging big data to gain competitive intelligence advantages. We have also introduced two additional elements: Risk and Audit, as well as internal governance. One of the most challenging aspects of modern accounting is learning how to assess the risks associated with the use or misuse of large datasets in people's daily lives, as illustrated in Figure 1. This is especially true in the corporate world, where big data is having an increasingly significant impact on the decisions made by customers, managers, shareholders, lenders, suppliers, and staff. Therefore, many other factors, such as social media, cutting-edge goods, and online marketplaces like Amazon and eBay, are having an increasingly significant impact on the way books are sold. This study examines the growing trend of accounting as a management and organising tool for big data in commercial settings, a trend driven by the need to address the aforementioned agenda (Janvrin & Watson, 2017). In recent years, big data has become a significant topic in various fields, including medicine, computing, social media, and accounting (Arnaboldi et al., 2017). Decision-making and resource-allocation systems have benefited from the availability of big data.

The study given in this article emphasises the growing significance of big data in diverse industries, such as accounting, in light of the COVID-19 pandemic and the ensuing upsurge in online activity. Nevertheless, while the increasing significance of big data in the field of accounting is evident, a noticeable gap exists in the scholarly literature regarding the evaluation and control of risks associated with the use of big data in accounting procedures (Al-Htaybat et al. 2017: Theodorakopoulos et al., 2024).

The article addresses the need to evaluate risks associated with big data in the field of accounting and acknowledges the challenge of comprehending these risks. However, it does not provide an in-depth analysis of the particular risks, their possible ramifications, or effective techniques for risk mitigation. Hence, there is a notable research gap in understanding and mitigating the risks, challenges, and ethical considerations associated with integrating big data into accounting procedures. Beyond that, this study examines the potential of big data as an intangible asset, both during and after the COVID-19 pandemic (Theodorakopoulos et al., 2024). Based on the research gap, this paper aims to address the following question: What are the precise dangers and obstacles associated with incorporating big data into accounting procedures, particularly within the context of the COVID-19 pandemic and the increased prevalence of online activities? What is the influence of these risks on decision-making and resource allocation in the field of accounting and financial management? This inquiry addresses the potential consequences of improper use or misuse of extensive datasets in accounting practices, as well as the strategies that can be employed to mitigate these issues (Al-Htaybat et al. 2017).

The use of big data as an intangible asset in accounting raises several ethical issues. Organisations must ensure the ethical usage of this data to maintain integrity and uphold societal values. What are the potential methods and governance structures that may be formulated to improve the efficiency, security, and privacy of users and data brokers within the realm of big data-driven accounting? Exploring these study inquiries will enhance scholarly understanding of the obstacles and opportunities associated with integrating big data into accounting methodologies, particularly in the aftermath of the COVID-19 pandemic, while also providing significant insights for both the academic community and the accounting industry (Al-Htaybat et al. 2017: Theodorakopoulos et al., 2024).

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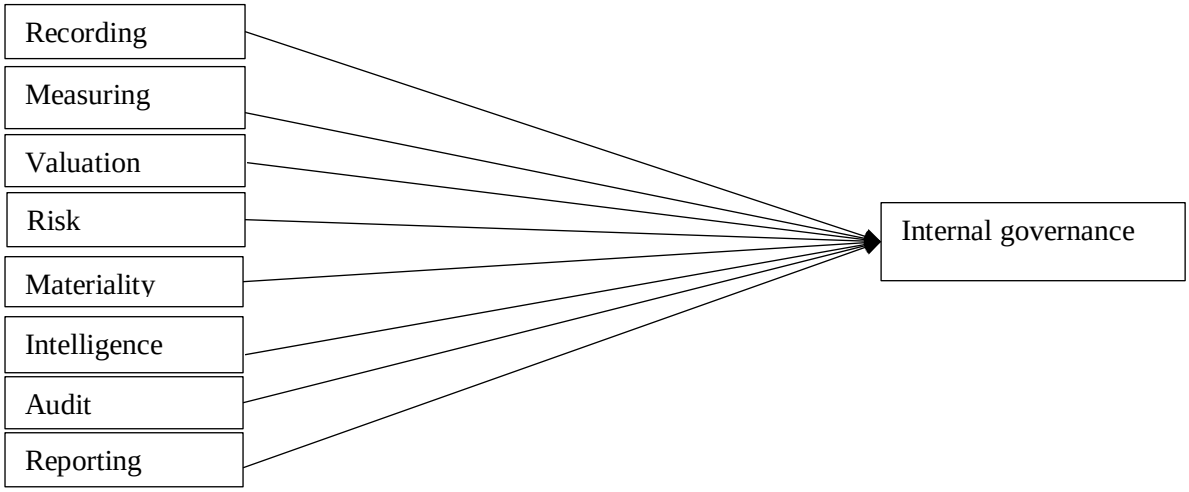

Figure 1
A modified Integrated Framework of the Accounting process
Source: Al-Htaybat et al. (2017) and Theodorakopoulos et al. (2024)

1.1 Research Objectives

This paper seeks to address the following objectives:

- To determine the precise dangers and obstacles linked to the incorporation of big data into accounting procedures, especially within the framework of the COVID-19 pandemic and the heightened prevalence of online activities.
- To find out the influence of these risks on decision-making and resource allocation in the field of accounting and financial management.
- To determine the possible ramifications that may arise from the improper utilisation or mistreatment of extensive datasets within the realm of accounting practises, as well as the strategies that may be used to alleviate these issues.

II. LITERATURE REVIEW

2.1 Theoretical Review

Due to their absence from financial statements and other business reporting, the study of internally created intangible assets is becoming increasingly important (Lim et al., 2020). A company's intangible soft assets are assets that are both one-of-a-kind and dependent on its specific environment. They are valuable resources that are interconnected to produce results and effects (Wataya & Shaw, 2019). Organisational value creation is demonstrated through the measurement and management of long-term investment decisions (Kang & Kim, 2014). According to Perrons and Jensen (2015), big data is an organisation's most valuable strategic intangible asset that can be used to obtain a competitive edge (Adesemowo, 2021). Debt finance and financial leverage can be supported just as well by intangible assets as they can by physical ones (Lim et al., 2020). For instance, the COVID-19 pandemic has only served to strengthen the competitive advantage of online retailers like Amazon, Google, and Microsoft, thanks to their streamlined procedures. As a result of their new role in mitigating the repercussions of the worldwide pandemic, including social distancing, online remote schooling, and the use of communication technologies, big data and data analytics software have become more influential intangible assets. A new use for big data emerged during the 2019 COVID-19 pandemic, described as a collection of organisational resources used to manage and support businesses (Adesemowo, 2021; Lim et al., 2020). Some research on managing and quantifying the influence of big data on company activities and transactions tends to gloss over the organisational interpretation of big data as an intangible asset, as presented below.

2.1.1 Value Creation and Measuring Big Data

In the past, the value of big data was evaluated based on metrics such as significant growth advantages, renewability, efficiency, stability, and co-value generation (Wataya & Shaw, 2019). With the use of big data, decision-making processes are bolstered by increased competitive intelligence in the form of high-performance analytics and data management tools (Panneerselvam, 2015). Big data's true worth as an intangible asset lies in the competitive information it provides. Increased profitability, expanded market share, and lasting success have all resulted from its application (Greco et al., 2013). De Mauro et al. (2018) emphasise the significance of big data as an intangible asset that can be leveraged by innovation management to yield better results. Big data can benefit businesses by facilitating the production of value and enhancing the beneficial impact of businesses through social media customer relationship management

systems. Value creation through social media contact and communication is a modern phenomenon. Particularly in the context of COVID-19, it is crucial to recognise and address the challenges of misusing big data through the development of cohesive governance and accountability measures. The internet and other digital technologies have emerged to facilitate modern life (Sein, 2020). Beyond the disease, however, this emerging digital environment will be leveraged to shape the way we conduct business. As part of this process, the organisation will need to develop new methods of sharing information with its various stakeholder groups to leverage big data and generate more distinctive organisational values.

Utilising big data as intangible assets, we propose that authorities and accounting standards setters should step in to modify impairment and amortisation methods. Individual, corporate, and national perspectives are all relevant when evaluating amortisation strategies and time frames (Ferramosca & Allegrini, 2021). Disagreement centres on whether or not to use an amortisation model or an impairment-only approach (Wen & Moehrle, 2016). That is why a large data accounting model based on amortisation is essential. The annual testing process (Wen & Moehrle, 2016), the impairment mechanisms (Ferramosca & Allegrini, 2021), and the risk exposure of improperly exploiting big data should all be accounted for in this model (Panneerselvam, 2015). We present three arguments against the widespread adoption of big data amortisation models. First, how to assess the usable economic life of big data as intangible assets by identifying the duration of big data usage, collecting, and processing periods using relevance-based methodologies (Park & Jang, 2021). Second, how big data is perceived and evaluated by those outside the organisation. Third, authorities and those responsible for setting accounting standards should determine how to assign a value to intangible benefits derived from big data, such as competitive intelligence, governance, revenue generation, and decision-making support.

2.1.2 Framework for Controlling and Organizing

Various regulatory frameworks typically structure and control traditional intangible assets. To provide a fair and honest portrayal of financial transactions, accountants have developed a set of rules and practices, as well as made adjustments to the way society operates (Riahi-Belkaoui, 2004). According to Leiwy and Perks (2013), one of the most significant difficulties in developing accounting standards is the prevalence of creative accounting. Standard-setters in the field of accounting are becoming increasingly stringent in an effort to eliminate and minimise discretionary accounting treatments and increase compliance monitoring and enforcement measures (or implementation). Modest and gradual adjustments to accounting rules and standards are part of creative accounting (Leiwy & Perks, 2013). We argue that, within certain accounting norms, creative accounting remains a functional and appropriate practice. Several options exist for businesses to track and report on their long-term effect and value generation in the wake of the pandemic. Despite this, the primary difficulty was in summarising and concluding the comprehensive accounting standards to ensure the simplicity of the implementation process in commercial institutions.

Both mandatory and voluntary regulations govern the use of big data. In the era of big data, the General Data Protection Regulation (GDPR) provides the necessary foundation (Tamburri, 2020). The adoption and implementation of the GDPR, however, have a far-reaching impact on how institutions utilise data analytics tools.

Specifically, the Global Reporting Initiative (GRI) II (GRI, 2013) and the United Nations Environment Programme Finance Initiative (UNEP FI) discussed the voluntary principles and protocols for tracking extensive data as intangible assets (UNEP FI, 2011). International institutional entrepreneurs, such as the United Nations, non-governmental organisations, professional accounting bodies, and social associations, have, however, produced these voluntary and organised principles. Utilising big data as intangible assets has been the subject of several studies in the field of accounting (Lim et al., 2020; Greco et al., 2013). In addition, Lim et al. (2020) argued that professional accounting bodies and other influential international organisations generally need accepted standards for the management of global guidelines, which are essential for the effective implementation of these guidelines, particularly in the context of intangible assets (e.g., the GRI reporting model). The widespread adoption of these global principles and organisational efforts to apply them in business activities expands accounting as a field of action for stakeholders.

2.1.3 Mechanisms for Recording Big Data

Financial business transactions (including intangible assets) were recorded using a double-entry recording technique in order to generate financial statements and regulatory reports (Leiwy & Perks, 2013). Since the 1600s, accountants have employed the double-entry bookkeeping technique to track their clients' finances (Crowther, 2010. The UK government commissioned the creation of this data logging system to track and address various national and federal requirements. To meet these requirements, the government had to undertake a wide range of tasks, including monitoring tax revenues used to finance the Napoleonic Wars and railway construction, as well as enforcing legal protections for company shareholders and creditors. As the following remark indicates, the double-entry technique was first used to track money transactions. In Ghana, the government has, over the past five years, attempted to implement and promote the digitalisation of all government transactions across various agencies. Big data could be a critical source of data mining for this initiative.

The 'double aspect convention' is one of the more common ones. As a result, every transaction requires two separate entries, one for the debit side and one for the credit side. This is a key tenet of accounting and is sometimes referred to as "double-entry bookkeeping." Historically, and especially before the widespread availability of standardised computer packages, the double-entry approach was used to record financial transactions reliably. As stated on pages 28–29 of Crowther's (2010), a critical aspect in keeping the balance sheet and other financial accounts in check is using the double-entry recording method (the equality of debits and credits).

2.1.4 Big Data Reporting

Financial statements are typically distributed to internal and external users, where information about intangible assets is reported (Alexander et al., 2003). We suggest that value drivers, institutional links, expertise, and organisational culture are all part of the value relevance reasoning that should be used when reporting on the big data value generation processes and mechanisms to stakeholders (Greco et al., 2013). Nonetheless, managers may learn whatever they need to know from other employees. However, users from outside may resort to negotiation or legal means to obtain the information they need. To secure the social licence to operate, accounting standards setters and regulators must address this tension (Mansell, 2013).

Voluntary reporting frameworks structure the vast majority of big data reporting procedures. Big data reporting can be viewed in at least two ways, each contributing to a distinct understanding of the intangible value it provides. The initial impetus for doing so was the requirement to establish standard operating procedures for the company. Second, the organisation may have reported its effect and transparency by actively consulting and communicating with its most influential stakeholders (Park & Jang, 2021). The real behavioural evolution of management strategies and information systems is one of the key goals of big data reporting. Some of the organisational externalities and the effects of economic activity can be managed by big data reporting techniques, which represent new accounts of the social contract (Mansell, 2013). Understanding corporate accountability requires taking into account the legal, ethical, and sociological factors inherent in the information flow of this contract (between a corporation and its stakeholders). Therefore, sharing information (e.g. value relevance, transparency, and accountability) about an organisation's effect on society is central to big data reporting standards.

2.1.5 Valuation of Big Data

When determining the value of a company's big data, it is essential to consider how the organisation leverages that data in the form of business strategies, decisions, and outcomes (Park & Jang, 2021; Greco et al., 2013). Until recently, the accounting literature lacked a discussion of the non-monetary value of large data. However, the term "big data valuation" can be used in two different contexts. These are the official and informal interpretations. The formal definition of integrated reporting as a means of creating value has been the primary emphasis of the International Integrated Reporting Council (IIRC, 2013). In its more colloquial sense, integrated reporting refers to the practice of explaining how businesses can report both financial and non-financial information together (Leiwy & Perks, 2013).

The value of big data analytical programmes can be described using various big data valuation approaches. For instance, Lim et al. (2020) claimed that businesses should analyse the outcomes of big data analysis in order to gauge the effectiveness of value creation procedures. This method of valuing, however, fails to account for the long-term consequences of improperly utilising big data for businesses. To further determine the extent to which organisations are answerable for their actions, an analysis of their influence was conducted using social contract theory (Mansell, 2013). The interactions between stakeholders and management should be used to evaluate this aspect of responsibility.

2.1.6 Big Data and Risk Management

The corporate governance codes in the United Kingdom prioritise risk management as a key management responsibility. The use of big data has the potential to enhance risk management in several ways, including improved monitoring and coverage, as well as the creation of models to support risk decisions. Because of its unique characteristics, big data has the potential to enhance not only fraud detection but also risk assessment, prediction, and measurement. The "Volume" and "Variety" aspects, for instance, will provide a plethora of internal and external data, as well as financial and non-financial data, in various formats (Theodorakopoulos et al., 2024).

With its big data technology, Alibaba Group can constantly track and evaluate potential fraud threats. Despite recent progress, further study is needed to determine whether or not big data can indeed enhance fraud detection and prevention (Cockcroft & Russel, 2018; Aboud & Robinson, 2022). Conventional methods of auditing and analysing financial reporting may be insufficient for detecting fake financial reporting. This means that cutting-edge analytic technologies could be used to boost assurance and audit quality.

2.1.7 The Materiality in Using Big Data

To determine which pieces of accounting data are most crucial for a company to share with its stakeholders, the concept of materiality was developed (Alexander et al., 2003). We contend that there could be tension between

management's goals and those of other users in how an organisation handles this sort of materiality. Therefore, conventional intangible assets (such as patents and copyrights) are concerned with gauging the value creation and direct values of these intangibles (Lim et al., 2020). The value of competitive intelligence and the risk of misusing big data — two aspects closely related to the use of big data as intangible assets —are often disregarded.

The materiality criterion guides businesses in disclosing the most important information to their stakeholders (Alexander et al., 2003). Stakeholders' attitudes and preferences regarding an organisation's operations and services may be affected by the organisation's selection of relevant information. Therefore, a process is necessary to identify the demands of the most influential stakeholders in order to publish the most relevant and required information about big data, thereby determining what information is material.

2.1.8 The Internal and External Reporting

The purpose of financial reporting is to disseminate information about a company's financial health to both internal and external stakeholders. The essential big data capabilities for organisational activities were interpreted and understood with the help of financial reporting (Hatherly, 2013). We believe that preferences are at play in how organisations distribute information to users of big data, in an effort to influence their behaviour. To present a credible picture of their overall operations to institutional investors, businesses, for instance, share data from corporate analytics (Greco et al., 2013).

Some scholarly efforts have also been made to evaluate the reporting procedure of big data outside of financial reports (Pei & Vasarhelyi, 2020). To address the inefficiency of traditional accounting methods and to make financial reports more meaningful, Pei and Vasarhelyi (2020) designed a new system. However, the dynamics and priorities of employing big data in the COVID-19 disease are overlooked in this endeavour.

2.1.9 Audit Evidence and Big Data

Big data and its analytics can improve the efficiency and quality of audit activities (Theodorakopoulos, et al., 2024; Institute of Chartered Accountants in England and Wales [ICAEW], 2014). Yoon et al. (2015) state that big data will play an important role in auditing. Big data enables auditors to obtain the required evidence in real-time, as it can be created and processed at a very high speed. According to the International Standard on Auditing (ISA), "Audit Evidence" refers to all the information used by the auditor, whether contained in accounting records or other information.

2.1.10 Precincts

The primary focus of traditional accounting is the monetary aspects of company transactions, with considerable attention also paid to non-monetary matters such as the impact of big data and the importance of financial reporting (Maynard, 2013). A company's future strategic organisational performance may be influenced by factors beyond its financial statistics, such as the way its management views climate change and environmental concerns (Hatherly, 2013). To produce value for present and future generations, integrated corporate reporting links financial and non-financial data to link business services, strategy, data governance, and the application of big data (IIRC, 2013). However, the interconnection between the financial components of corporate performance and the use of big data to support intangible assets, business operations, and decisions appears to be ignored by the boundaries of conventional accounting (Kastouni & Lahcen, 2022).

III. METHODOLOGY

In this work, we employed a desk study approach to investigate the difficulties and potential benefits that may arise as businesses utilise big data analytics to weather the COVID-19 storm and beyond. Desk research has been widely used in the past to review and discuss the work of others in a specific field of study (Bawole & Ibrahim, 2016; Albitar et al., 2020). Utilising big data as a business strategy offers new perspectives for applying big data techniques in organisations beyond the COVID-19 pandemic (Fiorini et al., 2018). We employed thematic analyses of the literature on big data analytics to demonstrate how this intangible asset can be leveraged to develop crucial alternative plans and gain a competitive advantage. This study's approach was selected for its potential to yield detailed insights into the unique circumstances and significant issues related to good accounting methods and governance across various organisations. The in-depth content analysis of the case studies was essential in enhancing the trustworthiness of the research results, as it aligned perfectly with the study's objectives. This data underwent analysis as it was deemed the most appropriate method. This method enabled the researchers to select relevant publications for the study (Kyngäs et al., 2020). After gathering extensive data, the researcher performed a thorough synthesis of the study's findings, narrowing the article pool from 1200 to 80–90 (Sachs & Kujala, 2021; Pedrini & Ferri, 2019). The publications included in this investigation covered the years 2011 to 2021, as indicated in Table 1. This study employed an exclusion and inclusion strategy, as illustrated in the first column. This study exclusively utilises articles published within the last nine years; articles older than ten years were excluded from consideration. The third column of Table 1 presents the keywords

utilised for data collection in this research. Column 2 presents the web databases and search engines employed to obtain the data pertinent to this research. This study commenced in November 2022 and concluded in November 2024. The two-year duration was due to the large number of articles involved that needed to be read.

Articles Published	Databases/Search engines Used	Keywords Used
From 2011 to 2021	Web of Science	Accounting Methods
Excluded 9 years or above	Science Direct	Big Data Analytics
Included 10 years or Less	Scopus	Artificial Intelligence
	Taylor and Francis online	COVID-19 Pandemic
	Wiley and Sons	Intangible Assets
	Springer Nature	Africa
	Google Scholar	Europe
	ResearchGate	Asia
	Sage Publication	Qualitative methods
	Emerald Publication	Financial Reporting

IV. FINDINGS & DISCUSSION

4.1 Big Data Implications in the Accounting Profession

By definition, Big Data consists of "the information assets characterised by such great volume, velocity, and variety to necessitate specific technology and analytical procedures for its transformation into value" (De Mauro, et al., 2016). Vast volumes, varied content, large sizes, varied natures, complicated structures, and high levels of complexity are all examples of what this phrase alludes to when discussing data (Varsarhelyi et al., 2015). It also alludes to the widespread adoption of a tacit understanding of the character of e-commerce in the wake of the global shutdown brought on by the COVID-19 pandemic in 2020/21 (Fiorini et al., 2018). Big data management tools include data mining, text mining, sentiment analysis, data modelling, and data analytics, all of which are used by businesses to inform their decision-making processes more effectively (Frizzo-Barker et al., 2016). Big data is influencing organisational strategies and policies (George et al., 2014). Due to the absence of a tangible good, financial service providers can benefit in ways that other businesses cannot, thanks to the availability of big data (Turner et al., 2013). It starts by determining what a firm needs, and then utilises existing resources, such as hardware, software, data, and analytics, to support that work. The use of non-traditional data sources necessitated a shift in accounting and auditing norms, which was made possible by the advent of big data (Vasarhelyi et al., 2015). The areas of security, risk, privacy, trust, accountability, real-world predictive analytics, data visualisation, ethics, data management, and data quality will be at the centre of this shift toward using big data in accounting and finance (Cockcroft & Russell, 2018).

Future research can also benefit from focusing on information governance, corporate reporting (Al-Htaybat & Alberti, 2017), and customer insights (Clarke, 2016). The most studied aspects of big data concerned trust, danger, and responsibility (Cockcroft & Russell, 2018; Al-Htaybat & Alberti-Alhtaybat, 2017; Vasarhelyi et al., 2015). Therefore, the purpose of this article is to investigate how companies and other organisations improve their accounting procedures by leveraging big data to generate competitive intelligence, enabling them to thrive in the face of and after the COVID-19 pandemic.

4.2 The Use of Big Data and its Implications: Accountability, Risk and Trust

Because data reliability is a crucial factor in data processing and administration, businesses are concerned about significant data risk and compliance management (Panneerselvam et al., 2015). Due to its tremendous integration, complexity, and variety, big data presents a significant danger of missing or abusing data (Bdaily, 2013). The auditing of big data and accounting tasks in businesses is complicated in many ways, including the risk of security breaches and data leaks (Ramamoorti et al., 2016). Business accountability through the use of social media networks and other online platforms is closely linked to the auditability of big data (Cockcroft & M. Russell, 2018). The reputation of any company, its ability to connect with its customers and other stakeholders, can both benefit from the use of social media and big data (Arnaboldi et al., 2017).

However, maintaining a company's good name requires more robust corporate governance and accountability than ever before. Reusing information gleaned through social media platforms comes with personal and societal hazards that may impact an organisation's standing in the public eye (Clarke, 2016). When it comes to boosting a company's bottom line and stock price, a positive online reputation is a crucial aspect (Ramos & Casado-Molina, 2021). A company's credibility may be compromised if the big data it collected was not used for its intended purpose (Clarke, 2016). Companies' social media presence will be used as a barometer of their economic success as the sharing economy gains popularity (Ramos & CasadoMolina, 2021).

Accounting and accountability methods have been advocated as a result of the use of social media and big data in businesses (Arnaboldi et al., 2017). Stakeholder expectations from various interest groups must be managed transparently as part of corporate accountability (Unerman & Bennett, 2004). More participation from those who matter most was achieved by incorporating their varied perspectives within a big data environment. This sort of activity is indicative of a corporation's controlled (kept) social licence to operate and survive.

A variety of arguments were made to defend the potential of maintaining a certain level of trustworthiness in managing large amounts of big data, as people came to comprehend the reliability of big data (Symons & Alvarado, 2016). Another obstacle to preserving trustworthiness and dependability is the social, legal, and political implications of leveraging big data to create value from corporate activity. Big data is being utilised by businesses to generate consumer value, but the exact form of this asset remains uncertain (Zerbino et al., 2018). Financial records and reports must be relied upon, documented, analysed, depreciated, audited, and reported on with respect to this asset. Financial statements are one tool used by traditional accounting to provide information about businesses to audiences beyond the management team (Alexander et al., 2003). Management can obtain any necessary information from within the company, whereas outsiders may need to resort to negotiation or regulations to obtain the details they require. Management and regulators face a significant task in resolving this conflict to earn the public's trust and approval, which is necessary before they can conduct business legally. Therefore, it is important to establish accounting standards for the administration and reporting of massive amounts of data within commercial enterprises. The next stage of this requirement is for businesses to adopt ethical and legal responsibility methods for commercialising big data to generate organisational values.

4.3 The COVID-19 Environment, Big Data and Corporate Governance

The healthcare sector, international trade, and the economy as a whole have all been severely impacted by the COVID-19 pandemic (He et al., 2021). The COVID-19 pandemic has resulted in a dearth of scientific contributions to big data governance. In this section, we examine the literature on the most important methods for handling the accounting side of big data governance during the COVID-19 pandemic. In the corporate world, big data has been utilised as a market-based tool to support decision-making (Al-Badi et al., 2018). One such market-based instrument for governing large datasets is competitive intelligence. To stay ahead of other businesses and provide valuable insights to your own, you need competitive intelligence (Ranjan & Foropon, 2021). The end goal is to build a centralised knowledge base for organisational decision-making by amassing, analysing, interpreting, and disseminating large amounts of data from rival institutions (Acharya et al., 2018). Business operations were supported by competitive intelligence tools, including benchmarking procedures (Jeong et al., 2021) and strategic planning processes (Tyson, 1998). To meet the privacy and transparency standards of public stakeholders, such as policymakers and regulators, organisations using big data for competitive intelligence must enhance their governance levels (Shamim et al., 2020). The term "big data governance" refers to the process by which an organisation handles and utilises massive amounts of data for strategic decision-making (Al-Badi et al., 2018). To guarantee dependability, trust, and consistency, big data governance must be carefully orchestrated and implemented.

However, big data can be manipulated, especially in the context of the COVID-19 disease environment, to influence corporate orientation (Rosado et al., 2021). This would be consistent with the core values of wealth accumulation and profit maximisation in current capitalism. Thus, in the face of the COVID-19 disease, it is necessary to manage big data governance and secure societal consent for this accumulation of wealth in order to obtain the licence to continue operations (Kaletsky, 2010). Legitimacy theory's tenet of a social compact (Mansell, 2013) is congruent with this position (Deegan & Blomquist, 2006). Business ties with various members of society are described in the social contract. Most businesses will likely last for quite some time and continue operating, but only the strongest will survive into the next generation. From an accounting standpoint, however, it is unclear how businesses manage big data governance to secure organisational legitimacy from stakeholders (society) in order to endure and accept their goals for profit development and wealth accumulation in the face of a pandemic. Managing the governance of big data has been employed as a strategy to enhance business profitability and support business survival through the development of new products and processes (Ortiz-Villajos & Sotoca, 2018). The factors driving this corporate innovation present more opportunities to create governance-based instruments for building accountability mechanisms to regulate wealth accumulation and profit maximisation in the face of the COVID-19 pandemic. This means that in the age of algorithms and the COVID-19 pandemic, the regulatory (Kempeneer, 2021) and informational technologies (He et al., 2021) present yet another crucial facet of controlling the governance and usage of big data (Kempeneer, 2021). However, there remains a lack of clarity regarding the description, key uses, classification, and utility of big data during the COVID-19 pandemic in terms of full governance and accountability. The following section examines the primary distinctive features of big data as an intangible asset from an accounting viewpoint.

4.5 Implications, Opportunities, and Challenges on Accounting Perspectives of Big Data

The purpose of this study is to create a unified analysis for an accounting framework that utilises big data to ensure the long-term viability of business enterprises in the face of and after the onset of COVID-19 conditions. The purpose of this section is to provide a literature study that demonstrates how the COVID-19 disease has influenced the evolution of accounting methods for the purpose of managing large amounts of data within commercial organisations. Before understanding the origins of these accounting procedures, it appears important to examine the historical context of big data's emergence as an intangible asset. For businesses, big data has proven to be a valuable resource for boosting profits and cutting expenses (Kastouni & Lahcen, 2020). Additionally, there is a significant need for accountants and auditors to acquire data analytics skills in order to effectively utilise big data in the field (Fay & Negangard, 2017). The scope and purpose of accounting with big data are still poorly defined and poorly understood.

Furthermore, several types of accounting procedures have been studied in diverse settings within the big data literature. Kastouni and Lahcen (2020) are just two authors who stress the importance of investigating the potential and actual applications of big data in accounting procedures across various organisational levels. A variety of organisational models are proposed in this work to comprehend better these procedures (De Maura et al., 2016).

To create and comprehend the utilisation of big data as a soft asset in corporate organisations, accounting practices offer analytical insights from a mix of fresh theorisations, constructivism, and empirical observations (Wataya & Shaw, 2019). To implement this recommendation effectively, it is necessary to conduct an open inquiry into the primary argument against treating big data as an intangible asset. The objective of this review is to elaborate on the benefits of these emerging intangible resources. To address the shortcomings of traditional accounting methods, businesses must first determine why they require these intangible assets and how they will be utilised (Sarkar et al., 2021). The qualities of big data from an accounting perspective have been identified using the interpretive-hermeneutic circle. We are now able to define the conceptual framework for using big data as an intangible or soft asset. The hermeneutic circle is a method for making sense of muddled concepts by honing our ability to differentiate between them. As shown in Figure 1, the hermeneutic circle was utilised to determine the most important aspects of big data in light of the actual reality of accounting procedures. Big data is an intangible asset, and this highlights its distinctiveness from more conventional intangible assets. This separation necessitates significant mental and practical disentangling between the two forms of intangible property. The ontological methods, the materiality of the critical themes, and the explanation of each framework are the intellectual parts of this differentiation. Each framework's description, measurement, organisational bodies, controlling and regulating framework, methods, communication, ultimate outputs, and difficulties comprise the concrete aspects of these intangible assets.

There are enticing upsides to treating big data as a form of intangible or soft asset. One of these advantages is the opportunity to prepare for the COVID-19 pandemic by building a strong infrastructure and unified organisational accounts that utilise big data to support businesses (Ahmed et al., 2021; Amankwah-Amoah & Adomako, 2019). This is why, in the sections that follow, we will delve further into the connections between traditional intangible assets and big data as a new tangible/soft asset.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

To help businesses weather the COVID-19 pandemic and beyond, this research has hypothetically explored how big data applications may be employed as soft, intangible assets. The following are some ways this study, which employed a desk study approach, contributes to the lively discussion in accounting about big data. As the paper's first significant contribution, it presents a novel theoretical framework for treating big data as any other high-value intangible asset. According to this theoretical framework, big data is an intangible asset that businesses can monitor and manage to help them acquire a competitive edge and generate new forms of value. Second, the study theorises how companies and other organisations might deal with the accounting repercussions of the system it proposes. Importantly, it provides guidance on how to account for big data as an intangible asset. Third, it suggests novel insights into how big data can help businesses thrive after COVID-19. As a fourth contribution, this study sheds light on the governance and risk of leveraging big data for competitive intelligence benefits, offering a fresh perspective on an established topic. Fifth, the paper emphasises the fundamental structure of the proposed accounting system for managing big data applications by providing a contemporary theoretical comparison of big data as valued intangible assets and traditional intangible assets. Beyond COVID-19, it offers novel accounting considerations for implementing big data strategies in corporate settings.

By delving into the primary modern accounting considerations for exploiting and misusing big data during and beyond the COVID-19 pandemic, this article offers practical implications for standard setters, accounting practitioners, corporate managers, and academics. Some motifs from the classical type of institutionalism are involved in the expert management of these pragmatic considerations. Beyond the era of the COVID-19 pandemic, this type of institutionalism provides the formal structure, norms, and values necessary to enhance company processes. From an accounting

perspective, this article also outlines the competencies and capacities that businesses require to manage big data effectively.

5.2 Recommendations

In this paper, we propose several important avenues for future study. The first step in managing big data as a valuable intangible asset and vital component of the social contract between enterprises and society is to conduct qualitative research through methods such as interviews and observations to determine the necessary organisational values and norms for doing so. Second, further research is needed to determine how accounting can utilise big data to enhance resource allocation, risk management, capital cost, earnings management, financial performance, and decision-making. Third, beyond the scope of the COVID-19 disease, more foresighted research ideas could be developed to describe the role of big data in bridging the gap between traditional accounting procedures and the needs of the modern market.

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