South Asian Journal of Marketing & Management Research (SAJMMR)
ISSN: 2249-877X Vol. 13, Issue 8, August 2023 SJIF 2022 = 7.911
A peer reviewed journal

INDUSTRY 4.0/5.0 BIG DATA AND ACCOUNTING INFORMATION QUALITY IN NIGERIA

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DOI: 10.5958/2249-877X.2023.00012.7

ABSTRACT

The study investigated industry 4.0/5.0 big data and accounting information quality in Nigeria. It further examined the effect of industry 4.0/5.0 big data on accounting information quality in Nigeria. The study is qualitative research using descriptive approach. Findings of the study showed that the effect of industry 4.0/5.0 big data on accounting information quality in Nigeria is at infant age. This study concludes that industry 4.0/5.0 big data has little effect on accounting information quality in Nigeria. It recommends that professionals and researchers should take advantages of these opportunities; and that further studies should be encouraged to extract hidden relevance of industry 4.0/5.0 big data on accounting information quality.

KEYWORDS: *Industry 4.0/5.0 Big Data; Accounting Information Quality; Internet Of Things (Iot); Artificial Intelligence (AI).*

1. INTRODUCTION

Globally, the call for relevant accounting information from stakeholders can be traced to periods before and after industrial evolutions which led to the development of essential qualitative attributes that are useful in accounting by different scholars and committee such as Trueblood committee, Wheat committee, Stamp report to mention a few (Belkaoui, 2014). To conscientiously pay attention to this call Chartered Finance Analyst [CFA] (2022) recommends that preparers of accounting information, regardless of size, company, or locality, should comply with the highest paradigm of transparency, faithful representation, relevance, reliability and timeliness in financial reporting. Relevance and reliability are the most fundamental; timeliness further enhances its significance (Ahmet, 2019). Based on this, most regulatory authorities such as the Securities and Exchange Commission (SEC) of the United States of America (USA), New York Stock Exchange (NYSE) and Organisation of Economic Cooperation for Development (OECD), underline the call for the timely release of corporate financial reports (Efobi & Okougbo, 2014). In Nigeria, a sum of 44 firms listed on the floor of Nigerian Exchange Group (NGX) may face panel from the body for failing the timeline in a rendition of 2020 audited financial records (Nnorom, 2021).

According to Mailafia and Adamu (2021); Chukwu et al. (2020); Ekienabor and Oluwole (2019) current academic studies have been focusing largely on many areas that might influence accounting information quality, however, to the best knowledge of researchers not much or little researches have been done on the role of industry 4.0/5.0 big data analysis in improving the quality of accounting information, especially timeliness in financial reporting (Idil & Destan, 2018; Ohaka & Akani, 2017). Industry 4.0/5.0 Big Data analysis is subset of the digital transformation of global communities and industries. The digital transformation of companies is premised on novel technologies brought about by the fourth industrial revolution which are cloud computing, the Internet of Things (IoT), Cyber-Physical Systems (CPS), and Big Data. This study attempts to fill this lacuna in the literature.

Despite of all these emphases, extant literature did not give adequate justifications to the relationship between adoption of industry 4.0/5.0 Big Data analysis and accounting information system in developing economies like Nigeria. Besides, the empirical proofs coming from various studies about the influence of industry 4.0/5.0 Big Data analysis and accounting information system in developing economies have so far produced mixed outcomes that are inconclusive and contradictory. Therefore, the issue of whether adoption of industry 4.0/5.0 Big Data analysis improve or worsen accounting information system is currently worthy of further research like the one being considered in this study. Besides, the effect of industry 4.0/5.0 Big Data analysis on development of accounting information system has not received sufficient research considerations in Nigeria. Research as well reveals that many of the studies on impact of industry 4.0/5.0 Big Data analysis on development of accounting information system that have been reported were conducted on industrialized economies. This implies that there is a main gap in the related literature on developing economies like Nigeria, which will be examined by this study. This study attempts to fill this lacuna by investigating the circumstances in Nigerian and offering more literature and empirical reviews on the impacts of industry 4.0/5.0 Big Data analysis on development of accounting information system in Nigeria.

It is thus essential at this point to embark on an examination of industry 4.0/5.0 Big Data analysis on development of accounting information system in Nigeria which is the main objective of this study. The specific objectives are to: investigate the significant effect high volume of data of industry 4.0/5.0 Big Data analysis on the timeliness of accounting information in Nigeria; examine the significant effect of high variety of data of industry 4.0/5.0 Big Data analysis on the timeliness of accounting information in Nigeria; and find out the significant effect of high velocity of data of industry 4.0/5.0 Big Data analysis on the timeliness of accounting information in Nigeria. In order to accomplish the objectives, the following research questions are formulated: Does industry 4.0/5.0 Big Data analysis contribute to the timeliness of accounting information in Nigeria? What are the impacts of high volume of data of industry 4.0/5.0 Big Data analysis on the timeliness of accounting information in Nigeria? Does high variety of data of industry 4.0/5.0 Big Data analysis have effect on the timeliness of accounting information in Nigeria? What are the impacts of high velocity of data of industry 4.0/5.0 Big Data analysis on the timeliness of accounting information in Nigeria?

The study is broken down into four sections. The next section contains conceptual review of relevant literature to explain various works that have been done on big data and areas that this study addresses. The second section discusses the related theories while third section reviews related empirical studies and last section covers conclusions and recommendations.

2.1 Conceptual Review

2.1.1 Big Data

The concept of big data is a blanket term for non-traditional strategies and technologies needed to make available large datasets (Benbrahim et al., 2020). Gartner (2018) defines it as a big, various and fast flow of information that requires using economically feasible and innovative processing methods with the aim of developing decision-making methods and the automation of processes. Loukides (2010) defines big data as when the size of the data itself becomes part of the problem and traditional techniques for working with data run out of steam. Big data refers to datasets that are large, diverse, and rapidly changing, making it challenging to manage them with conventional tools and methods (Elgendy & Elragal, 2014). Big data will, both in the current era and in the future, form an important resource for organisations (Xu, 2021). Its prominence recently in every sector of the economy has been due to the development in information technology (Vasarhelyi et al., 2015).

According to Kanakriyah (2016), accounting information quality is frankly related to accounting data and accounting methods. One peculiar attribute of accounting data is that it is structured. This makes it lack litheness, while rigidity and behind-the-schedule accessibility, especially for those that want assessment or apply prediction models, such as depreciation, risk assessment, and budgeting have been its limitations (Ibrahim et al., 2021). However, real-time access to accounting data through the use of big data might provide an avenue to improve the quality of accounting information. Ibrahim et al. (2021) opined that big data is much more than accounting and financial data. It includes financial and non-financial data, accounting and non-accounting data, and quantitative and qualitative data, which become available in massive amounts, in different formats, and in real-time (Bag et al., 2020). Big data is the data that contains greater variety, arriving in increasing volumes and with more velocity (Oracle Corporation, 2022). Data has value and it is intrinsic, so more data have more value (Binggeser, 2017). These values lie in the information generated, the insight, and the knowledge gained from its use and analysis. Therefore, this study's main objective is to examine the effect of big data on the quality of accounting information.

Younis (2020) states that the increase in the amount of data is not a new matter, but the rate of growth of data is unprecedented, and that data analytics is not a new concept, as accountants frequently employ analytical techniques like ratio analysis and time series analysis. Big data, however, does not only refer to large volumes of data since industries and businesses like banks have been using big data in the past (Jia, 2020). The relative difference between big data and traditional structured data used by an accountant lies in volume, velocity, variety, value, and veracity. Warren et al. (2015) suggested big data can be used in financial accounting and reporting where new data types (such as text, video, and audio) can be integrated with traditional accounting data into the accounting information systems.

Qiongge (2020) stated that big data is not only reflected in large numbers, but more importantly, the value contained in the data is very large, which has high value for the development of enterprises. These large numbers, high value, lot of variety and data arriving timely with high velocity present new features and concepts for accounting information which is the focus of this study. Lancey (2001) opined that volume, velocity and variety are the basic dimensions of big data management. Although studies have expanded these dimensions to 42 (Shafer, 2018), there is a consensus that volume, velocity, and variety form the basic nucleus of the concept of big data (Chen, Preston, & Swink, 2015; Ghasemaghaei, Ebrahimi et al., 2017; Gupta, Kar,

Baabdullah, & Al-Khowaiter, 2018; Lam et al., 2017; Ward & Barker, 2013). In agreement with this, this study examines the effect of these three basic features on the timeliness of accounting information.

2.1.2 **Accounting Information Quality**

There is neither a universal nor a consensus definition as regards the concept of accounting information quality. Lu et al. (2013) stated that accounting information quality is the precision with which financial reporting informs equity investors about future cashflows. Here, the quality of accounting information is based on how accurate it is in predicting the future cashflows for investors to make decisions. The emphasis is on the reliability or accuracy of accounting information when used for prediction, projection and budgeting. Information quality is a function of accounting techniques utilized to create the figures in the records, the accuracy and transparency of the reported information, and the speed with which the information is provided to shareholders (CFA, 2022). Hribar et al. (2014) explained accounting information quality as the extent to which accounting information accurately reflects the company's current operating performance, is useful in predicting future performance, and helps assess firm value.

The central concept of accounting quality is that some accounting information is better than other accounting information at communicating what it purports to communicate (Obaidat, 2007; Pounder, 2013; Achim, 2014; El-Hewety, 2019; CFA, 2021; Thao & Nhi, 2021; Sumiyana et al., 2021). These variations in the definition of accounting information quality, according to Pounder (2013), ultimately serve thesame purpose: to enable people to evaluate the value (value judgement) of accounting information (CFA, 2022). The value judgement, which is the purpose of every user and producer of accounting information, is the assessment of a course of action in relation to one or more standards or priorities. Achieving this purpose for all users and producers can be enhanced if the accounting information meets the standardized qualities (faithful representation, relevance, comparability, timeliness, and verifiability).

Good accounting information is usually characterized by issues such as reliability, relevance, timeliness and comparability for information to be accessible and useful for decision-making by the various stakeholders (Ehijiele, 2019). However, this study uses timeliness to measure the quality of accounting information. Timeliness of financial information points to the need for a timely rendition of accounting reports as required by law or guidelines (Odesanya et al., 2020). Accounting information must be produced as and when due. One of the most important features of relevance is timing, as old information will not benefit investors or creditors in making current or future decisions (Ladewi et al., 2017; Qatawneh & Bader, 2020). All accounting information must be reported on time to ensure that accounting information is of a high standard (Appelbaum et al., 2017). The purpose of financial reports is to serve the needs of stakeholders. It is necessary to strike a balance between the demands for faithful representation and timeliness.

Timeliness means having information available to decision-makers before it loses its capacity to influence decisions (Obaidat, 2007; Putri, 2018). Timeliness is associated with relevance. Information lacks relevance and becomes useless if it is either not available as and when required or becomes available long after the reported events have occurred. Timeliness alone cannot make information relevant, but a lack of timeliness reduces the relevance it might otherwise have had (FASB, 2001). However, this feature is also a compliment to both accounting information reliability and relevance. The achievement of this nowadays can be enhanced through the use of big data. Mehdi (2022) in his study stated that the computerization of the accounting information system has a significant impact on the quality of the accounting information. Information loses

its value if not provided as and when needed because the speed in providing information with a degree of accuracy is better than a high degree of accuracy with delay (Qatawneh & Bader, 2020). Big data is data that occurs in real-time (Zaki et al., 2020). The relationship between big data and the timeliness of accounting information, which is the focus of this study, therefore needs to be assessed.

The quality of accounting information can be measured by assessing how faithfully representative, relevant, timely, complete and verifiable accounting information is to stakeholders in making decisions. While all these features form an important ingredient of accounting information, this study focuses on the timeliness of accounting information. Putri (2018) opines timeliness as the period between presenting the desired information and the frequency of information reporting. Srimindarti (2008) argues that financial statements should be presented at a time interval to explain changes in the company that will affect information users in making predictions and decisions. However, the use of big data can enhance the timely rendition of accounting information. Big data is characterised by velocity, volume and variety. Ghasemaghaei (2019) explains volume as the size of the data, which is increasingly growing; velocity as the speed of processing data; and variety as the types of data, which range from unstructured to structured data. In addition to these three basic characteristics, Owais and Hussein (2016) explain other features of big data (veracity, validity, variability, volatility, visualization and value) and categorize them into five groups (collecting data, processing data, integrity data, visualization data and worth of data). Cockcroft and Russell (2018) opine that big data has the potential to improve data quality (accounting information quality) by increasing accuracy, completeness, and real-time availability. Consequently, the second objective of this study is to investigate the effect of each of the big data's characteristics (i.e., volume, velocity, and variety) on timeliness, which may eventually, impact the quality of accounting information.

Accordingly, this study uses a sample of Nigerian enterprises to assess the effect of big data characteristics on the quality of accounting information. The study examines the effect of the size and the rate at which data is growing on the timeliness of accounting information. Meiryani et al. (2020) state that big data when used in the accounting process, is useful in providing ease and speed of access to transaction data flow and can increase the effectiveness and efficiency of physical document storage costs. Qiongge (2020) opines that big data improve availability, and reliability, and has overcome the impact of adverse factors such as subjective judgment to a certain extent. The large volume of data may increase the completeness of accounting information, while its real-time availability and big data type may improve the timeliness of accounting information. Herath and Woods (2021) suggested real-time access to the accounting data can create efficient and error-free accounting reports as well as save time and money. The effect of the various types of big data (structured, unstructured and semi-structured data) on timeliness of accounting information is examined. This study provides valuable insight to policymakers, regulators, and entrepreneurs in recognizing the importance of big data in improving accounting information quality. The findings of this study help managers and researchers to better understand the impact of big data on improving the quality of accounting information. Also, the results provide a useful guideline for understanding whether each big data characteristic (i.e., volume, velocity, and variety) could be an antecedent of the quality of accounting information generated within organisations.

2.1.3 Volume and Quality Accounting Information

For the past two years, the volume of data created has been more than that created throughout entire human history (Marr, 2016). Here, volume of data matters and it forms the major part of big data (Patgiri & Ahmed, 2016). The volume is one of the bases of big data and refers to the amount of data that is produced by big data technologies or sources and the rate at which it is growing, which is enormous (Nasrizar, 2014; Hareth & Woods, 2021). But a large percentage of big data contains unstructured data from different sources. Cukier (2010) opined that the world contains an unimaginably vast amount of digital information which is getting ever vaster more rapidly and the effect is being felt everywhere, from business to science, from governments to the arts. Every human created about 1.7 megabytes of data per second in 2020 and more than 3.7 billion humans are already using the internet (Carter, 2022). The amount of data available for analytics purposes is growing at an exponential rate. According to Ogi (2020), there were 79 zettabytes of data generated worldwide in 2021, and this number is expected to double by 2025.

Firms have begun to collect and analyse large sizes of data to enhance their existing knowledge and make better decisions (Ghasemaghaei & Calic, 2019; Larson & Chang, 2016). The increasing use of digital devices has led to an unprecedented rate of data generation, which motivates firms to process data in a real-time manner to provide evidence-based decisions (Gandomi & Haider, 2015). For the accountant, this means that there is a huge amount of data available to work with (Crookes & Conway, 2018). Firms can collect different types of data, such as GPS location information, audio, videos, sensor data, weblogs, texts, and social media data, to generate value (Ghasemaghaei, Ebrahimi et al., 2017; Lash & Zhao, 2016).

In this context, the expansion of data sources and completeness feature of accounting information can move in the same direction. Owais and Hussein (2016) categorized volume as processing data while Ahmad and Ahmed (2020) linked the data processing stage to the completeness of accounting information. Ghasemaghaei and Calic (2019) showed that data volume does not improve data value and veracity generation (relevance and faithful representation of accounting information). The volume of data presents data sources for accounting measurement, performance evaluation, estimation, and budgeting. Consequently, accounting information should be complete, containing all relevant accounting information that occurred in the period. An increase in the volume of data might go hand in hand with accounting information, ensuring the completeness of accounting information.

2.1.4 Variety and Quality Accounting Information

Big data comes in various dimensions, forms, distinct features, nature and types. It includes structured (e.g., numbers) and semi-structured data (e.g., log data, XML data) and unstructured data (e.g., videos, pictures, customer reviews, audio, sensor data) (Lam et al., 2017; Bazzaz et al., 2021). The variety of data increases as more and more data are gathered from various sources (Marr, 2016). Brown (2022) stated that big data reflects the diversity of sources, types, and formats of information. Diverse data is created not only internally but also from external sources (Grover et al., 2018). Variety in big data is considered a fundamental aspect and refers to data diversity in data collection (Spacey 2017). Unlike in the past, when structured data could only be gathered from databases and spreadsheets, data is now available in a variety of formats, including emails, PDFs, photographs, videos, audios, social media posts, and much more (Rai, 2020). Variety refers to complexity, diversity and heterogeneity in the nature of data.

Though accountants have been used to structured but transactional data, unstructured data abounds. Technological advancements give firms access to data beyond the firms' business transactions (Yaqoob et al., 2016). Variety in big data refers to collecting data from multiple sources to understand a problem and make smarter, more informed decisions (Dimmick, 2017). Lukoianova and Rubin (2014) suggest that collecting and integrating data from various sources reduce the bias and errors that stem from analysing limited amounts of data. Different varieties of data present an avenue to sound and accurate accounting measurement and estimation which may enhance the faithful representation of accounting information. Ghasemaghaei and Calic (2019) argue that firms that constantly collect data from various sources may be able to improve their quality and certainty of data by reducing bias and errors stemming from a limited amount of data. Firms that are capable of processing different formats of data can generate profound and valuable insights (Erevelles, Fukawa, & Swayne, 2016; Ghasemaghaei, Ebrahimi, & Hassanein, 2016; Petrini & Pozzebon, 2009)

Big data changes the centralised method of warehousing data to a decentralised method. Both centralized and distributed processing complement each other to meet the needs of large-scale calculation of different types of accounting data (Qiongge, 2020). Variety, which is in collecting data group (Owais & Hussein, 2016), improves the faithful representation and relevance of accounting information (Ahmad & Ahmed, 2020). Wang et al. (2016) argue that processing different types of data reduces uncertainty for firms in making decisions. Ghasemaghaei and Calic (2019) argue that utilizing a wide variety of data may increase firms' capability to process high veracity of data and data value (relevance and faithful representation of accounting information). This can mean that there is going to be a reduction in errors and an increase in the presentation of true accounting data.

2.1.5 Velocity and Quality Accounting Information

This is the rate at which data is received and acted on in real-time. The proliferation of digital devices, such as sensors and smartphones, has considerably enhanced the rate of data generation, which has led to a growing need for analysing data in real-time (Gandomi & Haider, 2015; Ghasemaghaei & Calic, 2019). Brown (2021) stated big data refers both to the speed at which big data is generated and the speed with which organizations have to process it to keep pace. Big data is being generated more rapidly than data from traditional methods, so it flows heavily because of active interaction with the topics of individuals, clients, and beneficiaries (Younis, 2020). Almost immediately, data becomes available. This affects all areas of the company, including accounting.

The timeliness of presentation and preparation of accounting information can also be achieved if data is available in real-time. While prompt usage of data enables real-time processing of data to solve issues on a continuous basis (Manyika & Roxburgh, 2011; Saboo et al., 2016), its effect on timeliness of accounting information abounds. Related to the high velocity of big data is making available financial reports as and when due. The higher the velocity rate, the faster the data can be acquired and processed, and the more valuable and long-lasting the data collected will be in terms of value (Indicative Inc., 2022). Velocity forms part of the processing data group (Owais & Hussein, 2016), and it has a profound positive effect on timeliness of accounting information (Ahmad & Ahmed, 2020). Ghasemaghaei and Calic (2019) found that data velocity improves data veracity generation (faithful representation of accounting information). Therefore, the impact of velocity can be gauged directly on timeliness of accounting information. As the

generation of data is fast becoming more rapid, readily available accounting data can be used for decision making.

2.2 Theoretical Review

The fundamental basis of this study is anchored on decision-usefulness theory. It was propounded by George Staubus in 1961. It is based on the assumption that users of accounting information are rational and that the primary objective of financial reporting is to provide information that is useful in making investment decisions. Accounting involves the transmission of financial information to anyone who may need the information. These people then use the accounting information to make business and investment decisions. However, to make proper decisions, the information being provided needs to be reliable and relevant (Kareem et al., 2017) and the vital ingredient of this is timeliness. The quality of accounting information in terms of reliability, relevance, completeness and timeliness enhances its usefulness. Davern et al. (2018) showed that financial reports remain consistently relevant over time and that investors view non-GAAP and other non-financial information as complements, rather than substitutes, to financial reports.

In the conceptual framework, the IASB and the FASB identify decision usefulness as the main objective of financial reporting. Jonas and Young (1998) suggested that decision usefulness should be the criterion to measure the quality of accounting standards. Decision-usefulness in the context of financial reporting means that the information provided by financial reporting has characteristics that can potentially affect the decisions of the user. Beest et al. (2009) said if financial statements are to be produced, higher quality financial information should have fundamental characteristics underlying decision usefulness. Jabbar (2017) opined that the qualitative characteristics were needed to produce higher quality financial information such as understandability, comparability, timeliness, accuracy and verifiability. The knowledge of accounting information by both accountants and users for decision-usefulness improves accounting information quality. Though relevance might be the most important quality of accounting information, timeliness improves this quality. The awareness of this broadens accounting data sources, providing an avenue for the use of big data in the preparation, estimation, measurement, and presentation of accounting information. However, this theory has been criticised based on variation in the needs of users, which affect the prominence of individual qualities.

2.3 Empirical Review

Academic researchers have been conducting studies to explore the effect of big data on accounting and various ways accountants can leverage on such technology. Awad et al. (2021) examined the convergence of big data and accounting in alerting researchers to areas in the accounting profession where big data can be used. In their exploratory research, they described areas where big data could overcome data limitations of accounting issues. The study found that big data and data analytics were new areas that should be incorporated into the accounting profession because of their potential effect on numerous areas of accounting. While taking an overview approach, Bose et al. (2022) assessed big data, data analytics and artificial intelligence in accounting. The study found that accounting professionals could only leverage big data, data analytics and artificial intelligence to stay ahead of competition in a rapidly changing business environment. And that accountants needed to improve their skillsets to stay ahead of competition and capitalised on numerous opportunities in this quickly changing, disruptive, but ultimately beneficial environment.

Herath and Wood (2021) investigated the impact of big data and data analytics on accounting. The study, though qualitative, adopted a literature review methodology to examine, evaluate and describe the effect of big data on accounting. The study found out that there were great opportunities in accounting as a result of big data and that this could improve risk analysis to better organisations' performance and decision-making. The study also found that big data would have an important impact on accounting and accountants in improving the quality of accounting information, and providing real-time and dynamic information to assist in decision-making. Also, Cockcroft and Russell (2018) studied big data opportunities for accounting and finance practice. The research addressed the major themes in existing research on big data and the resulting gaps in the accounting and finance literature. The study pointed out six areas of big data in accounting and finance that received little attention from researchers. This included risk and security, data visualisation and predictive analytics, data management and data quality.

Ghasemaghaei and Calic (2020) assessed the impact of big data on firm innovation performance. In this study, we explore the impacts of big data's main characteristics (i.e., volume, variety, and velocity) on innovation performance (i.e., innovation efficacy and efficiency), which eventually impacts firm performance (i.e., customer perspective, financial returns, and operational excellence). To address this objective, data were collected from 239 managers while proposed model was empirically examined and the relationships analysed using ex-post research design. The results reveal that data variety and velocity positively enhance firm innovation performance data volume has no significant impact. In the same vein, Sejahtera-Surbaktia et al. (2020) examined factors influencing effective use of big data in an organisation. A systematic review of literature was conducted and the study identified 41 factors, which were categorized into 7 themes, namely data quality; data privacy and security and governance; perceived organizational benefit; process management; people aspects; systems, tools, and technologies; and organizational aspects. The study also proposed a framework for the study of effective use of big data as a basis for future research.

Again, Ramasamy and Chowdhury (2020) investigated big data quality dimensions. The study focused on analysis and review of literature. The study found that the fundamental quality of big data included accuracy, completeness, consistency, uniqueness and timeliness. The study also found new dimensions that are relevant to big data such as trust and confidentiality, credibility and confidentiality. In assessing data quality definition and assessment in big data, it mainly depended on the data types, data sources and applications. In a study conducted by Wamba et al. (2019) on turning information quality into firm performance in the big data economy, the study explored information quality dynamics in big data environment linking business value, user satisfaction and firm performance. Proposed information quality dynamics were tested using data collected from 302 business analysts across various organizations in France and the USA. The study found that information quality in BDA reflects four significant dimensions: completeness, currency, format and accuracy. The overall information quality has significant, positive impact on firm performance which is mediated by business value (e.g., transactional, strategic and transformational) and user satisfaction.

In China, Qiongge (2020) reviewed the impact of big data on accounting development. The study analysed of big data on accounting development from two aspects of financial accounting and management accounting. The study showed that in the era of big data, an increase in accounting information generation and the efficiency of data processing had led to the improvement of the quality of accounting information. Guo (2019) examined the trend and risk prevention of accounting information under the background of big data. In his exploratory survey, the study

explained that the exchange and sharing of information have increased rapidly as a result of big data technology and at the same time, it also brought more difficulties in the field of traditional accounting information calculation. Therefore, under the background of big data, there was a need to make a reasonable analysis of the development trend and risk of accounting informatization.

Also, Tiron-Tudor and Deliu (2021) studied big data's disruptive effect on job profiles, making management accountants a case study in Romania. This paper investigated the impact of big data including data analytics on management accountants' job profiles with the use of descriptive research, surveying the opinions of management accountants in Romania. They found out that management accountants had a vital role in the employment and diligent use of big data. And that prescriptive analytics would be the future of big data and only a minority of organisations had the aggregate of data and datasets necessary for data analytics. Idil and Destan (2018) investigated the impact of big data analytics on financial reporting and accounting within the institutional framework. The study, which was based on in-depth interviews of accountants in different organisations, analysed the potential uses and effects of big data analytics in financial reporting and accounting. Accordingly, traditional accounting practices were changing, but accounting and financial reporting's nature remained thesame. Big data and analytics provided the significant potential for accountants working in forensic and valuation fields.

Nagat and Marie (2020) evaluated the effect of big data on the future of accounting profession. In their exploratory survey, previous studies and related research were reviewed together with an in-depth interview with specialists in the field of accounting and data analysis was conducted. They found that big data would have an impact on the roles of accountants and the profession of accounting in the future and that big data analysis would improve the quality of accounting information. Meiryani et al. (2020) investigated the impact of big data on accounting information system in Indonesia. The study reviewed literature and found that big data is useful in providing ease and speed of access to transaction data flow; can increase the effectiveness and efficiency of physical document storage costs and changes in forensic audit and accounting techniques. Using bibliometric analysis, Varma et al. (2021) analysed the current state of knowledge on big data in the accounting domain. Through visual analysis, the study highlighted that big data was an innovation to be managed in the accounting domain to stimulate firms' competitive advantages in an effective, timely and efficient way. Big data was an accounting tool that affects the accounting environment only under certain circumstances which required new and renewed skills and capabilities for its value to be fully realised in the accounting environment.

Nagat and Marie (2020) researched the impact of big data analytics on financial reporting quality. They survey experts' opinions in the field of accounting to assess big data analytics in the kingdom of Saudi Arabia. The study found out that big data analytics would improve organisation competitiveness and accounting information quality. Big data analytics would also provide stakeholders with relevant information that aids decision-making and future information that could influence stakeholders' decisions. Ahmad and Ahmed (2020) investigated the impact of big data on accounting information systems and accounting information quality. This research collected data from accountants, chief accountants, chief financial officers, financial analysts, data analysts, and top management in organizations that used big data in their operations. This study developed a theoretical model that linked data collection stage to reliability, data processing stage to completeness, data storage stage to timeliness and information generation stage to understandability and accessibility quality of accounting information.

Wook et al. (2021) explored big data traits and data quality dimensions for big data analytics applications using partial least squares. While this study conducted a survey using a questionnaire as a data collection instrument, the partial least squares technique was used to analyse the hypothesised relationships between the constructs. The study found that big data traits can significantly affect all constructs for data quality dimensions and that the ease of operation construct has a significant effect on big data analytics applications. Wongsim et al. (2021) investigated factors influencing the adoption of big data analytics in accounting. The study used two organisations as a case study and questionnaire methods were sent to 156 respondents to obtain data. The study found that five factors ensure the use of big data in accounting. It included information technology strategists, top management commitment, skills development in BDA, technology capability; and competitive environments. All factors were statistically significant, therefore influencing BDA in accounting systems and ensuring DBA in accounting system successes.

In Nigeria, Suleman (2021) studied the effect of digitalization of accounting information on business organisation of some selected companies in Edo state, Nigeria. Data were collected with the aid of a questionnaire and analyzed using descriptive statistics. The researcher also employed a correlation matrix to determine the relationship among variables and least square regression to test the hypotheses. The study found that there is a positively insignificant relationship between information technology and accounting system; there is no significant effect of big data on accounting systems, while artificial intelligence has no significant influence on accounting information processing.

3. Conclusions and Recommendations

This study examines industry 4.0/5.0 Big data and accounting information quality in Nigeria. It covers conceptual, theoretical and empirical reviews. From various contributions of different researchers it was gathered that industry 4.0/5.0 Big Data have capacities to influence accounting information qualities. We observed that Industry 4.0 and Industry 5.0 represent the fourth and potential fifth waves of industrial revolution, respectively. These revolutions involve integrating advanced technologies such as the Internet of Things (IoT), big data, artificial intelligence (AI), and automation across various industries. In Nigeria, the adoption and progress of Industry 4.0/5.0 hinge on multiple factors, including infrastructure development, government policies, and businesses' readiness to embrace these technologies.

In Nigeria, Industry 4.0 technologies have been steadily gaining acceptance, particularly in manufacturing, agriculture, and telecommunications sectors. However, challenges like limited infrastructure, internet connectivity issues, and skill gaps in the workforce have somewhat hindered the pace of adoption. As for Industry 5.0, though still an emerging concept, it emphasizes human-machine collaboration, ushering in a more personalized approach to manufacturing and services, with a strong emphasis on human interaction. Achieving Industry 5.0's potential in Nigeria would likely necessitate a higher level of technological preparedness and investment.

Furthermore, the widespread implementation of Industry 4.0 technologies is poised to generate copious amounts of data across industries. In accounting, this data can be harnessed to gain deeper insights into financial transactions, risk assessment, and decision-making processes. Effectively utilizing big data can significantly enhance the quality of accounting information, leading to improved accuracy, transparency, and real-time reporting.

Nevertheless, Nigeria faces several challenges in fully embracing Industry 4.0/5.0 and optimizing accounting information quality. Firstly, the development of these advanced technologies requires robust infrastructure, including stable power supply and high-speed internet, which may still be lacking in certain regions of the country. Secondly, with the increased utilization of big data and interconnected systems, ensuring data security and privacy becomes of utmost importance. Nigeria would need to implement strict data protection regulations and cybersecurity measures to safeguard sensitive information. Thirdly, adopting Industry 4.0/5.0 demands a skilled workforce capable of effectively utilizing these technologies. Thus, investments in education and training programs are essential to equip Nigerian professionals with the necessary digital skills. Lastly, implementing Industry 4.0/5.0 technologies necessitates an updated and flexible regulatory framework that fosters innovation while ensuring ethical and responsible use of these technologies.

4.0 Limitation to the Study

This study is limited to conceptual, theoretical and empirical reviews. This implies that it does include research design, collection of data, and data analysis.

5.0 Suggestion of further Study

This study suggests that further study should consider empirical study.

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