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Sequence of Manuscript

I. Title page
II. Abstract (150-250 words)
III. Keywords (3-5)
IV. Introduction
V. Literature Review
VI. Methodology
VII. Results and Discussion
VIII. Conclusion and Recommendations
IX. References (APA 7th Edition)
X. Appendices (if necessary)
XI. Author Biographies (optional)

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DISRUPTIVE TECHNOLOGY AND GREEN ACCOUNTING

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ABSTRACT

Green accounting, also known as environmental accounting, involves the identification, measurement, and reporting of environmental costs associated with business activities. The purpose of this research is to investigate how disruptive technologies and green accounting relate. Specifically, it looks at how disruptive technologies might improve the effectiveness, transparency, and efficiency of green accounting. The paper considered four areas of disruptive technology; the big data, block chain, artificial intelligence, and the Internet of Things (IoT) and their interaction with green accounting in Nigeria. The library research method was adopted because the paper focused on the conceptual discussion of extant literatures on the effect of disruption technology on green accounting in Nigeria.

The result of findings indicates that the emergence of disruptive technologies, including but not limited to, block-chain, artificial intelligence (AI), and the Internet of Things (IoT), are expected to be beneficial to green accounting, which focuses on integrating environmental expenses into financial reporting. The study suggests empirical research of the conceptual framework that includes the independent variables of disruptive technology and how it can impact the dependent variable, green accounting issues.

1. Introduction

The need to incorporate sustainable practices into company operations is more significant than ever in our current environment, when environmental concerns are growing and developments in technology happen at a rapid pace. Companies are becoming increasingly aware of the impact their operations have on the environment, and they must quantify and disclose the implications in an accurate and transparent way. This is where green accounting comes into play. Green accounting, also known as environmental accounting, involves the identification, measurement, and reporting of environmental costs associated with business activities. It is an important tool for promoting sustainability, helping companies understand the full environmental impact of their operations and encouraging them to adopt more sustainable practices.

Numerous businesses are acknowledging the influence of environmental pressures and dangers on their operations and corporate activities. Technologies that have the potential to drastically alter entire markets and corporate processes are known as disruptive technologies, and they are developing quickly and significantly changing the corporate environment. In the current global environment, businesses have to regularly update their work practices and standard of procedures in order to respond swiftly to a variety of dynamic changes that frequently occur simultaneously and unpredictably and to keep up with the disruptive technologies (Anggraini & Sudhartio, 2019). These technologies, including but not limited to, big data, blockchain, artificial intelligence, and the Internet of Things (IoT) have the potential to increase efficiency, improve transparency, and encourage significant changes in all aspects of business, including accounting practices.

The purpose of this research is to investigate how

disruptive technologies and green accounting relate. Specifically, it looks at how disruptive technologies might improve the effectiveness, transparency, and efficiency of green accounting. Businesses can increase the thoroughness and accuracy of their environmental reporting while also promoting more significant sustainability-related action by utilizing these tools. Disruptive technologies' incorporation into green accounting may open the door to a new era of sustainable business practices, in which environmental issues are naturally integrated into an organization's core values. The significance of sustainable development has never been greater, and the means of achieving it are developing at a rapid pace, making this investigation more relevant. To keep us properly targeted we will look at the disruptive technology in four dimensions; the big data, blockchain, artificial intelligence, and the Internet of Things (IoT) and their interaction with green accounting in Nigeria

2. The Concept of Disruptive Technology

Disruptive technology refers to innovations that significantly change the way industries function, often displacing established practices and market leaders. Technologies such as blockchain, AI, and IoT have been identified as disruptive due to their potential to change various sectors (Bower & Christensen, 1995). It refers to innovations that significantly change an industry or business model. It often begins at the bottom of the market, where small companies with new technologies, products, or processes target underserved or unserved customers, and looks very different than the technology that conventional businesses or mainstream customers uses. Disruption happens when these companies move up the market over time, improving the technology product or model and attracting the mainstream customers. Common examples of disruptive technologies over the years include steam engines, electricity, Personal Computers, and the internet. But disruptive technologies are not always high-tech or computer-related. In fact, many of the most significant disruptive technologies in recent years have nothing to do with technology, such as the rise of the fast-casual restaurant format that combines the quality of casual dining with the speed and efficiency of fast food or the revitalization of American cities via economic development initiatives targeted toward the creative classes (Russell et al., 2019). Disruptive innovations that are delivered by Internet-based services have exploded (for instance, eBay and Craig's List for classifieds; Netflix for rental DVDs; Amazon.com for book sales). Green accounting, as it is known, is a relatively new area in the field of accounting. It encompasses object and subject (Lee et al., 2018). The subject is accounting while the object of accounting is the environment. That is, what do businesses do regarding the environment? And what is the nature of the environment is an economic entity? Accounting for the environment is ultimately a matter of accounting for its nature. But that nature is every time more complexly seen and sensed through increasingly sophisticated technologies. This reality, or nature of nature, is a real conundrum regarding understanding the environmental aspects, matters, and issues in accounting. Humanities, languages, cultures, practices, and activities are all aspects of an economic culture seeking and searching continuously to comprehend the blind force of becoming more penetrative (acquiring, using, and controlling more of the world).

Big Data

Massive data sets that can be computationally analyzed to find patterns, trends, and correlations are known as big data. These sets are particularly relevant to human behavior, activities, and interactions with the environment. These data sets are so large that they are unmanageable with conventional data processing software. Business issues that were previously unsolvable can now be addressed thanks to the enormous amounts of data. Big Data gained popularity along with the expansion, innovation, and growth of business operations. Companies started to struggle with enormous datasets produced by a variety of sources, such as sensor readings, social media interactions, and customer transactions. New technologies and methods were required because the volume, velocity, and variety of data being handled by traditional data analysis tools proved to be too much for them. With the responsibility of deriving insights and generating business value from Big Data, data scientists and analysts have grown to be highly sought-after specialists. According to Efozia et al. (2021), big data is one of the disruptive technologies because of the vast amount of data that comes from different sectors across the globe. When compared to their current counterparts in the market, this innovative disruptive technology has the advantages of being more widely available (in terms of distribution or usability), more affordable (from the standpoint of the customer), and employing a business model that offers structural cost advantages (in comparison to current solutions).

Blockchain

According to Marr (2020), blockchain is a database (that is, a storage infrastructure for data) that is secured by both encryption and by being decentralised. Peer-to-peer transactions within a network are made possible by it, doing away with the necessity for a central figure or middleman. In an open and transparent manner, network participants collaborate to originate and authorize transactions. It is a decentralized digital ledger technology that ensures transparency, security, and immutability in transactions. In accounting, blockchain can facilitate more accurate and transparent tracking of environmental costs and carbon credits (Tapscott &

Tapscott, 2017). The concepts of double entry accounting are anticipated to change as a result of blockchain (Bonson & Bednarova, 2019). Schmitz and Leoni, (2020) furthered that the, accounting community has to take advantage of the current trend and give the accounting literature the resources that communities and companies interested in implementing blockchain technology need.

Artificial Intelligence (AI)

Artificial Intelligence involves the use of algorithms and machine learning to perform tasks that traditionally require human intelligence. In the context of accounting, AI can automate data collection and analysis, reducing errors and increasing efficiency (Brynjolfsson & McAfee, 2014). Li and Zheng (2018) documented that AI represents the ultimate level of technical advancement. Automation in accounting operations can range from the total removal of human interaction to the elimination of routine tasks (Cooper et al., 2019). It is used for a wide range of functions, including auditing, fraud detection, and reporting (Hasan, 2021; Varzaru, 2022). Since artificial intelligence (AI) is a technology that can mimic mental processes, its study raises questions about how we define and view intelligence. However, more research is needed to understand how these processes will differ over time and how they will develop in relation to human thought.

The Internet of Things (IoT)

Internet of things is a concept that enables continuous and real-time data collection and monitoring by connecting physical objects to the internet. The accuracy of green accounting methods is greatly improved by the exact tracking of environmental measures, such as energy usage and emissions, made possible by this technical innovation (Atzori, et al., 2010). Businesses can gain a more thorough and current understanding of their environmental impact by incorporating IoT into green accounting. This can help them make better decisions and possibly implement sustainability efforts that are more successful. IoT adoption, however, also presents issues with data security and privacy because it necessitates substantial data collection, which may expose private information to risks if it is not properly managed.

Green Accounting

Green accounting is the practice of incorporating environmental costs into financial decision-making and reporting. This approach aims to account for the environmental impacts of business activities, including resource depletion, pollution, and waste generation (Schaltegger & Burritt, 2000). Green accounting helps businesses assess their environmental footprint and develop strategies to mitigate negative impacts. It is one process of progress between financial accounting and environmental accounting. There is growing international awareness of the fact that the environment is often not properly accounted for, especially by business enterprises. So far, accounting systems over centuries have accumulated a wealth of information on social and economic activities and stored it in monetary terms. To establish a sustainable economy, the environment must also be taken into account in a comparable way, alongside economic and social factors.

According to Liyanage (2023), the practice of integrating environmental costs and benefits into financial accounting and reporting is known as environmental accounting. Environmental cost accounting is an essential element of green accounting that involves putting a monetary value on environmental impacts, including emissions or resource use, and using that value to reflect these costs in financial statements. It is a technique used by organizations to track the cost of environmental damage produced by their activities and to measure and report on the environmental effect of their operations. Green accounting and sustainable development goals (SDGs) are closely related. By factoring in the social and environmental costs and benefits of economic activity when making decisions, green accounting can assist in coordinating economic incentives with the Sustainable Development Goals. This can lessen the detrimental effects that economic activity has on the environment and society and encourage the adoption of more sustainable methods.

The framework of green accounting based on the general process of accounting and handling of six monitoring devices covering monitoring, aggregation, allocation, presentation, disclosure, and enforcement was developed. In this framework, monitoring refers to the measurement of an economic value to environmental inputs and outputs, assessing the impact on the environment by economic activities, and addressing environmental responsibility based on sustainability index (Lee et al., 2018). It is used to formulate the quantification procedures of environmental monitoring, which compose an important database for economic activities. To aggregate, the environmental information is summarized and attached to the general accounting in order to provide overall financial information. Allocation means the apportionment process in the accounting framework, which bridges calculation procedures and accounting systems. The environmental aspects are attached to the costs, revenues, and assets of an account. They can be classified into preventive costs, actual costs, indirect costs, impairment reduction, and environmental revenues. In a broader sense, allocation is the remittance of the environmental costs and revenues to responsible economic agencies, such as factories, power plants, mining companies, etc. the presentation means the conversion of environmental items to a

monetary value to be presented on balance sheets, income statements, and cash flow statements. To disclose refers to the publication of environmental disclosures via reports, newspapers, pamphlets, etc. to provide environmental information for external parties. It involves giving stakeholders a thorough understanding of a company's sustainability activities by reporting on environmental, social, and governance (ESG) variables. Finally, the enforcement means the regulations and incentives for punishment or reward on the basis of the disclosures.

The interaction of Disruptive Technology on Green Accounting in Nigeria

The integration of disruptive technologies into green accounting carries the potential to significantly enhance the accuracy, transparency, and efficiency of environmental reporting. Prior to the adoption of green accounting in Nigeria, the traditional accounting system was used in recording, analyzing and reporting the financial transactions of a business operations to its stakeholders. However, this system was limited in its operations as it could not quantify the effects of adopting new technologies in its operations especially in regards to the company contribution to a sustainable environment, which has become a significant decision factor for relevant stakeholders in the global world. The traditional accounting system falls short of providing users who want to assess a company's environmental behaviour and its financial impact with the information they need. According to Gerged et al. (2024), the primary goal of the traditional accounting system is to educate interested parties about the company's financial performance. The focus has recently, however, switched to environmental considerations and how a company affects the environment, as well as how the environment affects the economic structure of its operations. Therefore, in order for users to evaluate the company's environmental behaviour and its non-financial economic impact, environmental accounting needs to include both financial and physical information. In environmental accounting, it is critical to take into account the different information requirements of different stakeholders. This concept is based on the understanding that the accounting system's growth in the 20th century was driven by the need to reflect the business process in a manner that aligns with users' information needs and decision-making tasks (Karl, 2002). This alignment is clarified through:

1. Enhanced data accuracy and integrity: here blockchain technology can ensure that environmental data, such as carbon credits and emission levels, are accurately recorded and immutable. This can reduce the risk of data manipulation and increase stakeholder trust in sustainability reports (Nakamoto, 2008).
2. Automation and Efficiency: AI can automate the collection, analysis, and reporting of environmental data, significantly reducing the time and resources required for green accounting. AI-driven analytics can also provide deeper insights into environmental performance, helping businesses make more informed decisions (Brynjolfsson & McAfee, 2014).
3. Real-Time Monitoring and Reporting: IoT devices can provide real-time data on environmental metrics, such as energy usage and emissions. This continuous monitoring allows companies to respond more quickly to environmental issues and adjust their practices accordingly (Atzori, Iera, & Morabito, 2010).
4. Cost Reduction: By streamlining processes and improving data accuracy, disruptive technologies can help reduce the costs associated with green accounting. This makes it more feasible for small and medium enterprises (SMEs) to adopt sustainable practices and report on their environmental impact (Tapscott & Tapscott, 2017).

While the potential benefits of integrating disruptive technologies into green accounting are significant, there are also challenges to consider especially in a developing country like Nigeria. These include:

1. Regulatory Compliance: There is a risk that the focus on technological solutions could overshadow the importance of human oversight and ethical considerations in green accounting. Therefore, as green accounting practices evolve with new technologies, regulatory frameworks will need to adapt to ensure that reporting remains consistent and transparent (Schaltegger & Burritt, 2000).
2. Implementation Costs: The initial costs of adopting new technologies can be high, particularly for small and medium-sized enterprises (SMEs). Implementing new technologies often involves substantial costs, both in terms of financial investment and the time required to adapt to new systems.
3. Data Privacy and Security: The use of technologies like blockchain and IoT raises concerns about data privacy and security, especially in the context of sensitive environmental data.
4. Reliability: The reliability of data generated through these technologies must be critically assessed to ensure that the improvements in reporting are genuine and not just superficial.

Theoretical Review

This study is guided by Christensen theory of disruptive technology (1997) and the Resource-Based View (RBV) theory proposed by Wernerfelt (1984) and later developed and refined by Barney (1991). The disruptive technology model, as conceptualized by

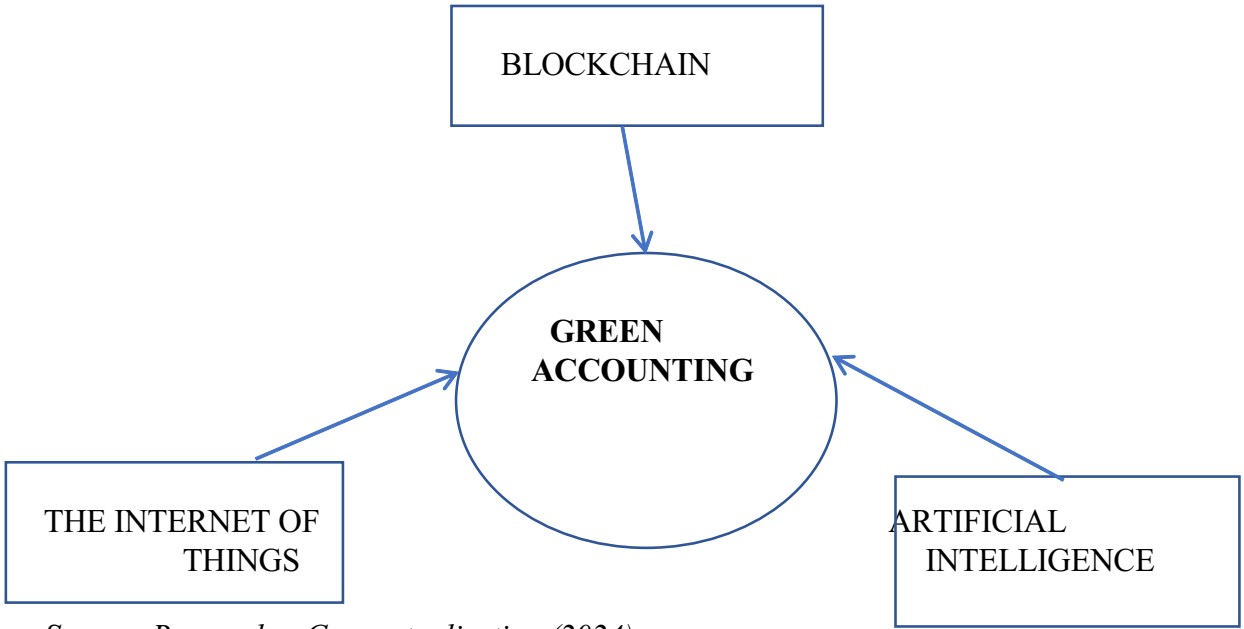
Christensen in 1997, focuses on the influence of innovative technologies on a firm's survival and success, especially in the face of intense global competition. According to this theory, a firm's continuous performance and long-term viability hinge on its ability to adopt and integrate new technologies that can disrupt traditional business models. Firms that fail to embrace these disruptive technologies risk falling behind their competitors, as they may be unable to adapt to changing market conditions or meet evolving customer demands (Bower & Christensen, 1995). This theory is primarily considered as the adoption of new and existing technologies (also known as disruptive technologies) in business practices, specifically in Nigeria, can be viewed as a sort of resources that would make the firm unique and stand out to potential and existing customers, thereby increasing their strengths and opportunities in the environment when compared to their competitors.

On the other hand, the Resource-Based View theory (RBV) by Wernerfelt (1984) emphasizes the importance of internal resources in driving a firm's competitive advantage. According to Hamisu and Akintoye (2023), when applied to the context of accounting, this theory suggests that revolutionary accounting technologies, such as Artificial Intelligence and Blockchain Technology, and platforms like QuickBooks, are critical resources that can significantly enhance an organization's performance. These technologies enable firms to streamline their accounting processes, improve accuracy, and provide more timely and insightful financial information. As a result, they become key assets that can help a firm achieve a sustainable competitive edge in the marketplace.

The relationship between disruptive accounting technology and green accounting is particularly important, as accountants are increasingly expected to leverage these new technologies to meet the growing demands for sustainability and transparency. The use of disruptive technologies in green accounting can lead to more efficient tracking and reporting of environmental costs, ultimately contributing to a firm's overall sustainability goals. However, the failure to implement these technologies poses significant risks. Firms that do not keep pace with technological advancements may find themselves unable to achieve the objectives they set out at the beginning, leading to diminished performance and potentially jeopardizing their position in the market.
Despite the promising potential of disruptive accounting technologies, it is essential to critically examine the challenges associated with their implementation. The adoption of new technologies often requires substantial investment and a willingness to undergo significant organizational change. Additionally, the effectiveness of these technologies depends on how well they are integrated into existing processes and whether they genuinely enhance the firm's capabilities. Therefore, while both the Christensen theory of disruptive technology and the Resource-Based View highlight the importance of embracing innovation, firms must approach the integration of disruptive accounting technologies with careful planning and consideration to ensure that they truly deliver the intended benefits.

To fully understand the integration between disruptive technology and green accounting, the paper proposes a research framework to provide an in-depth study of the variables given, which can be subjected to further empirical study, as shown below:

The Proposed Research Framework of the Paper:



Source: Researcher Conceptualization (2024).

Methodology

We adopted the library research method. This is because our work focused on the conceptual discussion of extant literatures on the interaction of disruption technology on green accounting in Nigeria.

Conclusion

This paper conceptually examined disruptive technology and green accounting and it provided a detailed overview of the study. It identified that the emergence of disruptive technologies, including but not limited to, blockchain, artificial intelligence (AI), and the Internet of Things (IoT), are expected to be beneficial to green accounting, which focuses on integrating environmental expenses into financial reporting. Furthermore, the study looked at how disruptive technologies can improve green accounting procedures by providing more ways to report on and make decisions about sustainability. In addition to offering suggestions for future research, the topic attempts to give a fundamental understanding of the possible interaction between the concepts.

From the review of existing literature and the theoretical framework adopted, the adoption of disruptive technologies in green accounting presents challenges that must be carefully managed. The study suggests empirical research of the conceptual framework that includes the independent variables of disruptive technology and how it can impact the dependent variable, green accounting. Future research should focus on developing frameworks for integrating disruptive technologies into green accounting practices, investigating the long-term effects on reporting sustainability, and resolving implementation and regulatory compliance issues.

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