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RESEARCH ARTICLE

Blockchain: The Building Block to the Future of Accounting

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ABSTRACT

This study was carried out on the opportunities blockchain has for the future of accounting. First, blockchain was studied and its concept explained. We looked at the different types of block chain; permissionless blockchain, permissioned blockchain, federated and hybrid blockchain and how each and every one of it works. The benefits and implications of blockchain was analyzed. The benefits being that it offers a more secured database for every transaction, reliable and fast for dealing with big data. One of the implications being the threat of cybercrime, fraud and many other internets scam. Its basic role to the future of accounting was analyzed and in conclusion, blockchain has a huge role to play in the future of accounting.

Keywords: Blockchain; Data; Ledger; Accounting Auditors; Financial Statement; Future of Accounting

1. Introduction

Technological advancement has resulted in basic changes in businesses and the methods employed in in processing and reporting accounting information. An instance is the developments in computing hardware and software which allows firms capture and process large sets of transactional data, in a lesser time. While this makes it easier for analyzing the firm's transactions and management of assets, the lack of a reliable record of transactions makes validation of these transactions more difficult. Regardless of this challenge, the possibility of organizations reverting to the use of more crude method of transactions is remote, which in turn makes the quality of data assurance by firms for transaction basis, and subsequent disclosures of performance, increasingly challenging and of utmost importance.

Obtaining a financial statement audit externally is a way firms attempt to assure outsiders regarding the validity of their disclosed transactions. At the same time, auditors face challenges coming from changes in technology. Therefore, auditors have to adjust their processes to take into cognizance the fact that clients' information can be obtained and stored up in multiple locations and locations, existing in multiple computer systems, be processed by software created by different developers, and can be accessed by any user at different locations. Auditors need to adapt to the way technology alters how their clients manage and record the business transactions. As business grows, so does the job of an accountant. Auditors still face concerns pertaining to reviewing the quality of the increasingly complex and large sets of clients' transaction data which is used to produce financial statements. While clients' adoptions of some modern technologies, such as cloud computing, which seems to make data quality assessment more difficult for the external auditor, blockchain platforms are perceived by some as a solution to the many auditors' quality of data assessment issues within the financial reporting procedures. Enterprise Blockchain Platform (EBP) technology has several unique qualities, some of which potentially addresses certain data quality concerns which companies face as regards to their financial reporting process. For instance, once a block of transactional data is added to the blockchain, users with access to the blockchain, can readily identify any alterations to its block's contents. "The locking of data within a chain of blocks often referred to as an "immutable ledger" is a core aspect

of all blockchain technologies, and ensures no other changes to details including the transaction's values and date. While some of the properties of blockchains provide some assurance on certain measures of data quality there are other claims made by management concerning their financial statements that could also be influenced by the use of blockchains. "The idea, that recording transactions using an EBP can result in an immutable ledger, has led to believe that inherent accounting assurance blockchain offers, will end the need for other external assurance mechanisms as, independent financial statement audits. Certainly, features such as those described above and in the subsequent section, make EBP technology amenable to address specific accounting and reporting risks.

The global economy is about to experience revolutionary changes in different domains and multiple industries (Dai & Vasarhelyi, 2017). This is a generation where technology is spearheading development, this development will continue in the future as long as there are creative minds at work seeking ways to make everyday life easier. These developments births changes in business and personal life as well as other spheres. It is a phase where every field has left the crude method of attending to its various needs and solving its multiple problems in search of a more time effective, efficient and quality method of facing challenges. The accounting field is not left behind at all, accounting which is the process of recording financial transactions related to business which includes processes as analyzing, summarizing and reporting transaction to regulators, agencies and tax collection bodies. Financial statement utilized in accounting is a summarized detailed information on the financial transactions of companies' operations, cash flows and financial positions over an accounting period.

As recent developments, for example, artificial intelligence and machine learning has changed not only the business landscape in terms of innovative products and technology but also has impacted the decision making as an opportunity for business leaders to elevate lawyers to contribute further to corporate strategies and operations (Tung, 2019) and blockchain technologies are disrupting the banking industry (Hassani, Huang, & Silvia, 2018) among others such as healthcare, law, supply chain and accounting (Frizzo-Barker et al., 2019).

2. Blockchain

As the name implies, a blockchain is a series of information "blocks" that are connected. The chaining of the blocks creates a time sequence in which order is preserved in such a way as to make reordering of events difficult if not impossible. The core components of each block are a set of transactions sent by participants to the chain during a short period of time. While other types of transactions, such as smart contracts, are being considered for blockchains, at this time exchanges of cryptocurrencies predominate on blockchains. Participates on the blockchain are assigned a key or wallet. Much like a traditional bank account, the wallet contains an amount of cryptocurrency exchanged on the particular blockchain. "The wallet has a public key which is used to locate the wallet on the chain, and a private key which is the owner's link to the wallet. Depending on the type of blockchain, each participant can add or accept transactions sent to the chain, and after a transaction is included in a block, each participant will get an updated copy of the entire set of blocks. The condition for a transaction to be added to a block is, it must be verified, and accepted by a simple majority (51%) of the chain's participants. There are a couple of steps in the verification process, and the finalization of an exchange transaction. First, the user digitally signs the transaction, indicating the recipient's wallet id, includes an amount of coin that is to be exchanged on the particular chain, and an amount of the coin to run the transaction. Different chains exchange different types of coin. It is envisaged that it would be easy to have exchange transactions across multiple chains, and therefore transactions which have multiple types of coins or resources. To accomplish these multiple resource exchanges, a number of issues need to be addresses (Back, et al., 2014). Wang & Kogan (2018) provide an example of the interaction of sidechains where different types of coins, representing different assets, are exchanged. The Accounting Blockchain Coalition (ABC) has also looked at different types of digital assets, including asset tokens which embody a claim against the issuer, utility tokens which allow the wallet holding them to access an application or service, payment tokens can be used to acquire goods or services, and hybrid tokens which have some characteristics of the others. These classifications are critical as different jurisdictions consider certain types of digital assets as securities while others do not (Accounting Blockchain Coalition Internal Controls Working Group, 2019). For example, the International Monetary Fund faces the problem of determining which digital assets, particularly if it is issued by a country, should be viewed as financial reserves (He, 2018). While, not quite the same as a traditional double spending attack, a user can alter the order of exchanges as they appear on the blockchain, by attaching a higher processing fee to a transaction. "This fee provides a financial incentive to the miners which will finalize the inclusion of a transaction in a block. "Therefore, by attaching a higher fee to one transaction an owner of a wallet can cause one transaction to appear to have occurred prior to what was actually an earlier transaction. Because of scalability issues with bitcoin type blockchains, the delay in propagation of transactions to the other participants, can allow modification of the information

(Gervais, Ritzdorf, Karame, & Capkun, 2015). The process of creating an immutable block of transactions is done through "mining". Mining is the process of accepting a set of transaction into a block, and propagating this new block to all chain participants. "The key to the immutability of both the blocks in the chain and to the information contained in each block is a set of hashes. Hashing algorithms are mathematical functions which take a string as input and produce a digital representation (Ali Orumiehchiha, Pieprzyk, & Steinfeld, 2012; Bellaire, Jaeger, & Len, 2017; Hamer, 2002; National Institute of Standards and Technology, 2015). These algorithms can be classified in many ways but majorly, they two important attributes. First, the digital representation, the hash, should change if there are any changes to the input string. Second, there should be few if any collisions. "The first attribute implies that a hash can provide evidence that the string, a set of information, has been altered. However, to actually find any change depends on the length of the string; a change in a ten-word sentence would be easier to find than a change in a 5 trillion record database. "The hash of a set of transactions in a block should detect a change in any of the characters which make up the contents of the block. "The second attribute is a measure of the probability that two different strings will yield the same hash; their hashes collide. "This attribute is similar to the first but has a slightly different implication. "The first implies a quick test to see if a set of information, a string of any length, has changed. "The second determines how easy it is to change the string and keep the same hash. Regardless of the hashing algorithm there is a non-zero probability of a collision; two different strings yield the same hash. For blockchain implementations, changing the original transaction's wallets to a different receiving or sending wallet that is sending the cryptocurrency would be a significant change. "The probability of finding the exact alteration that could make such a change undetectable used to be quite remote. However, with the advent of quantum computers this is no longer a remote possibility (Bryanov, 2019. Each blockchain can choose a particular algorithm to arrive at a consensus on way in which this mining is to take place (Chi & Zhu, 2017; Tan, Hu, & Wang, 2019).

A blockchain is a more discreet method of recording information in a protected form, making it difficult to hack, cheat of change the system. Blockchain is a safer, secured and transparent way of storing information. It assures the quality of the information stored as untapped and unadulterated. As the world is turning into a global village, this comes with plenty benefits which include faster services, we need not travel to far China to get the services we need, we need not travel by sea to Berlin to achieve the desired result. The global village has made cooperation easier and more accessible. Development and technology have also aided the accounting field, we need not deal with lose of data, mistakes in recording of transactions, errors in financial statements, challenge of working with large numbers amongst others, all thanks to the level of development we have attained, the accounting world is more friendly and safer. Despite the many advantages of technological and digital development of which the accounting sector has benefited from, there are also negative effects of these developments even on the accounting field. The level of internet fraud, scammers and hackers are on the increase and the accounting firm isn't protected against this menace. Understanding the blockchain and how it works, it can be used in the protection of the accounting information and also the accounting world.

This work seeks to determine the role blockchain has to play in the development of accounting. Blockchain technology is important in accounting, it's a distributed ledger technology which has significant impacts on the accounting and auditing profession, it offers an entirely new way in the recording, processing and storage of financial information and transactions. Offering a promising future for accounting and reshaping the entire business ecosystem, using blockchain provides clarity over asset ownership, expected obligations and improving of efficiency.

3. Types of Blockchain used in accounting

    i.   Public blockchain
   ii.   Permissioned or private blockchain
  iii.   Federated or consortium blockchain
  iv.   Hybrid blockchain

Public blockchain or permissionless: this blockchain technology allows records to be "shared by all network users, updated by miners, monitored by everyone, and owned and controlled by no one" (Swan2015, 1) public blockchain allows for any organization or individual to join the network. Its benefit is decentralization but then it has a speed limit based on quantity of transactions thus constraining its application to largescale use. Major setback is its lack of privacy, this makes business owners be burdened with concerns that distributed ledger might lead to business secret compromise.

Private blockchain: a permissioned blockchain is a type of blockchain with restrictions. Its control procedure and membership are highly restricted. In this type of blockchain, a configuration which is intrinsic defines the role of its

participants and only certain members can gain access to it, write information on the blockchain and approve the admission of new members. A private blockchain is partially decentralized because the members have varying authorization of access control, it has a greater potential of ensuring privacy.

Consortium blockchain: The consortium blockchain, also known as a federated blockchain, shares similarity with the hybrid blockchain in that it has private and public blockchain features. Its difference being that there is multiple collaboration of organizational members on a decentralized network. A federated blockchain is essentially a private blockchain which is limited to a particular group based on accessibility, and eliminating the risks associated with one entity controlling the network on a private blockchain. In a consortium blockchain, the consensus procedures are controlled by preset nodes. It has a validator node that initiates, receives and validates transactions. Member nodes can receive or initiate transactions. (Parizo, 2021)

Hybrid blockchain: Organizations sometimes want the best of both worlds, and they use hybrid blockchain. Hybrid blockchain is a type of blockchain technology which combines the elements of both public and private blockchain. Hybrid blockchain allows organizations set up a private, permission-based system alongside a public permissionless system, this allows them control access to specific data stored in the blockchain, and determine data which will be opened up publicly. Records and transactions in a hybrid blockchain are not made public but it can be verified when needed by allowing access through a smart contract. Confidential information is kept inside the network but is still verifiable. The hybrid blockchain can be owned by private entity and transaction cannot be altered. When a user joins a hybrid blockchain, they have full access to the network. The user's identity is protected from other users, unless they engage in a transaction. Then, their identity is revealed to the other party. (Parizo, 2021)

4. Benefits of Blockchain in Accounting

i.   Assures a more credible transaction: blockchain offers a transaction with less error in computation or data which may be the fault of anyone and saving us pointing accusing fingers.

ii. Reduced fraud and transparency: blockchain in accounting help reduce fraudulent activities which is very rampant in the world today. It also offers a transparent transaction method.

iii. Increased security in transaction: every individual desire security, the desire for secured dealings isn't just limited to individuals, businesses and accountancy seek topnotch utmost security in all their dealings. Blockchain offers security in every transaction carried out.

iv. Saves time: using bad data can be frustrating and time wasting, blockchain offers a more reliable and less bad data, this saves time and makes work more efficient and effective.

Despite the level of development and growth, people are still skeptical on the use of blockchain. The use of blockchain is still under exploration by many organizations including the accounting sector, one does not need to know all the onions of blockchain in accounting but definitely, being aware and involved in the development of blockchain technology in accounting is of utmost importance. Companies such as have already created bridge technology between crypto assets, exchanges and accounting software. Walmart and others have already implemented beta blockchains in their supply chain (Forbes finance council 2021)

5. Implications of Blockchain to Accounting

i.   Changes has occurred in accounting with the introduction of blockchain accounting. Blockchain accounting helps professionals keep track of order "blocks" in a secured manner. With the aid of blockchain, not only can transactions be recorded but also, transactions can be verified without necessarily involving an intermediary, it is an automated technology.

ii. Errors which occur as a result of existence of intermediaries and middle men will also be eliminated.

iii. It eliminates unnecessary expenditure as, the need to pay other people commissions and every other secondary transaction that will arise.

iv. There is transparency of transactions and verification by thousands of computers. Moreover, the blockchain algorithms that are used in accounting enable the collaborative creation of a digital ecosystem with more properties and capabilities that go far beyond what is used today, i.e., the traditional ledgers (Watson & Mishler, 2017).

These proves that blockchain technologies will be of benefit and have positive impact on real time accounting practices (Byström, 2019).

As stated earlier, A blockchain is a more discreet method of recording information in a protected form, making it difficult to hack, cheat of change the system. Blockchain is a safer, secured and transparent way of storing information. It assures the quality of the information stored as untapped and unadulterated. Blockchain accounting is expected to expand because of vast internet accessibility and knowledge present everywhere and this potential has a promising future for accounting, which will reshape the accounting world majorly. There are so many interdependencies and interconnectedness not only among rival companies but also amongst companies operating within the status quo of the industry. Given this, businesses are motivated to improve the level of dependency of the organizations and companies. Majorly inclusive of a sound and safe environment for accounting, transparency in the processes, reduced risk and tenacity from external threats, reliable and an in-depth accountability and importantly efficiency. The major contributors towards the exponential growth of the blockchain technologies are the financial service firms and technology-oriented organizations (Piscini, 2017).

The growth in blockchain technology is majorly due to the tangible and reliable updates which blockchain technology provides in decentralized public ledgers, which equips companies with the ability to view the history of transactions in this ledger and hence resulting in reliable, trustworthy, and timely updates which assures minimized human errors that might occur in the process of reconciling complex information sourced from various source. Nevertheless, the cons of this blockchain accounting remains on the high side basically because of the cybercrimes prevalent over the world. The fortunes and even the future of many multinational companies across the globe depends on their individual and personal ability to protect themselves and their data base from multiple existing external threats. These attacks are majorly targeted at gaining access to discreet and confidential information about finances and transaction records. The threatening situation demands the collaboration and full involvement of businesses and parties geared towards the sole aim of making blockchain accounting more protective by joined efforts of their expertise

Accounting involves working with and handling huge numbers, figures and data in current businesses. With the influence of blockchain in accounting use, there is assurance of more accurate data management. This is the interconnectedness of big data and blockchain. The essence of making use of Blockchain is to enable accountants to organize properly efficiently work with all of the new information that handling huge data causes them to have access to review, and work with as part of their job. Organizations are fast embracing working with big data, no more shying aware from works involving big data, and boldly approaching the dispensation and age of big data synonymously known as a "high velocity, high variety, and high volume" with the ability to heavily improve overall decision making (Rezaee& Wang, 2019). Companies are already establishing roles into their staff that is equipping them with the ability of being able to take advantage of large Data. Large data affects accounting in many different ways. It will be able to improve different factors of managerial and financial accounting, and also different financial reporting practices, as well as the profession of auditing. Big Data can contribute to the development of different control systems, as well as different ways to effectively develop a budget for a company within managerial accounting. Using Big Data can also improve the quality of financial report information, allowing it to be linked easier to its base documents. This will improve transparency, and allow for easier and more efficient decision making. Bigdata also affects forensic accounting. These accountants are facing large pools of information.

6. What blockchain Offers for the Future of Accounting

Advancement of technology is still progressing, as the day goes by, it keeps unfolding and many more is introduced. Many fields are benefiting from this advancement in technology. What promises does blockchain have for accounting? Our study narrows down to accounting; hence, we deduct the specific promises and role blockchain has to play in accounting most importantly.

Accounting keeps improving, the data also keeps growing, as the day goes by, so does the numbers an accountant works with also increase. More individuals are needing accounting services and this means more work for accountants, as the future promises to be great, how will accountants face the need of the growing and rising business need their services and dealing with large numbers? Blockchain offers a great help for the accounting to be birthed in years to come. With blockchain in accounting, there will no more be the phobia for dealing with large numbers or cumbersome ledgers blockchain accounting will handling the database of the future accounting well.

Security is a value every business looks out for. Security is of utmost importance to not just businesses but also humans. Accounting details has to be discreet and top notch, not everyone is supposed to have access to accounting detail business. As time goes on, businesses grow, so does their accounting information, will the limited crude

method of accounting still be reliable, assuring security? Blockchain accounting has a more secured and reliable system and as the future unfolds, it gets better. The future of accounting is in safe hands with blockchain. With its security system tight in the permissioned blockchain which allows only few members gain access, there is reliability and assured security for every accounting information.

Reliability of data is of utmost importance. Today or in the future, absolutely no one has interest in working with unreliable data. Blockchain assure that the data used in accounting is a reliable one. This is huge bonus to the future of accounting, therefore saving individuals and businesses from data lose as a result of handling cumbersome data.

Credibility of transaction. The future of accounting with blockchain offers a more credible transaction. Transactions that do not seem criminal but her very trustworthy and authentic. Firms will trust the ledger of its business more when the blockchain accounting is introduced to this field.

7. Conclusion

This study on the relevance of blockchain to accounting is an eye opener and a solution provider. As accounting duty gets more demanding as the year goes by, business growth and increase in data, numbers and transactions, knowledge of blockchain and how it works will be an advantage and as well offering a reliable solution to the many ever increasing accounting needs. Assuring security, reliability and credibility amongst other important values which accounting holds in high esteem, blockchain will make accounting easier and still maintaining its standard, quality and value. For the future of accounting, blockchain accounting will be more secured and reliable. businesses and organizations should therefore, intentionally embrace all of these technological developments, acquire knowledge of it and how it functions and apply it to their businesses.

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