An Overview of Blockchain Technology and the Value Added Tax System

Florence N. Belonwu

Department of Social Sciences and Administration,
School of Continuing Education, Bayero University, Kano

Abstract

The tax authorities have been combating value added tax(VAT) fraud and other VAT related problems for a very longtime, even the auditing of the accounts have not fully resolved the problems of VAT and tax in totality. As a form of advancement in technology, the blockchain algorithm which is a distributed ledger or a public ledger was first introduced as an underlying technology for Bitcoin. But along the line, it was discovered that some problems associated with VAT and other transactional taxes can be eliminated through this network. Some studies emphasized that the blcokchain network is a peer to peer or person to person network that makes all transactions traceable, provides transparent and accurate information; a self auditing system that is useful for tracking corporate fraud and can also help resolve the problems of manual collection and submission of returns; and a system programmed to automatically trigger payment and verify the validity of VAT paid. Although the block chain technology has a lot to offer, at present, it cannot be used for combating VAT fraud and other VAT related issues because of its inherent problems that are yet to be resolved. Therefore, the block chain technology is not an immediate solution for fraud and error detection, VAT calculation/payment, manual collection and submission of returns since the network is not generally accepted all over the world; it contains information of objectionable contents; it is an integral part of the deep web/dark web (a hidden site not open to other search engines) and within a short space of its inception, there has been 51% attacks of the blockchain network which shows that it has been hacked severally to the tune of 51%.

Keywords: *Blockchain technology, VAT, Bitcoin and Deep Web*

Corresponding Author: Florence N. Belonwu

Background to the Study

VAT is one of the driving factors as well as one of the largest contributions to government budget (Jurgen, 2018). In some countries, it is the sole income and top priority in government budget (Joshi, 2019). For several years, government has been looking for a system that can ensure the efficient collection and remittance of taxesor a network that can make all transactions traceable; prevent tax fraud/ non-compliance to tax and an automated digital ledger where returns and refunds can be easily recorded.

In a bid to reduce the rigorous work done by the tax authorities, the blockchain technology (which was first introduced in the year 1994 by Wei Dai) was reintroduced in the year 2008toserveas an underlying support for a particular crypt currency called the Bitcoin. That is, since the year when the bitcoin was introduced, the blockchain was also silently reintroduced because blockchain cannot exist without bitcoin since it is the underlying technology for the coins.

As time went by, it was discovered that the blockchain network can also be used for even greater things. As such, the first set of blockchain activities were related to indirect taxes such as VAT, sales tax, custom and exercise duties (Bulk, 2018).That was why Albert-Muller (2019), defines the blockchain technology as a distributed digital ledger that can be programmed to record not just financial transactions but virtually everything of value. While Joshi (2019) added that network has come a long way because it is a network that makes all transactions traceable (ownership of assets), and all applicable taxes like VAT can be calculated. Value added taxes (VAT) are indirect charges on the consumption of goods and services in the economy (SARS, (nd)). It can also be viewed as value addition at different stages of manufacturing and distribution of goods and services (Sinha & Agarwa, 2011).

From the above definition of VAT ,it shows that it is basically the amount that is added to the price of goods or services because it is only when value is added that a tax is applied. Since the year VAT was introduced in Nigeria, the tax system just like any other system has passed through a lot of problems, some of which are lack of payment by industries, fraudulent activities, difficulty in collection of VAT or VAT charges on bank services, etc. (Juwah-Ogboi, 2018). In relation to that, it is believed that blockchain algorithm is an interesting technology that has come to resolve the numerous problems encountered in the tax system. It is a network that cannot be ignored, and governments of many countries are trying to introduce it in their countries while so many large corporations have already embraced the technology because it simplifies tax system and speed uptax processes. The burden of manual collection, manual verification, validation and submission of returns are all taken up by the blockchain algorithm to reduce the use of paper materials and the rigorous/tiring processes involved. It is also an algorithm that provides clear and transparent information and it can be useful in tracking VAT fraud and to equally find out if VAT has been paid or not (Nicholson & Lynn, 2019). Therefore, the aim of the study is to highlight the place of blockchain algorithm in combating VAT fraud and other VAT related problems.

Literature Review

Warscotte (2018), stated that blockchain is about labeling and tracing flows of VAT money from a taxpayer up to the tax authority. Hence, it is a system that can help reduce fraudulent practices involved in the collection of VAT or taxes because it creates a tamper proof record of transactions where once an item is recorded or a transaction is made, it cannot be altered. This is because it is a virtual ledger of information that is replicated across computers that are joined, in a peer to peer network or it is a chain of blocks which are linked to each other (Frankowski, Baransk & Bronowska, 2017).

Another major problem of VAT as stated above is the difficulty in collection as many business owners and even government establishments fail to comply with the rules and regulations of VAT system. And with this kind of practice, funds are trapped in between because so many of these companies do not pay while others pay and after a while discontinue.

But with the introduction of the distributed ledger, fraud and error detection have become easy because blockchain is a transparent system that whenever data is updated, everyone or member in the network views the chain history of events simultaneously. Again, the block chain ledger records all transactions accurately and timely and can provide ready evidence to support the collection and payment of VAT to the last amount.

Some studies emphasized that with this kind of technology, the right amount of tax will be collected because data is updated for everyone in the network simultaneously. That is, with blockchain, VATs are efficiently collected because information is processed immediately unlike in the traditional system where things on VAT, or taxes have to take days, or sometimes weeks or months to be finalized (Albert-Muller, 2019).

In furtherance to that, bitcion in relation to the blockchain is a decentralized digital currency or it operates a decentralized system of government that is not regulated/controlled by any central authority like the central banks that we have today (Rose, 2015). Hence, the blockchain system operates a digital contract system/smart contract/blockchain contract which is a system that when an agreement is reached between two parties, the system self executes itself without the help of any regulatory authority (decentralized system) (Rose, 2015). Joshi (2019) posits that the smart contract can be used to automatically process all kinds of tax payments.

Furthermore, when a transaction is done, the smart contract calculates the VAT immediately and payment is made or the VAT amount is sent to the relevant tax authorities while the no VAT amount is sent to the account of the company involved. This reduces the rigorous process of filling returns and waiting for months for the computational processes to be completed (Frankowski, Baransk & Bronowska, 2017) which makes it difficult for government to track VAT payment and fraud. And if there is any refund, the blockchain smart contract will also issue refund after all calculations have been finalized. Basically, the smart contract is a system that helps to distribute sales price

and any other amount specified. Therefore, if blockchain technology is used for transactional taxes, it will deliver reliable real time information from a chronological chain of data uploaded into the blockcahins to the larger Audience (Jurgen, 2018). This also shows that transactions are conducted on real time (the real time process is where the computer processes data immediately).

Other benefits of the block chain on VAT are shown where the network is viewed as a public ledger (retains history of all transaction) without a central authority, which keeps a list of records in blocks that are secure and traceable (Seco, 2017); and the block chain technology operates a distributed digital ledger where information is not stored in a single server or computer like in the traditional method but is distributed among all members in the information chain (Thornton, 2018). And asa distributed ledger, it makes it difficult for the ledger to be attacked by a cyber attacker because each copy of the data and chain of blocks have to be attacked simultaneously (Gijsbert, 2018).

In the blockchain technology, the need for auditing of accounts is reduced. This is because the blockchain algorithm is described as a self auditing system that is transparent and immutable. That is, the system audits itself for any refund in tax, identifies items that are flagged for deletion/payment, and the system is programmed in such a way that it automatically triggers payment and verifies the validity of VAT paid etc. (Collins, 2018).

This shows that the need for performing existing audit procedure is reduced which will greatly reduce the work of the external auditor because ledgers would be easily accessible, transaction well casted and cross checked, hence, reducing estimates and guess work from management (Robin La Quercia, 2018).

Methodology
The study is descriptive in nature; information was sourced majorly from academic journals, review papers, textbooks and other relevant materials using Google scholar.

Discussion
Frankowski, Baranski & Bronowska (2017), emphasized that even with all that the network has to offer, the block chain network is an integral part of the deep web/dark web and the deep web is a hidden site not open to other search engines and an invisible site that encourages illicit activities. They further stated that 47% of the block chain activities are done on the deep web. More so, the network does not only contain information on financial transactions but also information of objectionable contents or illegal contents, politically sensitive contents and child abuse.

The block chain technology in relation to bitcoin has been accepted in about 111 countries out of 251 counties as sampled in coindance.com, which shows that 140 countries have not fully legalized its activities (see appendix 1). Notably, general acceptance is a vital issue when it comes to currency and it is the first and most important characteristics of money. Therefore, where there is limited or no acceptability, there can be no medium of

exchange which shows that the information entered into the blocks is unrealistic because all transactions in the block chain network are majorly bitcoin related.

The network has always been referred to as "the unhackable network" by all bitcoiners which goes to show that the network has never been hacked. But as at 2019, there have been 51% attacks of the blockchain network or it has been hacked severally to the tune of 51%. This means that within a short space of its inception, it has been attack severally which is dangerous for the network. Again, it is equally referred to as an immutable system because transactions in the network are irreversible even where some money was erroneously remitted to a non-existing account or to a wrong business partner, the amount remitted is said to be lost forever (Lanskey,2017). This is done for security reasons and to protect the network from hackers and attackers. But it is to the detriment of the innocent traders or VAT payer who engages in a business only to make profitor without full knowledge of how it works. This also points to the fact that once VATS payments and other transactions have been finalized, errors and mistakes cannot by corrected because there is no central authority to report to. This indeed is risky to undertake and that was why it was frequently stressed that "all CC account owner must have the required facilities for the transaction and must be very sure of the recipient's details"(Lanskey, 2017).

There are also incidences of double spending where an attacker or hacker gained control over the network and was rewriting the transaction history and changing figures thereby spending the same currency so many times (Orcutt, 2019); and in the year 2010, there was also "the value over flow incidence" where 184.4 billion bitcoins were created out of thin air by a hacker which almost destroyed bitcoin or instead of having only 21million bitcoins in circulation a hacker created 8,784 times more bitcoin than ever should have existed(shrem, 2018)etc. engaging in such activity is indeed a dangerous one for a growing economy because even the conventional currency (which has been there for so long) has never been hacked this much. There will always be a problem with this system or network because there is no regulatory authority (it is a decentralized system) to control its affairs, hence arbitrariness will subsist.

Conclusion
VAT assessment, computation and submission by government organizations and other businesses has always been a challenge. The tax authorities have lost huge resources trying to recover or combat tax fraud and evasion. It was in the process of sourcing how best to combat tax fraud and evasion that the blockchain technology was introduced in the year 2008.The blockchain technology which is a distributed decentralized ledger was introduced to combat and reduce the problems of VAT and other transactional taxes. The blockcahin algorithm is an immutable, transparent, incorruptible and self auditing system that is designed to speed tax refund processes, verify the validity of taxes paid, discourage the wrong use of VAT rates, ensure real time and smart contract systems, expose VAT evaders, fight VAT fraud, etc. (Bronowski, 2017 et al).

The block chain technology has a lot to offer but at present, it cannot be used for combating VAT fraud and other VAT related problems because of its inherent problems that are yet to be resolved. Therefore, the block chain technology is not an immediate solution for manual collection and submission of returns or VAT assessment and collection since the network is not generally accepted all over the world, including Nigeria; it contains information of objectionable contents; it is an integral part of the deep web/dark web (a hidden site not open to other search engines) and within a short space of its inception, there has been 51% attacks of the blockchain network which shows that it has been hacked severally to the tune of 51%.

Reference
Alberts – Muller, E. (2019). Blockchain technology and tax, *Delloitte*.

Bulk, G. (2018). How Blockchain could transform the world of indirect tax, E.Y.

Collins, D. (2018). Beyond Bitcon: Self Auditing Blockchain Accounting Systems. *Ballarmine University.*

Delloitte, (2017). *Blockchain and its potential in T*ax.

Frankowski, E., Baranski, P. & Bronowska,M. (2017). Blockchain Technology and its Potentials in Taxes, *Delloitte*.

Joshi, N. (2019). Here's why the tax sector desperately needs Blockchain now,*Allerin*.

Jurgen, G. (2018). Introducing Blockchain technology to the world of tax, *Medium Corporation.*

Jurowiec, P. (2018). Blockchain applications in the world of tax regime, *Good audience*

Juwah, O. C. (2018). Problems of VAT in Nigeria and possible solution. i*nfo Guide*. Nigeria.

Laquercia, R. (2018). How Blockchain is reshaping the Audit: Crypto development by PWC, KPMG, EY & Delloitte, *Blockchain news*.

Nicholson, K. & Lynn, L. (2019). Block chain technology could improve the tax system, *PWC Network*

Seco, A. (2017). Blockchain: Concepts and potential applications in the tax area, *CIAT Inter American Center of Tax Administration*. Antonio

Thornton, G. (2018). Taxation in Real Time: Gearing up for Blockchain

Warscotte, Q. (2018). Solving VAT fraud once and for all with Blockchain *KPMG*. Luxembourg.

Appendix 1
Table 1: A Table Representing Crypto Currency and the Level of Acceptance in Various Countries

111 countries out of 251 countries view CC as a legal transaction
I0 countries regard it as an illegal transaction
9 countries restrict its usage
24 Countries are neutral about it
97 Countries have no information about it.

Source: coindance.com