SME Bitcoin Transaction Accounting Ledger System

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Abstract— SME play important roles in the economic growth and sustainable development of every nation. They have provided bulk of the service sector in developing economies but yet their venture into the internet have remain a challenge due to unavailable small accounting system that can be used in carrying out modern transactions independent of the big accounting ledgers of modern e-payment system and crypto currencies. In this paper we examine the SME activities and the challenge of their migration to online platform as well as the offering of possible way they can use to overcome the online accounting problem involving crypto currency transaction accounting. The paper propose crypto currency transaction accounting ledger system design which will present a blue print for the development of an SME transaction accounting ledger usable in the era of Bitcoin and other crypto currencies that are fast evolving in the online business landscape.

Keywords—SME, Crypto currency, Bitcoin, Transaction, Accounting ledger

I. INTRODUCTION

The internet landscape is changing and the volume of trade on the internet using online bank transaction as well as the evolving crypto currencies is geometrically growing. Small and medium-sized entities (SMEs) can no longer be servicing offline locations and expect speedy growth. They need to equally establish their presence on the internet to be able to benefit from the various online boom in trade and services on-going across the globe. SME play important roles in the economic growth and sustainable development of every nation, [1]. The government of various nations have experienced growth in their economy via the activities of SME; and these feet can be replicated online for the growth and development of developing nations like Nigeria as well as the global economy. Many economist have identified entrepreneurship development as a major policy thrust to achieve economic development. This is evidenced by a number of institutions and programmes established by the government to provide funding and improve operational efficiency in the SMEs sector. The major advantages to any economy in developing SMEs have been identified as sources of innovation and business evolution[2]. The development and growth of SMEs in Nigeria can provide solutions to the problem of high unemployment facing the country because these entities have low start-up costs, low risk and can exploit untapped knowledge bases of creativity in the population for new product development. SMEs dominate many service sectors of the economy but when they migrate online they are often heavily dependent on IT companies who often attempt to take over their activities by making sure that financial transactions remain unclear and expensive even in crypto currency time when transaction fees seem cheap and easily manageable.

Accounting systems provide a source of information to owners and managers of SMEs operating in any industry for use in the measurement of their financial performance. The importance of financial performance measurement to any business entity, big or small, cannot be over-emphasized. In any sense, profit can analogously be viewed as the life-blood of a business and hence the accounting bases, concepts and principles adopted ought to capture and report all the relevant accounting information to ensure reliability in its measurement. Reported profits reflect changes in wealth of owners and this can explain why major economic decisions in business are centred on financial performance as measured by profitability [2]. It has been recognized that appropriate accounting information is important for a successful management of any business entity, whether large or small (European Commission (EC), 2008). It is crucial therefore that the accounting practices of SMEs supply complete and relevant financial information needed to improve economic decisions made by entrepreneurs. This noble idea notwithstanding online crypto payment systems are not designed to provide ledgers that can be used to manage individual accounts or transactions rather it is a system that is IT configured for handling transaction blockchain of the big crypto currency network of miners and other network transaction confirmations.

The continuous rise in the use of Bitcoin in online transactions as mode of payment calls for a shift in accounting system design and development of software, which most be engineered to handle the transaction of SMEs and for use by home offices in their daily service provision and goods trade online. This research therefore focuses on the design and implementation of SMEs accounting system by investigating the types of accounting records being kept and

maintained by SMEs, their completeness and the availability of accounting skills and knowledge to capture and process accounting information which can be used to measure transactions and performance in SMEs activities online.

The place of sound accounting and internal control systems in any business irrespective of its scale cannot be overemphasized. A vast majority of small-scale businesses cannot afford the complexity of a detailed accounting system and may not even understand the complex cash flow of crypto currency ledgers. Hence the existence of single entries in their books and in some cases incomplete records[3]. Audits of small and medium scale enterprises have proven to be among the most worrisome for professional accountants because of the inadequacy of the internal controls. Except for statutory demands, small and medium scale enterprises hardly give serious thoughts to the process of sound accounting, yet the inadequacy and ineffectiveness of accounting processes have been responsible for untimely collapse of a host of them [3]. Governments today prefer to fight the moving tide of crypto payments but if a good online accounting ledger is developed and proper profit is computable, then tax accruing to government will easily be paid.

II.   SME AND CRYPTO CURRENCY ACCOUNTING

A. Small and Medium Enterprises

Evidence from literature reveals that there is no universally agreed definition of a SME across all academic disciplines. This is so because no single definition can capture all the dimensions of a small and medium-sized entity, nor can be expected to reflect the differences between entities in different industrial sectors or countries at different levels of development. Most definitions are however based on size and they use fundamental bases such as number of employees, financial position or annual turnover [4]. However, none of these bases are pegged at the same level across disciplines and national boundaries . In virtually every jurisdiction, from the largest economies to the smallest, over 99% of companies have fewer than 50 employees [3] quoted in South Africa Institute of Chartered Accountants (SAICA). In Nigeria, the Ministry of Commerce defines a small enterprise as a business that employs not more than 50 people while operating as a registered entity, and a medium enterprise as one employing up to 75 and 100 people[4] .

SMEs are often called Start-Ups in IT world since it seem that an SME today may be a large company in a matter of two years from date of starting based on various factors. But it is not all SME that provide IT services and this paper is tailored towards all SME, both IT based SME and non-IT SMEs that provide other services that are not directly IT services. However, the type of SME notwithstanding it is a known fact that a healthy and robust SME sub-sector is a *sine qua non* for inclusive and socially sustainable development and one of the significant characteristics of a flourishing and growing economy is a booming and blooming small and medium enterprises SME sector [5]. The performance and role of SMEs going forward are bound to be even greater and more pervasive with a demonstrable impact on the emerging world trading order and continous growth in the crypto currency usage in the online market subsector. SME offer some benefits such as:

B. Employment and Poverty Alleviation

Employment generation globally is one of the most significant reasons for encouraging the promotion and development of SMEs. SMEs account for well over half of the total shares of employment, sales and value added [6]. If SME are able to thrive online migrant can stay in any place and benefit from online skill development and employment and Europe migration will simply stop. The UN need to recognize that reduction of poverty through the promotion of SMEs plays a substantial role in the achieving development across the nations and achieving world peace.

C. Income Distribution

The SMEs is often supposed to contribute to a more equal distribution of income or wealth. The SME managers and workers are in the lower half of the income distribution; promoting the growth of online vibrant SMEs may lead to a more equitable distribution of global income. SMEs contribute not just to income generation, but also income distribution which improve living standards, being close to substantial local capital formation and achieve a high degree of productivity and capability in narrowing the gap between developed and developing nations, social inequities and rural migration [5] promotion of the development of SMEs should continue to be a policy priority and any technology that encourages it must be supported.

D. Crypto Currency Transaction Accounting

Accounting has been described as the process of identifying, measuring and communicating economic information to permit informed judgments and decisions by the users of the information. Several concepts, theories and principle under grid the practice of accounting. Prominent among them are *Going Concern, Consistency, Accrual, Business Entity, Money Measurement, Prudence and the Double Entry*. [7]. Accounting manifests in several ways such as financial, cost, management and tax accounting. An accounting system is an orderly, efficient scheme for providing accurate information and controls. Regulatory requirements and internal administration policies must be considered in designing an effective accounting system. Accounting system should show the books, records, vouchers, and files and related supporting data resulting from the application of the accounting process [7]. Accounting had been done from the days of trade by batter, to days of object use as money then to the use of coins, notes and today use of both notes and e-currencies to a noteless future.

Crypto Currency (CC) on the other hand are digital representations of value, issued by private developers and denominated in their own unit of account. They can be obtained, stored, accessed, and transacted electronically, and can

be used for a variety of purposes, as long as the transacting parties agree to use them. The concept of CCs covers a wider array of "currencies," ranging from simple IOUs of issuers (such as Internet or mobile coupons and airline miles), CCs backed by assets such as gold, and "cryptocurrencies" such as Bitcoin.[8]

The value users attach to CC includes the technology and network itself, the integrity of the cryptographic code, and the decentralized network. This instills confidence that this new form of value carries attributes in common with other longstanding stores of value, as well as some attributes unique to this new technology. For most cryptocurrencies, these attributes include the following [9]

i) The code's resistance to counterfeiting.

ii) The network's ability to prevent "double-spending" (that is, spending money you do not own by use of forgery or counterfeiting) by verifying that each transaction is added to a distributed ledger or a blockchain.

iii) The limited supply, and the market's ability to divide single units into smaller fractions on a practically unlimited basis.

iv) The nearly instantaneous and irreversible transmission of value that takes place over the Internet, without the need for a trusted third-party intermediary.

v) The decentralized network, which provides network security and transaction verification.

vi) The incentives embedded in the network protocol, which encourage participants to contribute computing resources for network support.

vii) The publicly available knowledge that a transaction has been posted to a global public transaction ledger.

viii) The personal data security enabled by public-private key cryptography.

The dedicated core team of developers and miners who continually support and improve the code, help secure the network, and validate transactions.

The key issues of interest is the seventh point where publicly available knowledge that a transaction has been posted to a global public transaction ledger-the blockchain. The blockchain is a ledger, or list, of all of a cryptocurrency's transactions, and is the technology underlying Bitcoin and other cryptocurrencies . This decentralized public ledger keeps a record of all transactions that take place across the peer-to-peer network. Users can contribute to the network by providing computational power to assist with the verification of transactions in real time (known as "mining").

This technology allows market participants to transfer assets across the Internet without the need for a central third party. Specifically, the buyer and seller interact directly with each other and there is no need for verification by a trusted third-party intermediary. Identifying information is encrypted, and no personal information is shared. However, a transaction record is created. For this reason, transactions are considered pseudonymous, not anonymous. As shown in Figure 1, the blockchain public ledger technology has the potential to disrupt a wide variety of transactions, in addition to the traditional payments system. These include stocks, bonds, and other financial assets for which records are stored digitally and for which currently there is a need for a trusted third party to provide verification of the transaction.

From the perspective of businesses and merchants, cryptocurrencies offer low transaction fees and lower volatility risk resulting from nearly instantaneous settlement, and they eliminate the possibility of chargebacks (the demand by a credit card provider that a retailer make good the loss on a fraudulent or disputed transaction). In the future, we may see these benefits diluted by new regulations covering items such as chargeback rules or consumer protection. The greatest opportunity for business here is not in business-as-usual, but rather in providing innovative and disruptive products, services, and business models driven by global consumer needs, especially those that target tech-savvy consumers. This approach must not only meet consumer demand but also lessen merchant risks associated with payment settlement, cybersecurity, and regulatory requirements.

For example, the online media, especially newspapers, can consider using micropayments offered by digital currencies to allow users to pay per access to a single article. Another challenge for merchants is the volatile price of cryptocurrencies. Currently, the market for even the most popular cryptocurrencies is illiquid, fragmented, and highly volatile—much more characteristic of a thinly traded commodity than of a broadly accepted currency. The lack of liquidity leads to significant costs associated with exchanging fiat currency into cryptocurrency, and vice versa, in the form of large bid/ask spreads, significant fees, or both. Price volatility also generates significant exchange-rate risk, which understandably discourages both merchants and consumers from holding cryptocurrency for any significant length of time. Fortunately, the two most popular US-based cryptocurrency payment processors have established a new level of maturity by adopting a business model in which they immediately convert cryptocurrency into US dollars at the spot exchange rate. While the transfer of cryptocurrency itself across the peer-to-peer network is instantaneous and nearly cost-free, there are "toll charges," such as exchange fees and price volatility, which apply at the exchange point between fiat currency and cryptocurrency. These toll charges produce additional costs for anyone not looking to take a net-long position in this new asset. On the plus side, as the cryptocurrency market continues to grow and mature, we may see liquidity increase. This would lead to tighter bid/ask spreads and significantly reduced exchange fees. It also would reduce price volatility, which would decrease exchange-rate risk and lessen the pressure on risk-averse merchants and consumers to immediately convert cryptocurrency back into fiat currency. Broadly speaking, increased liquidity would help cryptocurrency develop characteristics that are more like widely accepted fiat currency, rather than those associated with a commodity.

Even with changes to the incentive structure over time, minimal transaction fees may help cryptocurrency dominate traditional payments and transfer methods.
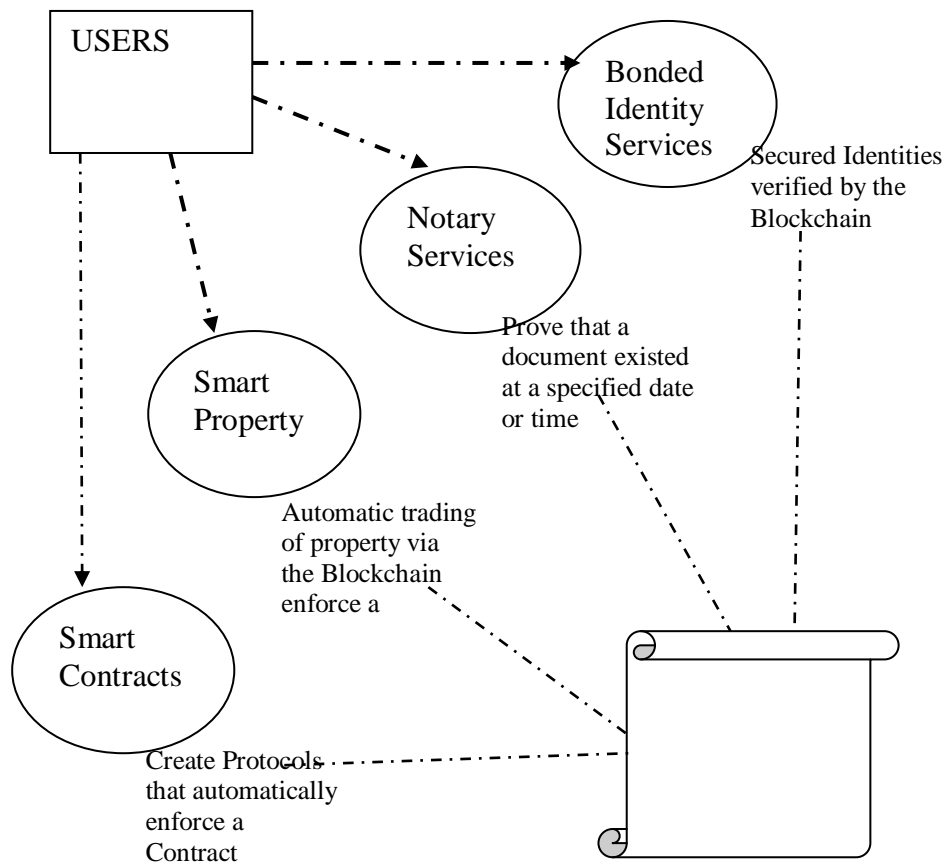
Fig.1: The blockchain and cryptocurrency technologies potential to open the door to other revolutionary possibilities.

It comprises of steps, procedures, documentation and devices needed to implement a flow of transaction processing. The non-existence or inadequacy of internal controls is an avenue for wastes, fraud and defalcation. The existence of sound system guarantees prompt action and customer satisfaction, thus increasing potentials for greater incomes and growth in real termed. Measuring a company's financial performance and final position requires establishing a distinct accounting period [4].According to Edmundon et al., "Income statement shows the earnings of the firm between two balance sheet dates"[4]. Firstly, locate net earnings; secondly, locate earnings per share (EPS) and note whether this is primary of fully diluted. To achieve this, the trading profit and loss account and a balance sheet are prepared [3].

E. SME And Accounting System

Some aspects of the existing research delved into the relationship between record keeping and performance of firms. Edmundon et al., [4] comment on the reasons why SMEs prepare financial statements, and argue that on the list, SMEs rank assessing profitability second to the purpose of tax returns. Owners of SMEs consider profit maximization as the most important financial objective. This has led to the argument that SME owners pay attention to profitability and measurement of net profit when they evaluate their firms` performance. The extent of accounting practices in SMEs depends on a number of factors such as age of business, size of the business, and the nature of the industry. They further pointed out that most SME owners and managers engage public accountants to prepare required information. The development of a sound accounting system in SMEs hinge on owners level of accounting knowledge and skills. Some authors have argued that small businesses use professional accounting firms for preparation of annual reports and for other accounting needs [5], reported that the main reason why SMEs prepare financial statements is pressure from regulatory authorities. A good accounting system is not only judged by how well records are kept but by how well it is able to meet the information needs of both internal and external decision-makers and that is where the need for blockchain transparency comes in. It is common for qualified accountants to do a good job of keeping records up to date but they fail to provide information needed by decision-makers. Interestingly, however, others argued that the high cost of contracting professional accountants has left SME owners with no better option but to relegate management of accounting information [6]. One expect this attitude to be even worse in these era of online transaction were it is difficult and much more expensive to contract online transaction based professional accountants. If main stream accounting application developers on desktop application neglected SME accounting system, one may be expecting a worst case on online and crypto currency era but this can be checked by calling the attention of all IT sector developers as been done in this research.

Accounting software can be used to improve accounting practices, albeit the unavailability of medium-sized software for SMEs. Business enterprises must improve production if they are to effectively compete in this era of rapid economic and technical change [6]. Improved productivity requires both capital investment as well as a work force that has the flexibility to acquire new skills for newly created jobs resulting from structural changes in the economy.

Accounting records provide a basis for complete and accurate income tax computation both in regular business and in online and crypto currency based SME, a basis for sound planning for the future and basis for discussion with partners, potential investors, and lenders all these are important aspects which enhance performance of the business. Business also depends on correct accounting records to make good decisions about the firm. Decision such as expansion, drop or maintain decisions of product lines, make or buy decisions, about size of debtors. Therefore if proper records are kept they will facilitate efficient, proper timely decision making and enhance performance in small and medium scale industries.

Accounting procedure is programmatic, more numeral than principle and more susceptible to change, an accounting system for the emerging economy must be developed in a way that it can be able to interact with crypto currency blocks and record confirmed transactions from the chain of network of miners. There must be a way to represent alternative way of applying the same principle in record keeping [7]. Determining the scale of operations and structure of small or medium scale enterprises is crucial. Among the notable indicators are independent management (independent of any other party, except from the owners) mostly dominated by the sole proprietorships, partnerships and private limited company. This independent nature is similar to the autonomy and pseudo-anonymity inherent in crypto currencies. Flexibility of administration is another important feature of small/medium scale enterprise. This has greatly enhanced their productivity and profitability because administrative bottlenecks are totally absent. Adaptability to customers' needs enhances competitiveness. Other considerations include organizational manpower, limit on capital investment, annual turnover, management structure, as well as the assessment of size of particular enterprises.

In the bid to increase its share of world's industrial production (about 25%) by the year 2000 and (about 40%) by the year 2020 as recent world industrial production statistics show, developing economies are increasingly focusing on small and medium scale businesses. It has been discovered that lots of small and medium scale enterprises shut down before they can achieve their goals as a result of poor management arising from inadequate weak and undependable accounting and financial information. [6].

F. Accounting Practices And Financial Reporting Of SMEs

In most jurisdictions, the law requires all or many of the SMEs to prepare financial statements and often, to have them audited. In Zimbabwe, all companies are required to keep proper books of accounts in compliance with Section 140 of the Companies Act (Chapter 24:03) and to prepare and submit tax returns based on these financial statements to the tax authority, Cameroon [6] revenue authority, in compliance with various pieces of tax legislation. Small firms used professional accounting firms for preparation of annual reports and for other accounting needs [6]. The professional accountants should develop their services to also include graphic presentations and comments and interpretation of the amounts in financial statements. The high cost of hiring professional accountants leaves SME owner-managers with no option but to relegate accounting information management.

Contemporary studies are discovering that the number of users of accounting information in SMEs is increasing to include venture capitalists and customers in supply-chains [7]. Accounting and marketing pose major challenges to management of SMEs and managers or owners in SMEs must learn about accounting or hire experts. Conventional accounting reports play a significant role in SMEs but the reports must be adjusted in order for them to be understood, hence the use of the cash basis rather than the accruals basis. Financial reporting practices in SMEs seem to fall short of what is dictated by various external financial reporting imperatives that exist for them, owner-managers appear particularly reluctant to produce financial reports which might become accessible to outside parties either directly or through the offices of regulatory authorities.

The only solution therefore will be to use an accounting ledger that is capable of linking their transaction to the blockchain that will be publicly available and authentic for the public. The design of the transaction accounting ledger process system is what our paper proposes.

III. ANALYSIS

A. Analysis of proposed Crypto currency Accounting Ledger use case

A use case scenario presents itself were Dr Fubara Egbono formed a cooperative of farmers with offer to get support from a foreign NGO that offered a condition of transparency of their transaction. The easiest means of transfer and transaction with the organization financially is Bitcoin [10] and the SME the cooperative formed to handle fertilizer acquisition and distribution find it hard to handle dollar transactions. Dollar fiat transactions in Nigeria, where several restrictions are place on dollar access, are difficult. The existing system of ledger verification in Bitcoin will be explored with the hope of borrowing a leave from similar process in the development of the accounting ledger. The ledger is expected to be peer-to-peer and verifiable by a third party. Hence, the way the Bitcoin ledger works needed to be critically analysed as the existing system from where the system will borrow from.

In the case of Bitcoin a specialized nodes verify new transactions and add them to the distributed ledger. Bitcoin's solution is to require additions to the ledger to be accompanied by a mining activity New transactions are broadcast in a peer-to-peer fashion across the network by parties to those transactions[11] . Miners look at those transactions and confirm by checking their copy of the ledger (the block chain) that they are correct (not double-spends).

If they are legitimate transactions, miners add them to a queue of new transactions that they would like to add as a new page in the ledger (a new block in the block chain). The miner that successfully mines (solves the proof-of-work problem) broadcasts his solution to the problem along with the new block to be added to the block chain [10] . The other miners can easily verify whether the solution to the problem is correct, and if it is they add that new block to their copy of the block chain. The process begins anew with the new block chain as an input of the problem to be solved for the next block.

In the proposed accounting ledger apart from recording the hash of transacted crypto currency which may include received amount, staff paid, items purchased and other accounting variable it is also expected to present a similar accounting report which represent classical report but must not be in the form the present accounting report are represented. It could be a hash form which can be converted to human understandable format if so desired. The accounting ledger just as its Bitcoin equivalent should also be able to broadcast such report for verification by who so ever may need to vet it [12]. The main aim is transaction interface provision and transparency which will aid SME to be able to receive necessary input both from the public, government and financial institution. In this paper the items that must be captured in such accounting ledger and the nature of the report is left for accountant, the key interest to set the software structure for the development of such system.

IV. DESIGN

System design is the synthesis of a new system using component parts specified during the analysis stage of the system development process. It also involve the building of a new system by modifying or retrieving components of existing systems in a way of refactoring the existing system. No system is completely free from a problem, which is why computer scientists endeavour to produce newer system to tackle the problem associated with the existing once. System design is a solution to a business problem [13]. The challenge here is the creation of SME accounting ledger that can be hashed in the blockchain. These will allow their transaction to be publicly available to government, non-governmental organization and financial institution. The transparency will enable them to secure loans, grants and other financial benefit without collateral. There are many other benefits that can be derived from the system. In designing the system there are some areas of the component design that we will present.

A.   Logical Design

This produces a specification of the major features of the new system. It normally include content requirement of the following system component.

   i) Output (reports, display)
   ii) Input (forms, screen, dialogue)
   iii) Procedures (structure for the collection, transformation, and output of data)
   iv) Storage (data to be stored in databases)
   v) Recording (requirement for transaction hashing in the Blockchain and recovery from the blockchain)

B.   Physical Design

A physical design of the transaction ledger takes the logical design blueprint and produce the program specifications, Physical file or database definition, and user interface for a selected or given target hardware and software[14]. Physical design considers the data aspects of the system in handling the challenges inherent in the system by highlighting the data dictionary or data structure of the information required in the development of the new system that is required for the implementation of the elements of the system using the necessary database management system. The detail implementation in the database systems may differ but the structural formation of the data across the space are basically the same for the various DBMSs that could be deployed in the implementation. There is a need to specify and design the database structure in some detail before the system can be implemented using a Database Management System. This will make the system to be understandable even at the design level before it could be implemented.

C.   Database Design and Structure

In creating a database, assumption is made on the data that are used by SME in its daily activities. The data is necessary in creating the database structure and the tables that will hold the end user data[15]. Three tables were created under the database. These tables are:-

   i) Record of Goods Sold (Income)
   ii)Record of incoming Goods or fund (Stock/Loan/Grant)
   iii) Record of Expenditure made (Expenditure)

The structure of the data are illustrated in table1, 2 and 3 showing the field, field type and length of the field.

Table 1 Income database table

FIELD	FIELD TYPE	LENGTH
CUSTOMER NAME	VARCHAR	20
GOODS BOUGTH	NUMBER	20
CATEGORY	VARCHAR	15
QUANTITY	NUMBER	20

PRICE	NUMBER	15
TIME BOUGHT	VARCHAR	15
PAID	VARCHAR	15
CHANGE GIVEN	NUMBER	15
TOTAL INCOME	NUMBER	15
SESSION	VARCHAR	15

Table 2: Store database table

FIELD	FILED TYPE	LENGTH
QUANTITY	NUMBER	15
NAME OF GOOD	VARCHAR	30
CATEGORY	VARCHAR	15
DESCRIPTION	VARCHAR	50
PRICE PER UNIT	NUMBER	30
NAME	VARCHAR	20
PASSWORD	VARCHAR	15
CATEGORY	VARCHAR	20
FULL NAME	VARCHAR	30
ADDRESS	VARCHAR	50
PHONE	VARCHAR	15

Table 3: Expenditure database table

FIELD	FILED TYPE	LENGTH
SNO	NUMBER	15
NAME OF ITEM	VARCHAR	30
DESCRIPTION	VARCHAR	50
EXPENDITURE PER UNIT	VARCHAR	30
REASON	VARCHAR	20
TOTAL EXPENDITURE	VARCHAR	15
AUTHORIZATION	VARCHAR	15

The data represented is only from one cooperative Store SME for a community in Niger Delta of Nigeria. This data is used for the structural design and should form the foundation of the SME transaction ledger.

D. Blockchain

There are two main blockchain in use presently, the Bitcoin blockchain and the Ethereum blockchain. An application programmer interface may be needed to interface between the blockchain and the SME accounting transaction ledger in other to create and transmit the hash generated to the blockchain. When the hash data is transmitted into the public blockchain, the transaction account of the SME can't be changed without invalidating the hash. This makes sure that the SME transaction account's privacy and data is always available for future validation and for use in checking the progress of the SME in terms of loan and grant offering. When the SME grows that will also make it easy for the company to be easily listed at the stock exchange. In figure 1 the blockchain of the two main crypto currency in circulation is illustrated where the hash of the SME transaction account ledger can be posted for public reference. The blockchain could be a Bitcoin blockchain and/or an Ethereum blockchain donors, sponsor agents, loan granting institutes and guarantors and investors in a fast growing SME start-up can always access the blockchain and get all the necessary financial record of the SME from the hash in the blockchain.
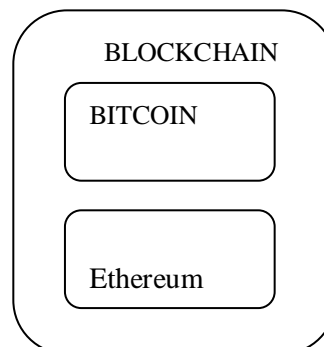

Fig. 1: Blockchain of two Main Crypto Currency

The process design of the proposed system illustrated in figure 2 show the SME financial activity involving spent fund first being recorded in the transaction accounting ledger, and the fund generated by the SME also recorded.

The fund clearly could be in fiat (paper) money or in cryptocurrency and transaction report can be generated for the use of the SME. It also clear from the design that via the SME public key a hash generated can be sent through an API linking the transaction accounting ledger with the blockchain. The blockchain receives and stores the hash code once generated and sent into it. Loan and institution that offers Grant can get the hash of any SME of their choice and view their transaction report which is securely tied to the hash.
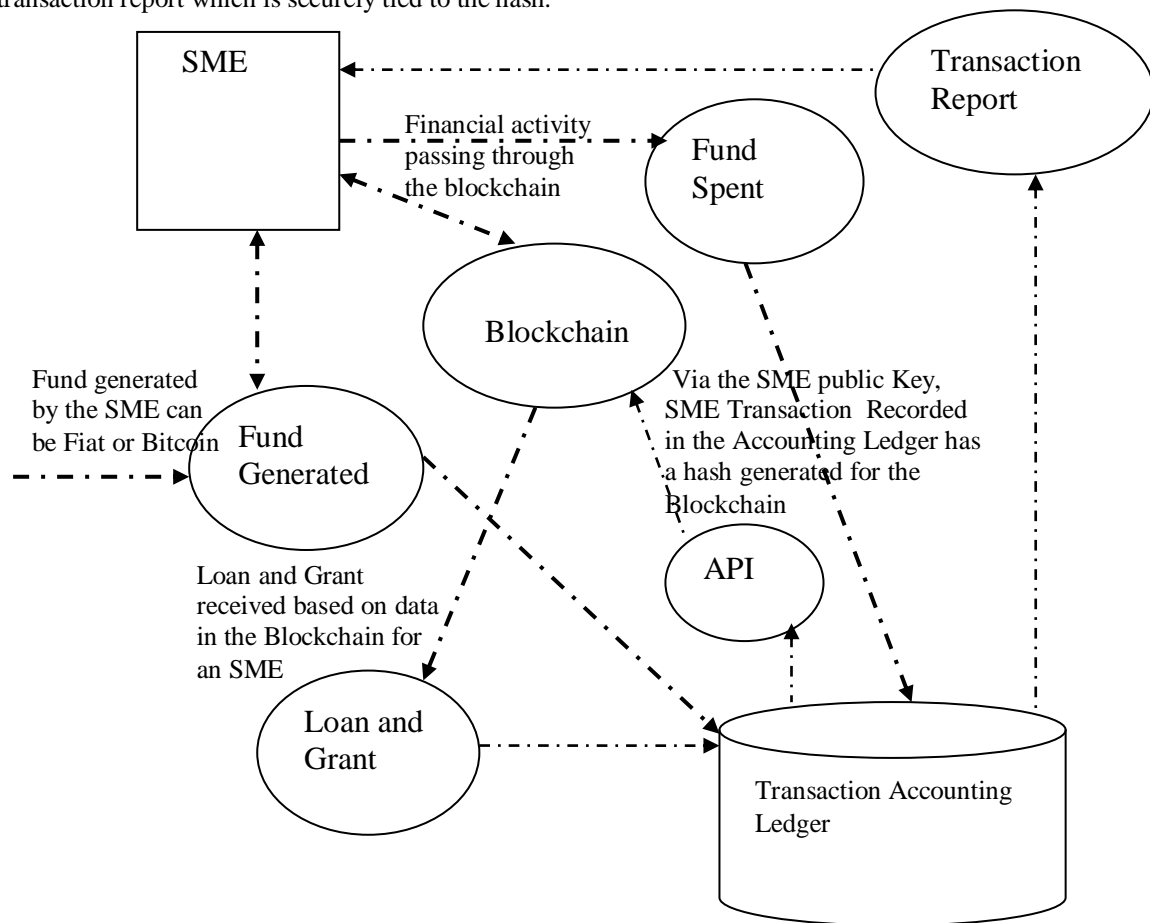

Fig. 2: The proposed Bitcoin Transaction Accounting Ledger Process Design

V. RECOMMENDATION

The design proposed in this paper is recommended for implementation and deployment by accounting software developers or other software engineer who may be interested in developing a computer system that can aid SME in getting to their feet fast in contemporary time of e-commerce and cryptocurrency use. Blockchain software developers can also get inspiration from the design in the development of other application related to the transaction accounting ledger. Researcher in blockchain technology and accounting system development will also find the system design useful as a building block for more advanced research and development in the Bitcoin integration into the regular accounting system presently occupied by fiat currencies. The blockchain API system that link the accounting ledger with the blockchain is another important area recommended for further detail design and research. SME will find this design as a good stimulant in looking into cryptocurrency and how it can assist their activities. The government of Nigeria and other developing nation that want to stimulate SME activities within their country will also find the research useful in exploring how to implement the design and assist their local SME in integrating their activities with the crypto system. Blockchain technology in India for instance has been receiving a lot of attention lately. The interest in distributed ledger technology has been further enhanced by the recent trials conducted by the Reserve Bank of India in association with the blockchain company, Monetago. Many banking institutions in the country also enjoy existing partnerships with the likes of Ripple, Hyperledger, and Stellar blockchain platforms (Gautham,2017). The deployment of the design in Nigeria will increase transparency in the activities of the SME in the country and facilitate the growth of the economy.

VI. CONCLUSION

In this work, we proposed a Blockchain Transaction Accounting Ledger Process Design that can allow regular accounting activities of SME to be well computerized and hashed on the Bitcoin or Ethereum Blockchain. Presently such system do not exist but research, development and increased adoption of cryptocurrency have made research in that direction very important in impoving the fortune of SME in Nigeria and in the developing nations. At the time of this research some developed nations and some developing nation such as Japan and India respctively have adopted Bitcoin at varying degrees but Nigeria seem to be looking elsewhere. This paper therefore is a system design proposal that can give IT detail design guide on how the system can help in developing the SME sector in the Nation.

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