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Will Blockchain Base Triple Entry Accounting System Replace Double Entry System?

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Abstract- Block chain base triple entry accounting system is being termed as the fifth disruptive innovation in computing. In simple terms, it is an immutable and verifiable distributed ledger of records. It will soon take the place of the traditional double accounting system.This paper attempts to focus on identification whether blockchain base triple entry accounting system will replace double entry accounting system. It tried to find out the justification of replacement of triple accounting through SWOT Analysis of blockchain technology. Blockchain base triple entry system is very sound on security and transparency point of view. Actually these features were missing in double entry system, but are need of today's time. That's why this block chain takes place in heart, mind and working of the people. It is assumed that due to its immutability feature this technique is far better to traditional accounting system. All the opportunities like decentralize and immutability in triple entry system was not available in traditional entry system. So, triple entry system can be said far better than double entry. On the other hand it is not find suitable for all the parameter of strength and opportunity. Most of the weaknesses and threats of double entry system has been still unsolved. That's why author recommended 4- Dimensional accounting system. Here is a need of an improved technology means 4- Dimensional accounting system. It is assumed, this 4-D system will replace triple accounting by 2030.

Keywords-Block chain technology, Potential, immutable, SWOT Analysis

1. INTRODUCTION

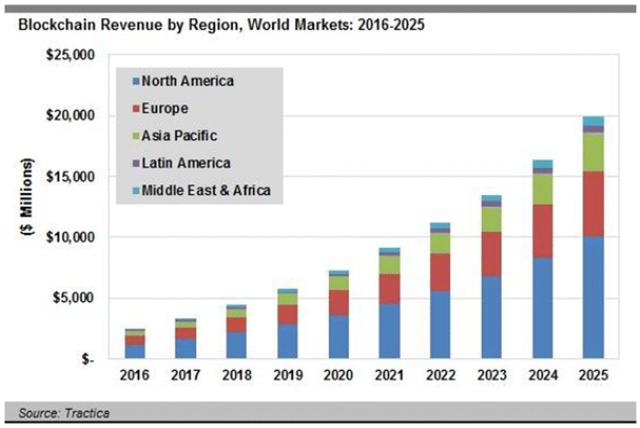
Industrial revolution in 17th century, technical revolution or second industrial revolution in 18th century, scientific technical revolution in mid-19thcentury, has revolutionized the way we work and our lifestyle. We are currently in the age of Digitalization. Personal computers in 1970s, Internet in 1983 and Virtual currency in 2008, has disrupted the way we buy and sell things, the way we manage work, the way we travel, the way we live basically. From agricultural sector to industrial sector, to service sector, there has been a massive growth in terms of production, quality and maintenance and cost reduction.

As described by World Economic Forum, Blockchain technology is the future "Beating Heart" of the financial sector. Blockchain technology was first introduced in 2008, by an individual or a group of individuals, under a pseudonym Satoshi Nakamoto, when they launched a virtual currency Bitcoin. The background process supporting this operation is based on distributed ledger technology or as we know Blockchain technology. Blockchain technology is based on peer to peer network technology where information is cryptographically sealed. It has become so popular because of its ability to offer transaction between two parties, who don't know each other, with trust, without the need of traditional trust system such as bank. Blockchain technology offers an entirely different kind of transaction settlement structure that has potential to revolutionize globally.

Due to its innovative currency economics and distributed architecture, blockchain practises have attracted interest from businesses other than financial services. Blockchain is not just an information technology, but also an institutional technology. This distributed ledger technology enables entries on a decentralised ledger to be made without the involvement of a third party. Due to its decentralised structure, it improves excellent security. Blockchain technology is a powerful tool that has the ability to revolutionize how we conduct business and store records. Cryptocurrencies, payment settlement, tracking, claim settlement, smart contract execution, and trust companies are among its current applications.

From its introduction, Blockchain technology has been explored, developed and used in sectors beyond financial service and payment settlement. A lot of countries have started incorporating Blockchain technology in to their economy. There also has been a good usage of this technology in sectors such as insurance, supply chain,

exchange and trading, healthcare, waste management, governance et cetera.



The chart depicts that the blockchain market is expected to have a major share at 39.1% in 2020. The global blockchain market size is expected to grow from USD 3.0 billion in 2020 to USD 39.7 billion by 2025, at an impressive Compound Annual Growth Rate (CAGR) of 67.3% during 2020–2025. The purpose of the paper is to investigate the potential of blockchain technology where this technology can be leveraged to increase productivity. In this paper, we are looking upon concept of Blockchain Technology, its strength, weakness, opportunity and threats. Also, being such a promising technology, key challenges its current applications and potential applications has been tried to find out. This study basically aims to increase knowledge of Blockchain Technology and highlights its application, challenges and implementation issues in context of India.

2. REVIEW OF LITERATURE

Based on the review of literature, it is tried to identify the need for blockchain technology triple entry system and its efficiency in comparison to double entry system and the research gap.

Enrique Bonson (2019) in his paper provides general insights into Blockchain technology and the extent to which it might transform the accounting system. Scalability, flexibility, a proper architecture, and cyber security are among the pending challenges for Blockchain, according to the report. It demonstrates how and why Blockchain is a beneficial, efficient, and secure way of conducting transactions, as well as how and why it automates back office procedures and reduces costs, by citing instances from prominent businesses such as the Big Four, Deloitte, KPMG, Ernst & Young, and PwC. Based on the architecture of Blockchain technology, the researcher explains the potential promises of Blockchain technology in accounting, including how this technology will aid in avoiding systematic duplication of efforts, eliminating human errors and the costs of periodic controls, and limiting fraud and misbehaviour. It also demonstrates how Blockchain technology would benefit many departments and personnel. Additionally, it discusses the numerous issues involved with Blockchain technology, such as public blockchain confidentiality, private blockchain manipulation risk, and transaction verification limitations.

Aino Nordgren, Ellen weckstrom, Minna Martikainen and Othmar M Lehner (2019) in their paper focused on Blockchain technology, its applications in the fields of finance and accounting, and the disruptive power of Blockchain in these fields. It provides an overview of the criticism and obstacles that need to be dealt with for Blockchain to realize its potential. By explaining the fundamental working of Blockchain technology, it explains the various benefits that can be drawn and also issues that will be associated with. This Paper describes the various advantages offered by Blockchain technology in Accounting & Auditing and in Finance.

Zheng, R. (2021) in his paper on 'Applications Research of Blockchain Technology in Accounting System' discussed the working principles of the accounting information system of the seller and the buyer and developed the Longitudinal and horizontal application models of blockchain technology in the accounting system.

Tiron-Tudor, A., Deliu, D., Farcane, N., & Dontu, A. (2021) in their paper on 'Managing change with and through blockchain in accountancy organizations: A systematic literature review' presented a categorisation in a structured way of Blockchain Technology challenges and issues associated to them . It also presented an explanation of how BCT can alter accounting and auditing methods.

Hambiralovic Mahir, Karlsson Rasmus (2018) in their paper investigated how technological advancements could change sectors and professions throughout time. Finally, it assesses the impact of Blockchain accounting on the company and its main stakeholders, which include auditors, banks, and tax authorities.

Anit Dani Simon, Sheetal Kasale, Pingale Murali Manish (2018) in their paper **'**the applications of block chain in Accounting and Auditing' explained how Blockchain technology is being used in an organization's accounting and auditing. The adoption of Blockchain technology in the company reduces the need for human recording and verification. Finally, it concludes that using Blockchain Technology in the company is the most effective way to eliminate frauds and errors in recording and verification.

By reviewing the papers certain research questions comes in mind :

A- Will blockchain base triple entry accounting system replace double entry accounting system
B- What is the future potential of block chain technology?
C- What are strength, weakness, opportunities and threats of block chain technology?

3. RESEARCH METHODOLOGY

Research methodology comprises the research design, sample design, sources of data, selection of data, various designs and techniques used for analyzing the data. The methodology used for the study at hand is as under:

3.1 Research Design: The research design used for the research problem in hand is causal research as the objective is to determine which variable might be causing certain behaviour. In This type of research is applied to find that there are no other factors influencing the adoption of block chain technology. Primary survey and questionnaire has been prepared and send to block chain developers.

3.2 Objective of the study

To analyse blockchain chain base triple entry system through SWOT Analysis of block chain technology

3.3 Hypothesis

H_{01}: There is no significant difference between blockchain base triple entry system and double entry system on strength criteria;

H_{02}: There is no significant difference between blockchain base triple entry system and double entry system on weakness criteria;

H_{03}: There is no significant difference between blockchain base triple entry system and double entry system on opportunity criteria;

H_{04}: There is no significant difference between blockchain base triple entry system and double entry system on threat criteria.

4. THEORITICAL EXPLAINATION OF SWOT ANALYSIS OF BLOCKCHAIN TECHNOLOGY

It is clear that Blockchain is a disruptive technology. It has the ability to revolutionize the way we buy and sell things, from property to food. It uses the internet and safe cryptographic techniques to provide a safer and faster way to do transaction with having full trust. Following factors have been taken for systematic SWOT Analysis.

Table 1 Factors of SWOT Analysis

Symbol	Feature	
S1	Efficiency	Strength
S2	Security	
S3	Transparency	
S4	Repay Cost	
O1	Decentralize	Opportunity
O2	Fraud Remove	
O3	Immutability	
W1	High Cost	Weakness
W2	No Regulation	
W3	No Standard	
W4	Organisation Context	
T1	Technical Issue	Threat
R	Blockchain base triple entry accounting system will replace double entry accounting system	Grouping variable (1-5) Likerts scale

3.1 Determinants for Strength

It is because of its Architecture, Blockchain technology has the power to impact the traditional financial system, including accounting and auditing, giving 'Trust' to the transaction records. We shall try to explain various aspects of Blockchain architecture to realize its true potential.

Nodes can be private or public, permissioned or permissionless, depending on the objective for which Blockchain was established. When a transaction occurs in a central system, the administrator authority maintains and updates the ledger and grants/denies specific access to users.This aspect of Blockchain architecture helps when one node goes offline (either due to technical failure or an attempted hack), as each node/participant has its own copy of the ledger and all nodes are updated at the same time .Since, in Blockchain, each node receives a copy of the record, for any new transaction to occur, it requires a consensus of all the nodes. If all the nodes agree (according to a pre-defined set of rules), then only the transaction will occur and be stored in the network, updated in the ledger and copies distributed to all the nodes. This reduces the chances of erroneous entries significantly. It also reduces the need for an external/ third party to reconcile/ examine the data as the 'trust' is now shifted to each node in the network. It is because of this 'Triple entry Book keeping' nature embedded in Blockchain architecture, it provides the reliability to the accounting information. In a Blockchain, transactions are cryptographically sealed. Each transaction is signed with a digital unique signature of the user who initiated it. No one else can know this signature and hence cannot change the previous records of that user. This cryptographic system thus provides accountability of user and prevents any hack/fraud. This feature makes Blockchain, tamperproof.

4.2 Determinants for Weakness

Though we have presented that Blockchain Technology has slot of potential application in a wide variety of areas, it is also a fact that Blockchain technology has not been implemented at a large scale. There are some challenges associated in implementing Blockchain technology such as regulations, interoperability, standardization, organizational issues criteria.

Legal framework and regulatory authorization is still missing in this market. In India, there is no legal protection to anyone who deals with crypto currencies. Banks have been barred to deal with any type of crypto currency by RBI. The laws that apply to cash/official currency does not apply to crypto currency. Today, there exist a good

number of Blockchain based projects, but these Blockchain projects are very specialized in working. Several Blockchain exists in parallel. To improve or streamline an enterprise's business process, Blockchain which have build and tested only for a specific cause will need to be interoperable with others as well as with enterprise's established database. Specific standards are needed to make Blockchain interoperable.

Ultimately each of us are working to create a profit. There is a cost involved in implementing Blockchain based solution. Organization need to upgrade their system for heavy computation and storage, which is a huge investment. It has to be determined whether the benefit of implementing such solution will cover the expenditure. In order to develop and adopt organization must incur huge overhead cost to upgrade their system for heavy computation and storage. Corporate processes will have to significantly change and a lot of investment has to be made in Smart Contracts. Private Blockchain offer more security and privacy to data. It offers more organizational control, whereas public Blockchain offers the stakeholders the ability to access data, thereby establishing trust.

Test Statistics[a,b]

	S1	S2	S3	S4
Chi-Square	4.527	12.435	11.635	4.154
df	3	3	3	3
Asymp. Sig.	.210	.006	.009	.245

a. Kruskal Wallis Test

b. Grouping Variable: R

3.2 Determinants for Opportunity

Blockchain technology has the potential to improve "Ease of doing Business". It can improve efficiency, reduce cost and risk associated. Following are some of the major benefits of Blockchain technology:

Blockchain technology could improve the efficiency of accounting and auditing processes. When a transaction has to occur, all nodes must give consensus, and the network only then validates, stores and give copies of the transaction to all the nodes. This means that the data which traditionally needs to be validated or reconciled through third party, is no longer required as the same work has been done by Blockchain in real time. As Blockchain based system reduce the need of third party for validation and reconciliation, the cost associated is also reduced. As all nodes are connected to each other, participants can exchange items of value directly. Hence it reduces the overhead cost for intermediaries. All the data in a Blockchain is cryptographically sealed. Each transaction is signed with a unique digital signature which no other user can know. Hence no other user can change/delete that record for fraudulent purposes. Transactions recorded cryptographically in a block are also irreversible. Once a transaction is registered in the network, it is immutable, i.e., No one can go back and edit the record for own benefit. In a Blockchain system, each node must agree to the consensus mechanism and only then a transaction can occur and gets registered in the network. Now, if one wishes to do so, then it would require consensus of all nodes.

4.4 Determinants for Threat

There are many technical aspects which act as obstacle and threat in the implementation of Blockchain technology.

Adoption of Blockchain technology in current system will require a significant upgrade in storage and computational power. Also, there is a lack of technical knowledge of what Blockchain technology is and how it works. Relevant education and training is required. Most Blockchain that are currently operational, works in a very specific area of application. There is a need for a common technology that gives interconnectivity between these applications. Thus, Scalability issue needs to be overcome.

5. DISCUSSION AND RESULT ANALYSIS

For analysis of data purpose questionnaire has been framed. It was send to 200 respondent but 132 is found suitable. Questions were framed on likert scale basis. Proving the hypotheses Kruskal Wallis Test has been applied.

H_{01}: There is no significant difference between blockchain base triple entry system and double entry system on strength criteria

The result shows that p-value is more than .05. So the hypothesis is accepted. It means that blockchain base triple entry system is equally strong as double entry on efficiency and repay the cost. But hypothesis is rejected on the security and transparency point of view. It is assumed that due to its immutability feature this technique is far better to traditional accounting system.

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H_{02}: There is no significant difference between blockchain base triple entry system and double entry system on weakness criteria

Test Statistics[a,b]

	O1	O2	O3
Chi-Square	7.348	5.772	7.034
df	3	3	3
Asymp. Sig.	.062	.123	.071

a. Kruskal Wallis Test

b. Grouping Variable: R

The result shows that p-value is more than .05. So the hypothesis is accepted. It means that there is no significant difference between blockchain base triple entry system and double entry system on weakness criteria. Most of the

problems like cost, standardization, proper regulation and organization context have not been yet solved with this advanced technology. It means most of the weaknesses of double entry system are still unsolved. That's why author recommended 4- Dimensional accounting system.

H_{03}: There is no significant difference between blockchain base triple entry system and double entry system on opportunity criteria

Test Statistics[a,b]

	W1	W2	W3	W4
Chi-Square	1.118	.366	1.111	.922
df	3	3	3	3
Asymp. Sig.	.773	.947	.774	.820

a. Kruskal Wallis Test

b. Grouping Variable: R

The result shows that p-value is less than .05. So the hypothesis is rejected. It means that there is significant difference between blockchain base triple entry system and double entry system on opportunity criteria. It means all the opportunities like decentralize and immutability in triple entry system was not available in traditional entry system. So, triple entry system can be said far better than double entry. Still, on the basis of recording process fraud free. It is not very effective and equal to tradition system. Again, here is a need of an improved technology means 4- Dimensional accounting system.

H_{04}: There is no significant difference between blockchain base triple entry system and double entry system on threat criteria

Test Statistics[a,b]

	T1
Chi-Square	.745
df	3
Asymp. Sig.	.863

a. Kruskal Wallis Test
b. Grouping Variable: R

The result shows that p-value is more than .05. So the hypothesis is accepted. It means that there is no significant difference between blockchain base triple entry system and double entry system on weakness criteria. the problems like cost, standardization, proper regulation and organization context have not been yet solved with this advanced technology. It means most of the weaknesses of double entry system are still unsolved. That's why author recommended 4- Dimensional accounting system.

6. CONCLUSION

One thing is clear that Blockchain technology has the potential to revolutionize digital market. Since its introduction to the world, researchers have been working on developing applications based on this technology to increase productivity, efficiency, transparency and reduce cost. In the years to come, Blockchain technology will be regularly used for accounting, auditing, managing records, swift transactions, banking related processes, insurance related processes, manufacturing processes, supply chain management, healthcare related processes et cetera. But there are many challenges to its implementations in India. Still there is a need of proper jurisdiction for matters related to crypto currency use. There must be a regulating authority. Many technical challenges are needed to overcome for its implementation. Issues like Interoperability and Scalability needs research. Accountants, auditors need to properly research and formulate guidelines for integrating Blockchain into enterprise's business. Proper training and education is also needed to be given to professionals. It can be concluded with saying that even though there are some challenges in implementing Blockchain technology, this technology has shown very promising results and surely its future is bright.

Result reveals that even after the innovation of unique advanced technology of blockchain base triple entry system, it is not sufficient to come over the weaknesses, threats of double entry system and to satisfy the need of the era of industry 4.0.

That's why it is expected to develop a new **4-Dimensional accounting system** is required. Very soon by the end of the decade around 2030, 4 D system will become demand of corporates, forms, industries in the area of accounting, auditing and financial reporting.

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