Sustainability of Bloackchain in Manufacturing with IOT

Preeti[1], Dr. Banita[2]
[1] *Research Scholar, C.S.E. Department, B.M.U., Asthal Bohar (Rohtak), Haryana India*
[2]*Associate Professor, C.S.E Department, B.M.U., Asthal Bohar (Rohtak), Haryana India*

Abstract- Now days we can't imagine our life without digital technology. In this paper we will be discussed the major trending techniques blockchain and I0T (Internet of Things) in various fields with sustainability and trust frame.I0T is connecting different nodes to each other they communicate in wireless environment. The blockchain technique invented by Santoshi Nakamoto in 2008 with cryptocurrency bitcoin. It was used with distributed ledger but now it is also using hyperledger. Hyperledger is collaboration of open sources to help in advance application of blockchain and distributed ledger. We need sustainability in technology or engineering challenges. The creation of intelligent technologies is essential to ensuring the sustainability of production systems in the future. Blockchain is upcoming generation technology for enables sustainability in enterprises and sectors. After the large studies on Blockchain and IOT industries enable sustainable manufacturing from technical, commercial, organisational, and operational angles. This study for blockchain and I0T overcomes on potentially sustainable on product system and product lifecycle system .It is also sustainable for urgent issues for development industries.

Index terms- Blockchain, Additive Manufacturing, Internet of things (I0T), Ethereum

1. INTRODUCTION

It is collection of blocks, and each block connects to other block. It came with digital currency (cryptocurrency) in 2008.It still famous for various reasons. Researcher are researching of actually potential of blockchain. We all heard the term IoT. It is a combination of physically connected smart devices these devices using sensors. These sensors gain the information and react on information and the new ways opening for large sources.I0T based on client and server model. It is connected the wireless network they share information without human connections. But both technology facing some problems firstly we have discussed below:

1. Scalability: - It is the main problem in IOT and Blockchain. How we can manage the large amount of data and network devices. We have made a transparent model for production.
2. Reliability: - It is very important to store the information without changing the sensors.
3. Privacy: - Due to demand of blockchain and IoT system we need the smart contracts, but they have bugs to control these bugs we need a monitor. Blockchain used the decentralized public legder that is difficult for hackers.
4. Energy and Time required: -Using the Proof of Work (PoW) blockchain provides best security to IOT. It is not very complicated.
5. Discovering: - IOT and blockchain both are new technology, so we need expert for this work. It is not easy to use only experienced person can handle anything.

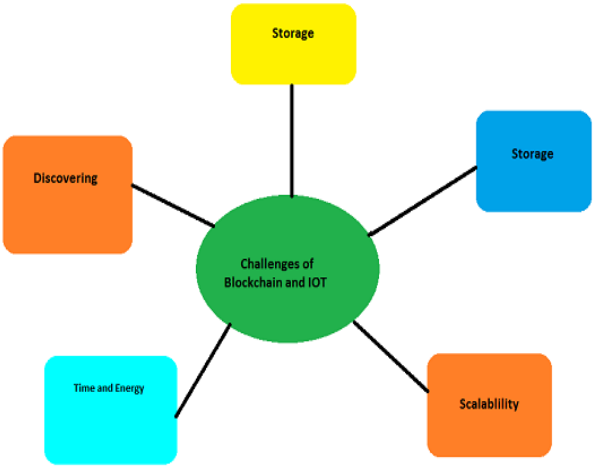

Fig1. Challenges of Blockchain & I0T

- Ethereum Blockchain: -Block chain is widely used computer to computer in social media, industries, health, financial applications. In this paper we are not provide the systematic learning of ethereum smart contacts but they face the security issues and vulnerabilities in real life. The executable code, contract address, state made up of private storage, and balance in virtual currency make up an Ethereum Smart Contract account. Smart contracts is major secure for information, popular business models

,proper management, supervision, manufacture data collection and integrated system. It searches for main power of this technology. Its application is used in wide areas. It is implemented in fourth industries revolution in finance, accounting, business models, supervision of management, automation, digital dictionary, supply chain. Due to very potential it is used for foreground areas of many applications.

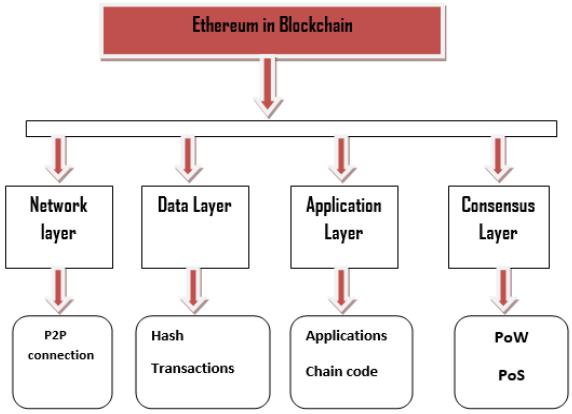

Fig2. Diagram for Different Layers of Ethereum Blockchain

- Blockchain in Additive Manufacturing: -

Additive Manufacturing (AM) is cutting edge printing technique known as. It is invented in 1987 used by layer-to-layer integration for 3D printing object.

There are mainly three reasons which support the use of Blockchain.

In additive manufacturing (AM).

1. IP security prevents public access to additive manufacturing features.
2. Cloud platform monitoring of the 3D printing
3 Additive Manufacturing company model monetization.

Security is main issue for the experts. So, they use security tools to change the financial and industries services. Blockchain is distributed ledger and immutable in nature provide more security.It is consist of nodes these nodes use hash contains information and they hide the nature of information and provide the unique identification. It is used decentralised blockchain for various solutions in social media platforms. It is used the different methodologies like Material extrusion, VAT Photo polymerization, Power bed fusion, Binder Jetting, Material Jetting etc. This is used blockchain distributed ledger on different computers on internet. In this user see all transaction not central ledger i.e. distributed ledger. It is used peer to peer connection for transactions no third party involved in this.

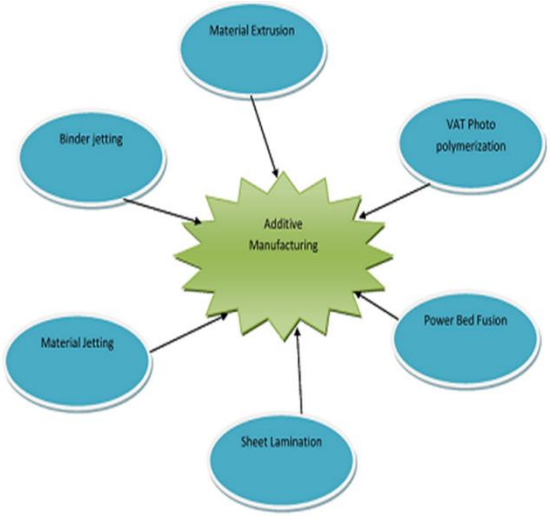

Fig3. Different Methodology of additive manufacturing

It is find out the root, sub-root causes of a problem. It is used for transparency, vulnerability and security for different applications used in future.

2. LITERATURE REVIEW

Different Methodology used by different user in this table

SR. NO.	TITLE/AUTHOR	METHODOLOGY	CONCLUSION	FUTURE SCOPE
1	Blockchain for IoT Security and Privacy: The Case Study of a Smart Home Ali Dorri, Salil S. Kanhere	Blockchain, Internet of Things (I0T),	IOT gaining more popularity in industry and smart home. I0T security solutions may not be ideal owing to high energy consumption and processing requirements.	We will look for other I0T domains. Blockchain is solution for I0T issues.
2	A Survey on Blockchain for Big Data: Approaches, Opportunities, and Future Directions Deepa N, Quoc-Viet Pham	Blockchain, Security	It is using disruptive ledger technology to support big data system with efficient network and security. It increases the applications of smart	Main focus on big data for networking to improve the service quality.

			healthcare, transport and home using blockchain.	
3	Blockchain in additive manufacturing processes: Recent trends & its future possibilities Turusha Ghimire, Atharva Joshi	Additive manufacturing, Blockchain	The prevalence of additive manufacturing is rising. It is also using the new 3D printing platforms. It changes the relation in industries.	Blockchain is used for new upgrade in business and data flow in industries. It is also allows the customer role in selling or buying maintain the monetization of goods .It can make more accessible and attractive models.
4	Blockchain technology for bridging trust, traceability and transparency in circular supply chain Piera Centobelli, Roberto Cerchione	Circular blockchain, Smart contracts	It effects on various operational performance time and saving cost. It is also in the favour of circular supply chain.	In this paper the combination of supply chain and blockchain interactive with radio transformation. The industry wants more trust, traceability and transparency in adoption of blockchain in pandemics.
5	Systematic Review of Security Vulnerabilities in Ethereum Blockchain Smart Contract SATPAL SINGH KUSHWAHA1, SANDEEP JOSHI2	Blockchain, Smart contract, Decentralized, and Ethereum	Ethereum and smart contracts using different parameter such as types of tools, language implementation, input etc. It vulnerabilities by roots and sub roots.	Blockchain using ethereum and smart contracts increased the security platforms. It prevents from security attacks.
6	The link between sustainable business models and Blockchain: A multiple case study approach Davide Calandra, Silvana Secinaro |	Blockchain, business models sustainability,	To research provides the new opportunities. We found some research clusters that are connected to sustainable production, smart energy climate change, etc.	To discuss the business models sustainability and blockchain to explore the various fields due to discoveries.
7	Blockchain for Modern Applications: A Survey Moez Krichen, Meryem Ammi	Blockchain, wireless networks, Internet of Things (IoT), smart grids	In this paper we see the various application of blockchain with IOT like financial services, military government services with observation of its beniftes and limitations.	It is ensuring blockchain technology will be better challenge for various field such as government services, financial services, healthcare etc.
8	DDoS Attack Prevention for Internet of Thing Devices Using Ethereum Blockchain Technology Rahmeh Fawaz Ibrahim, Qasem Abu Al-Haija	Blockchain, smart contract, Ethereum	The main goal is to replace current centralised system solutions with decentralise to prevent this attack on IOT devices.	A public blockchain with scalability issues is used to construct system. The system will point out the problem in future by present solutions and contrasting them to choose which one works best.
9	Hybrid Blockchain Platforms for the Internet of Things (IoT): A Systematic Literature Review Ahmed Alkhateeb, Cagatay Catal, Gorkem Kar and Alok Mishra	cloud computing, hybrid blockchains	In various field to adopt the integration very challenging. It is also effecting privacy, integration and adopting technology.	Energy, materials, connectivity, processing scalability is challenging the front of ethereum, cloud computing and edge computing. We intend to deploy a hybrid blockchain platform to decrease the problem.
10	A Bibliometric Analysis of Blockchain Technology Research Using VOSviewer Aleksandra Kuzior and Mariya Sira	Blockchain technology; Bibliometric	Due to flexibility of development and demands of industries it moves for new digital sources. In this we studied the Bibliometric examination of the literature regarding "blockchain"	We used the Scopus database in future we will use Springer Link and also find the powerful topic for research.

3. CONCLUSION

Blockchain is in trending for various researches such as agriculture, healthcare, financial, smart industries, manufacturing. It is combined with different technology like fog computing, edge computing, cloud computing, ethereum and internet

of things (IOT) to adopting the integration of blockchain for scalability, probability, security and other challenges. Our objectives are to highlight the private data security, implementation of blockchain and sustainable manufacturing in engineering challenges. In the future area, Research will concentrate on the benefits and limitations of blockchain technology, as well as its effectiveness and potential concerns. Due to security and demanding this technology grows day by day in different platforms.

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