BLOCK CHAIN TECHNOLOGY

[#1]Mrs.M.Parameswari, [*2]S. Induja , [*3] J. Jenifer, [*4] J. Kayathri , [*5]S Tanuja, [*6]G. Vigneshwari

[#1]Associate Professor, Kings Engineering College
[*2,*3,*4,*5,*6]Department of Computer Science and Engineering
Kings Engineering College,

Abstract:-Digital world has produced efficiencies, new innovative products, and close customer relationships globally by the effective use of mobile, IoT[5] (Internet of Things), social media, analytics and cloud technology to generate models for better decisions. Blockchain is recently introduced and revolutionizing the digital world bringing a new perspective to security, resiliency and efficiency of systems. While initially popularized by Bitcoin[2], Blockchain is much more than a foundation for crypto currency[6]. It offers a secure way to exchange any kind of good, service, or transaction. Industrial growth increasingly depends on trusted partnerships; but increasing regulation, cybercrime and fraud are inhibiting expansion. To address these challenges, Blockchain will enable more agile value chains, faster product innovations, closer customer relationships, and quicker integration with the IoT[5] and cloud technology. Further Blockchain provides a lower cost of trade with a trusted contract monitored without intervention from third parties who may not add direct value. It facilitates smart contracts, engagements, and agreements with inherent, robust cyber security features. This paper is an effort to break the ground for presenting and demonstrating the use of Blockchain technology in multiple industrial applications. A healthcare industry application, Healthchain, is formalized and developed on the foundation of Blockchain using IBM Blockchain initiative. The concepts are transferable to a wide range of industries as finance, government and manufacturing where security, scalability and efficiency must meet.

Keywords:Bitcoin[2], Medical services, Standards, Cloud computing, Ethics

INSPEC:Controlled Indexing cloud computing, cryptography, electronic money, health care, Internet of Things, mobile computing, social networking (online)

INSPEC:Non-Controlled Indexing block chain technology innovations, digital world, social media usage, mobile usage, IoT[5] usage, Internet of Things, cloud technology mobile, Bitcoin, crypto currency[6], cybercrime, trusted contract, robust cyber security

features, Healthchain, healthcare industry application, IBM Blockchain initiative Author Keywords Blockchain, Business, Cloud computing, Cloud services, Control Systems, Cybersecurity, DevOps, Finance, Government, Healthcare, IoT[5], Industry 4.0.

I.INTRODUCTION

Blockchain is a distributed ledger technology, commonly used in the crypto currency Bitcoin[2]. The Financial Times (2016) defines Blockchain as a "network of computers, all of which must approve a transaction has taken place before it is recorded, in a 'chain' of computer code. The details of the transfer are recorded on a public ledger that anyone on the network can see".

Blockchain Fundamentals :

Blockchain or, more precisely, Distributed Ledger Technology (DLT) is currently one of the hot topics specially in financial sector. Originally blockchain was segregated as block chain where blocks holds the list of digital records which are secured using encryption technology(Cryptography).

Blockchain[3] is a shared, distributed ledger which helps in processing any digital transaction over the business network and tracks the tangible or intangible assets involved that facilitates the process of recording transactions and tracking assets in a business network. Asset can be tangible—a house, a car, cash, land—or intangible like intellectual property, such as patents, copyrights, or branding. Virtually anything of value can be tracked and traded on a blockchain network, reducing risk and cutting costs for all involved.

"What the internet did for communications, blockchain will do for trusted transactions."— Ginni Rometty

Understanding Blocks in blockchain :

A blockchain[3] by itself is just a data structure defining how the data is stored and logically put

together. Every block in a chain can be considered as a pages in a book, where every page has text and also the meta-data which tells the title , chapter number , page no

That is, how data is logically put together and stored. Other data structures are databases (rows, columns, tables), text files, comma separated values (csv), images, lists, and so on. You can think of a blockchain[3] competing most closely with a database.

Transaction data is permanently recorded in files called blocks. They can be thought of as the individual pages of a city recorder's recordbook (where changes to title to real estate are recorded) or a stock transaction ledger. Blocks are organized into a linear sequence over time (also known as the block chain). New transactions are constantly being processes by miners into new blocks which are added to the end of the chain and can never be changed or removed once accepted by the network (although some software will remove orphaned blocks).

Bitcoin Blocks :

Let us first understand what is Bitcoin : It's a digital cryptocurrency[6] now accepted worldwide specially in digital payment systems. The Digital currency (Bitcoin)uses a system which is peer-to-peer[1], and where transactions take place between users directly, without an intermediary. These transactions are verified by network nodes and recorded in a public distributed ledger called a blockchain. Bitcoin[2] was first invented by a Satoshi Nakamoto as an open source technology released in 2009

Bitcoin[2] Blocks are files where data pertaining to the Bitcoin network is permanently recorded. A block records some or all of the most recent Bitcoin transactions that have not yet entered any prior blocks. Thus a block is like a page of a ledger or record book. Each time a block is 'completed', it gives way to the next block in the blockchain. A block is thus a permanent store of records which, once written, cannot be altered or removed.

Blockchain technology : How It Works

The best example to understand blockchain will be to find how it resolves double spending problem in financial transaction. The simplest way to think of blockchain is as a large distributed ledger of sorts that stores records of transactions. This "ledger" is replicated hundreds of times throughout the public

network so it is available to everyone. Every time a transaction occurs, it is updated in ALL of these replicated ledgers, so everyone can see it.

Every time a new transaction is initiated, a block is created with the transactions details and broadcast to all the nodes. Every block carries a timestamp, and a reference to the previous block in the chain, to help establish a sequence of events. Once the authenticity of the transaction is established, that block is linked to the previous block, which is linked to the previous block, creating a chain called blockchain. This chain of blocks is replicated across the entire network, and all cryptographically secured which makes it not only challenging, but almost impossible to hack.

Utility of Blockchain:

It helps to maintain strong and secure Digital IdentityTokenisation : For the purposes of authenticating a unique physical item, the items are paired with a corresponding digital tokenData Management for big organization[4]Regulatory compliance is a big business opportunity by for many blockchain developers.For Audit Trail in any large financial institutionsIt can be a great technology for Contract Management between two parties involved.

III.REFERENCES

1. S. Nakamoto, Bitcoin: A Peer-to-Peer Electronic Cash System, pp. 9, 2008.

2. S. Underwood, "Blockchain beyond bitcoin", Commun. ACM, vol. 59, no. 11, pp. 15-17, 2016.

3. G. Hurlburt, Might the Blockchain, pp. 12-16, April 2016.

4. B. Libert, M. Beck, J. Wind, "How blockchain technology will disrupt financial services firms", Knowledge@Wharton, pp. 2-7, 2016.