CONTRIBUTION OF BLOCKCHAIN TECHNOLOGY
TO THE GROWTH OF THE SOCIETY

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Abstract— Peace engineering describes proper use of engineering principles towards overall development of humans without any conflict. Inventions and innovations lead to powerful human community. But, the powers are very much centralized. Centralized powers pave way to misuse of these innovative technologies. Advancement should always be towards contribution of peace in the society and not a threat Contribution of block chain for peace engineering includes Information is not copied but distribute, Powers are decentralized which avoids misuse of data ,Every change in value is updated and verified, No intermediaries to break the chain, Transparent maintenance of records, Decentralization of records prevents hacking, No possibility of errors for conflicts, Synchronization of the activity avoids time delay in the network ,Owning of information by the identity and is verified Data is secured by both public and private keys held by an identity

Keywords—Block chain; Peace Engineering; Application of block chain; Contribution to the society.

I. INTRODUCTION

We explain Peace Engineering as, the engineering working towards secure society by integrating innovative technologies thereby preventing conflicts and protecting the peace in the society. Technology growth is being witnessed around the globe, beyond the boundaries through digitization of the business. People around the globe are interconnected digitally which raised innovations for the enhancement of lives. Blockchain can be considered as one of the finest innovation, to secure the data in the chronological order. These data are authenticated and are stored in blocks.

II. EXPLORING BLOCKCHAIN

A. Propitious Niche:

Satoshi Nakamoto presented a white paper on bitcoin and blockchain technology in 2009, but it took few years to find its niche. The data stored in the blocks are validated on consensus basis and change is immutable. The uniqueness of the technology also lies in protecting the origin of data.

B. Features of Blockchain:

Blockchain is a digital ledger to store the data. The way the digital ledger is maintained for transactions makes it crystalline. Blockchain bears the following features:

➤ *Decentralized:*

Data is stored in distributed ledger system, which prevents the influencing of certain authorities, making it decentralized.

➤ *Immutable:*

Since blockchain is decentralized, data is available with all the accessible members. Any change in the information is validated by all the members, which makes it immutable to alter valid information.

➤ *Transparent:*

Blockchain allows public access and permissible access as per the design of the smart contract, which creates the transparency of the information. Any change in the information is authenticated by the members associated with it.

➤ Tamper-proof:

Information stored is validated and transparency is maintained by all its members which makes it ideal to be a tamper-proof.

➤ *Cost reduction:*

Blockchain works on peer-to-peer basis and authentication of information is done by every member associated with it, which reduces the interference of third party and its cost.

III. BLOCKCHAIN TYPES

Blockchain can be customized as public, consortium and private based on the end user. Various platforms have come up for implementing this technology as per its requisition.
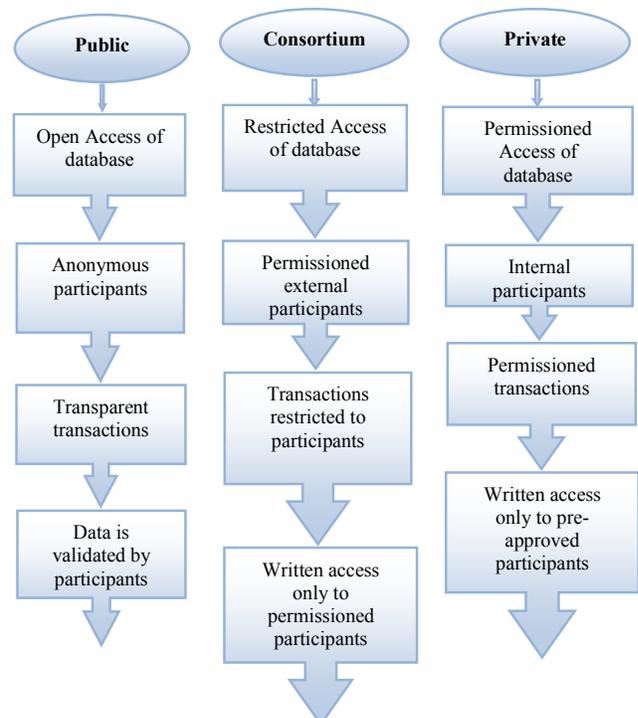
IV. IMPLEMENTATION OF BLOCKCHAIN

Blockchain is an open source technology. Many companies are developing PoC for implementation of it. Few platforms have created a way for it,

	Ethereum: An open source blockchain platform, which can be used to develop any decentralized applications released in July 2015. Token of Ethereum is Ether and a public blockchain. It works on consensus of "Proof of work" shifting to "Proof of Stake".
	Hyperledger: An open source project released by Linux foundation in December 2015 which supports innovation through permissioned/permission-less distributed ledger. It uses smart contract languages for programming and different consensus mechanisms according to the requirement.
	Ripple : An open source licensed by Silicon Valley Private Company, released in 2012. Although it is a open source platform, it uses company directed software for development. This platform is widely used for international trading purpose. Its products like Ripple Network, Ripple Connect, Ripple Stream supports the trading. Token of Ripple is XRP, however it also supports fiat currency through liquidity provider.
	R3 Corda: Corda is an open source distributed ledger developed by R3, a consortium of biggest financial institutions in 2015. It is a permissioned blockchain built specially for finance oriented applications. Corda is a permissioned private blockchain platform which achieves consensus between firms at the level of individuals and not at the level of the systems.

V. ADOPTION OF BLOCKCHAIN

According to the theory of Diffusion of Innovation, adoption of technology can be placed on the following categories:
- Innovators
  - Early adopters
    - Early majority
      - Late majority
        - Laggards

Different countries fall under different category based on the adoption level of the blockchain technology. Implementation of blockchain does not require any special hardware but talented software developers are needed for mass data handling.

Although blockchain is attractive for several reasons, it requires huge investments, which is a major concern for its implementation.

Concluding on the adoption level, it's difficult to find the scaling of the technology, but trending shows it is highly preferred in areas where securing data is a major concern.

VI. APPLICATION OF BLOCKCHAIN

Remembering the features of blockchain, Decentralized, Immutable, Secured, Transparent, we find its applications widely in many sectors like:
1. Financial Services
2. Asset management
3. Healthcare
4. Insurance
5. Logistics
6. Trading
7. Supply chain tracking
8. HR management ………and the list expands.

An Art piece:
Blockchain is creating a huge impact in the banking sector. Major concerns like, third party involvement, client identification, compliance involves huge cost. Banking sector is working on blockchain technology to reduce the cost as well as the time of transaction. The distributed ledger system of the blockchain is one of the major attraction for the sector, along with it the efficiency and transparency witnesses 30% of the sector in implementing it. The international transactions are finding easy route and less time because of this. No wonder that the sector will dig deeper into the technology to witness its growth.

VII. CASE STUDY

Validating Medicine using blockchain
Introduction:
Medicine, a drug prescribed to the patient in need of treatment. It is very essential that the prescribed drug should be taken to the required level. Any deviation can affect the treatment drastically. Its worthy for the patient to know the details of the consuming medicine. The manufacturer reveals the following details of each medicine:
1. Composition of chemicals
2. Manufactured date
3. Expiry date
4. Batch no.
5. Price

When we buy the medicine, we should be aware of the above details for our safety purpose. Government make essential check over the medicines being sold in the market.

Problems faced by the government:
Medicines can be manufactured under proper license provided by the government. Any deviation leads to an offence. Although various steps are being taken to control this offence,

counterfeit medicines still exist in the markets which are not manufactured by the proper licensee.

Importance of Blockchain:

Blockchain is an emerging technology, which are being adopted in various fields to store the origin of each data which are authenticated. The data stored here is immutable. These features can be utilized to validate the medicine.

Significant method to validate genuine medicine:

1. Program for validating the genuine medicine can be developed on Consortium blockchain, which gives access to both public and authorised private people.
2. Hyperledger platform shall suit for the implementation.
3. Here the drug is referred as data.
4. Each data can be identified by a unique address in the blockchain.
5. The address shall bear all the essential details of the data like chemical composition, manufactured date, expiry date, price and certain other details.
6. Each data uploaded in the blockchain shall be authenticated by the government.
7. Only the licensed manufacturer shall upload the data.
8. Authentication validates the origin of the data.
9. Only the Licensed drug sellers shall be given authorisation for selling the drug which have the address in the blockchain.
10. The licensed drug sellers shall be given permission to update the transaction alone.
11. Any transaction made on the data is updated in the blockchain.
12. No other persons are given permission to modify/update the data in the blockchain.
13. General public can be given permission to access the data alone.
14. Individual buying the medicine shall verify the originality of the medicine by logging on to the blockchain.

Outcome on implementation:

A Study on the above shall be helpful for the society to create a healthy environment. It shall protect the society from falling prey to drug mafias. It also avoids the illegal market of selling the medicine. People shall stay fearless and live a healthy life.

VIII. CONCLUSION

Blockchain is trying to occupy more space in every sector day by day. Many start-ups are working on the application of this technology to witness the growth of the sector. Although implementation of blockchain involves huge investments, industries are trying to bridge the gap of it to create a revolution. The reliability of it creates a reason for its attraction to research on it. Research and development on this technology shall pave way for building an innovative society which are more focused on creating the health and the wealth of the people for peaceful living. There is no doubt that blockchain will make many wonders in the near future towards the growth of many sectors of a country thereby to its peace.

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