# Role of Blockchain Technology to change working style in different Functional Areas

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***Abstract :*** Over long years ago, we are working with centralized system in different areas either it belongs to banking system, Finance or many different corporate sectors, in which they are either dealing with business to business or business to customers. But it's time to change the working style and need to shift from centralize system to decentralized system. Decentralized system is much more flexible, reliable as well as secure in prospective of transactions and trade related functionalities than centralized system. Blockchain technology is well equipped to make this decentralized system successful and able to create the new era of working system in different sectors.

***IndexTerms*** **– Blockchain, Distributed Network, Distributed Ledger.**

## I. Introduction

Blockchain Technology is based on chain of blocks and each block is verified by using hash of previous block. Blockchain holds the records in distributed database network or we can say that public distributed ledger holds records of each transaction. Distributed ledger has fascinating property, once data recorded in the ledger, becomes very difficult to change. Distributed ledger will solve the trust problem which is lesser in the centralized system. Trust is the heart of blockchain and it is going to change the way we trust. One of most popular blockchain application is Crypto Currency. A Cryptocurrency is a form of digital money that is stored and transferred electronically. With the use of this application users can perform peer to peer transactions. It would be completely secured and trustworthy.

## II. Working of blockchain

When new transaction begins, the request of new transaction broadcasts over the peer to peer network for verification, once it is verified by nodes of peer to peer network, transaction is added with other transactions to create a new block of data for the ledger. This new block then is added to the existing blockchain, addition will be permanent and unalterable. Chain continuously grows as new transaction begins and is verified by peers of distributed network. We can say that peer to peer network verifies the transactions itself, secures each transaction's history, and completes the transaction by continuously holding the verified data into the ledger. This ledger will be distributed all over the distributed network. Every valid transaction will result in the change of ledgers all over the distributed network.

**Figure 1: Transaction Process of Blockchain**

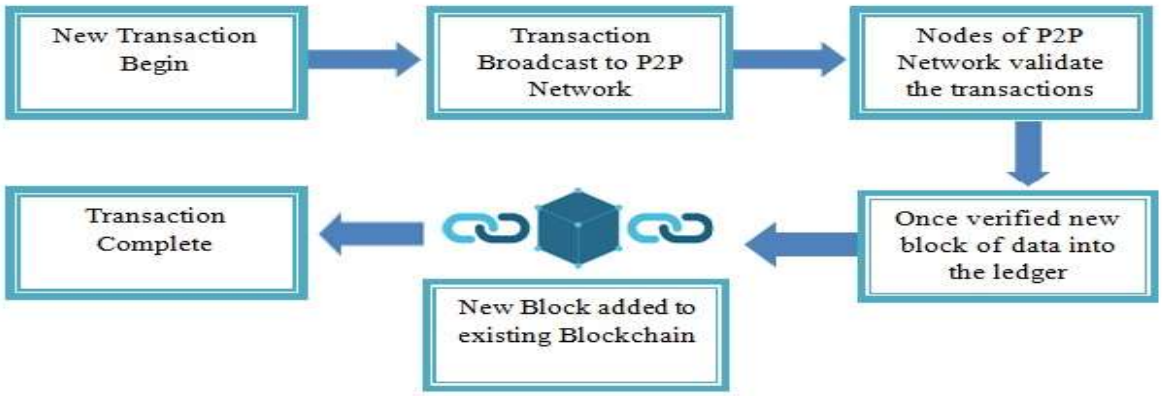
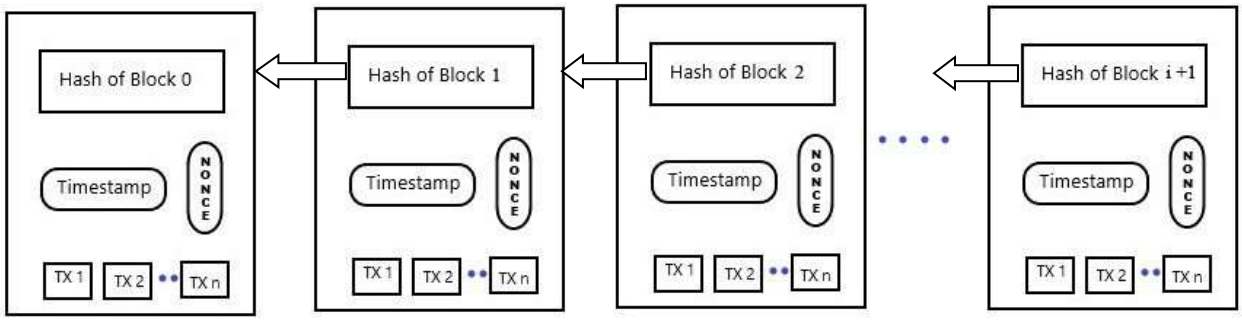


**Figure 2: Addition of block in Blockchain**




Cryptography plays a vital role in blockchain. Cryptography hash is used to generate unique value with digital signature. Each block is added with nonce. Nonce is just a random number; due to this addition, hash result of the block gets change. Every block is securely attached with upcoming block using hash of previous block, any mischievous activity is prevented from being unwanted change in ledger. This is the logic behind blockchain to maintain integrity, persistency, anonymity and auditability.

Distributed ledger Technology is noble approach used in blockchain to store and share data across multiple data stores. Every transaction is recorded, shared and synchronized across the distributed network. In the ledger new record will be added by the node that generates the new block. Information about new addition is published over the distributed network to update. Each node over the network holds a copy of information and all the nodes over the network verify the record. After the verification, nodes update the individual ledger. In Distributed ledger, it is not possible to do malicious change in the database because blockchain does not have centralized data storage. Database distributed over all the nodes, to make malicious change in database, attacker needs to change multiple nodes record at same time which would required bunker amount of computing power for altering records. Tempering of records is not possible in blockchain. So, distributed ledger to maintain database is the best choice in prospective of security.

Cryptocurrency is one of the most famous application of blockchain. Bitcoin is first cryptocurrency to use blockchain, invented by Santoshi Nakamoto in 2009. Supply of bitcoin is limited to 21 millions coins. Market capitalization is calculated as number of coins in circulation multiplied by current value of coin. In earlier days, santoshi nakamoto is estimated to have 1 million bitcoin. First real world transaction performed by buying pizza in Jacksonville, Florida for 10,000 BTC in 2010 and within five days price of bitcoin hike by 900% , rising from $0.008 to $0.08 for one bitcoin [2]. During the starting period of 2011, value of bitcoin was same as $1 USD and in the end of this year one bitcoin price hit by $1000, then it shows some up and downs. In the year of 2017, bitcoin got more attention and popularity, at end of the year 2017, one bitcoin price surge to $17900. By seeking its popularity, government of many countries come into action, some of them put ban on initial coin offering as well as on cryptocurrency exchanges to stop trading in cryptocurrency as like China did in the month of September, 2017. After China ban, cryptocurrency faced downward pressure. In the month of May 2018, Chinese President Xi Jinping said in a speech that blockchain — the technology underlying bitcoin — has "breakthrough" applications[3]. On 26 May, 2018 CCN reported that the State Council of China ordered local financial authorities and government-funded research centres to allocate more resources in developing, deploying, and commercializing the blockchain[4].

## III. Problem Areas

The functional areas ranging from financial services, health care services, voting system, real estate, education and many more in which we are strict with old way of functioning require changes in their working style. Various functional areas described below in which blockchain can bring drastic change in working style of current way of functioning.

## IV. Blockchain in Financial Sector

Financial sector is one of the biggest and sensitive functioning areas where a lot of transactions take place everyday. One of the eminent blockchain application i.e. cryptocurrency can be an alternate to restructure the payment method, financial services and enterprises. It can be the better way to transfer money faster than current financial transactions processing system in the form of hard money. Financial transactions, these days still take a weak or longer time to clear, especially in case of international transactions.

A Number of frauds with ATMs, Internet banking or credit card are increasing day by day. Most common attack over internet banking is phishing, in which unaware users are targeted by hackers. These kinds of frauds can be avoided by using digital currency, due to its nature of peer to peer transaction and each transaction is verified by multiple nodes.

In Nov 2016, Indian government announced the demonetization of 500 and 1000 banknotes. A few reasons behind demonetization were to bring black money out and abolish the fake currency which is in the circulation with actual currency. Digital Currency is the solid solution of all these problems; due to nature of cryptocurrency neither fake currency nor black money will be generated. This decentralized digital currency like bitcoin and many other crypto currencies are based on blockchain, ignite much excitement in financial sector. To implement cryptocurrency as legal, regulation as well as proper platform is required for its implementation. Shifting to cryptocurrency as a payment method, will also reshape E-Commerce payment method for trade.

## V. Blockchain in Real Estate Sector

The real estate sector is one of the most globally recognized sectors. The term real estate means real, or physical, property. It also refers to producing, buying and selling property. It is the biggest trade sector which itself described into four different types. First type includes new construction and resale of homes. Second category is called commercial real estate which includes shopping centers, multiplex and institution buildings, hotels and offices. Industrial real estate is third type and fourth category of real estate includes Land (Vacant land or working farms).

As per Joint report of CREDAI and JLL published on March 2018, Real estate sector is projected to reach a market size of $180bn by 2020, a sharp rise from $126bn in 2015 [5]. The report also unveils that the housing sector's contribution to the Indian GDP is expected to nearly double to more than 11% by 2020 up from an estimated 5 %-6% [6].

To manage this vast functional sector and to keep eye on its working whether dealers are properly following rules and regulations or regarding valuation of asset and to keep track of all real estate trades, blockchain comes into work very efficiently and authentically.

**Figure 3: Keep track of real estate trade with Blockchain**


Let us suppose land sold to builder at Rs 20 Lakh in 2010, new block for this trade will be generated after verifying by some node, this will be called as block 1. After this trade, builder construct houses on this land and sold to retail users. Each trade for these houses are then verified over the distributed network and blocks added to blockchain using hash of previous block. Refer to the figure 3, builder sells house to owner-1 at Rs 50 lakh recorded in block 2 with time stamp i.e in 2012 and linked to blockchain using hash of block 1. Then owner – 1 gifts house to child in 2015, this trade is recorded in new block i.e block 3 and is linked to previous block using hash of block 2. This way block chain grows continuously. Every event regarding real estate will be recorded into blocks and added to blockchain, even government notices regarding objection over trade or failed inspection of

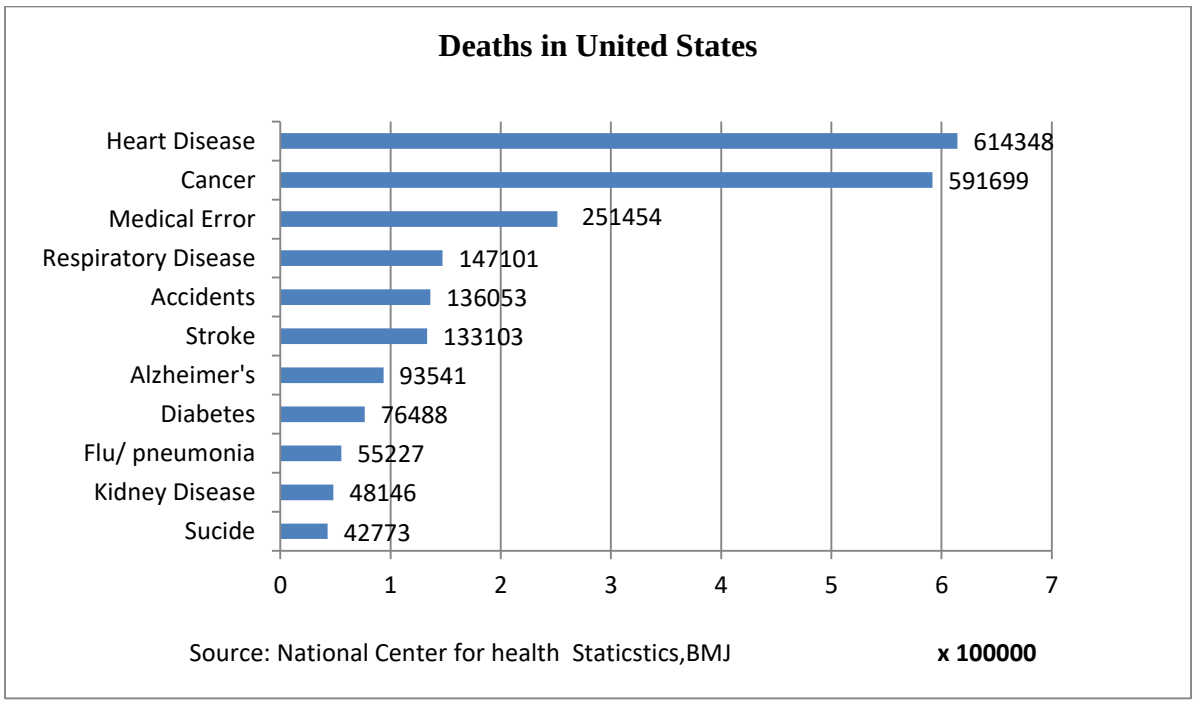
construction etc. By this way, blockchain will change the way of record keeping of real estate trades and all related activities by maintaining integrity as well as trust.

## VI. Blockchain in Medical Sector

Blockchain is transformative technology in Medical Sector. It will bring drastic change in the services of health care as well as in medicine. Health of an individual has great significance in life, so maintaining patient's health history and records of treatment will set a new way to heel the patients from forthcoming health problems. In many cases, patients get inadequate treatment due to previous history unknown to medical practitioner. Medical record keeping is not only important for treatment of patients but also for analyzing treatment results, medication results, to plan treatment protocols, and for further research purposes.

Dr Girdhar J. Gyani, Director General, Association of Healthcare Providers (India), talked with Economic Times Health World(ETHW) about the issues and challenges exist in current Indian healthcare system on Aug 2016 and mentioned that 5.2 million medical errors are happening in India annually as per a Harvard study by Prof. Jha [7]. Johns Hopkins University researchers estimate that medical error is leading the third cause of death in US [8].

**Figure 4: Yearly death rate as per Johns Hopkins University research in 2016**




If any medical error happens, there is need of solid proof of medical negligence which can be used for legal process if patient complains. Because the legal system mostly depends on documentary proof and this proof will be beneficial for both doctors and patients [9].

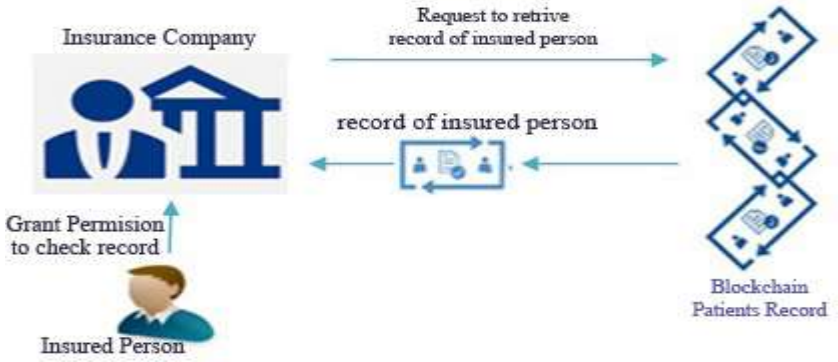
The insurance companies also need to be aware these days because many people are misusing of insurance facilities to get fake claims. For getting right information regarding patient who claims, is true or false. So for this purpose proper documentation is needed mainly. This documentation will also be helpful for patient if he loses proofs pertaining to medical claim [9].

So, keeping records of patients is very important, so blockchain is the best way to keep detail of patients in an immutable way. With the help of this fascinating technology, we can hold the record of patients which includes history of patient by recoding all health related problems of individual in regular timeline, all medical diagnostic test results, every prescription given by doctors and notes of a patient's progress etc.

Once maintained record of patient's health's history with blockchain, will abolish the communication gap between doctors as well as minimize the medical errors which will also include miscommunication between nurses and doctors.

Maintaining immutable records of patients with Blockchain technology will also be helpful to insurance companies. By taking permission from patients, health insurers can verify details about patients regarding claiming amount. Similarly, companies can offer accurate premium based on medical record of insured person to be purely transparent to them.

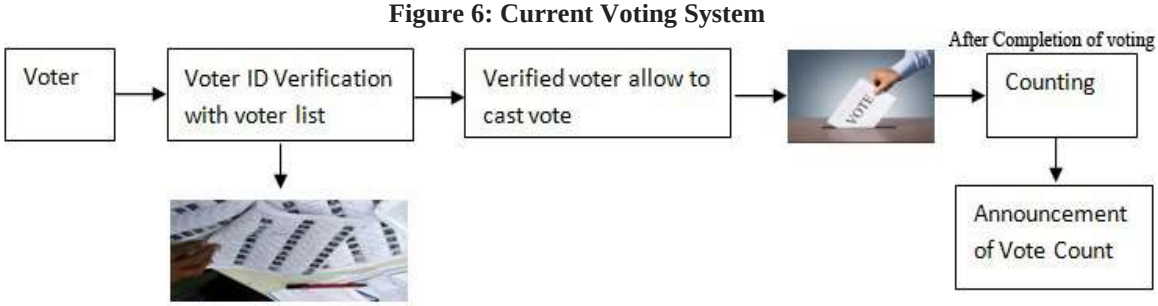
**Figure 5: Retrieval of insured record**




## VII. Voting via Blockchain Network

Democracy is the form of government that is governed by the people of the country. Present time is considered era of democracy. Today the countries having no democratic government, are trying continuously for adopting democratic government and the countries in which democratic government are working, are aware for the protection of democracy and they are ready to protect this form at any rate for having trusted government. Paper ballots or EVM machines are used to cast vote in democratic states because everyone has share in it. This method of casting votes is considered good for maintaining democratic system.

**Figure 6: Current Voting System**




Now these days, Election process of the country has become mistrusted due to some rumour regarding tempering of voting machines and some are due to false voting by unauthorized or fake voters'. Such kind of controversial rumours are not suitable for democratic countries. It should be avoided at both counting as well as at voting level. To develop voting system fully trusted, needs to make voting process transparent which is achievable through blockchain. With this, issues regarding immutable and integrity will come on the track. Implementation of voting with use of blockchain properties and Public key cryptography will lead entire voting system authentically, where casting of votes will be performed by unique keys and counting of votes will follow elite property of blockchain i.e. distributed ledger which will hold immutable record of casted vote.

## VIII. Conclusion

It's 21th century, many functional areas are demanding a drastic shift to make system much reliable, trusted with full authenticity than current working system. Blockchain is a package with fascinating properties and able to replace current working style with new style of working in financial sector, real estate sector and many others. This will change the way of trust as well as functioning of work. So, its need to utilize fantastic properties of blockchain and let the world to work in distributed network where the third parties that are in use for maintaining trust between two users, will be abolished completely and peers will trust in each other directly on behalf of distributed ledger which is immutable.

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