

AN EMERGING SECURED INTELLIGENCE SYSTEM: A BLOCK CHAIN TECHNOLOGY PERSEPTIVE

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Abstract:

Block chain is one of the emerging technologies which has higher scope for future applications. Block chain process is formulated based on blockchain thinking and formulating thinking. Blockchains allow us to have a distributed peer-to-peer network where non-trusting members can interact with each other without a trusted intermediary, in a veritable manner. The basic applications of blockchain provide vast chances to create more secured intelligence system. The feature of block chain with respect to sustainability is concluded with some of the major advantages and disadvantages of block chain.

Keywords: Blockchain; philosophy, thinking, utility, secured, intelligence system, use case

I. Introduction

Blockchain is based on distributed data structure which shares information among the members across the network. A blockchain is a database shared by every participant in a given system. The block chain stores the complete transaction history of a cryptocurrency or other record keeping system.

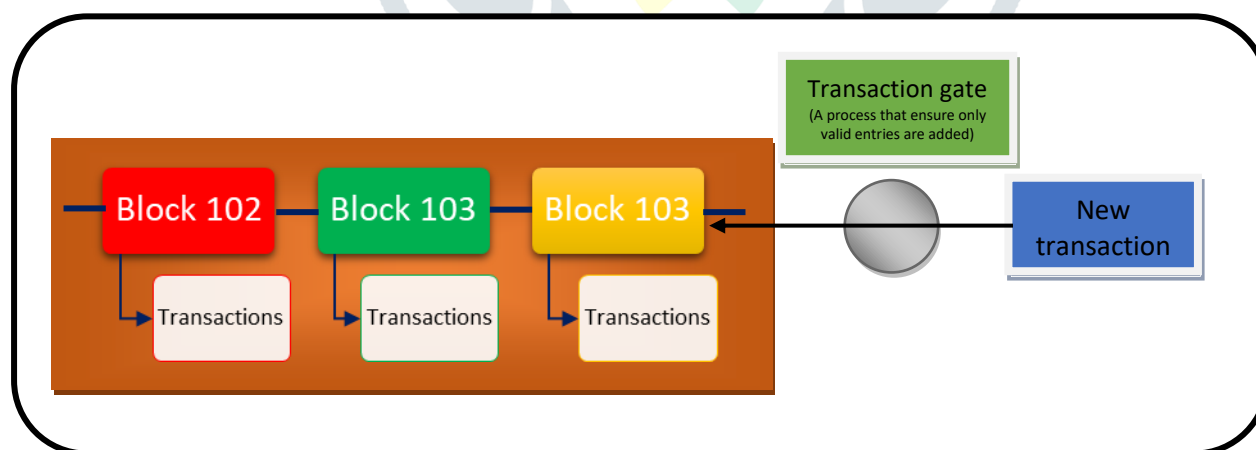


Figure 1 : The transaction process of blockchain

Bit coin introduced the concept of blockchain basically to overcome the issue of double spending problem. A user requests for a transaction. A block is created representing the transaction. After that it is broadcasted to all the nodes of the network.

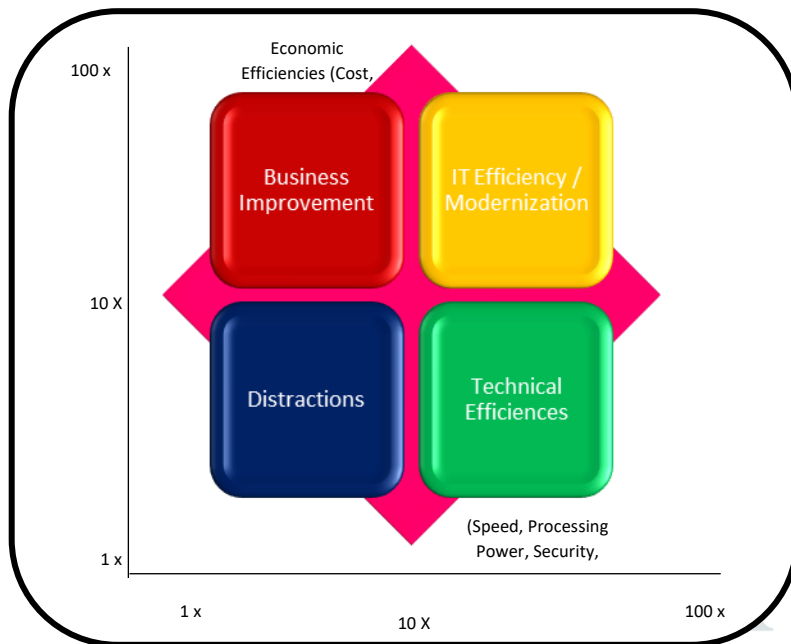


Figure 2: Block chain value creation

All the related nodes validate the block and henceforth the block is added to the chain. Finally, the transaction is verified and added.

II. Blockchain based secured intelligence system

i. Blockchain Thinking

Blockchain in combination with AI works like a human brain. The memory is like a conventional neural network, but stored in multiple locations. This memory is retrieved whenever required for performing some computations. The neural network learns from external and stores in the Blockchain.

ii. Architecture

The architecture of Blockchain thinker is input-process-output model. The input is various data obtained from external. This data is processed in distributed environment. The output is the actions taken based on the results of processing.

iii. Input

Various sensors are employed to collect data from external. For example, in a home automation system, sensors such as gas detector, power detector, smoke detector, cameras, fire detector, temperature sensors, water level detector, proximity sensor, pressure sensor, water quality sensor, IR sensor, motion detector, accelerometer sensor, gyroscope sensor, humidity sensor, optical sensor are used to collect data from external. This data is stored in Blockchain as a distributed file. These files are retrieved using internet from distributed locations. These sensors are recording the mind of a person and his mood also into digital files. The daily routine of a person is digitally stored along with the person's mood and the actions based on his mood.

iv. Processing

The data retrieved from distributed locations are analyzed using deep learning networks to take decisions. For example, there is a noise received from sound sensor, the noise is analyzed whether from a television

set or from a cracker blast or from a toxic substance burst. The analysis is done by smart contracts running in different machines in a distributed way. A right decision is taken after the analysis. For example, in case of a fire accident, the owner of the house has to be alerted.

A person's behavior is studied by the deep learning networks. The mind and mood patterns are analyzed to predict the sequence of next activities. For example, when one person is doing exercise, the next action can be taking bath.

v. Self mining system

When one sensor transfers data, another sensor is doing mining to validate the genuineness of data transferred. For example, when a camera detects the owner waiting for the door to open, the proximity sensor mounted in the door is doing mining work. The camera sensor data is validated and approved by proximity sensor to take next action such as opening the door.

vi. Proof of decision

The Blockchain thinker supports proof of decision by the participant nodes of the Blockchain. For example, in a home automation system, all sensors constitute a Blockchain. when camera sensor takes the decision to open the door, more than 50% of the sensors approve the decision to prove the genuineness of the decision. This avoids a malicious attack from external hacker to open the door illegally.

vii. Output

The output of a Blockchain thinker is an action or a feedback loop or a just notification. The actions are executed by smart contracts running on different participant nodes of the Blockchain. Feedback loops help to learn the environment. Notifications are used to update the states of the participant nodes. For example, actuators are used to perform actions such as opening the door, closing the door, switching on the geizer etc.

III. Use cases

i. Academic credentials on Blockchain

Verifying the academic credentials is a tedious task which is mostly performed by third parties involving cost and time. As people graduating every year are increasing in countries like India and china and migrating to USA and other countries for higher education. In this process verifying the transcripts for foreign universities becomes a tedious task to eliminate and identify the fake certificates. In this process lot of third parties is involved incurring huge cost to universities and even employers which also involves counterparty risks. Blockchain would be an excellent solution to resolve this issue. Universities can issue their transcripts on Blockchain which are distributed, secure, transparent and any employer / university can verify the credentials online thereby reducing fraudulent claims of unearned educational credits.

ii. Professional Profile Verification

Profile verification has become of the biggest challenge in the industry. Whenever any company post jobs lot of candidates apply for the job and its very tedious to really validate the real candidates and candidates with fake experience in this process the company need to evaluate them using third parties which involves verifying the profile, bank statements and pay slips of the candidate and even some times these documents are also manipulated. To eliminate and create a better professional profile platform we can implement an Blockchain based profile verification system where employers and employees are involved as stake holders and the employer will validate the profile in Blockchain whenever any employee claims his experience in the company which eliminates fraudulent candidate profiles.

iii. **KYC [Know Your Customer]**

KYC is an mandate for every customer of the bank to prove their existence by submitting proof of Address/Identity which involves collecting, tracking and store huge amounts of data in centralized servers. More and more people are migrating to other countries and cross-border banking transactions have grown enormously which needs to ensure security measures in the process. In the existing system as every bank have their own specification and this lack of standardization, complying to each request is time consuming. Due to frequent change of regulation rules it becomes irksome for any customer to provide same information to different banks. Blockchain would be an excellent solution in which customer enters into this eco system and bank verifies the documents and uploads to Blockchain. The updates can be accessed by any entities in real time as and when required which eliminates the tedious process submitting the same document to multiple banks.

iv. **Records Management**

Securing and tracking government records is a challenging issue due to paper based processes and there is huge scope of manipulating and tampering records. In this scenario Blockchain enables to maintain a decentralized, transparent and secure system where all the government records can be stored and verified online without any third party involvement which increases the accountability between authorities and those they serve. As data is distributed it eliminates the data threats and hacking of government records which is now a huge concern for government authorities.

IV Advantages of Blockchain

Many of the real time issues can be fixed using blockchain. It can be also applicable for maintaining our financial life. It also has a lot of impact on industries. Some of the major advantages of block chain are

1. Decentralized

Banking sector shackle and handle customers in monopoly way. A huge amount of money is charged to verify the customers own particular assets.

After being decentralized also blockchain is still applicable to a large number of users. It also retains some additional advantages such as no middle man scenario and most importantly the whole network is not in control of any one.

2. Distributed

In spite of having a centralized server, the network is still distributed. The data is spread to all over the user and nodes. Henceforth every user has control over the system. Blockchain networks are also compatible with IoTs. In realistic it is unbackable.

3. Immutable

Over time, the process of recovery and undoing gets tougher. So, in that sense, the technology can be said to be immutable. It's a good and bad thing at the very same time. If you are a freelancer, once the client sends you the payment. Such a feature makes the tech more robust and sustainable and more trustworthy among the users.

4. Trustless

Users follow a common consensus algorithm that will verify every transaction and store it one the common ledger. Moreover, everyone can see the all the transactions made. And if any transaction violates

this consensus algorithm, the transaction itself gets violated. So, even if the parties don't trust each other, it doesn't matter. The system is designed to ensure safety and common trust among the users.

IV. Disadvantages of Blockchain

1. Block Size variation

The blocks can contain various types of data.

- A more centralized rather than distributed network.
- Creation of smaller ledgers which will harm the immutability and the consensus algorithm.

None of these conditions are desirable as it changes the very appealing nature of the technology that everyone wishes for.

2. Immutable Smart Contracts

A smart contract is a contract between two individuals that have an absolute time limit and conditions. Once these conditions are met, the deal becomes self-validating. Ethereum first introduced the smart contracts.

A significant characteristic of such smart contracts is they are immutable. Meaning, once you have made the deal with the conditions to fulfill become unchangeable. The hackers could use this very feature to attack us. Again, if they can crack the code to creating such contracts disasters will follow by.

3. Market Specialization

The blockchain technology just started growing. One of the primary reasons why people are afraid of is because of the volatility, and there are just too many blockchains on the market. Which blockchain should you choose and which cryptocurrency you should even invest on. The market is too much speculative.

4. Higher Network Cost

A blockchain consists of nodes. But some blockchain ecosystems have a limited number of nodes. If the total number of the users surpass the number of nodes, the whole network may crumble. Such scenarios raise two major problems –

- Higher costs
- Slower transaction rate

Sooner there might be the introduction to the incentive nodes. Thus, there is a significant possibility of creating a new digital system which entirely against the underlying ideology of the technology itself.

5. Power Consuming

Running the consensus algorithm is indeed a daunting task for the processors. PoW entirely depends on the raw processing powers of the nodes. Sadly, without spending much processing power and electrical power, you cannot mine enough coins. Moreover, the whole copy of the overall system is stored to all the members within the network. Having the data in all the nodes might make you think how much data it consumes.

6. Cross chain transaction

As numerous Blockchains are evolving there is a need for developing Interledger protocols which enables to make transactions from one Blockchain to another Blockchain. Till date there are very few protocols developed with limited functionalities.

V. Conclusion

Block chain process is formulated based on blockchain thinking and formulating thinking. Blockchain thinker helps to build more intelligent systems by combining Blockchain with AI. The system is continuously learning itself and takes smart decisions like a human. It learns the mind, mood and behavior of a person and records the mind map, mood swings and sequence of activities of a person. The transactions are made secured and avoid a malicious attack from a hacker. Blockchains allow us to have a distributed peer-to-peer network where non-trusting members can interact with each other without a trusted intermediary, in a veritable manner. Blockchain thinking might give rise to new forms of consensus models such as self-mining ecologies and proof of intelligence. Blockchains give us resilient, truly distributed peer-to-peer systems and the ability to inter-act with peers in a trustless, auditable manner. Incentivizing behavior with purpose-driven tokens, transparency and reduction of bureaucracy & transaction costs are makes the system more secured. Advantages and disadvantages of Block chain are finally stated.

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