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Blockchain Technology: An Overview

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Abstract: ***Digital world has produced efficiencies, new innovative products, and close customer relationships globally by the effective use of mobile, IOT (Internet of Things), social media, analytics and cloud technology to generate models for better decisions. Block chain is recently introduced and revolutionizing the digital world bringing a new perspective to security, resiliency and efficiency of systems. While initially popularized by Bit coin, Block chain is much more than a foundation for crypto currency. 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.***

Keywords- Bit coin, Medical services, Standards, Cloud computing, Ethics

I. INTRODUCTION

Block chain is a distributed ledger technology, commonly used in the crypto currency Bit coin. The Financial Times (2016) defines Block chain 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".

The Block chain is an undeniably ingenious invention – the brainchild of a person or group of people known by the pseudonym, Satoshi Nakamoto. But since then, it has evolved into something greater, and the main question every single person is asking is: What is Block chain?

By allowing digital information to be distributed but not copied, Block chain technology created the backbone of a new type of internet. Originally devised for the digital currency, Bit coin, (Buy Bitcoin) the tech community is now finding other potential uses for the technology.

Bit coin has been called "digital gold," and for a good reason. To date, the total value of the currency is close to $9 billion US. And block chains can make other types of digital value. Like the internet (or your car), you don't need to know how the block chain works to use it. However, having a basic knowledge of these new technology shows why it's considered revolutionary.

II. WHAT IS BLOCK CHAIN GUIDE

- "The block chain is an incorruptible digital ledger of economic transactions that can be programmed to record not just financial transactions but virtually everything of value."
- Block chain technology is like the internet in that it has a built-in robustness. By storing blocks of information that are identical across its network, the block chain cannot:
- Be controlled by any single entity.
- Has no single point of failure.

Bit coin was invented in 2008. Since that time, the Bit coin block chain has operated without significant disruption. (To date, any of problems associated with Bit coin have been due to hacking or mismanagement. In other words, these problems come from bad intention and human error, not flaws in the underlying concepts.)

The internet itself has proven to be durable for almost 30 years. It's a track record that bodes well for block chain technology as it continues to be developed.

The block chain network lives in a state of consensus, one that automatically checks in with itself every ten minutes. A kind of self-auditing ecosystem of a digital value, the network reconciles every transaction that happens in ten-minute intervals. Each group of these transactions is referred to as a "block".

A. Two important properties result from this are;

- Transparency data is embedded within the network as a whole, by definition it is public.
- It cannot be corrupted altering any unit of information on the block chain would mean using a huge amount of computing power to override the entire network.
- "Block chain solves the problem of manipulation. When I speak about it in the West, people say they trust Google, Facebook, or their banks. But the rest of the world doesn't trust organizations and corporations

that much -I mean Africa, India, the Eastern Europe, or Russia. It's not about the places where people are really rich

- A network of nodes
- A network of so-called computing "nodes" makes up the block chain.

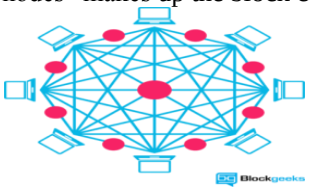

Fig. 1 Network nodes of Blockchain

In fact, each one is competing to win Bit coins by solving computational puzzles. It's now recognized to be only the first of many potential applications of the technology. There are an estimated 700 Bit coin-like cryptocurrencies (exchangeable value tokens) already available. As well, a range of other potential adaptations of the original block chain concept are currently active, or in development.

"Bitcoin has the same character a fax machine had. A single fax machine is a doorstop. The world where everyone has a fax machine is an immensely valuable thing."

Advantages and Disadvantages of Blockchain

A. Advantages of Blockchain

Fig. 2 Advantages of Blockchain

B. Strengths of Blockchain Technology

i. Process Integrity

- Due to the security reasons, this program was made in such a way that any block or even a transaction that adds to the chain cannot be edited which ultimately provides a very high range of security.

ii. Traceability

- The format of Blockchain designs in such a way that it can easily locate any problem and correct if there is any. It also creates an irreversible audit trail.

iii. Security

- Blockchain technology is highly secure because of the reason each and every individual who enters into the Blockchain network is provided with a unique identity which is linked to his account. This ensures that the owner of the account himself is operating the transactions. The block encryption in the chain makes it tougher for any hacker to disturb the traditional setup of the chain

iv. Faster processing

- Before the invention of the block chain, the traditional banking organization take a lot of time in processing and initiating the transaction but after block chain technology speed of the transaction increased to a very high extent.
- Before this, overall banking process takes around three days to settle but after the introduction of Blockchain, the time reduced to nearly minutes or even seconds.

A. Disadvantages of Blockchain & The weakness of Blockchain Technology

Fig. 3 Disadvantages of Blockchain

i. Power Use

The consumption of power in the Blockchain is comparatively high as in a particular year the power consumption of Bitcoin miners was alone more than the per capita power consumption of 159 individual

countries. Keeping a real-time ledger is one of the reasons for this consumption because every time it creates a new node, it communicates with each and every other node at the same time.

ii. Cost

As per the studies as an average cost of the Bitcoin transaction is $75-$160 and most of this cost is covered by the energy consumption. There are very fewer chances that this issue can be resolved by the advancement in the technology. As the other factor that is the storage problem might be covered by the energy issues cannot be resolved.

iii. Uncertain regulatory status

In each and every part of world modern money has been created and controlled by the central government. It becomes a hurdle for Bitcoin to get accepted by the preexisting financial institutions.

So, this was all about advantages and disadvantages of Blockchain. Hope you like our explanation of Pros and Cons of Blockchain technology.

III. APPLICATIONS

What are the real-world applications of Blockchain technology?

A development platform: Blockchain, born with Bitcoin, has proven to be a reliable platform for the development of multiple 'contractual' and 'transaction' based use cases.

Holds a distributed System of Record: Both dynamic data (transactions) and static data (registry) are recorded in the block chain.

Secure and Immutable: Due to it's distributed structure and consensus- driven mechanism all participants/nodes in the peer-to-peer network need to validate the transaction and hence the nature of block chain is very secure. Any attempt to tamper data will create a need to change data present on all computers (nodes) within the network, and any violation will make the tampering invalid.

With these features, there is a major hype around possible use-cases of block chain technology. But before we try to explore some truly valid use cases, let us try to understand 'why' do we need Block chain or more importantly, do we really need it

The product can be tracked at every stage creating the record of the location, who handled it and when. It can also record details like temperature, internal pressure at each point to help retailers be assured of product safety. This could possibly solve the problem of lost or damaged products in the shipment and increase accountability at each point. Due to an accurate, specific and immutable nature, retailers can resolve issues easily.

Wal-Mart is experimenting with block chain to address food safety by tracking the place of food items and faster identification of the source of an issue if any product is causing health problems to customers.

IV. CONCLUSION

This paper has tried to demonstrate that block chain technology's many concepts and features might be broadly extensible to a wide variety of situations. These features apply not just to the immediate context of currency and payments (Blockchain 1.0), or to contracts, property, and all financial markets transactions (Blockchain 2.0), but beyond to segments as diverse as government, health, science, literacy, publishing, economic development, art, and culture (Blockchain 3.0), and possibly even more broadly to enable orders-of-magnitude larger-scale human progress.

Blockchain technology could be quite complementary in a possibility space for the future world that includes both centralized and decentralized models. Like any new technology, the block chain is an idea that initially disrupts, and over time it could promote the development of a larger ecosystem that includes both the old way and the new innovation. Some historical examples are that the advent of the radio in fact led to increased record sales, and ereaders such as the Kindle have increased book sales. Now, we obtain news from the New York Times, blogs, Twitter, and personalized drone feeds alike. We consume media from both large entertainment companies and YouTube. Thus, over time, block chain technology could exist in a larger ecosystem with both centralized and decentralized models.

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