Blockchain Technology

February 8, 2019

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The cryptocurrency and the technology used in cryptocurrency is making news since many years. Now, the applications of that technology are being explored. Hence, the technology has to be understood thoroughly. One can expect the questions on it in mains especially.

In news

Budget-2019 says about Blockchain Technology for use of Government

Placing it in the syllabus

Awareness in the fields of IT, Space, Computers, robotics, nanotechnology, bio-technology and

issues relating to intellectual property rights.

Static dimensions

1. Technology behind blockchain
2. Cryptocurrency

Current dimensions

Debates on positive utility of Blockchain Technology

Content

About Blockchain Technology

The Blockchain is an encrypted, distributed database that records data, or in other words it is a **digital ledger** of any

transactions, contracts — that needs to be independently recorded. One of the key features of Blockchain is that this digital ledger is accessible across several hundreds and thousands of computers and is not bound to be kept in a single place.

With Blockchain technology in financial sector, the participants can interact directly and can make transactions across the internet without the interference of a third party. Such transactions through Blockchain will not share any personal information regarding the participants and it creates a transaction record by encrypting the identifying information.

The most exciting feature of Blockchain is that it greatly reduces the possibilities of a data breach. In contrast with the traditional processes, in Blockchain there are multiple shared copies of the same database which makes it challenging to wage a data breach attack or cyber attack . With all the fraud resistant features, the Blockchain Technology holds the potential to revolutionize various business sectors and make processes smarter, secure, transparent, and more efficient compared to the traditional business processes.

Advantages

1. Increased **time effectiveness** due to the real-time transactions.
2. **Direct Transactions** eliminate the overheads and intermediary costs.
3. **Reduced risks** related to cybercrimes, frauds and tampering.
4. More transparent processes with a **proper record creation** and tracking.
5. **Highly secure** due to cryptographic and decentralized Blockchain protocols.
6. **Accuracy:** Transactions on the blockchain network are approved by a network of thousands or millions of

computers. This removes almost all human involvement in the verification process, resulting in less human error and a more accurate record of information.

7. **Decentralization:** Blockchain does not store any of its information in a central location. Instead, the blockchain is copied and spread across a network of computers.

8. **Privacy**: Many blockchain networks operate as public databases, meaning that anyone with an internet connection can view a list of the network's transaction history. Although users can access details about transactions, they cannot access identifying information about the users making those transactions.

Applications of Blockchain Technology In Various Industries

Blockchain technology can be utilized in multiple industries including Financial Services, Healthcare, Government, Travel and Hospitality, Retail and CPG.

1. **Financial Services:** In the financial services sector, Blockchain technology has already been implemented in many innovative ways. Blockchain technology **simplifies and streamlines** the entire process associated with asset management and payments by providing an automated trade lifecycle where all participants would have access to the exact same data about a transaction. This **removes the need for brokers or intermediaries** and ensures transparency and effective management of transactional data.

2. **Healthcare:** Blockchain can play a key role in the healthcare sector by increasing the privacy, security and interoperability of the healthcare data. It holds the potential to address many **interoperability** challenges in the sector and enable secure sharing of healthcare data among the various entities and people involved in the process. It **eliminates the interference of a third-party** and also avoids the overhead costs.

With Blockchains, the healthcare records can be stored in distributed databases by encrypting it and implementing digital signatures to ensure privacy and authenticity.

3. **Government:** Blockchain technology holds the power to transform Government's operations and services. It can play a key role in **improving the data transactional challenges** in the Government sector. The proper linking and sharing of data with Blockchain enable better management of data between multiple departments. It improves the transparency and provides a better way to monitor and audit the transactions.

4. **Consumer packaged goods (CPG) and Retail:** There is a huge opportunity for Blockchain technology to be applied in the retail sector. This includes everything from **ensuring the authenticity** of high value goods, preventing, fraudulent transactions, locating stolen items, enabling virtual warranties, managing loyalty points and streamlining supply chain operations.

5. **Travel and Hospitality:** The application of Blockchain can radically change the travel and hospitality industry. It can be applied in money transactions, storing important documents like passports/ other identification cards, reservations and managing travel insurance, loyalty and rewards.

Problems with blockchain/ Ill-effects

1. The main negative impact on current implementations of blockchain relates to **energy usage** and consequential environmental and other impacts. Blockchains require a lot of **computing power,** which in turn requires a lot of electricity and cooling power.

2. While blockchain-based solutions — or crypto governance in general — has been offered as a way to alleviate some environmental problems by increasing traceability and

ensuring ownership, the negative impact of these solutions to the environment should not be ignored.

3. The current architecture of the blockchain is high on energy consumption, and also has **problems with scaling**. The root problem is that all transactions in the blockchain have to be processed by basically everyone and everyone must have a copy of the global ledger.

4. As the blockchain grows, more and more computing power and bandwidth are required and there is a **risk of centralisation** of decision making and validation power in the blockchain as only a few want to devote their efforts to keeping the blockchain running.

5. Along with problems of scaling, the issue of governance in blockchains is an unsolved challenge. Since there is no central actor, there needs to be mechanisms for solving disputes.

6. **Network size:** Blockchains (like all distributed systems) are not so much resistant to bad actors as they are 'antifragile' – that is, they respond to attacks and grow stronger.

7. **Unavoidable security flaw:** There is one notable security flaw in bitcoin and other blockchains: if more than half of the computers working as nodes to service the network tell a lie, the lie will become the truth. This is called a '51% attack' and was highlighted by Satoshi Nakamoto when he launched bitcoin. For this reason, bitcoin mining pools are monitored closely by the community, ensuring no one unknowingly gains such network influence.

Associated topic with Blockchain Technology

Cryptocurrency

What is it?

A cryptocurrency is a digital or virtual currency designed to work as a medium of exchange. It uses cryptography to secure

and verify transactions as well as to control the creation of new units of a particular cryptocurrency. Essentially, cryptocurrencies are limited entries in a database that no one can change unless specific conditions are fulfilled. Following are the **examples of crypto currency:**

Bitcoin, Ethereum, Ripple, Bitcoin Cash, NEM, Lite coin, IOTA, NEO, Dash, Qtum, Monero, Ethereum Classic, Cardano, Stellar, etc