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Blockchain Technology: Application in the Financial Industry

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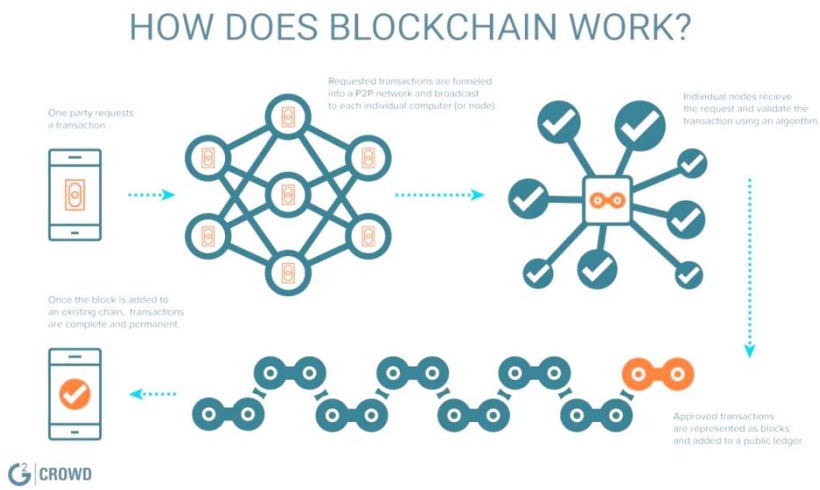
Abstract
Cryptocurrencies and their underlying blockchain technology are being out as the next big thing after the creation of the internet. The Blockchain is an encrypted, distributed database that records data, or in other words, it is a digital ledger of any transactions, contracts - that needs to be independently recorded. Blockchain has been initially launched as an approach to payment transactions based on cryptography to provide an alternative mechanism for the trust between two transacting parties. Blockchain technology has sparked a lively debate among researchers. This article tried to study the applications of blockchain technology in the financial industry.

Keywords: Blockchain Technology, Applications, Opportunities, Challenges, Financial Industry

Introduction

"*The blockchain is an incorruptible digital ledger of economic transactions that can be programmed to record not just financial transactions but virtually everything of value*." - Don & Alex Tapscott, authors Blockchain Revolution (2016). According to the article published by Forbes magazine, blockchains is a secure distributed database that preserves ordered lists of records, known as blocks, which cannot be changed. Imagine a Microsoft Excel spreadsheet that can be copied as many times as we want across a network of computers, and suppose this network of the computer can regularly update the excel spreadsheet. In the same way, blockchain technology is working (see figure 1). Blockchain technology, first used for Bitcoin cryptocurrency, launched in 2009. Blockchains is a secure, shared database that maintains ordered lists of records. These records are known as blocks, which can't be distorted. Each block contains a ten minutes timestamp and links to a previous block.

Figure 1: Working of Blockchain Technology



Source:https://www.cnet.com/news/blockchain-explained-builds-trust-when-you-need-it-most/ retrieved on 20/01/2019

A distributed database is based on decentralizing technology and is not connected with a single computer system. Users can access their blocks with a digital password. Only the block owner and whomever the owner chooses to share the key with have access to the block. A block can store any number and type of data, including cryptocurrency, and cryptocurrency doesn't exist outside of a block. (Peone, 2018). All users can review previous records as well as record new ones. Transactions are grouped in blocks, recorded one after the other in a chain of blocks. The links between blocks and their content are protected by cryptography, so previous transactions cannot be destroyed or forged. The ledger and the transaction network are trusted without a central authority.

Blockchain and the Financial Industry

The potential future of leveraging on Blockchaintechnologyis to change the financial world fundamentally. Blockchain technology has also attracted interest from Central Banks, financial institutions, and technology firms, who are currently discussing and investigating the opportunities and challenges of using Blockchain technology. The financial industry realizes that Blockchain technology has enormous potential. (Meijer, 2015) The recent report of KPMG discussed the benefits of Blockchain technology are mainly related to the transparency of data, faster access to the information, real-time synchronization of information, reduce capital requirement due to the faster settlement of trade, Immutable records reduce the chances of fraud. Blockchain technology will resolve several problems faced by the financial sector see table 1.

Table 1: Comparison of traditional banking businesses, Internet finance businesses, and Blockchain with banking businesses

Particular	Traditional Business	Internet finance business (FinTech 1.0)	Blockchain + banks (FinTech 2.0)
Customer Experience	Uniform Scenarios	Rich Scenarios	Rich Scenarios
	Homogeneous services	Personalized service	Personalized service
	Poor customer experience	Good customer experience	Good customer experience
Efficiency	Many intermediate links	Many intermediate links	point to point transmission, disintermediation
	Complex clearing process	Complex clearing process	Distributed ledger, transaction = clearing
	Low efficiency	Low efficiency	High efficiency

Cost	Large amount of manual inspection	Small amount of manual inspection	Completely automated
	Many intermediate links	Many intermediate links	Disintermediation
	High Cost	High Cost	Low cost
Safety	Centralized data storage can be tampered	Centralized data storage can be tampered	Distributed data storage cannot be tampered
	Easy to leak user's personal information	Easy to leak user's personal information	Use if asymmetric encryption, User's personal information is more secure
	Poor safety	Poor safety	Good safety

Source: Ye Guo and Chen Liang. (2016)

International Payment

Generally, international payments often rely on processing by intermediary clearing firms, which involves a series of complicated processes, including bookkeeping, transaction reconciliation, balance reconciliation, payment initiation, etc. The remittance requires approx. Three days to complete depending upon the clearing procedures of the involved country. It blocks the high volume of the fund and results in inefficiency. Therefore, cross-border payments are always being costly and slow. Further, sometimes it isn't easy to trace the transaction's origination, which opens the opportunity for money laundering. The Blockchain has the potential to speed up this process and can also reduce the cost of transactions significantly.

Fraud Reduction

Money is involved in all economic transactions in both physical and virtual forms. The involvement of money increases the chances of fraudulent activities. Financial sector currently has a high rate of fraud. Today, financial institutions are using a centralized database system for transactions and money management. Centralized databases are highly vulnerable and can be attacked by hackers if any single point of the system fails. Therefore, financial institutions require more secure systems. Blockchain technology can be a potential solution. Since Blockchain is distributed, there is no chance of a single point of failure. Each transaction is stored in a block with a cryptographic mechanism, which is extremely difficult to corrupt. Blockchain operates with contactless interface cards. This provides a much higher level of security. Hardware is used to help secure private keys with smart cards. It allows access to cryptographic keys that are untethered. Despite being a new technology in the market, the Blockchain can reduce fraud in the financial sector.

The smart Contracts

One of the most promising applications of blockchain technology is the smart contract. It can execute financial transactions and contracts automatically. It also enforces the obligations of all parties in a contract without the added expense of a middleman. The complex International trade transactions and terms of trade can be uploaded on the Blockchain network. This Blockchain is then shared with concerned parties such as importer, exporters, and banks on the single distributed ledger. Once certain specified conditions of the agreement are met, the smart contracts will automatically execute themselves. The involved parties can view all the transactions performed. An Israel-based start-up and Barclays has successfully completed a trade transaction that would generally take 7 to 10 days, in just 4 hours, using Blockchain technology. When compared to the existing infrastructure, the use of Blockchain can reduce costs dramatically relating to licensing, ticketing as well as other overhead charges and would help increase the speed and simplify complex processes. This will also ensure accurate information transfer as the transaction will be approved only if all the code's written conditions are met. Finally, information is available to all the parties involved in the transactions, the chances of error at the time of execution are reduced radically.

Know your Customer

Financial institutions in India are responsible for complying with and reporting several Reserve Bank of India and other regulators' requirements. This regulation was created to minimize money laundering activities and financial crimes. Banks and financial institutions are strictly concerned about the increasing costs that they have to bear to comply with Anti-money Laundering and Know Your Customer norms. All these processes consume a lot of time and have to be performed individually by all the banks and money-based institutions. Know Your Customer (KYC) is an essential requirement here, but the process is time-consuming and requires an automated customer identification technology to be efficient and effective. Blockchain technology would automate the account opening process and share the KYC documents with all the participants through a digital single source ID. This would reduce not only resources and costs but also maintain the privacy of the data.

Insurance: Claims Processing

Today's insurance industry faces challenges in the claim-processing process primarily due to fraudulent claims, manual processes, legacy underwriting models, and fragmented data sources, causing low customer satisfaction. Policies can be created as smart contracts on Blockchain as an ideal use case for insurance. This will ensure that all policies get recorded appropriately and linked with the claims more transparently. Blockchain technology could trace the origin of the ownership of assets such as homes and cars, thereby preventing the payment of fraudulent claims. It could improve the risk modeling for the sector by comparing data across the existing silos.

Bank credit information systems

The current credit information system is inefficient due to scarcity and poor quality of information about a customer to judge their credit capacity. Simultaneously, due to privacy and security concerns, it is difficult to share this information with other financial institutions. The current credit information system is not a hundred percent accurate for the asset's ownership under claim. The potential solution to these problems would be Blockchain technology as it is a distributed database, can provide some assistance in addressing these issues.

Distributed innovations in financial transactions

Supply-chain finance involves an extensive number of manual inspections and paper-based transactions. The process also has numerous intermediaries, a high risk of illegal transactions, high costs, and low efficiency. Blockchain technology can drastically reduce manual interventions and employ smart contracts to digitize procedures that rely heavily on paperwork. This would greatly improve the efficiency of supply-chain finance and reduce manual operational risks. With the supplier, buyer, and bank as the main trading parties, and the sharing of contractual information on a decentralized distributed ledger, smart contracts can ensure that payments are made automatically once a predetermined time and result is reached.

Adoption of Blockchain technology and challenges

Blockchain sure has its advantages in terms of adoption given its proposed features, but there are some hurdles. Banks and financial institutions need to consider these hurdles to implement Blockchain technology effectively.

Privacy:

The experts are predicting that blockchain technology will replace banks and financial institutions. However, the people have trust in banks, not in the machine. This transformation requires making blockchain technology trustworthy for the people who are going to use it. The Blockchain should able to keep the secrecy and identity of individuals who are using it.

Encryption:
An Authorized User with a private key can only access the blockchain network. The entire security of the system is based on this key only. However, once the private key is lost or misplaced, there is no other way to retry it again. Thus, it is also important to note the banking industry needs to develop a proper mechanism to secure the private key.

Security:
The Blockchain is based on cryptography techniques, which make it safe and secure. Breaching such a network required a huge amount of computational work. When this technology would be used for the banking sector, it demands a system capable of restricting unauthorized users from accessing the system.

Scalability:
Soon, the network database will grow like anything. Further, as financial institutes and people start using Blockchain technology, the amount of database required will increase. The biggest challenge predicted by the Blockchain expert is that do the Blockchain can maintain the speed of accessibility by handling a huge amount of traffic. Thus, it is necessary to build a system that has the capacity to larger volume of data.

Energy Consumption:
Blockchain technology worked based on a network and required a huge amount of computational work. It increased the consumption of energy and harmed the environment by adding a massive carbon footprint. Thus, it is almost important for the banking industry to work on this issue before adopting Blockchain technology.

Legal Regulations:
Blockchain technology would mainly be useful for the banking sector. Currently, Blockchain technology is vulnerable. It does not have any international and national regulations or standards on which it can be managed and monitored. However, if it is possible to identify any solutions concerning the standards of regulations for Blockchain, it would expand its future application in the banking sector.

Conclusion

The article discussed the basics of Blockchain technology and its application in the Financial Industry. It also has discussed the potential major challenges of using Blockchain for the financial industry. The article highlighted that blockchain technology might be implemented for financial functions such as international payment, insurance, execution of contracts, know your customer clearance, credit system, and financial supply chain. The application of Blockchain in the financial industry will increase the efficiency and security of all financial transactions and will reduce the chances of fraudulent activities. However, there are many challenges associated with Blockchain and its application. This includes the key issues such as security, legal regulation, privacy as Blockchain does not have any centralized regulatory organization. However, blockchain technology has the potential to offer a solution to many challenges faced by the financial industry.

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