A REVIEW REPORT ON CHALLENGES OF BLOCKCHAIN TECHNOLOGY IN SUPPLY CHAIN MANAGEMENT

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Abstract
The research has explored the potential impact of blockchain and Internet of Things on supply chain management. In this article, we argue that while blockchain and Internet of Things have some potential to impact supply chains will require significant research advances. Blockchain technology has emerged as a primary enabler for verification-driven transactions between parties that do not have complete trust among themselves. Bitcoin uses this technology to provide a verifiable ledger that is based on consensus. The use of blockchain as a transaction service in non-cryptocurrency applications, like business networks, is at a very growing stage. While the blockchain supports transactional origin,the data management community and other scientific and industrial communities are assessing how blockchain can be used to enable certain key capabilities for business applications. In this article paper, we discuss the challenges of Block chain Technology in supply chain management. Blockchain is a decentralized, distributed database that maintains a continuously growing list of secure data records. It first emerged in the context of Bitcoin, where it serves as a decentralized, distributed digital ledger recording all Bitcoin transactions. Bitcoin is a currency that is controlled by the network of users instead of by centralized banks. Through the use of Bitcoin, money can be transferred directly.
Furthermore, a review is conducted on the latest implementations of blockchain technology in various business organizations. Finally, a new case study of a blockchain-based business platform is presented addressing the drawbacks of current designs, followed by recommendations for future blockchain researchers and developers. The ability to exchange data securely is important so that new borderless integrated business services can be provided to clients

Keywords: Blockchain Technology, Internet of Things, Crypto currency, Data Management, Decentralized Applications, Blockchain based platform.

Introduction

Block chain is adecentralized, distributed database that maintains a continuously growing list of secure data records. It first emerged in the context of Bitcoin, where it serves as a decentralized, distributed digital ledger recording all Bitcoin transactions.[1] Bitcoin is a currency that is controlled by the network of users instead of by centralized banks. Through the use of Bitcoin, money can be transferred directly. In the traditional banking system, when money is transferred through banks, they are notified to transfer the money; the banks will send notification and update accounts appropriately. The relevant data is stored in a database owned by the bank and users only have partial access to that data. Users must trust third parties. This approach has an implication that if some third party or the bank itself manipulates the data or commits fraud, it might be challenging for all participants to quickly and efficiently detectthis. On the other hand, the Bitcoin database is decentralized and distributed, so that every one has theentire database on his or her own device.These are not copies of some original database but they are the database itself. Thus, if a specific device is hacked, or imports incorrect data, the network will not accept this, and will correct the data using other databases. Unless a single entity controls more than half of the devices on the network, it is almost impossible to delete or edit data. In blockchain, data is stored in blocks of data that are linked to the previous blocks. On average, every ten minutes Bitcoin creates a block of data an dalluser devices will permanently store that data. Each block references the previous blocks, so if someone wants to change data in a block, he must change all previous blocks as well, which is almost impossible.

One important difference between block chain and a traditional centralized network is that blockchain-stored data is undeletable and inevitable. In a centralized database, there is always risk of fraud or external hacker attacks, while in a blockchain, the network will work consistently therefore, a large number of users almost significantly reduces the possibility offraud.

Blockchain can revolutionize Supply Chain Management IF the following problems areaddressed. The study showed that the solution to the following open questions will revolutionize blockchain-enabled supply chains.

How can physical products be linked to the digitalledger?

How can blockchain-enabled networks be linked to other externalmarkets?

How can blockchain be enhanced to account for complicated supply chain structures?

How can enough space be reserved to store the amount of information required by supplychains?

Blockchain Data Analytics

Built-in analytics forblockchain

As the original blockchain is purely a transaction repository, an execution engine will be required for analytics running directly on block chain data. A possible solution to this problem is to make blockchain data readily accessible by data parallel processing systems such as MapReduce or Spark. In particular, an input reader could be implemented so that Map Reduceand Spark programs are able to scan through blockchain data efficiently. Further, MapReduce or Spark execution nodes can be physically co-located with blockchain data nodes to reduce the need of data transfer, and hence improving analytics performance.Apartfrom the above batch analytics, there are also use cases such as IoT applications.

Integration and analytics across on-chain and off-chain data

It is worth noting that the need of data integration across multiple blockchains that an organization participates in, is just one dimension of the problem. Another dimension of data integration problem comes from common data entities referred by both the blockchains and the organization's legacy systems of record. In particular,where as block chains function independently of legacy systems in most cases, at somepoint in the application development process organizations will need to integrate blockchain data with their existing systems of record for deriving complete business insights. Since multiple parties are joining a blockchain network, cases of overlapping or inconsistent data between the blockchain and their legacy systems will likely arise. As a consequence, there is much scope for development of new techniques in entity resolution for big data spanning across blockchain and off-chaindata.

Intelligent Blockchain Systems

Blockchain technology has started to be used in a wider range of applications, e.g., Internet of Things (IoT).Nevertheless, the volume of data generated in thi sera of the Internet of Things is growing significantly, which puts blockchain systems to their limits of transaction throughput and storage capacity. Consequently, when a new piece of data arrives, it is important for the blockchain system to be able to understand the input data, reason about its relevance to the business so as to determine whether dropping the data or accepting and storing it in the blockchain. Recently, a technique to reduce data acquisition cost by only accepting data that is useful for answering queries has been proposed. However, none of prior systems is able to self learn the relevance of incoming data to the business. This necessitates an active-oriented and intelligent blockchain system for making sense and intelligently classifying incoming data, which greatly helps reduce redundant data storage and computation at later stages. In fact, intelligence can be embedded at every step in the pipeline of data processing inside a blockchain-basedsystems, similar to the concept to fintellective data warehousing.

Conclusion

Thus, for blockchain to have a significant impact on supply chain management, it has to eliminate the need for trusted third parties, and to be adapted to the specific needs to supply chains, both in terms of data requirements, and interms of the potentially complex structures of supply chains.We believe that in order for blockchain-enabled supply chain technology to reach its potential,and indeed,for many of the interesting proposed blockchain-enabled supply chain use cases to be feasible, technology must be developed to adapt and extend pureblock chain. If it is, we have little doubt that the potential here isenormous.

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