Emerging of Block chain Technology in Business Industry

Varadha Pally Vinay Reddy

MVSR ENGINEERING COLLEGE, Hyderabad, Telangana

Abstract- **Blockchain technology is emerging in every area. Blockchain is a constantly growing ledger in which every block in the network are connected with cryptographic hash of the previous blocks with distributed, decentralized and immutable properties. Supply Chain Management is collection of activities, organizations, suppliers etc, which maintain the flow of information about the products from its initial stages to until it reaches the consumer. With the implementation of blockchain technology in business area in the form of supply chain management it provides data transparency, traceability, reliability across the network. The paper discusses different case studies in which business companies are implemented and produced efficacious results. And it also shows how blockchain helps in overcoming fraudulent cases. The paper shows applications of blockchain and how its implemented in supply chain which provides transparency, immutability and distributed properties.**

Index terms- **Supply chain, Blockchain, Business Transparency, Network effects and Scalability**

I.INTRODUCTION

Blockchain is a chain of blocks in which every block is cryptographically hashed. One of the most appealing benefits of using blockchain in business is that it allows the data to be more interoperable. Due to this, it becomes easier for companies to share information and data with manufacturers, suppliers, vendors, and customers. Transparency in Blockchain helps reduce delays and disputes while preventing goods from getting stuck in the supply chain business industry. As each product can be tracked in real-time, the chances of misplacements are rare. If any, we can easily find them.

Blockchain offers scalability due to it's distributed (shared public ledger) network through which any large database is accessible from multiple locations from any parts of the world. It also provides higher standards of security and the ability to customize according to the data feed and needs of the user. Moreover, blockchains can be created privately too, which will allow the data to be accessed explicitly between the parties who have permission for it.

The value of adopting blockchain technology can be taken from the fact that it has the potential to connect different ledgers and data points while maintaining the data integrity among multiple participants.

The properties of transparency and immutability of blockchain technology make it useful for eliminating fraud in the supply chain and maintaining the integrity of the system.

Other than these, a few other benefits of adopting Blockchain technology in the supply chain industry are:

1. Reduce or eliminate fraud and errors
2. Minimize courier costs
3. Reduce delays from paperwork
4. Identify issues faster
5. Increase consumer and partner trust

How blockchain helps in enhancing supply chain management (Business)?

An effective supply chain management depends on several parameters of the chain like transparency and privacy at any instant of time which includes where goods are at any given time, and the origin of all the parts of the chain. By using blockchain technology-based records, we can store and share that information for every component by using shared public ledger so that we can track the flow, how it was created and where it is at any moment.

For business, as it depends on trust or reliability, they provide to the consumers by providing authentic products with transparency makes them more trustworthy. Benefits: By using blockchain, we can efficiently improve traceability and transparency, and a consumer can access to information of the product from it's the initial stage to until it reaches the

consumer. Measurement of supply chain management performance is often described in terms of objectives such as quality, speed, dependability, cost, and flexibility.

II. MOTIVATION

We often visit supermarkets for our daily products, In that super I have enthralled seeing apples from US, intrigued by those there must be some technology which provides trust which shows they are authentic apples(which are from US).This made a constant driving force in exploring blockchain technology in supply chain management. I have been doing research in this field for the last 1 year.

III. RELATED WORK

A prominent objective of supply chain management is also to reduce risks. Among the various risks that different organizations (companies) faces include relational risks such as a business partner's engagement in opportunistic behavior (e.g.,cheating, distorting information)[1](Baird & Thomas, 1991; Bettis & Mahajan, 1985). According to Svensson (2000)[1], the sources of risk in supply chains can be classified into two main categories, namely, atomistic or holistic. To deal with atomistic sources of risk, a selected and limited part of the supply chain need to be looked at to assess risk. This approach is suitable for components and materials that are of low-value, less complex, and easily available. On the other hand, holistic sources of risk require an overall analysis of the supply chain to assess risk. This approach is preferable for high-value, complex, and rare components and materials.

Application 1: FOOD SAFETY
 Food safety is one of the prominent areas where the research is going rapidly. Approximately, for one percent reduction in foodborne disease in the United States, it saves the US economy $700 million.

CASE 1: FOOD SUPPLY CHAIN
Alibaba teamed up with AusPost, Blackmores, and PwC to explore the use of blockchain to fight food fraud, which involves selling lower quality foods and often with counterfeit ingredients. The four companies aim to develop a "Food Trust Framework" to help improve integrity and traceability on the global supply chains. They are working to develop a pilot blockchain solution model that participants across the [2] the supply chain can use

With the increase of complexity involved in the food supply chain it is becoming a difficult job to trace the food through its chain.

Consumers are increasingly becoming aware and are demanding transparency in terms of the food they consume. Presently, about only 12 percent of consumers trust the brands that they purchase food from a company which produces that product. In a consumer driven society, the consumers has to know information of their food while 94 percent of consumers state that it is highly essential for them to learn about all the information related to the food products that they buy.

Blockchain resolves the issues of a convoluted supply chain by providing neutrality in the platform. Since there are no third parties involved in the transaction authorization i.e. which is a decentralized and everything works based on a consensus, both, the users and the operators of the system had to follow a set of rules to keep the system working in a efficient way.

Benefits of Blockchain in Food Safety:
1. Enhanced food safety.
2. Less Food waste.
3. Detect food fraud.

We are in dire need of reducing food waste because one-third of all food that's produced on the planet goes to waste.

CASE 2: WALMART
It is one of many business cases in which blockchain is implemented. Walmart in collaboration with IBM developed blockchain technology to monitor the consumer products by adding a RFID sensor tags to it's products.so that when a consumer wants to know about the product information like where it was produced, what are the ingredients that are used, expiry date and the suppliers etc. On May 31 2017, Walmart released the results of using blockchain technology in food supply chain and it reported that it reduced the time taken to track the food product form days to minutes [4].

And blockchain is also used in tracking the pork in china to know the illegal selling of pork[5].With the use of barcodes, sensors in supply chain provided the

relevant data about the storing information about the product which produced efficacious results in transparency and traceability across the supply chain.

CASE 3: Everledger

Everledger, an London based startup implemented blockchain technology in the tracking of diamonds to eliminate any illegal selling in the markets, It produced propitious results in providing transparency across the supply chain which lead to reduced risks and frauds [6]. Evenledger also used blockchain technology in tracking the wines by adding RFID tags for each bottle. As the bottle moves through the supply chain it stores the information of suppliers, location etc. which is used to track the bottle at any given time[7].

CASE 4: Modum

Modum, an swiss startup in collaboration with University of Zurich implemented blockchain technology to ensure safe delivery of medicines [8].

As we know that many medicines needs to be transported within the temperatures that medicines needs to be kept(sustained), humidity etc. With the conventional record keeping requires a tedious effort of storing information and monitoring the products. When the medicine reaches the destination, the information about the medicine is transferred to the ethereum based blockchain in which it is checked with all the requirements of the product with the standard requirements stored in smart contract[9]. If any medicine, not satisfying the requirements in smart contract are eliminated.so that we can get the medicine in proper conditions.

IV. CONCLUSION

In a consumer driven society, providing trust is the prominent objective of any company. Blockchain technology with it's distributed, decentralized and immutable properties provides trust, reliability to the consumers by providing details about the products in every step of the supply chain. And also many businesses should embrace this technology in order to increase their effectiveness in the market.

Due to immutability property once the data is entered can't be changed which makes it as one time data insertion due to this property we have to be very careful about the information of the product. Being

unequivocal at the transaction fees in the blockchain mining makes it as unreliable and the consensus algorithms that are used, and there is huge scope of research in which blockchain technology should be embraced which has the ability to revolutionize the supply chain etc. By integration of blockchain, IoT, Machine Learning which provides propitious results for the security concerns in every field.

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