Blockchain in Supply Chain Management

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Abstract: *This study focuses on impact of blockchain in having a sustainable supply chain. The aim of study is to define the use and concept of blockchain, focus on the existing parameters of blockchain that can help it in being more sustainable and study the possibilities of real time connect throughout supply chain with blockchain. As the modern need of customer arises, companies want to build a more sustainable business model and while every segment is being focused on, Blockchain provides a safe and secured method for supply chain management. With the complex algorithms it has been able to provide a secured methodology for transactions and the ever-changing algorithm is able to derive promises from supply chain management. As the preferences of consumers are changing, they want a product to reach faster and in a safer way, along with these factors the customers also want to keep an eye on the carbon footprint a particular brand is making, so the brands have to make sure they have a sustainable supply chain which can be achieved through blockchain technology.*

Keywords: Blockchain, SCM

1. Literature Review

1) Blockchain Design for SCM- January 2018-SSRN Electronic Journal DOI: 10.2139/ssrn.3295440 To investigate the impact of blockchain technology (BCT) on SCM and the inherent design issues, we consider a generic stochastic model, where a firm seeks to maximize the total expected discounted profit.

2) Supply Chain Management based on Blockchain: A Systematic Mapping Study- January 2018- Matec Web of Conferences-200 (2):00020

Groundbreakingly, blockchain technology (BCT) has gained widespread acceptance and importance in the last few years. Implemented in different areas of applications such as social and legal industries, finance, smart property, and supply chain networks. This technology assures immutability and integrity of data without the need of a third trusted party. Furthermore, BCT could guarantee a transparent and decentralized transaction system in businesses and industries.

3) Blockchain for the IoT: Privacy-Preserving Protection of Sensor Data- Journal of the Association for Information Systems 20 (9), IEEE

A constantly growing pool of smart, connected Internet of Things (IoT) devices poses completely new challenges for business regarding security and privacy. In fact, the widespread adoption of smart products might depend on the ability of organizations to offer systems that ensure adequate sensor data integrity while guaranteeing sufficient user privacy. In light of these challenges, previous research indicates that blockchain technology may be a promising means to mitigate issues of data security arising in the IoT.

2. Blockchain Technology

A blockchain, in simple terms, is a list of records that are commonly known as blocks which are interconnected by cryptography. Every block contains a cryptographic hash of the last block , a time stamp and an exchange information. Blockchain can be used to store information where everybody can see and if we want a particular audience to visit it, restricting blockchain can be done. When anything is recorded or stored inside blockchain it is exceptionally hard to change it. Blockchain has been able to develop transparency in its part so that every transaction can be scrutinized by any client. These salient factors have been able to generate trust in the public domain and lots of cryptocurrencies have been able to leverage this platform. Bitcoin being the largest of all. Financial protection was the most desired attribute of blockchain and cryptocurrencies were able to leverage this attribute.

3. A Sustainable Supply Chain through Blockchain

According to Kim and Laskowski, "Internet-aware sensors capture finely granular real-time data about products and environment characteristics as well as location and timestamps throughout the supply chain. So, lack of a digital footprint may no longer be an issue. Furthermore, distributed, shared databases using blockchain technologies promise to offer highly secure and immutable access to supply chain data."

Supply Chain has always been a major issue of concern for majority of retailers. Though Bitcoin was a success as a digital ledger, dealing with physical products is a totally different aspect. What we need from blockchain is not just a cloud storage that operates in real time but a self-learning functionality that rationalizes the need of the business. The logistics has always been an integral part of supply chain management so how blockchain will be able to support the logistics to take the Sustainable Short Route (SSR). SSR will help the business to be more efficient with the viable truck loading capabilities. This also opens doors for IoT in this segment.

Continuing with real time feedback, it also makes it a very fast and reliant network, though it will have huge trends by the end of 2025, blockchain in supplychain management will cause the end of cloud storing capabilities in coming days. When you have a more secure front, why businesses will turn to cloud. In days to come, consumers will buy only those products that are more eco friendly and have less carbon emission.

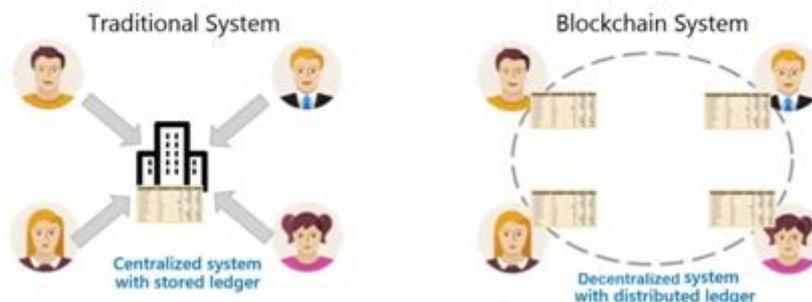Having a sustainable supply chain also means that the following factors will be impacted:

- Revenues
- Costs
- Quality

- Sales
- Speed of the production, distribution, and sales in the longer run.

Centralized vs. Decentralized

Supply chain will be able to leverage from decentralized blockchain where every aspect of the supply chain can access it and add or change information with respect to his domain, this data will be totally visible to other aspects but they cannot change it. Though cloud-based applications were able to deliver the same advantages but the security was questionable. Also, app-based devices weren't able to assure a 100% real time data generation. The logistics can be fully managed and short sustainable route can be developed for having a lower carbon footprint.

Not only sustainable, but blockchain has been able to modify the payment method used in supply chain as a whole. Freight forwarding, a term often used by logistic giants, blockchain will be able to leverage in many ways. In opening for research, blockchain will create a mass disruptive trend in coming days especially in supply chain management.

4. Summary

As the modern need of customer arises, companies want to build a more sustainable business model and while every segment is being focused on, Blockchain provides a safe and secured method for supply chain management. With the complex algorithms it has been able to provide a secured methodology for transactions and the ever-changing algorithm is able to derive promises from supply chain management.

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