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Blockchain Technology for E-commerce Industry

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Abstract

Blockchain technology is considered as a significant development after the invention of the internet. Blockchain technology records the transactions on database which are encrypted and distributed over many computer networks like a digital ledger of online transactions. This technology can be utilized in the e-commerce industry to develop a decentralized online buying and selling platform. E-commerce industry presently facing many unique challenges like security measures of the e-commerce system, transparency, and trust, efficiency, etc. These challenges can be answered by the implementation of blockchain technology in the e-commerce industry. The article discussed opportunities for using blockchain technology in the e-commerce industry. Blockchain applications and opportunities are discussed for various aspects of e-commerce like Payment, Security, Supply chain, Work automation with Smart contract, Ethical practices for transparency in e-commerce transactions.

Keywords: *Blockchain Technology, Applications, Opportunities, E-commerce Industry.*

1. Introduction

The Internet has changed the way we live our life. Every minute of our life in augmented by its use for sharing our view, virtual engagement on social networking sites, digital entertainment, marketing and even buying and selling. If organizations want to take advantage of the latest Internet technologies, then they should take strategic initiative. One of the most significant areas where a company can focus on is E-commerce. Electronic commerce is a revolutionary era which growing and continuously changing the way business has been managed. Moreover, it becomes the base for a new form of business around the world. E-commerce is built on the foundation of Electronic Data Interface (EDI) and other supported technology like the Internet, the World Wide Web, and Networks. Further, in the recent history blockchain is considered the remarkable technological advancement. It is based on disruptive computing, the science of cryptographic, and various forms of software. It can be defined as the chain of online transactions saved as a shared ledger across the many computers on a peer to peer network [1]. According to the World Economic Forum, blockchain has the potential to become a powerful tool for transactions that increases trust, empower users and reduce corruption [2]. The article aims to discuss the potential applications of blockchain technology in the e-commerce industry.

2. E-commerce

E-commerce means buying and selling on the internet. Further, e-commerce is not merely a financial transaction between customer and organization but it more than that. It also includes non-financial transactions that customers have with the company [3]. E-

commerce in modern times implies that a transaction is termed as electronic commerce if it typically uses the World Wide Web at least at any point in the transaction's lifecycle [4]-[6]. The E-commerce industry continuously retains the position of the fastest growing industry. It is expected that the world e-commerce industry will reach $5 trillion with a growth rate of around 20 percent [7]. According to Statista report, in 2019, global B2C e-commerce sales were $3.53 trillion and it is projected to reach $6.54 trillion in 2022 [8].

3. Blockchain

"*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 [9]. According to the article published by Forbes magazine, blockchain is a secure distributed database that preserves ordered lists of records, known as blocks, which cannot be changed. For instance, it is like a word file which can be shared across the many computers. It is possible to create multiple copies of this file on a network and a network can update the file regularly. Blockchain technology initially used for cryptocurrency Bitcoin. It is a secure shared database that maintains ordered lists of records. These records are known as blocks, which can't be distorted. It is a distributed database created on decentralizing technology and not connected with a single computer system. Only the block owner and whomever the owner chooses to share the digital key have access to the block. A block has a capability of storing any type of data. Transactions are recorded one after another in a chain of blocks and thus it is called a blockchain.

4. Blockchain for e-commerce

E-commerce is growing at an extraordinary speed and emerge as a major industry in the last decade. Online shopping becomes the most preferred activity by the consumers and its influence by many recent technological advancements. One of these technologies is Blockchain [11]. Over the last few years, blockchain technology has made its impact and attracted many industries for its potential applications. Companies like VISA, IBM and Microsoft are investing in blockchain technology to learn the implementation of this technology in their businesses [12]. Blockchain technology has many potential applications for the e-commerce industry. This will help e-commerce companies to overcome their short and long term challenges. The following section of the article discussed the potential benefits of the implementation of blockchain technology and its impact on e-commerce business.

4.1 Payment

The cost of transactions in blockchain based platform is lower than normal e-commerce transactions. These lead to the possibility of rapid micropayment. Further, blockchain transactions are faster than traditional payment mechanisms in e-commerce. As per the study of Monetha company revealed that traditional payment system involved around 16 stages and results in 2 percent to 6 percent processing fees for the customers [12]. Whereas blockchain-based platforms like Ethereum' Lighting network can handle millions of transactions per second [13]. This technology has the potential to offer cheaper payment transaction cost, strong security standards and smooth customer experience for e-commerce [12].

Further, there are many payment solutions are available for e-commerce. But still, trust and transparency are the major challenges face by both consumers as well as online retailers. Blockchain can be the answer to this problem. Transactions recorded in blockchain are shared in a ledger and it is not possible to modify. It also provides high

security, faster processing speed, and traceability with a decentralized network. This will foster the trust of consumers and online retailers on each other [11].

Blockchain base payment is not affected by any restrictions, fees, exchanges rate that act as barriers for the normal e-commerce international payment. Thus this technology can be used for cross-border e-commerce payment. Further, E-commerce payment transactions are processed by the third party payment gateways. Many startups are working on the blockchain-based payment gateway to improve the working of traditional payment gateways. In the future, it may possible that blockchain-based payment cards and digital wallets will be used for e-commerce payment where direct money transferred will be done between the seller and consumer [14].

4.2 Security

Blockchain provides the highest level of protection for hackers and fraudsters. The transactions data are distributed and shared with the network connected with millions of computer systems. This data are checked and encrypted by nodes on the network. The chain of node become longer and make it impossible to hack [15]. In a blockchain, decentralization is the main key to the security and reliability of data. The E-commerce company can use this technology to store consumers' database. Normally e-commerce company stores this data at a centralized location or on online cloud and it always has a potential threat from hackers. Blockchain stores data on a decentralized system which has less possibility to hack [11].

E-commerce retailers generally use email or hard copy to send the receipt of invoice and other terms and conditions of after-sale service. Now it is possible to store all this information in the cryptographic form in a data block. This will make easier for a buyer to claim the service and for a retailer to render the claimed service [16]. Blockchain customer database can be used for the redemptions of rewards scheme, warranties, guarantees, promotion, loyalty programs, etc. [13]. Reward points can be redeemable at any e-commerce platform with a high level of authenticity and reliability [17]. Further, there is no central mechanism in the blockchain which has the power to collect and control customers' data. This power remains in the hand of customers and they will decide to share or not to share data with third parties [14].

Lack of transparency is a major challenge faced by the e-commerce business. Blockchain technology has the potential to provide the highest level of transparency in e-commerce transactions. This technology can notice the smallest change in the transactions and it enables customers to feel secure as they can track transactions whenever they want. In line with this, recently, blockchain projects are declared by the Unilever and Walmart to use blockchain technology for their business [18], [19].

4.3 Supply Chain

One of the challenge faced by e-commerce is the lack of an efficient supply chain and distribution network. There are many unethical practices performed by the company to manager their supply chain. It is difficult for customers to check the authenticity of the transaction at each stage of the supply chain. For example, a retailer might use poor quality parts to assemble final products and claimed it as genuine parts or sell inorganic food products as organic. These kinds of malpractices can be curb by the implementation of blockchain technology in managing the supply chain for e-commerce. The transparency and immutable blockchain will make each stage of the supply chain accountable. It enables customers to track the origin of each product they have purchased [13]. Maersk, a world leader in providing supply chain management solutions, has partnered with IBM to utilized blockchain technology for the system TradeLens. This

system provides real-time shipping lifecycle data to each member of the supply chain. The technology will reduce paperwork and human efforts and enable faster shipping process [13].

Further, E-commerce companies can use blockchain technology to improve their supply chain. It will provide a secure, accurate, authentic and reliable platform to track products in transit. Retailers and customers can track their shipment on real-time bases [12]. Tacking and the record-keeping task can become easier by using radio frequency identification tags and sensors technology. It enables both sellers and consumers to track the entire timeline of the product in its journey on the e-commerce platform. IBM is already using blockchain for mining and metal business [16]. It is possible to reduce or even eliminate middlemen between the company and final customer which will result in the reduction of supply chain cost. Further, it may possible online retailers require less human resources for managing product delivery and distribution [20].

4.4 Smart contract

Smart contract enable automatic execution of contracts based on predefine rules and conditions. Smart contract technology can streamline workflow with its integrated management systems. E-commerce companies can use smart contracts for partnering with payment and logistics intermediaries [11]. This technology can automate certain processes related to e-commerce based on pre-established rules and hence, up to a certain level it is possible to reduce the requirement of human resources. For example, a smart contract can be implemented for Inventory management [21]. It will help e-commerce companies not only in maintaining a record of inventory but it also helps in automated replenishment of inventory. Successful implementation will result in zero out of the stock situation for online store and thus it will increase the convenience to final consumers [17].

As discus above, smart contracts are based on pre-decided rules that automatically execute when a particular situation occurs. This system can work without any dependency on others. This kind of technology has the potential to offer two benefits to e-commerce. One is being cost-effective and second quick response time when certain service requests raised by the consumers. For instance, if the customer cancels the online purchase order and requests for a refund, it would take a quite long time to refund the money in traditional e-commerce system. In case of smart contract implementation, the refund process can be done quickly. The system will refer the standards and in real-time refund would be credited in the customer's account. Further, if a customer has changed the delivery address when an ordered product is in transit. The smart contract can make it possible automatically by updating the new delivery address on the system [16]. The smart contract can be used for loyalty program management and automation. As each online purchase transaction stored in a chain, it is convenience for online retailers to automate issuing loyalty points and discounts to their customers [21].

4.5 Ethical practices

Ethical practice is considered the biggest challenge faced by e-commerce companies [20], [18]. The issue of transparency is becoming a discussion point for many stockholders and government agencies. Donald J. Trump, President of the United States, recently tweeted his concern with the transparency of e-commerce companies like Amazon. The issue can be solved by the implementation of blockchain technology in e-commerce where all transactions are stored in the shared ledger and near impossible to modify by anyone [11]. It will ensure that the online platform system remains intact to provide the highest level of transparency to the consumers. The application of blockchain will nil down the probability of fraud [19] and ultimately foster the customers' trust in e-commerce companies [15]. For instance, Bitboots, a blockchain-based e-commerce

company, provides a decentralized online shopping platform for online transactions between sellers and buyers. Thus, many big names in e-commerce like E-bay, Alibaba, and Amazon are already working on blockchain to develop a business model [12].

5. Conclusion

The traditional e-commerce industry is facing many challenges. These challenges are related to online transaction processing, data security, order and payment processing, transparency, etc. The potential answer to all these challenges may be given by upgrading e-commerce with blockchain technology. Blockchain technology can enhance the efficiency of the e-commerce industry. The paper has discussed the various applications of blockchain in areas of Payment, Security, Supply chain, Work automation with Smart contract, Ethical practices for transparency. The companies like MultiChian (Provide service to establish private blockchain for the financial transaction), Elinext (Software development company), Eligma (Artificial Intelligence-driven blockchain platform work as personal commerce agent), Coupit (An affiliate platform built on the blockchain) and Ravain (Blockchain-based Review Platform) are already working and have developed implementation related solution for e-commerce [22]. Thought, consumers might take significant time to understand the process of using blockchain-based e-commerce platforms. It will create an environment of transparency and trust for e-commerce platforms [23] which give greater power to the customers. Blockchain enables e-commerce platforms to offer an efficient payment system, decentralized control prevent domination of big companies, anti-fraud system, less transaction processing charges and overall efficient e-commerce platform [24].

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