

# The New Era of Business Transformation with Blockchain Technology

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**Abstract:** *The current condition of data creation, capture, and storage methods has changed as a result of the advancement of modern technologies. Blockchain technology has started to ensnare many companies in the domains of banking, governance, healthcare, supply chains, and cyber security because of its potential to greatly increase security. The primary goals of the research study were to examine the key blockchain platforms and applications. It also explored the benefits and drawbacks of blockchain technology in the context of modern business. This research is conceptual in nature and is predicated on an analysis of many studies. This study identifies the broad applications of blockchain technology in the banking and insurance sectors, government agencies, supply chain management, healthcare, and farming and fishing. The key benefits of blockchain technology are enhanced security and privacy, decentralisation, fraud control, quality assurance, traceability, efficiency, peer-to-peer global transactions, and instant settlements.*

**Keywords:** Blockchain, peer-to-peer, decentralisation, smart contracts

## I. INTRODUCTION

Since the launch of Bitcoin, the application of Blockchain technology has been increasingly widespread (Nakamoto, S., 2009). Immutability, peer-to-peer network operation, and decentralization—perhaps its most important feature—are some of its attributes. Blockchain originated with the classic ledger-based bookkeeping approach. These days, thousands of computers process it digitally and make it available to everyone on the network. 2009 saw the development and adaptation of this concept by Satoshi Nakamoto, who developed it shortly after the global financial crisis of that year. It was put to use when Bitcoin first started to gain popularity. Procurement and supply chain technology is being utilised not only in cryptocurrency but also in the finance, technology, government, and health sectors. However, there are limits and constraints on how the corresponding industries can develop; these are covered in this article for future development. N. E. Villanueva (2021).

Blockchain technology is going to dominate the future globally. It's just getting started right now. Developed countries with diverse industries, such as the US, UK, and Europe, started utilising this technology. A few developing countries have also started to think about utilising Blockchain technology. Blockchain technology is a promising future technology (Ramageri & Arjunwadkar, 2020).

The blockchain technology is not without its problems. This study aims to investigate, evaluate, and elucidate the benefits and drawbacks of blockchain technology across a range of domains, such as finance and banking, supply chain management, cyber security, healthcare, governance, smart contracts, and insurance, among others.

## II. CRYPTOCHAIN

All executed transactions or other digital events that have been shared by all parties involved are simply listed in a public ledger called a blockchain. Every transaction is verified by the majority of system users before it is entered into the public ledger. Furthermore, once data is entered, it cannot be deleted. On the blockchain, each and every transaction is documented in a precise and verifiable way. To use a basic example, it is easier to steal a cookie from a private cookie jar than it is to steal one from a public cookie jar where thousands of people can see you.

### III. A REVIEW OF THE WORKS

According to research by Yuan & Wang (2016), network security is increased by the blockchain's immutability. Anything that is added and approved as a block is regarded as immutable and cannot be altered or eliminated. Data protection is aided by the use of encryption and decryption to keep out unwanted users and individuals.

Min & Co. According to studies by al. (2019), blockchain technology has a big influence on video games, particularly those with incredibly large multi-player regions. Furthermore, the computer game industry's capacity to stay abreast of and respond to technological changes has contributed to the rapid growth of the gaming business in recent years.

A. Robinson. (2016) found that after conducting a study, multinational supply chain enterprises are beginning to see the benefits of using blockchain technology into their supply chain operations. Actually, big international companies like Amazon, Alibaba, Maersk, Microsoft, and Maersk have all made large financial investments in this technology. Their own research indicates that blockchain technology can increase GDP by 5% and sales by 15%.

The usage of blockchain in a number of areas, such as identity management, banking, insurance, healthcare, voting, real estate, and the music business, is examined by Laroiya et al. (2020). After conducting research, the authors discovered that blockchain is being used by sectors because to its affordability, security, openness, and security as well as its ability to improve the contribution economy, prevent payment fraud, and process financial transactions rapidly.

Casino & Co. al. (2019) created a taxonomy of blockchain-based applications following a review of 260 articles and 54 reports from the grey literature. Financial applications, governance, the Internet of Things, integrity verification and distributed device management, health, privacy and security, education, business and industry, and data management are among the possible application domains that are identified by the taxonomy.

### IV. PURPOSE OF THE STUDY

- To research a few well-known blockchain platforms.
- To determine the blockchain's implications on many businesses.
- To research blockchain's advantages and constraints.

### V. THE MAJORITY OF BLOCKCHAIN PLATFORMS

Ethereum: Arguably the most prominent and extensively utilised platform, even for those who are not aware with the blockchain. As stated on its official website, Ethereum is able to "codify, decentralise, secure, and trade almost anything." An open-source, blockchain-based computing platform was the team's goal when they built Ethereum in 2013. Because it is an open platform, anyone can design and use blockchain applications on it.

Quorum: The well-known blockchain platform Quorum was developed by financial giant JP Morgan with the intention of "advancing blockchain technology". It is essentially the enterprise edition of the Ethereum blockchain technology. Updates for Ethereum can be incorporated into Quorum by means of core modifications. Unlike Ethereum, it is not a public blockchain network, hence access to the platform is restricted to authorised users only.

Blockstream: This cross-industry blockchain platform solution does not support smart contracts, but it makes up for it with the special capacity to provide community-developed features. One of their peer-to-peer mechanism's features—a private transaction—attracts companies seeking to create applications with increased security.

Utilising blockchain technology across several industries

#### Healthcare Sector

Blockchain technology is being used in supply networks to track and trace prescription drugs. This programme can help manage the supply of fake medications, recall unsafe and ineffective products, and terminate the supply of fake medications quickly and easily. To improve healthcare services among hospitals, governments, and research institutes, data exchange and dissemination are important goals in the healthcare industry (Ukanah & Obimbo, 2020).

#### Management of the Supply Chain

The management of the supply chain is highly intricate and data-intensive. The primary reason for this is the continued prevalence of paper-based record-keeping, particularly in the maritime sector, which accounts for a sizeable portion of the worldwide supply chain. Efforts to digitally alter the supply chain management industry remain substantial. Smart contracts are the first major application of blockchain technology in the SCM. As a result, the supply chain's operations

would become more automated, transparent, safe, and effective. International transactions would benefit more from blockchain technology (Wang et al., 2019).

### **Online Insurance**

Policies for cyber insurance are a relatively new concept. Protecting the insured from the costs associated with hacking, cyberattacks, and data breaches is the aim of cyber insurance. Every year, ransomware attacks increase in frequency. Compared to the same period in 2018, there were 105% more attacks reported in the first quarter of 2019. In the same time frame, there was a 93% spike in ransom requests, with hackers requesting an average of \$224,871 to unlock data. Blockchain technology can help us better identify financial and pricing risks by enabling faster, more secure information sharing between insurance industry participants. It creates a layer of trust that increases security and enables entities to gain mutual confidence. With the use of blockchain technology, insurance companies can provide goods that are more suited to the market (Yu & Yen, 2018).

### **Online safety**

In 2020, an individual is expected to generate approximately 1.7 MB of data every second. That is equivalent to about 2.5 quintillion bytes of data every day. Because we have so much data and information at our disposal, a security breach is conceivable. The estimate states that phishing (22%), malware (17%), hacking (45%), and human error (95%), are the main causes of breaches. Over \$75 billion is spent annually by businesses attempting to recover from ransomware attacks. Two fundamental tenets of blockchain technology are decentralisation and a consensus-driven, trustless structure, which confer on it intrinsic security, alertness, and resistance to breaches. Blockchain leverages automated data storage to address the primary vulnerability in cyber security—human error.

### **Banking and Finance**

Blockchain provides the banking and financial industries with a number of benefits, including increased security, transparency, and improved record-keeping. This makes it the best option for financial jobs including fraud prevention, onboarding new customers, and anti-money laundering. Blockchain is a great technology for tackling issues encountered by banks and other financial institutions because of its capabilities, which include the Blockchain ledger, data tracking, smart contracts, transparent distributed ledger, public and private blockchain networks, and more (Chang et al., 2020). The most common use of blockchain is monitoring, as its digital nature enables transparency, improved traceability, and quicker analysis.

### **Authorities**

Some of the most innovative uses of blockchain technology could be to improve government. While some state governments, such as Illinois, currently encrypt official documents using blockchain technology, it may also significantly lower financial costs and improve the efficiency and transparency of bureaucracy. With the use of smart contracts, blockchain technology may hold public authorities accountable, cut down on administrative time spent annually by millions of hours, and promote transparency by maintaining an open record of all activities. Blockchain has the potential to change the electoral process. The confidentiality and immutability provided by blockchain technology enable voting on mobile devices, which may boost civic involvement (Zhang et al., 2019).

### **Real Property**

Real estate is another sector where blockchain technology is being applied in a number of ways. Buying real estate involves a lot of paperwork, is frequently time-consuming, and has a high fraud risk. By eliminating the need for middlemen, blockchain promises to speed up transactions, lower prices, and promote transparency in the buying and selling process. Additionally, it provides the ability to establish an ongoing, distributed ledger amongst purchasers, lenders, brokers, insurers, and other parties to a transaction. Because everything is publicly visible on the ledger, any malicious actor attempting to fake a document can be swiftly exposed by anybody else with access to the blockchain (Joy & Sebastian, 2020).

### **Agriculture and Fisheries Sector**

Both farming and fishing have benefited greatly from the application of blockchain technology. These sectors will gain the most from Blockchain's robust supply chain information delivery capabilities. The farming and fishing sectors are worldwide, multi-geographical, and multi-stakeholder networks by definition. This complexity is partly caused by the opaqueness and poor communication in the existing supply chain processes, but Blockchain can solve these issues. Blockchain technology is useful in the supply chain because of its uses for contacts, product tracking, and real-time payment records. Provenance has successfully implemented blockchain supply chain technologies in the coffee, coconut, and general farming businesses. Provenance leverages data verification along the supply chain to enable coffee firms to verify the provenance of their coffee beans.

## **VI. ADVANTAGES OF BLOCKCHAIN TECHNOLOGY ADOPTION**

Blockchain technology's primary advantages are:

### **Delocalization**

This is one of the main benefits of blockchain. The system is decentralised. It is not controlled by one particular source. Since the system is open-source, neither external parties nor the government are able to monitor its usage. Since most systems, including the internet, are centrally located, all online transactions are visible and trackable to both sides. Using blockchain technology, therefore, is completely the opposite of this.

### **Fraud Prevention**

Hacker attacks are more difficult to execute on a system that keeps data in numerous locations as opposed to simply one. Even if hackers are able to access the data, it is very easy to retrieve the information.

### **Guaranteed Excellence**

In essence, a blockchain is open-source data transfer software. It is therefore more transparent. This ensures that transparency is developed with the community's best interests in mind. It provides the same quality for dependable and efficient data transfers to all businesses, not just one.

### **Accountability**

Businesses can concentrate on developing a blockchain-enabled supply chain that works with suppliers and vendors. In the traditional supply chain, it is challenging to track down items that might lead to a variety of problems, like stolen goods, counterfeit goods, and missing goods. Blockchain technology has made supply chains more transparent than they have ever been. It enables all parties to track the commodities in order to stop replacement or misuse along the supply chain process. Businesses may maximise blockchain traceability by implementing it internally.

### **Effectiveness**

All of the data is automatically processed using pre-established procedures. Because of this, blockchain technology not only dramatically lowers labour costs but also boosts productivity. The payment automation for the Blockchain 1.0 digital currency is the main function of a distributed ledger automation system. By reducing the number of middlemen and increasing the speed and efficiency of the reconciliation process, blockchain technology may expedite the clearing and settlement of some economic transactions (Wang et al. 2016).

### **Peer-to-Peer International Trade**

Transacting money internationally is now economical, safe, and feasible thanks to blockchain technology and cryptocurrencies. Peer-to-peer transactions are free of taxes and less expensive. For foreign financial transfers, this is the option that many businesses select.

### **Quick Settlements**

With blockchain technology, trust is essential for completing data and financial transactions, but once you're involved, settlements take place instantly. All you have to do is trust the information that is being provided to you.

### VII. PROBLEMS WITH BLOCKCHAIN TECHNOLOGY

The following are some drawbacks with blockchain technology:

- Scalability: A block is currently mined every ten minutes or so, and the maximum size for a Bitcoin block is 1 MB. Thus, the Bitcoin network, which is capped at 7 transactions per second, does not allow high frequency trading. Larger blocks, however, spread more slowly over the network and demand more storage space. The huge blockchain will gradually become less maintained by users, which will result in decentralisation. As such, balancing blocksize and security has proven to be a challenging undertaking.
- Immaturity: People are not yet very confident in or ready to invest in blockchain technology because it is still a relatively new technology (it has only been around for a few years). Even though many blockchain applications have proved effective across a range of industries, the technology still needs more confidence before its full potential is realised.
- Energy Consumption: By 2018, the verification of transactions conducted through blockchain technology is expected to have consumed 0.3 percent of global electricity. Since it requires a lot of energy to confirm any transaction, this becomes problematic.
- Time-consuming: Miners must continually compute the nonce in order to add the subsequent block to the blockchain. To be used for business purposes, this intricate procedure must be expedited.
- Respect for the law: A number of nations have outlawed the use of blockchain technology in applications such as cryptocurrencies. These nations oppose the use of blockchain technology for business purposes.
- Storage: Because blockchain databases are maintained on each network node, storage becomes an issue as more transactions require storage.

### VIII. FINAL SAY

In conclusion, a number of industries are experiencing a revolutionary period thanks to blockchain technology. Thanks to its decentralised, irreversible ledger technology, it has set high standards for security, transparency, and trust. By enabling speedy, secure transactions and cutting-edge financial tools like smart contracts, blockchain has transformed traditional banking in the financial industry through the use of cryptocurrencies. Healthcare has advanced with secure, interoperable patient data management, enhancing research and patient care. Supply chains today benefit from end-to-end traceability and efficiency gains, which eradicate fraud and guarantee product authenticity. More security and impermeability could be added to the voting process. However, there are also issues, including concerns about how various blockchain systems may damage the environment, scalability issues, and regulatory challenges. These issues will need to be resolved through additional research and development efforts if the technology is to reach its full potential.

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