

KNOWLEDGE MANAGEMENT WITH BLOCKCHAIN TECHNOLOGY IN BUSINESS: A THEORETICAL PERSPECTIVE

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Abstract: Knowledge management is an essential process for providing required information for effective decision-making. It involves storing, organizing, summarizing, analyzing and sharing of knowledge created. The process of managing knowledge has been digitalized with technological advancements over in the past few decades. Advancement of technology has resulted in increased adoption of knowledge management systems by the business organisations. In the recent times, Blockchain and distributed-ledger technology has given further boost to knowledge management. Several studies have been conducted to identify and develop ways in which Blockchain technology has been used to enhance the overall process of knowledge management for sustainable business options. Blockchain technology with its distinctive features of enhanced security, decentralization, immutability, and transparency can leverage knowledge management. In this paper, we have attempted to provide a theoretical perspective wherein Blockchain technology has been used for augmentation of knowledge management process. The paper adopts the approach of reviewing the existing literature and synthesizing their findings to present an overall conceptual view of Blockchain and knowledge management. The findings of this paper are expanded to the domain of business management and electronic commerce. The current paper can be helpful in providing new insights on knowledge management process and how it can be improved.

Key words: Knowledge Management, Blockchain technology, e-commerce, durables

Introduction

Researchers are still investigating the quantum of value supplied by the Blockchain Technology Based System, as is common with developing technologies. In terms of benefits, there is an urgent need to undertake studies to determine if the performance expectation of Blockchain Technology Based Systems such as transparency, information immutability, decentralization, efficiency, and smart contracts has a favourable influence on competitive advantage. A blockchain-based system presents a number of issues. It is assumed that it has the ability to improve product safety and security, quality management, inventory management, replenishment advancement, illegal counterfeiting reduction, new product development, cost reduction, and so on, thereby assisting companies in gaining a competitive advantage over competitors in the marketplace through strategic benefits. Some issues must be answered, such as how effectively technology advancements such as Blockchain are used in a business and how much originality they give in terms of becoming resources of competitive advantage. Although research addressing the use of blockchain in management

has gained momentum, this field presents a discontinuous overview of the focus on blockchain applications in specific managerial sectors, such as finance and supply chain management. However, this field's conceptual evolution is posited to be in its infancy in other sectors, such as for managing (Tandon et al., 2021).

Blockchain is a type of distributed ledger technology (DLT) that is also known as a public ledger. In its most basic form, blockchain is regarded as a data structure that serves as the foundation for the creation of an unbreakable digital record of transactions that can be shared. The fundamental technique is such that public-key cryptography is utilised to sign transactions between several parties that will eventually be kept on a distributed ledger. This distributed ledger is made up of blocks of transactions that are cryptographically connected. A Blockchain is made up of these transactional blocks. It is impossible to change or erase data blocks that have been stored on the Blockchain ledger. The chain continues to develop as additional blocks are added to it. The usage of DLT prevents the occurrence of a single point of failure (Kshetri, 2017; Zheng et al., 2017). With the right and secure recording of transactions and infrastructure processing, Blockchain may be used to establish open, secure, and trustworthy systems. These technologies can assist in resolving concerns of information integrity and openness (Iansiti& Lakhani, 2017). According to a World Economic Forum report, business managers must understand the possible consequences and risk of blockchains in order to achieve and retain a competitive advantage (White, 2017).

Several research have been undertaken in order to find and create methods in which Blockchain technology might be utilised to improve the overall process of information management for long-term business choices. Blockchain technology, with its distinguishing properties of greater security, decentralisation, immutability, and transparency, has the potential to use knowledge management. The study takes the method of examining current research and integrating its findings in order to give a comprehensive conceptual understanding of Blockchain and knowledge management. Blockchain technologies will continue to gain prominence in business and marketing as large multinationals and more stakeholders recognise its potential for providing solutions to existing and emerging business problems and situations. Blockchain will continue to grow in importance in business and marketing as larger corporations and more stakeholders recognise its potential for providing solutions to existing and emerging business problems and situations (Antoniadis et al., 2019).

Literature review

Blockchain is described as a digitally distributed ledger that has had such a significant impact on our daily lives that there is an obvious risk associated with ignoring it. Blockchain is widely regarded as the next potentially disruptive technology innovation with long-term implications for businesses, prompting them to plan an appropriate strategy for using it to gain a competitive edge. It is believed that the implementation of Blockchain, which is regarded as a cross-country and cross-industry technology, may boost organisational competitiveness significantly due to its unique features and uses. As an emerging technology, blockchain has the potential to change the very concept of competitive advantage.

Decentralization, persistence, anonymity, and auditability are major qualities of a Blockchain that aid in cost reduction and efficiency (Zheng et al., 2017). Decentralization occurs when no one institution or individual has control over the processing of transactions. The term "distribution" refers to the sharing of computing effort among many computers. DLT

(Distributed Ledger Technology) is a technology that distributes information across several systems, nations, or organisations. (Treiblmaier, 2018). Each entity in the Blockchain has access to the whole database of blocks and its entire history in the case of a distributed database. This means that no single entity has control over the data and that all entities may check the records. Transactions occur directly between entities rather than through a central node, implying that a single entity can store and convey information to all other entities (Dobrovnik et al., 2018).

In their study, Prasad, Shankar, Gupta, and Roy (2018) attempted to identify 19 critical success factors, which include user engagement, industry collaboration, a rich ecosystem, standardisation of Blockchain technology, regulatory clarity, cost efficiency, energy efficiency, dealing with Blockchain bloat, miner incentives, alignment of business case to Blockchain capability, side-chains development, Blockchain talent pool availability, and leadership readiness for a decent future. Dobrovnik et al. (2018) noted the following benefits related with the adoption of Blockchain-enabled technology:

- Facilitates origin tracing
- Reduces transaction fees
- Excludes a centralised governmental entity
- Open dissemination of information
- Provides the opportunity to purchase sustainable products and logistics
- Improves consumer buying behavior

Research Method

The paper is based on the systematic review of literature. Secondary data comprising of journal articles, conference proceeding and published thesis was used. The articles selected for the purpose of research ranged from the year 2016 to 2022. A search strategy was conducted, via Google Scholar, to select the relevant data. The authors used search words like 'Blockchain', 'Knowledge management', 'blockchain technology', 'smart contract', 'data management' and 'distributed ledger'. Majority of the articles belonged to the domain of blockchain technology.

Results

After a thorough review of the selected articles, the authors identified five themes covering both blockchain technology as well as knowledge management. These themes are discussed below. The most dominant application of blockchain technology has found to be among SCM and finance domains.

Data Storage and Sharing

Blockchain's principal use is data management. The assumption that blockchain can handle heterogeneous large data, avoid single points of failure, and work with encrypted data both online and offline is pushing blockchain adoption for managing data (Adere, 2022). Blockchain technology may be used to secure data authenticity and data storage, making data administration more efficient. It may be used in industries such as healthcare to build files including patient health information or transportation, where riders can speak directly with drivers (Zheng et al., 2017). In their study, Crosby, Nachiappan, Pattanayak, Verma, and

Kalyanaraman (2016) discovered that banks and financial institutions no longer see Blockchain technology as a threat to their old business models. Several large banks intend to use Blockchain technology. Non-financial uses, on the other hand, can vary from legal papers, health information, and royalty payments in the music sector to notary, private securities, and marriage licences in the Blockchain.

According to Maher and Jha (2022), the company's performance management and collaboration among supply chain partners on numerous factors connected to data sharing, confidentiality, and system governance are both critical for deploying blockchain technology in the supply chain. Blockchain technology is a distributed record of all transactions or shared public/private ledgers of all executed digital events. This approach and information has a lot of potential for supply chain design and real-time implications. Blockchains, as distributed, immutable, transparent, and trustworthy data warehouses can have an impact on the long-term viability of supply chain networks (Saber et al., 2018). Participants in multi-party supply chains are frequently hampered from providing the necessary information. They may face issues such as poor supplier synchronisation, a lack of accountability, or a difficulty to monitor partner actions in real time (Gürpınar et al., 2020). This can be solved via blockchain. According to Kohli and Liang (2021), blockchain might be used with artificial intelligence to construct smart contract application which helps multi-party transactions to be completed and stored automatically.

Smart Contracts

When applied to the supply chain, smart contracts are a critical element of blockchain because they encourage openness, data verification, no data modifications, and product and service tracking (Jardim et al., 2021). The usage of smart contracts improves user authorisation, software integrity, software synchronisation, and privacy. The advent of simple blockchain-based security protocols can make establishing safe connection between IoT devices easier (Adere, 2022). Blockchain technology is also being used to support technology such as 'smart contracts,' which are being led by leading open source companies such as Ethereum and Codius. Smart Contracts are pre-programmed contracts that execute automatically when certain criteria are met. Ethereum is also enabling a vast range of Smart contract enabled applications in areas such as Governance, autonomous banks, keyless access, crowdfunding, financial derivatives trading and settlement (Crosby et al., 2016). Blockchain technology gives the opportunity to make resources more fluid, permitting businesses to move shift from traditional ownership and access resources only when needed. In the case of smart contracts in real estate transactions, the transacting parties provide resources such as human capital and physical capital, while blockchain technologies facilitate the peer-to-peer exchange of these resources (Morkunas et al., 2019).

Sustainability

Consumers' desire for sustainability is connected to their desire for reliable information. As a result, there is a need to educate the general public on the concept and possibilities of blockchain. This is crucial in order to improve confidence between users and the blockchain's information. In terms of social sustainability, blockchain-based apps can manage the triple bottom line problem transparently. Through blockchain technology information

environmental sustainability can be provided to the consumers which can improve their buying decisions (Lützenburg, 2017).

Khan et al. (2022).reports on the benefits of using blockchain technology for agricultural supply chains and the promising solutions experienced by farmers during the COVID-19 pandemic. They found that recyclers can track waste as it moves through the chain, and major stakeholders in the agricultural supply chain can compare their recycling efforts.Friedman and Ormiston (2022) sought to understand how Blockchain technology addresses sustainability in global food supply chains and its role as a SOI for food supply chain management.The findings reveal that Blockchain is used within food supply chains as a tool for sustainability as well as a broader philosophical mindset for addressing sustainability challenges. The implementation of modern digital technologies that ensure the visibility of supply chains, such as integrated transport and logistics systems visibility at all phases of delivery of products from manufacturers to end-users, may be a solution to barriers in ensuring green SCM (Bag et al., 2020).

Aslam et al. (2021) proposed the framework for the adoption of Blockchain into supply chain management via SCM practices for improving the integration among all supply-chain functions which lead to an increase in operational performance. They proposed the framework for the adoption of Blockchain into supply chain management via SCM practices for improving the integration among all supply-chain functions which lead to an increase in operational performance. The identification of challenges and barriers to be managed is the first step in successfully implementing blockchain technology to trace sustainable practices and manage supply chain operations and products. The barriers are summed up and classified into four major categories: intra-organizational barriers, inter-organizational barriers, system-related barriers, and external barriers (Saber et al., 2018).

Data Security and Transparency

Blockchain technology has the potential to affect organisational information exchange and trust difficulties. The primary benefit of exchanging information via blockchain might be increased openness and data security. Another advantage of blockchain technology is the security of keeping and sharing information, as well as data control, because once stored, all transactions cannot be edited or erased. This enhances confidence in data while also ensuring data quality (Petersson & Baur, 2018).The main features of the blockchain technology are transparency, traceability, security, efficiency, confidentiality and immutability (Chang et al., 2018). According to Chang et al. (2018), the characteristic of information security is critical for financial applications, but the feature of system transparency and traceability is advantageous for supply-chain applications.

Blockchain technology can help with supply chain management and provide data transparency during the recycling process (Khan et al., 2022). While data security encompasses a wide range of challenges, blockchain-based solutions are primarily concerned with handling three issues: data integrity, access control, and data confidentiality. Similarly, by boosting transparency throughout the medication supply chain, blockchain technology can help prevent counterfeiting, substandardization, and diversion (Adere, 2022). Treiblmaier (2018) finds that blockchain characteristics such as data openness and non-repudiability provide prospects for reducing costs and independence from intermediary services.

Malyavkina, Savina, and Parshutina (2019) discovered that blockchain technology can protect supply chains due to the use of cryptography, the difficulty of changing the chain of blocks, operational tracking, the blocking of fraudulent transactions, the prevention of doubtful providing data by any of the parties, and the simultaneous updating of information at all supply chain participants in real time.

Decentralisation and Governance

The decentralisation of blockchain is a key strength and an adoption incentive, as each actor owns a copy of the database file (Jardim et al., 2021). The apparent requirement for additional infrastructure will have a favourable impact on blockchain switching costs. Blockchain-based technologies provide several advantages, the most important of which is decentralisation. The need for a centralised power to manage a distributed decentralised system may become outdated. This can result in advantages such as faster transaction rates and transaction irreversibility as compared to other solutions (Walsh et al., 2020). According to Morkunas, Paschen, and Boon (2019), organisations that use existing processes built on the notion of acting as an intermediary between two transaction parties must take into account whether and how blockchain technologies will influence their service offerings, how they stay competitive, and how they continue to function.

Gad et al. (2022) illustrated the current scientific and industry hurdles to adopting Blockchain for various applications, including scalability, interoperability, privacy and security, selfish mining, quantum robustness, and a lack of governance and standards. The potential of blockchain technology moderates the many contributing aspects via the use case, cooperation, expertise, and government regulations (Härting et al. 2020). Nowiski and Kozma (2017) identify three strategic implications in which nascent blockchain organisations intrinsically differ from existing organizations based on the developed generic ecosystem: governance, trust, and transparency. The critical manner in which blockchain technology can actually effect and disrupt business practices: by validating traded goods, decentralisation, and reducing transaction costs.

Conclusion

Blockchain technology when combined with knowledge management is a game-changer. It will make life easier and safer by altering how personal information is maintained and how goods and services are purchased. Every transaction is recorded permanently and immutably using blockchain technology. Fraud, hacking, data theft, and information loss are all impossible with this unbreakable digital ledger. Manufacturing, retail, transportation, education, healthcare etc. will be affected by technological advancements. When combined with knowledge management, this is going to give a more sustainable and effective tool for solving the inherent problems of businesses. The integration of blockchain technology with knowledge management with that of supply chain will give an altogether new perspective to the business world. The scope of this paper extends to providing new dimensions in implementing blockchain technology with knowledge management.

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