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Use of Blockchain technology in improving business efficiency: An Empirical Study

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Abstract
In this age of technology taking an integral place in everything from daily tasks to national security, transparency and security become the key characteristic demands in innovations. Blockchain technology stands tall in this scenario with its efficient and revolutionary features that ensure transparency that stamp out data fraud, and handle large-scale ownership. In simple terms, it is a distributed data storage technology, a database, in the form of a blockchain. It is mostly popularised by NFTs and Bitcoin but its impact on business industries is largely overlooked. Efficient and sound use of blockchain technology in business management can provide better visibility, immutability, transparency, and traceability for transactions and the "smart contract" feature can greatly keep fraudulency at a bay. And just like any other technological tool, blockchain technology has its fair share of disadvantages too, which can be rectified in the coming years, but still the current applications overweigh the demerits by a large margin. This paper intends to show empirical evidence from studies and literature from around the globe to substantiate the positive influence of blockchain technology in improving business efficiency. The researcher had surveyed 290 people from business sector to know the use and effect of Blockchain technology in improving business efficiency The study concludes that the efficiency of the business is significantly affected by blockchain technology.
Keywords: Blockchain technology, bitcoin, business efficiency, digital data, applications, decentralised, supply chain

Introduction

Blockchain, one of the ways of distributed ledger technology implementation, the backbone of the digital cryptocurrency Bitcoin, has also become synonymous with efficient, safe, and transparent information and data exchange and interaction. It is a time-stamped and highly secure non-manipulatable database that is distinguished by its decentralised and distributed nature. It is currently used as a peer-to-peer distributed innovative data infrastructure that also manages the uprising operational costs. Blockchain in the food chain, security, education, and mining business processes has proven effective and efficient management of records while also being low cost. It is still not excused from the vicious cyber security attacks and other privacy concerns but these can be rectified with mitigation measures like system time, network time protocol (NTP) and password protected secret sharing, etc (Koolwal, Kumar, & Mohbey, 2020).

Blockchain presents a reliable tool for consistent use while avoiding data duplication and manipulation with reduced costs. Its reliability, consistency, and autonomous characteristics are positive advantages with an application at every business process management stage but along with its con of resource intensiveness. This means a huge impact on business processes during organizational collaborations as there would be transparent and safe interactions between the collaborators. Blockchain also helps in finding solutions for problems that exist prior to each stage of business process management. Proper integration with existing innovations further enhances the efficiency of blockchain in not just business planning but also in other sectors like banking, healthcare, and tax collection. (Yakubov, 2022).
The operational conditions, decision-making process, methodology, and security of financial transactions are all highly influenced by the changes and revolutions in these aspects of business industries. And blockchain technology has the potential to widen a large spectrum of business processes and its gaining popularity has forced experts and other research entities to ensure that the value created by these new technologies is successfully integrated with already existing technologies instead of a direct replacement. Blockchain is exponentially yet gradually changing the business environment and paving the way to better and improved innovations that ensure more security, transparency, and efficiency (Gatomatis, Tsiomos, & Bogonikolos, 2020)

Literature review

Blockchain though synonymous with bitcoin and cryptocurrency has larger uses in the technical world for its decentralised property. The transformation in traditional business industries brought forward by features of blockchain like decentralisation and anonymity while keeping accountability and auditabilty shows how efficient the changes have been. For example, if we take the case of Nestle, their ability to share vital information with their consumers in an accessible means will ensure better commitment to the company from the consumers. The increase in transparency reflects in the company-consumer relationship in a positive lead. Better accessible information about a company meets the expectation of consumers to know more about the production and origin of their favorite products. The companies that take advantage of this technology have been able to reduce marketing and other costs while building a good reputation in this digital world (Jyoti, 2019).

Blockchain has become a keyword for various technologies and applications that can bring transformations in business as well as the economy as a whole even though it is something that is highly misunderstood and criticized (Treiblmaier & Tumasjan, 2022) by some, more research and studies on reducing the cons and improving the pros will lead to better supporting of industries thus helping social, economic as well as industrial betterment while forecasting the changes too (Schneck, Tumasjan, & Welpe, 2020). Blockchains have the potential to reshape the future, not just of business or commercial industries but also of other domains and even policymakers in varying fields. And this will be accelerated by major institutions giving pilot programs to the public and with more investments from financial industries. The increasing integration of IoT into daily life will also make way for the collaborative win of blockchain-IoT advancements (Bucovetchi, Badea, & Stanciu, 2018).

Creating a supply chain finance environment by integrating blockchain technology into present-day technologies can help in creating an optimal ecosystem for consumers, suppliers, and financiers thus improving liquidity and better allocation of capital through the value chain present. Jaoude & Saade, 2019 studied the present literature and concluded that blockchain applications are heavily concentrated on the IoT, finance, energy, healthcare, and other government sectors due to the nature of these industries being aided by the distinctive characteristics of blockchain. The research on blockchain implications on business models is expanding to a greater exponent and the present studies show a highly marginal positive influence.

In a study of Blockchain based companies in China by Hasan, Shiming, Islam, & Hossain in 2020, it was found that blockchain deployment in firms' operations and working showed an increase in their performance. There were larger benefits obtained from blockchain integration, especially by firms with larger financial leverage and return on assets while there was a lower level of benefits for larger and older firms due to blockchain implementation. Hence it is argued that blockchain provides an excellent space for increasing operational efficiency globally by similar studies even though the said study is based in the Chinese context.
Supply chain activities are among the industries most likely to be influenced by blockchain technology as the issues faced by traditional management can be rectified using the transparent, fast, and effective forecasting of outcomes and performance. The study by Sheel & Nath, 2019 showed that blockchain technology implementation can improve the adaptability, alignment, and agility of the supply chain leading to a competitive advantage over the ones without blockchain implementation, which translates to better firm performance and that there is an improved sense of trust of consumers on the firm, which also increases firm performance. Blockchain is becoming accretive to firms due to the clearing of the myths and fog that surrounded the innovation and the distributive nature of blockchain technology. Blockchains' ability to reach an optimal large number of recipients along with the decentralisation makes it difficult to manipulate as any changes made would need to be consensually approved by all the recipients (Valeria.2020).

Blockchain in farming and agricultural businesses can allow simplification of marketing strategies of products and elimination of intermediaries in distribution chains as the transparency factor of the data stored can redefine and reorganize the relationship between suppliers, transporters, processing industries, and consumers in a better way. Blockchain will also help in the detection of fraud (Bogomolov, Popok, Savinskaya, & Tyunin, 2019). Blockchain technology has such a huge impact on the efficiency of performance of both commercial industries as well as government sectors that it is said to possibly trigger a third industrial revolution and there are four waves of blockchain deployments anticipated. The fourth wave will see the uprising of a decentralised financial ecosystem, but it will also mean the drawbacks of blockchain need to be rectified by then (Sakız & Gencer, 2019).

Weking et al., 2019 proposed a blockchain business model taxonomy that show typical instances of its influence on certain aspects of business models. Blockchain also has the ability to find new ways to organise economic activities giving better cost efficiency to business models. They also showed that blockchain technology contributes to and improves business value while enriching other pre-existing technology-driven blockchain research. Lage, Saiz-Santos, & Zarzuelo, 2021 found by analysing existing works that even though decentralisation of processes and business models are the most sought features of blockchain, firms demand trustworthiness of their information, data, digital identity, and shared asset management showing how firms make decisions only after a thorough study of new innovations. The decentralisation and disruption of present business models have the potential to push the creation of newer models which work on the primal feature of decentralisation. Blockchain technology needs to be adopted by both private and public organisations and a better study and understanding of "why" firms choose blockchain technology will facilitate bettering the respective features of blockchain, which can catalyse the entire decentralisation as well as improvement in business models Li, Marier-Bienvenue, Perron-Brault, Wang, & Paré, 2018).

Objective

1. To know the use of Blockchain technology in improving business efficiency.
2. To know how the efficiency of the business is affected by blockchain technology.

Methodology

The researcher had surveyed 290 people from business sector to know the use and effect of Blockchain technology in improving business efficiency with the help of a structured questionnaire. The researcher had collected the primary data through convenient sampling method. Data was analysed and evaluated by mean and t-test.

Findings

Table below is sharing general details of the respondents where in total 290 respondents 67.6% are male and 32.4% are female. 31.7% are below 40 years of age, 47.6% are between 40-46 years of age and rest 20.7 are above 46 years of age. 29.6% are from supply chain, 27.2% are from Food Distribution sector, 21.7% from financial Services, 13.8% from Retail sectors and rest 7.6% from other business sectors.

Table 1 General Details

Variable	Respondent	Percentage
Gender		
Male	196	67.6
Female	94	32.4
Total	**290**	**100**
Age (years)		
Below 40	92	31.7
40-46	138	47.6

Above 46	60	20.7
Total	**290**	**100**
Business sectors		
Supply Chain	86	29.6
Food Distribution	79	27.2
Financial Services	63	21.7
Retail	40	13.8
Others	22	7.6
Total	**290**	**100**

Table 2 Use of Blockchain technology in improving business efficiency

S. No.	Statement	Mean Value	t Value	Sig.
1.	Blockchain technology stamp out data fraud and handle large-scale ownership	3.11	1.906	0.029
2.	Blockchain technology provide better transparency and traceability for transactions	3.21	3.662	0.000
3.	It is used as an innovative data infrastructure that manages high operational costs	3.13	2.303	0.011
4.	Blockchain technology avoid data duplication and manipulation	3.18	3.125	0.001
5.	It has the potential to widen a large spectrum of business processes and its gaining popularity	3.09	1.588	0.057
6.	Blockchain technology pave the way to better and improved innovations and ensure security, transparency, and efficiency	3.12	2.082	0.019
7.	It creates an optimal ecosystem and improve liquidity & allocation of capital	3.17	2.977	0.002
8.	Blockchain provides transparent, fast and effective forecasting of outcomes and performance	3.10	1.759	0.040
9.	It improves the adaptability, alignment, and agility of the supply chain for competitive advantage	3.15	2.606	0.005
10.	Blockchain simplifies marketing strategies and eliminates mediators in distribution chains	3.19	3.359	0.000

Table above is showing different use of Blockchain technology in improving business efficiency. The respondent says that Blockchain technology provide better transparency and traceability for transactions with mean value 3.21, Blockchain simplifies marketing strategies and eliminates mediators in distribution chains with mean value 3.19 and Blockchain technology avoid data duplication and manipulation with mean value 3.18. The respondent also says that blockchain technology creates an optimal ecosystem and improve liquidity & allocation of capital with mean value 3.17, It improves the adaptability, alignment, and agility

of the supply chain for competitive advantage with mean value 3.15 and it is used as an innovative data infrastructure that manages high operational costs with mean value 3.13. Blockchain technology pave the way to better and improved innovations and ensure security, transparency, and efficiency with mean value 3.12, Blockchain technology stamp out data fraud and handle large-scale ownership with mean value 3.11, Blockchain provides transparent, fast and effective forecasting of outcomes and performance with mean value 3.10 and blockchain technology has the potential to widen a large spectrum of business processes and its gaining popularity with mean value 3.09. Further t-test shows that all the statements are significant (with the value below 0.05) except *blockchain technology has the potential to widen a large spectrum of business processes and its gaining popularity (significance value 0.057).*

Conclusion

In a highly competitive industrial space such as the current one, a firm needs to keep up with the latest technological innovations to survive and blockchain technology is one of those few innovations that show great potential to decide the fate of an organization. Most of the existing literature is conclusive of the positive impact blockchain implementation has on a firm's efficiency. Even though there are significant drawbacks to the technology, the top-notch level of transparency and security it offers at this stage is still impressive. It is relevant to see it as still in its nascent developing stage and the rectification of these drawbacks in the coming years will assure a greater improvement in business models as well organisational structures.

The study had explored different use of Blockchain technology in improving business efficiency and found that Blockchain technology provide better transparency and traceability for transactions, simplifies marketing strategies and eliminates mediators in distribution chains, avoid data duplication and manipulation, creates an optimal ecosystem and improve liquidity & allocation of capital and blockchain technology improves the adaptability, alignment, and agility of the supply chain for competitive advantage. The study concludes that the efficiency of the business is significantly affected by blockchain technology.

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