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BLOCK CHAIN TECHNOLOGY AND ITS APPLICATIONS IN BUSINESS DECISIONS

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Abstract

Blockchain technology has the ability to alter our commercial environment and will have a significant impact over the next ages. It has the ability to change our perspectives of company processes and transform our society. Blockchain is essentially and public blockchain program that aims to provide visibility, data protection, and authenticity since it cannot be interfered with or created. The majority of mainstream Blockchain Technology studies have been focused on its usage for cryptocurrencies such as Bitcoin, with just a few studies looking at its use in other contexts or areas. Blockchain technology is much more than simply bitcoin; it has potential applications in administration, finance and economics, bookkeeping, and managed services, among others. As a result, the goal of this study is to examine and investigate the merits and drawbacks of Blockchain Technology for application potential.

Key words: *Blockchain, Cryptocurrency, Applications, Business decisions*

1. Introduction

Blockchain technology is a novel computing system that enables the digital file and storing of data across multiple devices, known as nodes. Among the most important components of Blockchain is also the "Ledger," which is akin to a database system. A blockchain is a series of encoded electronic evidence or activities, which are called a block. Each block is then "chained" to the successive stages in a logical, sequential order using a cryptographic signature. The blocks include a replica and among the most transactions made that have been made that since preceding block. As a result, the shared block, or ledger, is linked to all users who use their computers in a data connection to check or access data, removing the need for a third party. Blockchain technology has been used in fresh and imaginative manner to secure and distribute data. The lack of a centralised embodiment in a distributed network implies a major shift in how non-intermediaries or auxiliary services engage with one another (Christidis & Devetsikiotis, 2016). As a nutshell, Blockchain can only be altered with the agreement of all system participants, and an activity can never be modified or wiped (Fanning & Centers 2016). Its decentralised database, unlike a normal, centralised database with a subscription access mechanism, cannot be traced, controlled, or halted.

Once, data is posted to a Blockchain, no one, not even a system administrator, has the ability to edit or delete anything else from the record. Because each piece of data is kept remotely and

temporally linked with a cryptographic sign (Anwar, 2019). Blockchain technology may be utilised in virtually any type of value-added action, including money, goods, land ownership, clinical records, and perhaps even votes. The methodologies used in this work were primarily data collection and theory building. Data collection and foundation theory were conducted using a number of ways. The research, for instance, thoroughly evaluated all books published revealed in the published studies, encompassing textbooks, scholarly articles, lectures, seminars, and technical documents, as well as searching several databases with phrases.

2. The Applications of Blockchain Technology in Business

The section that follows addresses a few of the real-world applications of Blockchain Technologies in different sectors. Several of the applications described include smart contracts, government, finance sector, accounting, and business process management.

a. *Smart Contracts*

A Smart Contract is a programmed procedure that carries out the terms of a contract. Simply described, a Smart Contract is a contract generated in programming code that is designed to be carried out in the Blockchain network. As a result, such contracts are commonly referred to as Smart Contracts in the IT sector (Ali, Nelson, Blankstein, Shea, & Freedman, 2019).

A Smart Contract is designed to ensure the party that the counterparty would fulfil his commitments. The Blockchain concept aims to do away with the requirement for a third-party facilitator in operations. Generally, this third party is in responsibility of contract management and implementation, as well as instilling trust in all relevant parties (Altunay, Avery, Blackburn, Bockelman, Ernst & Fraser, 2011). As little more than a result, Smart Contracts may be able to solve adverse selection concerns such as probably unnecessary while also dramatically cutting the cost of validation and implementation.

The establishment of completely digital Smart Contracts that are performed without the participation of people is among the most promising uses of Blockchain Technology. Smart Contracts facilitate the adoption of computerized systems for recurring or high-priority activities. The blockchain will seamlessly authenticate, implement, and uphold the counterparties' contractual terms. Smart contracts get their derived from the fact that they may be indirectly or directly self-executing and self-enforcing (Bartling, 2018).

Some examples of Blockchain Smart Contract applications are as follows:

- Contract Management - Blockchain Technology in Contract Management offers a method for businesses to authenticate relevant documentation, which could be incredibly crucial for businesses and companies among all kinds, including those in the scientific and building industries. Contract Management with Blockchain Technology would indeed

allow businesses to enhance the operation of their production processes, assess suppliers, and gain more worth and faster response time (Bahga & Madisetti, 2016).

- Entertainment - Using Smart Contracts, Blockchain allows for the seamless transfer of revenues in real-time transfers to everyone people involved in the entertainment and media business.
- Healthcare - Blockchain technology is already being used in the healthcare business. In the healthcare business, smart contracts may be used to keep accurate financial records handled by insurers, practitioners, and medicine producers. Medical practitioners may construct Smart Contracts for any insurer or provider, which are subsequently preserved in their electronic evidence.
- Insurance is a growing paradigm for Blockchain Technology, with the expenditure over $2 billion on deception and accountability each year. Blockchain technology has immense opportunity for use throughout the financial system and the economy. Many insurance products can be automated thanks to Smart Contracts. Blockchain has the potential to reduce errors, negligence, and detect deception, and to verify the validity of customers and its regulations.
- Blockchain Internet-of-Things (IoT) is a system for linking computational computers to networks, system of interrelated computing devices, products, creatures, or persons with special Characters and the ability to communicate data over a network without the need for human-to-human or human-to-computer communication (Bahga &, Madisetti, 2016). It facilitates data collection and exchange between detectors, integrated development environment, and a common language.

b. Implementation of e-Government

The applicability of Blockchain Technology to systems decentralised ledgers offers up more opportunities for authorities to ensure accountability, minimise fraud, and build public sector credibility. Blockchain has the potential to boost government activities by increasing delivery of public services and increasing trust in the government sector. The tracking of operations on distributed ledgers for the state management system offers numerous advantages to governments, like data accuracy, better transparency, access controls, identity verification, and the spirit of teamwork and confidentiality. As a consequence, a distributed ledger provides a one-of-a-kind tool for boosting financial transparency and lowering worries about fraud.

Thus, utilising Blockchain Technology, official documents, e-voting, bids, financing, and approvals may be possible, reducing corruption, boosting trust between individuals and the government, and enhancing public-sector operational efficiency. Numerous countries, including the United States, China, the United Kingdom, Sweden, the Netherlands, the United Arab

Emirates, and Estonia, have begun to study the possible application of Blockchain in the government industry and government. Many of the potential benefits, including trust and commitment, may be incredibly useful to developing countries, which are more subject to fraud, deception, and lack of confidence than developed countries.

Finally, using Blockchain Technology and Smart Contracts, it will be possible to build an e-Government. As a result, e-Government using Blockchain Technology would significantly decrease inefficiency, eliminate physical copy documents, reduce operational costs, totally manage bureaucrats, eliminate waste, root out corruption, and increase corporate performance of a particular domain.

c. Financial Breakthrough

Blockchain is a foundational development that has the potential to significantly reduce management fees and revolutionise the environment. Blockchain Technology, as per the Harvard Business Review, has been doing to financial intermediates whatever the internet did to communication systems.

Blockchain was invented by Nakamoto as the underpinning for Bitcoin, the most famous autonomous digital currency. Blockchain is particularly beneficial for monetary operations and organisations, and it has the opportunity to overcome a myriad of issues involving the transmission of data, knowledge, and wealth. Banking institutions may utilise Blockchain to interact directly data and presenting secure, low-risk solutions that are distributed and accessible at a low cost. Ultimately, banking firms have reaped the benefits of Blockchain Technology in comparison to traditional systems and antiquated methods. By overcoming various issues, blockchain will significantly increase the operating performance of the banking sector. Financing, Intelligent Resources, Settlements, and Smart Contracts are a few examples.

d. Real-Time Bookkeeping

Financial reporting digitalization is now in its early stages when compared to other sectors, which have also been significantly impacted by Blockchain Technology breakthroughs. The adoption of Blockchain will improve reporting quality since auditors will indeed be effective in enhancing the possibilities of the accounting field by decreasing the cost of maintenance, providing a more stable environment, and balancing ledgers.

Credible records, automated bookkeeping and restructurings, book value, navigation monitoring, and activity validation will all be provided via blockchain.

Blockchain technology, in notably, can assist bookkeeping by instantly recording the company's current activities into a common ledger, culminating in an interlocking system of long-lasting financial records. Since all items are disseminated and cryptographically protected, changing or wiping them to disguise activity is practically impossible.

e. Business Process Management

Business Process Management (BPM) is usually in charge of work process design, execution, monitoring, and development. A business process is the sequence of steps taken by a company in order to provide a goods to the customer. As a consequence, BPM assists businesses in improving their current company processes, business requirements, system effectiveness, and management. Commercial processes can be classified as intra-companies' procedures or inter-companies procedures. Intra-company steps are performed within a firm, while inter-company operations are conducted from outside the firm's boundaries. However, in inter-company relationships between intrinsically unreliable parties, business functions such as interoperability, flexibility to change, loss of faith, and confidentiality are not successfully addressed. Blockchain technology has the potential to get a trustworthy framework for carrying out inter-organizational activities. Blockchain technology has the potential to radically transform business processes. Conventional BMP services, on the other hand, frequently solely handle internal systems within a single firm.

Blockchain technology, on the other hand, permits the creation of a participant BPM system with no central power. A vandal technique for distributed collaborative company's activities, letting numerous organisations to communicate information directly with participants while verifying the process's validity. This is vital to work with regulated activities that require rigid compliance to certain criteria. Moreover, inter-company procedures can be programmed using Blockchain Technology and Smart Contracts, allows companies to verify and enforce concrete steps, ensuring that the joint procedure is done correctly by any seller on the scheme with none communication and confidence among endpoints. Moreover, Blockchain allows users and intermediaries to take possession of their information even if the system has placed limitations on it.

3. Blockchain Technology's Issues and Challenges

Even with all these beneficial benefits and potential uses of Blockchain Technologies, such as e-Government, Financing, Banking BPM, and many more, the study identified a variety of challenges and constraints that must be solved. In this section, we highlight the challenges and fields of study that we uncovered during our investigation in the framework. Successful growth should address these issues in alleviating scientific and regulatory problems and increase the BT's use for open research and far beyond. We focused on the most important and fascinating subjects that, in our view, are still to be studied or have been researched enough. They will provide energy for further research in the form of starting points; as a positive side effect, fixing these challenges will aid in the growth of other non-scientific areas.

We want to underline that the problems described in this section are exceedingly intricate and serious, and we do not expect them to be remedied fairly soon. For instance, the system reliability issue, which is critical to smart contracts, has existed that since start of programming and is yet

unsolved. As a result, the following topics provides understanding into core components that should be investigated over the process of a thorough BT implementation.

3.1.Smart Contracts issues and authentication

Since authenticity is a critical component of BT and one of its significant factors, developers should design all aspects of their programmes to support and offer that value. In this regard, we believe that SCs used in many applications are crucial because they may present a range of chances for malevolent action and are prone to serious code faults during construction. The ability to use Turing-complete computer languages increases not just the variety of possible use instances and capabilities, as well as the complication, and thus the risk of human mistake and the quantity of section also explains. These might lead to procedural breakdowns or flaws in the programme architecture, enabling hackers to obtain access to the information that a virtual deal manages. The uniqueness of SCs supports the conclusion that knowledge of their structure, operation, processing, and validation is still in its early phases. One method of reducing SC concerns is to simplify of the underlying computer program. Other factor is the recent appearance of many manufacturing audit services. They are examining SCs to verify that they are performing their duties flawlessly. Encryption and real-time validation are two instances. In this context, we believe that research into approaches to speed the assessment of SCs using software in order to quickly remove the possibility of certain assaults holds potential.

3.2.Inadequate Specifications and Structures

A well-developed framework and structure for solutions can be crucial, providing several perks like time efficiency, error handling, and enhanced safety. Our investigation revealed that they are substantially deficient in BT. Up to this point, blockchain developers have led the way, software upgrades in a wide range of languages with little concern for technological standards. As a consequence, a plethora of diverse application designs emerged, each of which has set of benefits and limits, as well as data breaches and vulnerabilities. Standardization for BT can help with execution, scalability, system robustness, and, most significantly, trust. They also improve connectedness to the larger development of blockchain applications. Standardised APIs can, in most cases, render the creation of new gateways redundant in the event of software interaction. There is a bright future in researching essential requirements and processes for the BT, such as making it easier to develop and build blockchain-based software or incorporating a blockchain into research operations. Integrating ideas for just how educational publications might utilise this technology to improve and profit from certain processes are also important. Infrastructural frameworks like Hyperledger, in our view, will play an even more important role in the creation of a wide range of creative applications. One overall goal of frameworks and standards should be to simplify things for non-experts to enter blockchains and break down barriers to entry. Overall, these domains provide a variety of exciting research prospects, and we expect they will form the backbone of the BT in the future.

3.3.Incentive Mechanism for Science

We noticed that several of the blockchain investment proposals employ numerous financial reward system depending on the distribution of digital coins/tokens in exchange for research areas or specific activities such as peer-reviewing. We question these reward systems due to the obvious current volatility and speculative nature of cryptocurrencies. The worth of blockchain-issued coins/tokens might change substantially in a short period of time, and there is also the risk of massive loss. Coinmarketcap helps in monitoring the cryptocurrency market's progress. Moreover, it is unknown where all the money was coming from. Several proposals offer scholars as funding units; however, it is uncertain if they would recompense others autonomously for their scientific contributions. Additionally, the financial worth of even an offer is largely reliant on the amount available. Therefore, we show that financial considerations may shift scholars' focus away from qualitative active learning and toward a quantifiable performance mindset in which they strive to disseminate as fast as feasible in order to benefit financially.

We assume there is considerable research possibilities in analysing cryptocurrency incentive systems that are both reliable and scalable on the one side, and encouraging for researchers on the other. Promising research challenges, in our perspective, are how to positively effect employee creativity by external organizational stimuli, and if BT can contribute significantly to that goal. Another approach is to evaluate existing incentive systems to see whether they may be enhanced using such a technology. Somewhere at meantime, scholarly benefits are mostly dependent on metrics such as the citation count, the impact factor, and the resulting notoriety. Another research concept is to concentrate on encouragement for the increasing number of micro-contributions, which really should be appropriately recognized. Ultimately, there are several starting areas worth studying in order to leverage the benefits of IOT for the construction of new and superior scientific motivational strategies.

3.4.Scientific Metrics

Academic services such as ResearchGate, Mendeley, Altmetric, Web of Science, and Google Scholar are important providers of scholarly metrics content. Each has its own repository, which is largely made up of scholar biographies, publications, and links to other studies. One form of a metric used to estimate the impact factor of journal articles and academia is the count of citations. The assessment showed significant discrepancies, which we found to be far more prominent on other systems. Funding agencies, for example, can make decisions based on scientific measurements. The crucial variation of the indicators from one research platform to another, as demonstrated, is a challenge with this decision-making technique, which is produced by the employment of independent calculation formulas and a different dataset each site. In other words, because the measures have non-identical values, a funding body's decision to support a certain researcher or group may vary based on the network under consideration. We feel that BT is a

potential solution for greatly boosting the scientific key statistic system's informative value and reliability.

3.5.Legal Uncertainties

Some study on blockchain-based cryptocurrencies, SCs, and DAOs in relation to legal concerns and themes has previously been conducted, but there is still a high demand for more work and clarity. Several blockchain initiatives we examined, for example, depend on times and dates to confirm various characteristics such as the availability of certain data at a singular time or seek to issue a letter to authenticate the ownership rights assets. A specific example is the timestamping of a dashcam recorded video of a vehicle accident to authenticate the time of the incident and the validity of the video, as well as other facts that may be essential in a legal procedure decision. The issue is, what would be the legal standing and recognition of blockchain-based material in a litigation? In the face of that ambiguity, we consider it worrisome that a handful of the evaluated programmes work with commitments that are not legally enforceable.

4. Conclusion and Recommendations

According to a review of related evidence, Blockchain Technology has enormous experimental values and prospective applications for addressing backup and recovery challenges, promoting accountability, increasing safety, minimising abuse, and build confidence and anonymity. Economics, bookkeeping, e-government, business process management (BPM), health coverage, leisure, trading systems, healthcare, internet-of-things, and legal firms, among many others, have the potential to be transformed by blockchain technology. As a consequence, regardless of geographical location or sector of deployment, Blockchain Technology has a significant potential for offering innovative solutions, because technical innovation and application may accomplish commercial prosperity and societal benefits.

Nevertheless, implementing Blockchain Technology in several businesses may be outrageously costly. Transferring or upgrading current infrastructure involves a significant investment on the side of businesses. Embracing Blockchain Technology at this early stage would demand the development of a cohesive platform that allows such cross-platform architecture that combines Blockchain and earlier technologies. As a result, they must have a deeper understanding of Blockchain Technology, its value, possibilities, and risks. As a result, the technique has only been employed in a few occasions with these platforms.

To conclude, more thorough research in this field of Blockchain Technology is necessary to advance the industry's maturation, since it has been in the experimental phase with various legal and technological difficulties to solve. As a consequence, this study serves as a suitable beginning point for future research topics in Blockchain web applications, as well as support to professionals and academicians.

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