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Blockchain-Based Management Information Systems: Benefits and Challenges

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ABSTRACT
Blockchain has gained great attention as a technology capable of providing security, transparency and decentralization in the data management process. This research aims to analyze and identify the advantages and challenges associated with implementing a Management Information System (MIS) based on Blockchain technology. This research uses a qualitative approach with descriptive methods. The research results show that the application of blockchain technology has a positive impact in various sectors, such as Management Information Systems, corporate finance, and the entertainment industry. The use of blockchain increases security, transparency and efficiency of information management, facilitating better decision making. Although challenges such as initial costs and regulatory differences arise, the innovative potential of this technology remains significant. With understanding and efforts to resolve challenges, blockchain implementation in various fields is expected to provide greater benefits in improving operational efficiency and data security.

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INTRODUCTION

Management Information Systems (MIS) extend their functionality to a wide range of Internet applications, primarily focusing on aspects of information security, transaction inspection, reporting, centralized policies, and application connectivity. It plays an important role in improving management capabilities at various levels of the organization (Karajeh et al, 2020). MIS includes a combination of workforce, tools, procedures, and software designed to complete various business tasks within an organization (Tripathi, 2011). It is an integral part of business operations, providing business managers with timely and accurate information for informed decision making (Masa'deh et al., 2017). Also known as Information Systems, Information and Decision Systems, or Computer-Based Information Systems, MIS has become widely accepted in various industries, especially in managing complex projects.

The increasing adoption of Automated Management Information Systems is positively overhauling the decision-making process (Chaffey & White, 2010). Companies that use automated SIMs no longer rely on 24-hour service from human workers, which is crucial for

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business. Automation allows machines to be programmed to handle tasks, providing significant advantages in decision making. This relieves managers of some decision-making responsibilities, especially technical decisions that can be more efficiently addressed by automated systems (Johnson, 2006).

In the decision-making process to determine the Management Information System (MIS) strategy to be adopted, it is important to ensure that the decisions taken are fully aligned with the existing system. A strategic MIS decision-making approach not only helps avoid reckless choices but also results in saving time and money that would otherwise be wasted (Jahangir, 2005). It is important to note that the MIS strategy or tool chosen must be aligned with the decisions to be taken. In other words, there must be a logical relationship between the decision-making process and the MIS used by the individual or corporate business owner (Tarhini et al., 2015).

As a result, MIS provides an effective platform for informed decision making (Al-Zhrani). Additionally, MIS forms a solid basis for targeted decision making by providing timely information, systematic tools, and adequate managerial policies. Nowduri (2011) emphasizes that some MIS allow multiple users to access the same content simultaneously without any inconsistencies. In summary, strategic alignment of MIS decisions with existing systems not only prevents reckless choices but also results in significant savings. Alignment between the chosen MIS strategy and the specific decisions to be taken is key, emphasizing the role of MIS as a platform for effective decision making, supported by timely information (Babaei & Beikzad, 2013).

Blockchain, an innovation that first emerged with the existence of Bitcoin, has changed our paradigm in viewing and managing data and transactions. Initially, blockchain was known as a technology closely related to digital currencies such as Bitcoin. However, as time goes by, the development of blockchain goes beyond its original limitations and is applied in various applications outside the financial sector. One area experiencing significant transformation is Management Information Systems (MIS) (Berdik et al, 2021).

The importance of blockchain in SIM is not only limited to its use in financial transactions. Through this evolution, blockchain has become the foundation for managing information in a more distributed, secure and transparent manner. Not only as a tool for recording transactions, blockchain has created a security and reliability model that is highly valued in the context of information management (Chan et al., 2019).

By implementing blockchain in SIM, benefits include high data security, immutable transaction recording, and decentralized access to information. Blockchain's ability to create an immutable digital footprint becomes a valuable asset in maintaining data integrity and providing certainty in the information management process. So, not only as part of the digital currency ecosystem, blockchain has proven its value and flexibility as a strong foundation for innovation, including the revolution taking place in Management Information Systems (Lu, 2022).

In its essence, blockchain can be considered as a digital ledger that brings the concept of decentralization, high security and transparency. This concept underlies the way

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information is stored and managed within a network, where every detail is recorded in interconnected "blocks." The uniqueness of blockchain lies in its method which allows every transaction entered into it to go through a careful verification and encryption process (Ghosh, 2019). This verification process provides a high level of certainty regarding the authenticity and integrity of each transaction. Once a transaction is verified, the data contained in the block becomes immutable, creating a digital footprint that cannot be manipulated. As a result, blockchain becomes a very safe and reliable tool for tracking, storing and securing data (Shao et al, 2021).

With its high security and data immutability characteristics, blockchain is not only a technology that revolutionizes the way financial transactions are carried out, but also provides a solid foundation for managing information in various contexts. Therefore, the presence of blockchain opens the door to innovation in the development of Management Information Systems, providing fundamental aspects of security and transparency to support effective and reliable data management.

METHOD

This research is descriptive in nature with a qualitative approach, in accordance with the postpositivist view explained by Moleong (2014). Qualitative methods are used to examine the condition of natural objects, where the researcher functions as the main instrument. Data collection techniques are carried out triangulated or combined, data analysis is inductive/qualitative, and the research focus places more emphasis on meaning than generalization. The aim of this qualitative descriptive research is to describe, depict, explain, explain and answer in detail the problems related to Blockchain-Based Management Information Systems: Benefits and Challenges. Humans as research instruments in a qualitative context, with written results in the form of words or statements in accordance with the observed reality. This research chose a qualitative descriptive method because its focus was on exploring the use of instructional video media in the context of biology learning. Information is obtained through literature study, which includes various literature such as books, research articles and media reports.

RESULTS AND DISCUSSION

Benefits of Blockchain in Management Information Systems

High security is one of the main aspects that attracts the use of blockchain in Management Information Systems (MIS). When data is entered into the blockchain, every piece of information is recorded using extremely strong encryption, creating a layer of security that is difficult to penetrate. This uniqueness lies in the distribution of stored data across the network, resulting in identical copies of the digital ledger on every node or computer in the network. Thus, any attempt to access or manipulate data in a blockchain must have the consent of most or all participants in the network, making it nearly impossible for unauthorized parties to carry out such actions.

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Moreover, this high security comes not only from strong encryption, but also from the immutable or non-manipulable nature of each transaction. Once a block of transactions is verified and added to the blockchain, the data within it becomes immutable and unchangeable. This ensures data integrity and reduces the risk of manipulation or fraud. With this high level of security, the use of blockchain in SIM gives users confidence that the information stored in the system is reliable, secure and free from unwanted tampering.

Apart from providing high security, blockchain technology also brings an extraordinary level of transparency. Every transaction entered into the blockchain is recorded openly in a ledger that can be accessed by all interested parties. In other words, every entity in the network can view and verify transactions in real-time. This uniqueness provides a layer of openness that traditional systems lack, where information is often limited to certain parties.

This high level of transparency has a positive impact in increasing accountability within the organization. With an open ledger, every action or change in data can be traced back to its source, minimizing the risk of error or fraud. The ability to provide direct, real-time access to all interested parties also allows for better monitoring of activities and decisions occurring within the system. Thus, the use of blockchain in Management Information Systems not only increases operational transparency, but also provides a strong basis for accountability and trust in the organizational environment.

Blockchain's ability to enable fast transaction processing without the intervention of third parties or intermediaries has a significant impact on operational efficiency. In traditional systems, transactions often take a long time because they involve a verification process involving intermediaries or financial authorities. With blockchain, transactions can be processed directly between the parties involved, without the need to wait for approval from a third party. This reduces bottlenecks and accelerates processing speeds, making the time required to complete a transaction more efficient.

In addition, reducing the involvement of third parties or intermediaries in transactions can also have an impact on significantly reducing operational costs. Traditional systems often require additional fees associated with intermediaries or financial institutions providing transaction management services. By using blockchain, these costs can be minimized or even eliminated as the transaction process becomes more direct and automated. As a result, companies or individuals who use blockchain in Management Information Systems can save on their operational costs while increasing speed and efficiency in their transaction processing.

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Challenges of Using Blockchain in Management Information Systems

Although the advantages of blockchain technology in Management Information Systems (MIS) are very attractive, certain challenges remain obstacles that need to be overcome. One of the main challenges is the high initial implementation costs. The process of developing hardware and software that meets blockchain requirements can pose a significant financial burden for organizations seeking to adopt it. This investment includes the purchase of necessary infrastructure, employee training, and software development that meets business needs. Therefore, organizations need to carefully consider the financial aspects before switching to blockchain technology.

Additionally, differences in regulations and compliance across countries can be a serious obstacle. Because blockchain is a technology that involves cross-border data exchange, different regulations in each jurisdiction can make uniform implementation difficult. Organizations need to understand and adapt to the regulatory framework applicable in their operational areas to ensure compliance and avoid potential legal conflicts.

Collaborative efforts between government, industry, and other stakeholders may be necessary to create consistent standards and regulatory frameworks. Improved communication and cooperation at a global level can help overcome regulatory challenges, creating a more conducive environment for the adoption of blockchain technology in MIS. By understanding and overcoming challenges such as implementation costs and regulatory differences, organizations can plan more effective strategies for adopting blockchain in their MIS, maximizing the potential advantages of this technology.

Potential Use of Blockchain in Management Information Systems

Blockchain provides an innovative solution to manage and store patient electronic health records securely and efficiently. In a blockchain-governed environment, every entry or change to a patient's health record is recorded in connected encrypted blocks, creating an immutable digital footprint. This uniqueness provides a high level of security, because patient health information cannot be manipulated or accessed without authorization.

Apart from security, blockchain also enables secure access for authorized health providers. Each health provider involved in a patient's care can be authorized to access specific blocks in the blockchain that contain the patient's health records. This provides a trusted and transparent way to share medical information between health providers, reducing the risk of error, and speeding decision making in patient care. Thus, the use of

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blockchain in the storage of patients' electronic health records not only improves data security, but also promotes efficient and patient-focused collaboration within the healthcare industry.

The application of blockchain technology in industry opens up huge opportunities to increase visibility and transparency in supply chains. By using blockchain, every stage of product movement from producer to consumer can be recorded and verified securely in one decentralized digital ledger. This provides the ability to track every detail, including origin, production time, and every point of product movement throughout the supply chain.

The main advantage of using blockchain in tracking product movements is that it creates a greater level of transparency. Information stored in the blockchain can be accessed by all parties involved, from producers, distributors, to consumers. In this way, consumers can trace the origins and journey of products more easily, while parties in the supply chain can verify product authenticity and sustainability. This not only provides a higher level of confidence in the product, but also increases efficiency in overcoming logistics issues, stock management and early detection of potential risks in the supply chain. The use of blockchain in tracking product movements in industry creates a more transparent and reliable ecosystem, reduces the risk of counterfeiting or illegal movement of goods, and increases consumer confidence in the products they purchase.

The application of blockchain technology can make a significant contribution to increasing transparency and security in corporate financial management. In the context of recording transactions, blockchain creates a decentralized ledger that allows all transactions to be recorded automatically and securely. Each transaction is verified and encrypted before being added to the block, creating an immutable digital footprint. This uniqueness eliminates the risk of manipulation or falsification of financial data, providing confidence that the company's financial records are reliable and accurate.

In terms of internal auditing, blockchain provides easy access to audit transactions directly without the need for intermediaries or third parties. Information stored on the blockchain can be verified easily and quickly, reducing the time and costs associated with traditional audit processes. This strengthens the integrity of the audit process and provides assurance that the company's financial reports comply with applicable standards and policies.

The importance of blockchain is also seen in tracking corporate assets. By using this technology, companies can track the origin, movement and ownership of assets in a clear and documented manner. This helps prevent loss or theft of assets, as well as providing a greater level of transparency regarding the value and condition of assets. Overall, the use of blockchain in corporate financial management not only increases transparency and security, but also opens up the potential for significant efficiency in record-keeping, auditing processes , and company asset tracking. Top of Form

In the entertainment and media industry, the application of blockchain technology can provide innovative solutions for monitoring the use of digital content and ensuring fair royalty rights for creators and copyright holders. By using blockchain, every transaction or

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use of digital content can be recorded automatically in a decentralized ledger. This information includes details about when, where and how digital content is used. The main advantage is that every song play, movie showing, or other content distribution can be accurately recorded, creating an immutable digital footprint.

The use of blockchain in monitoring the use of digital content also provides benefits to creators and copyright holders. With a transparent and verifiable system, they can ensure that every reported use of digital content results in fair royalties. Smart contracts on the blockchain can be set to automatically execute royalty payments based on agreed terms, reducing the risk of negligence or errors in the royalty payment process.

The application of blockchain in the entertainment and media industry not only increases transparency in the use of digital content, but also paves the way for more efficient and fair royalty management. This creates an ecosystem that empowers creators and copyright holders to gain commensurate benefits from their creative works, making blockchain an innovative tool in strengthening copyright and sustainability in the entertainment and media industry.

CONCLUSION

The application of blockchain technology has a significant positive impact in various sectors. In Management Information Systems (MIS), blockchain provides high security, transparency, and efficiency in information management, enabling better decisions at the organizational level. In the company's financial aspect, this technology brings changes by increasing the transparency of transaction recording, facilitating internal audits, and ensuring asset security. Furthermore, in the entertainment industry and media, blockchain can improve monitoring of digital content usage, provide fair royalty rights to creators, and strengthen copyright. However, challenges remain, such as high initial implementation costs, regulatory differences, and the need for a deep understanding of the technology. However, with continued innovation, collaborative efforts, and increased understanding, many of these challenges can be overcome. Overall, blockchain promises positive changes in the way we manage information, finances and copyright. By understanding and addressing emerging challenges, organizations can optimize the potential of this technology to achieve greater efficiency, security and transparency in various aspects of business and industry.

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