

THE ROLE OF INCORPORATED INFORMATION BLOCKCHAIN TECHNOLOGY IN MANAGING INFORMATION SYSTEM AND ENABLING SECURITY STANDARDS

Abdulnaser Al-MSloum SH, University of Jeddah

ABSTRACT

Emergence of information system, universities, enterprises, and government sectors are persistently moving towards the generation of electronic based information management system. Huge varieties of information are gathered and stored that is further utilised for the generation of needful insights. If the stored data is leaked or tampered that will lead to the exposure of personal data and it is a serious issue or cause irreparable damage. The generation of huge information and management necessitates the effective technology and the Blockchain technology is incorporated into the information management system. The impulsive character of Blockchain is traceability and non-tampering. Blockchain characteristics has huge potential managing the information and efficiently solve numerous issues occur in the traditional information management. Blockchain gather and store information organised as group that is blocks. It ensures effective information storage, management, privacy, and security standards. In this paper, numerous roles of information, incorporation of Blockchain in information system, applications and their challenges are detailed.

Keyword: Information management system; Blockchain; Privacy and security standards.

INTRODUCTION

In the twenty first century, the economy and the business sector is evolving due to the generation of huge information that also enhances the ideas of academics with prolonged perspective, individual information necessitates an efficient management scheme and it required high end structure (Ye et al., 2020). The management and effective usage of information getting huge attention among the researcher's whereas significant insights are generated from the processed information system. The user interest identification and the generation of efficient recommendation system is commenced from the proficient maintenance of information generated from diverse sources (Hinrichsen et al., 2020).

The reliable and efficient information are acquired quickly and maintained reliable by the Blockchain technology. This will efficiently remove the manual search process of information, classification of data, indexing mechanism and data acquisition to automated management of information via intelligent schemes (Polyzotis et al., 2017). The management of information is evolved initially from the educational field where the conceptual framework is necessary for the maintenance of information about the people in the organization. The main intent of developing an information management scheme is to formulate the significant information for future utilization (Sun et al., 2018).

Data the executives is a novel worldview to advance and set up the obtain information from assorted assets. Through, powerful data the executives plans it give help to the person to consolidate a by and large available scope of sources with the data age instruments

(Muthuveloo et al., 2017). This makes the rise of valuable information and data. Actually, data can enhance, incorporate the data assets and advance the serious expertise among the businesses. The applied engineering of data the board will consolidate data from different source and it is considered as a huge part in the administration of data. Data the board is a methodology of identification, acquisition, advancement, utilization, assessment, and sharing for information (Hadjimichael & Tsoukas, 2019).

The meaning of data the executive's framework requires the effective data stockpiling, handling and support component. This highlight is refined by the Blockchain innovation (Yaga et al., 2019). Blockchain is an arising record list called as squares that is connected with the instrument of cryptography. Each square holds a cryptographic based hash capacity of the previous square, exchange data and timestamp. The timestamp guarantees that the exchange data accessible when the square of information is created to get into the hash work (Pilkington et al., 2016).

Every block encompasses an information about the preceding block and it generate a chain structure (Treleaven et al., 2017). The blocks in the Blockchain is resistant to the alteration because once the information is stored, then it cannot be modified retroactively without modifying all the succeeding block of information. Generally, every block in the Blockchain is maintained by the P2P network and utilises the publicly accessible ledgers. Although, the information in the blocks remain unaltered and it is considered as a secure mechanism by design (Efanov & Roschin, 2018). The adoption of Blockchain in the information management system across diverse field is detailed in this article.

The rest of the paper is coordinated as follows: the job and execution of data the executives framework is definite in Section 2, the blockchain based data the board framework is given in Section 3, utilizations of data the executives by using blockchain is portrayed in Section 4, challenges in the appropriation of data the executives is given in Section 5 and the article is finished up with future idea in Section 5.

IMPLEMENTATION AND ROLE OF INFORMATION MANAGEMENT SYSTEM

Information management system plays a prominent role in the modern environment, and it is widely utilized by numerous fields. It denotes the digital application, hardware, utilities in internet, and communication system. It also incorporated in the business, industry, and educational institution that is utilized in the notion of big data and information management (Efanov & Roschin, 2018). Generally, information management system discusses and examines the processes information deployed and incorporated to confirm the appropriate system to acquire the effective retrieval of information.

The computational power of distinct technologies are still important and it is complicated than the accessibility and dissemination of information regulated by the system. This is considered as a huge significance to the researchers of information related studies. The information management system is a generic form that encompasses workflow of business, data retrieval, storage and access. The overall framework of information management system is displayed in Figure 1.

In Figure 1, the information retrieval from data source and digital assets are processed and retrieved by the information retrieval strategies. The information are acquired from user, business and third party application.

Typically, numerous information management system is incorporated in diverse disciplines and the encompassed application vary. For example, geographic data is involved in collection, organization, manipulation and storing the information of street information, boundaries of property, longitude and latitude of coordinate points. Health related

information delivers utilities for medical experts to exchange the information securely and safely about the patients to relevant parties, authentication and progression of identification approaches to confirm all the parties involved in medical system (Zhong et al., 2016).

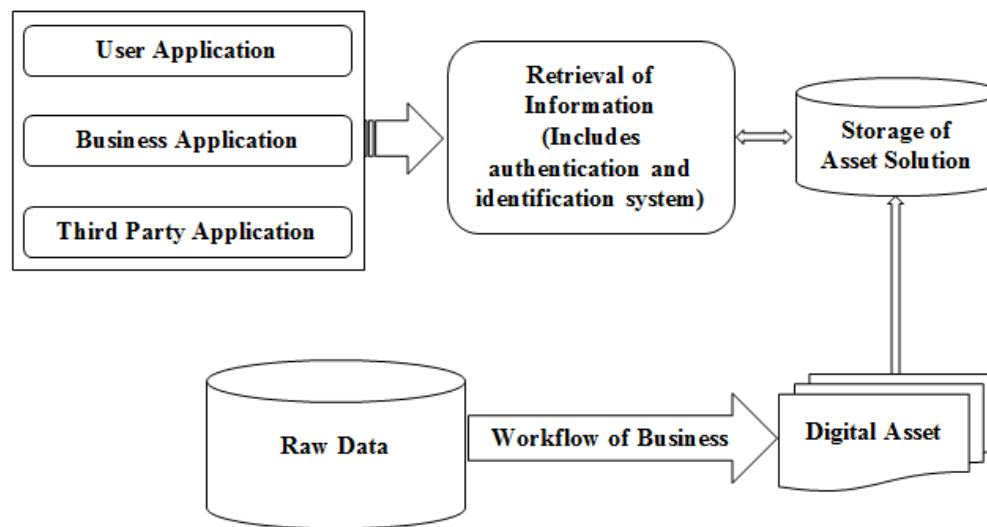


FIGURE 1
OVERALL CONTROL PROCESS OF INFORMATION MANAGEMENT SYSTEM

Incorporation of Blockchain permits the healthcare system that holds the health record of patient is shared through diverse entities in a decentralized way while it ensures the integrity and security of the information. Management of information system necessitates the understanding of workflow of complicated business and behavior of human to ensure simple access of business platforms. This is utilized and established for the transmission of information to relevant parties (Ancker et al., 2015). Investigation of interdependent correlation provide assistance in promoting the interoperability among applications and users. This eventually determines the tools or application that is utilized in information transmission among the system.

The complications in the adoption of robust applications or alterations in the structure of those applications occurs in the management of information is a complicate process. The tendency of the robust users of any information system rejects and resists the alteration in the management system. This resistance is predominant in the issues namely information perception, indentation or unindentation in the updates or new system that utilizes time-consuming, complicate or otherwise disagreeable for the involved parties in the information system (Turner et al., 2015). The prominent and ubiquitous utilization of information management across various fields, employing to enhance them and confirm the function at the ultimate performance by utilizing the most effectively and readily accessible by the significant technology (Sundram et al., 2018).

Information management system is incorporated in a unique way and exceptionally diverse, every management approach has drawbacks and benefits. Numerous information management systems are incorporated for the management of relational databases that is the primary solution for the asset storage. Databases are handled through numerous tools and applications due to the huge capacity of storage, recovery features, query recovering speed and logging. Generally, database maintenance is attained by applications namely, MySQL, Microsoft SQL server, PostgreSQL and MySQL. Every management system offers certain

features and gives the information access. Traditional approaches face certain issues in terms of retrieval maintenance and security.

Applications or programming programs that utilize promptly accessible information are frequently the objective of data frameworks. Whether presenting this data to a bunch of clients in some structure or another, creating a yield item from this data, or otherwise controlling the data introduced, applications that influence the robotization accessible through data systems are basically essential to organizations, offices, or different establishments as the consequence of their works. Applications that can use the full capability of data frameworks are fit for giving a competitive edge to the business or office that created it by integrating all parts of the interaction into one single utility to guarantee no perspectives are disregarded or in any case left inadequate (Jose & Abraham, 2020).

BLOCKCHAIN TECHNOLOGY IN INFORMATION MANAGEMENT SYSTEM

The term Blockchain is arrived from the Bitcoin technology and the overall architecture is shown in Figure 2. Basically, Blockchain technology is a database system distributed over the peer-to-peer network. In this system, data transmitted across the network is packed as blocks by the miner nodes and the association among the nodes is accomplished by the hash operations (Zahid et al., 2018; Berentsen, 2019). As illustrated in Figure 1, the whole original block of data is encompassed of body and header of a block. The body of the block holds the details of every transaction and whole merkle tree. Hence, every transaction can be queries or traced. The header of the block holds the metadata that is utilized in the process of identification. Metadata is mainly categorized as three significant groups of metadata (Li et al., 2017; Lei et al., 2018; Lu, 2018; Firdaus, 2020). The details of every block and their structure are given in Table 1.

Type	Item	Function	Description
Block Header	Hash	Identification of block	The hash value of the block is utilized as a current block identifier
	Prev Block Hash	The hash pointer is used in the historical information retrieval	The parent block hash value is used to denote the previous block point
	Nonce	The appropriate significant data of PoW (Proof of Work)	The process and value utilized in PoW is necessary for the identification of nonce that meet the necessities
	Difficulty	The appropriate significant data of PoW (Proof of Work)	The block with difficulty target PoW value
	Timestamp	The appropriate significant data of PoW (Proof of Work)	Approximates the time and generates the miner block
Block Body	Digital Signature	Safeguards the trade blocks and transactions	The encryption based digital signature mechanism utilized for verifying the integrity and authenticity of data
	Merkle Tree	Verify the exactness of every transaction in the data block	Merkle tree is a kind of binary tree that is generated by hashes for every transaction proficiently verify the huge data integrity

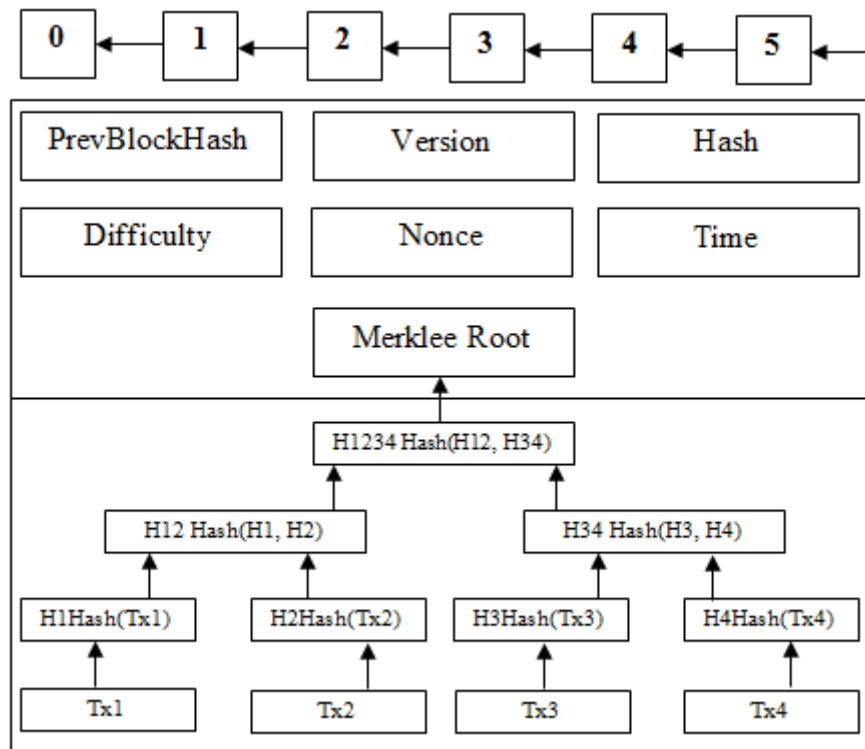


FIGURE 2
OVERALL BLOCK COMPOSITION AND LOGICAL SCHEME OF BLOCKCHAIN TECHNOLOGY

A whole system of blockchain encompasses numerous technologies namely proof-of-work mechanism, timestamp, digital signature and consensus techniques (Cachin, 2016; Ampel et al., 2019; Cui & Guin, 2019; Skulimowski, 2021). This system has the characteristics as follows:

- Decentralization: The entire network depends on the organization of management and centralized hardware.
- Reliable Databases: Every node in the blockchain holds whole set of information and node destruction at any point will not influence the integrity of the data in the whole database.
- Maintenance of collective resource: The entire network is maintained by the nodes in the blockchain and the malicious nodes in the network are ineffective in tampering the historical data.
- Credentials of security: Once the information in the system is verified, then it will be permanently stored in the database of the blockchain, and it cannot be tampered.
- Anonymity: Every node in the blockchain follows a fixed technique and the exposure of party's information is not necessary.

As indicated by different setting of use the movement of blockchain is ordered into three phases that is blockchain 1.0 for Bitcoin that is virtual digital currency, blockchain2.0 for the arrangement of keen agreements that is used for business and blockchain 3.0 for monetary industry. In view of the innovation of blockchain the data the board framework and their discernibility are shown in Figure 3 and the capacity of each hub in blockchain is itemized in Table 2.

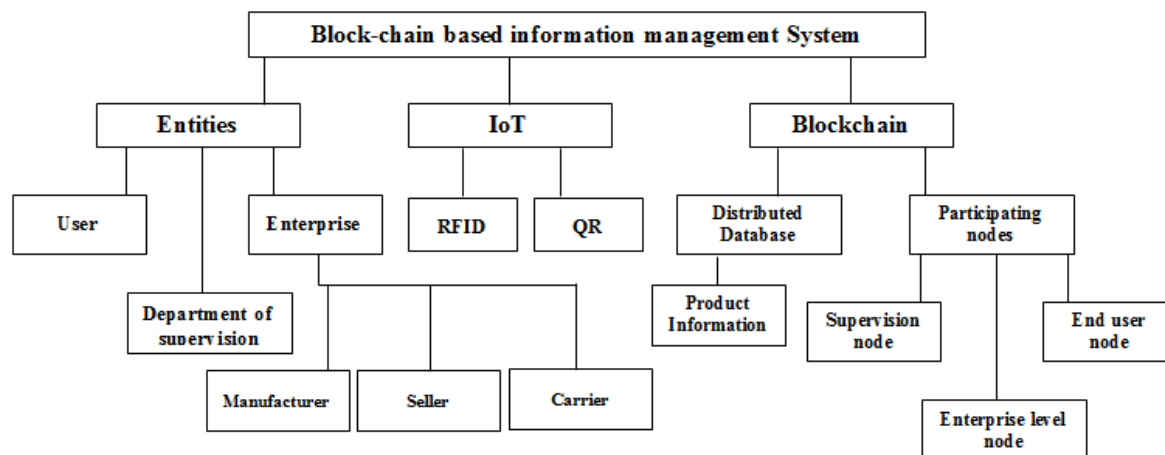


FIGURE 3
BLOCK-CHAIN BASED INFORMATION MANAGEMENT SYSTEM

In the Figure 3, the data generated from diverse sources are depicted and management of that information across different block of node is given in Table 2.

Table 2 FUNCTIONALITIES OF NODES IN THE BLOCK-CHAIN BASED INFORMATION MANAGEMENT SYSTEM							
Type of the node	Contender	Function and permission of nodes					
		Read	Write	Analysis	Verification	Supervision of Trade	Supervision of Process
Enterprise node	Carrier	Yes	Yes	Yes	Yes	No	No
	Seller	Yes	Yes	Yes	Yes	No	No
	Manufacturer	Yes	Yes	Yes	Yes	No	No
	Supplier	Yes	Yes	Yes	Yes	No	No
End user node	Visitor	Yes	No	No	No	No	No
	Consumer	Yes	No	No	No	No	No
Supervisor node	Department of legal supervision	Yes	No	No	No	Yes	Yes
	Department of market supervision	Yes	No	No	No	Yes	Yes

Various levels of information access and functionalities for different user are given in the Table 2. Every node in the blockchain maintains information and also accomplishes the functionalities.

APPLICATIONS OF BLOCKCHAIN TECHNOLOGY BASED INFORMATION MANAGEMENT

Blockchain technology is widely accepted in numerous domains due to its security standards and storage facility. It is used in the financial industry for business transaction, the data generated by internet of thing is effectively handled, and protection of medical information is achieved by Blockchain technology. Applications handles confidential and personal information uses Blockchain technology for ensuring the security standards. The

applications and their inference are described in this section. Some of the applications based on Blockchain technology are described in Table 3.

Table 3 COMPARISON OF NUMEROUS BLOCKCHAIN BASED APPLICATIONS			
Domain	Application	Advantage	Inference
IoT	Blockchain connected gateway (Cha et al., 2018)	The mechanism of strong digital signature is incorporated for the secure management and authentication. It improves trust and privacy of the user in the IoT application where the legacy is utilized by the IoT applications.	Privacy concerns are accomplished by the management of security and also rectify the privacy disputes.
	Beekeeper: Blockchain based IoT system (Zhou et al., 2018)	The homomorphic estimation is processed on the information rely on the server and it is attained without learning.	Offers a homomorphic estimation and secure storage
Payment	Blockchain based secure protocol for payment routing (Blass & Kerschbaum, 2018)	It comprehends extensible and low-cost bidirectional transaction via micropayment.	Generates a scalable and secure protocol for the transmission of fund among the network and client.
Auction	Strain: secure auctions for Blockchain (Wang et al., 2018)	Blockchain has low latency and high efficiency	To meet the security necessities of namely non-tractable attempts against adversaries with whole malicious content
	Enterprise Blockchain platform for inter-bank payment system (Guo et al., 2020)	Blockchain supported system ensures the reconciliation, gross settlement and gridlock resolution for the business payment done in inter-bank	To facilitates higher level of settlement service for the payment facility
	Mobile Blockchain network for optimal auction approach (Ramezan & Leung, 2018)	It generated a multi-layer neural network-based framework that is based on the analytical solution for the auction of optimal value.	To establish a deep learning based optimal solution for the allocation of edge source
Healthcare	Blockchain based local sharing and multi-level privacy preserving scheme (Zhu et al., 2021)	Healthcare system generates a Blockchain based sharing of location by utilizing merkle tree and encryption by order-preserving	To accomplish decentralized management of information, location records of patients record, and medical information system based on telecare.
	Medical data preservation system using Blockchain (Chen et al., 2019)	The information stored in the system ensures perpetuity and consistency. It prevent the information from deletion, forging and tampering.	The data stored in the cloud is managed, sharable framework is generated and the privacy for the individual is assured.
	Smart contract-based healthcare Blockchain system (Griggs et al., 2018)	It can facilitate monitoring and intervention system on real-time basis for patients.	The medical data generated from IoT devices are effectively handled and protected.
	Blockchain based medical service	The index data of transaction and medical record is stored. In	The medical data is managed and stored in a decentralized and

	framework and medical record secure storage (Chen et al., 2019)	the chain framework of medical system, the data gathered and stored in the cloud is encrypted as well as secured.	distributed way.
	Secure cloud based electronic health record utilizing attribute based Blockchain and cryptosystem (Wang & Song, 2018)	The digital signature is implementing the security feature for ensuring the identity based signature system. The medical data is encrypted by using the attribute and entity-based encryption system.	It accomplishes authentication, integrity, confidentiality and supports an effective access of data.

CHALLENGES OF BLOCKCHAIN BASED INFORMATION MANAGEMENT SYSTEM

The implementation of Blockchain technology in the information management system has faces certain issues in maintenance, validation, and integrity that are described in this section (Dorri et al., 2017; Halpin & Piekarska, 2017; Joshi et al., 2018; Huynh et al., 2019).

Lack of Adaption

The ecosystem of blockchain necessitates a wide adoption. The technology has to be accepted by the organization as well as the employers involved in the supply chain management. Especially, during the pandemic of COVID-19, the blockchain based system shows effective tracking and supply chain management system.

Skill Gap

Blockchain is a continuously evolving technology, and it necessitates effective skill for the employers. The skill gap is considered as a top challenge among the users. Training is necessary even for executing the blockchain based smart contracts. Though, it doesn't require any specialized knowledge and basic knowledge is necessary.

Trust among Users

One of the biggest obstacles in the implementation blockchain is building trust among the users. The challenge comes in two forms that is security of the technology and trust among the parties. Each transaction reside in the blockchain is private, secured and verified. The centralized validation system is not available in blockchain, and it is decentralized in nature.

Financial Resources

Incorporation of blockchain into an organization is not free and the pandemic made financial crisis among the organization. The closer examination on financial resource depict it is correlated to an underlying lack of understanding and awareness. Blockchain focuses mainly on the information management that illustrated how the technology is beneficial for the business organization.

Interoperability

Most of the organization started to adopt the blockchain technology, the inclination of numerous organizations to develop the own system will come with diverse characteristics that is version, different models, rules involved in governance, maintenance etc. These block in the blockchain will work separately and the communication among these blocks has no standards. The blockchain interoperability encompasses the capability of information sharing, accessing, and viewing across diverse channels without any central authorization. The lack in the interoperability can lead the mass adoption of information is impossible.

A questionnaire is prepared and circulated among the employers in the supply chain management sector and 171 employers were responded to the system. The respondent's challenges in the adoption of blockchain are given in Figure 4.

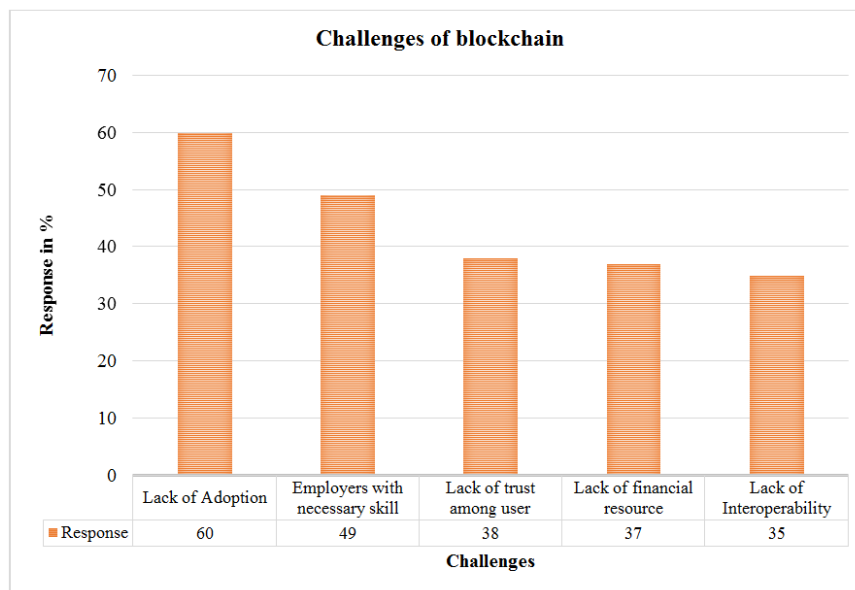


FIGURE 4
CHALLENGES IN THE BLOCKCHAIN ADOPTION AMONG THE EMPLOYERS

From the observation most of the employers lack in knowledge and training in the utilization of blockchain technology based information management system. This study shows, the employers need proper training and require skill of blockchain technology.

CONCLUSION

Due to the emergence of communication technology, the information era is evolved that makes the generation of huge information. The personalized and confidential information are generated and stored across different platforms and servers. To ensure the effective data management and provide security standards, blockchain based technology is introduced. The information are stored and maintained by the blockchain technology ensures confidentiality for the personal information of the users. This makes the adoption of blockchain technology in diverse fields. In this article, the role of information management system and incorporation of blockchain technology is described. Additionally, the applications that utilizes blockchain technology also given in detail. Besides all the benefits, it also has certain challenges and issues in the adoption that is analyzed by the simple survey. The analysis is attained from the supply chain management respondents and shows needful insights. Blockchain

technology has numerous advantages and the challenges can be resolved easily by effective management schemes where these necessities can be attained in future.

REFERENCES

- Ampel, B., Patton, M., & Chen, H. (2019). Performance modeling of hyperledgersawtoothblockchain. In *2019 IEEE International Conference on Intelligence and Security Informatics (ISI)* (pp. 59-61). IEEE.
- Ancker, J. S., Witteman, H. O., Hafeez, B., Provencher, T., Van de Graaf, M., & Wei, E. (2015). The invisible work of personal health information management among people with multiple chronic conditions: qualitative interview study among patients and providers. *Journal of medical Internet research*, *17*(6), e137.
- Berentsen, A. (2019). AleksanderBerentsen Recommends “Bitcoin: A Peer-to-Peer Electronic Cash System” by Satoshi Nakamoto. In *21st Century Economics*, 7-8
- Blass, E.O., &Kerschbaum, F. (2018). Strain: A secure auction for blockchains. In *European Symposium on Research in Computer Security*, 87-110..
- Cachin, C. (2016). Architecture of the hyperledgerblockchain fabric. In *Workshop on distributed cryptocurrencies and consensus ledgers*, 310, 4.
- Cha, S.C., Chen, J. F., Su, C., &Yeh, K.H. (2018). A blockchain connected gateway for BLE-based devices in the internet of things. *IEEE access*, *6*, 24639-24649.
- Chen, Y., Ding, S., Xu, Z., Zheng, H., & Yang, S. (2019). Blockchain-based medical records secure storage and medical service framework. *Journal of medical systems*, *43*(1), 1-9.
- Cui, P., & Guin, U. (2019). Countering botnet of things using blockchain-based authenticity framework. In *2019 IEEE Computer Society Annual Symposium on VLSI (ISVLSI)* (pp. 598-603). IEEE.
- Dorri, A., Steger, M., Kanhere, S. S., &Jurdak, R. (2017). Blockchain: A distributed solution to automotive security and privacy. *IEEE Communications Magazine*, *55*(12), 119-125.
- Efanov, D., &Roschin, P. (2018). The all-pervasiveness of the blockchain technology. *Procedia computer science*, *123*, 116-121.
- Firdaus, M. (2020). A Review of Performance Analyzing on Public and Private Blockchain Platforms. OSF Preprints.
- Griggs, K.N., Ossipova, O., Kohlios, C.P., Baccarini, A.N., Howson, E.A., &Hayajneh, T. (2018). Healthcare blockchain system using smart contracts for secure automated remote patient monitoring. *Journal of medical systems*, *42*(7), 1-7.
- Guo, S., Dai, Y., Guo, S., Qiu, X., & Qi, F. (2020). Blockchain meets edge computing: Stackelberg game and double auction based task offloading for mobile blockchain. *IEEE Transactions on Vehicular Technology*, *69*(5), 5549-5561.
- Hadjimichael, D., &Tsoukas, H. (2019). Toward a better understanding of tacit knowledge in organizations: Taking stock and moving forward. *Academy of Management Annals*, *13*(2), 672-703.
- Halpin, H., &Piekarska, M. (2017, April). Introduction to Security and Privacy on the Blockchain. In *2017 IEEE European Symposium on Security and Privacy Workshops (EuroS&PW)* (pp. 1-3). IEEE.
- Hinrichsen, S., Adrian, B., &Bornewasser, M. (2020). Information management strategies in manual assembly. In *International Conference on Human Interaction and Emerging Technologies* (pp. 520-525). Springer, Cham.
- Huynh, T.T., Nguyen, T.D., & Tan, H. (2019). A survey on security and privacy issues of blockchain technology. In *2019 International Conference on System Science and Engineering (ICSSE)* (pp. 362-367). IEEE.
- Jose, B., & Abraham, S. (2020). Performance analysis of NoSQL and relational databases with MongoDB and MySQL. *Materials today: PROCEEDINGS*, *24*, 2036-2043.
- Joshi, A. P., Han, M., & Wang, Y. (2018). A survey on security and privacy issues of blockchain technology. *Mathematical foundations of computing*, *1*(2), 121.
- Lei, K., Zhang, Q., Xu, L., & Qi, Z. (2018). Reputation-based byzantine fault-tolerance for consortium blockchain. In *2018 IEEE 24th International Conference on Parallel and Distributed Systems (ICPADS)* (pp. 604-611). IEEE.
- Li, Z., Kang, J., Yu, R., Ye, D., Deng, Q., & Zhang, Y. (2017). Consortium blockchain for secure energy trading in industrial internet of things. *IEEE transactions on industrial informatics*, *14*(8), 3690-3700.
- Lu, Y. (2018). Blockchain: A survey on functions, applications and open issues. *Journal of Industrial Integration and Management*, *3*(04), 1850015.

- Muthuveloo, R., Shanmugam, N., & Teoh, A. P. (2017). The impact of tacit knowledge management on organizational performance: Evidence from Malaysia. *Asia Pacific Management Review*, 22(4), 192-201.
- Pilkington, M. (2016). Blockchain technology: principles and applications. In *Research handbook on digital transformations*. Edward Elgar Publishing.
- Polyzotis, N., Roy, S., Whang, S. E., & Zinkevich, M. (2017). Data management challenges in production machine learning. In *Proceedings of the 2017 ACM International Conference on Management of Data* (pp. 1723-1726).
- Ramezan, G., & Leung, C. (2018). A blockchain-based contractual routing protocol for the internet of things using smart contracts. *Wireless Communications and Mobile Computing*, 2018.
- Skulimowski, A. M. (2021). Visions of a Future Research Workplace Arising from Recent Foresight Exercises. *e-Science*, 169.
- Sun, B., Ma, W., Li, B., & Li, X. (2018). Three-way decisions approach to multiple attribute group decision making with linguistic information-based decision-theoretic rough fuzzy set. *International Journal of Approximate Reasoning*, 93, 424-442.
- Sundram, V.P.K., Bahrin, A.S., Munir, Z.B.A., & Zolait, A.H. (2018). The effect of supply chain information management and information system infrastructure: The mediating role of supply chain integration towards manufacturing performance in Malaysia. *Journal of Enterprise Information Management*, 31(5), 751-770.
- Treleaven, P., Brown, R. G., & Yang, D. (2017). Blockchain technology in finance. *Computer*, 50(9), 14-17.
- Turner, A.M., Osterhage, K., Hartzler, A., Joe, J., Lin, L., Kanagat, N., & Demiris, G. (2015). Use of patient portals for personal health information management: the older adult perspective. In *AMIA Annual Symposium Proceedings*, 1234.
- Wang, H., & Song, Y. (2018). Secure cloud-based EHR system using attribute-based cryptosystem and blockchain. *Journal of medical systems*, 42(8), 1-9.
- Wang, X., Xu, X., Feagan, L., Huang, S., Jiao, L., & Zhao, W. (2018, July). Inter-bank payment system on enterprise blockchain platform. In *2018 IEEE 11th International Conference on Cloud Computing (CLOUD)* (pp. 614-621). IEEE.
- Yaga, D., Mell, P., Roby, N., & Scarfone, K. (2019). Blockchain technology overview. *arXiv preprint arXiv:1906.11078*.
- Ye, X., Wang, Z., Zhang, Y., & Li, H. (2020). How do knowledge governance mechanisms impact on repatriate knowledge transfer intention? The moderating role of perceived career and repatriation support and person-organization fit. *Management Decision*, 59(2), 324-340.
- Zahid, J. I., Ferworn, A., & Hussain, F. (2018). Blockchain: A technical overview. *IEEE Internet Policy Newsl*, 1-3.
- Zhong, R. Y., Newman, S. T., Huang, G. Q., & Lan, S. (2016). Big Data for supply chain management in the service and manufacturing sectors: Challenges, opportunities, and future perspectives. *Computers & Industrial Engineering*, 101, 572-591.
- Zhou, L., Wang, L., Sun, Y., & Lv, P. (2018). Beekeeper: A blockchain-based iot system with secure storage and homomorphic computation. *IEEE Access*, 6, 43472-43488.
- Zhu, L., Liu, X., Yu, L., Cai, Z., & Zhang, J. (2021). Blockchain-Enabled Privacy-Preserving Location Sharing Scheme for LBSNs. *Mobile Information Systems*, 2021.

Received: 13-Jun-2022, Manuscript No. JMIDS-22-12173; **Editor assigned:** 15-Jun-2022, PreQC No. JMIDS-22-12173(PQ); **Reviewed:** 22-Jun-2022, QC No. JMIDS-22-12173; **Revised:** 25-Jun-2022, Manuscript No. JMIDS-22-12173(R); **Published:** 30-Jun-2022