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UTILIZING BLOCKCHAIN AND SMART CONTRACTS TO ENHANCE TRANSPARENCY AND EFFICIENCY IN HUMAN RESOURCES MANAGEMENT PROCESSES: A CONCEPTUAL APPROACH

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Abstract: *Combining the principles of the blockchain and smart contracts with the human resources management framework can be viewed as a chance for further advancement of organisational transparency and performance. This approach looks at how the characteristics of blockchain require decentralisation and immutability to help solve common HRM issues, including data accuracy, recruitment and payroll issues. For instance, using smart contracts, some of the human resource operational processes can be transacted only when specific contractual conditions are met, hence leaving out any middlemen and reducing corruption cases. Additionally, using blockchain in the HRM will make it easy to provide verifiable employee details, efficient management of human capital, and accreditation of performance management systems. Ensuring the existence of an accurate and immutable employee register strengthens the shareholders' confidence; the improvement of business decisions based on the data provided by the HR department meets the increasing trend for HR data transfers. It is, therefore, believed that if organisations continue to implement digital solutions, blockchain has the potential to grow as the premier option for enhancing engagement and performance as an element of HRM. This study, therefore, seeks to establish a literature review on how blockchain and smart contracts could be applied in HRM and the consequential recommendation for future research and practice. Extending from the comprehensive literature review of the current state of HRM technologies, this study aims to develop a framework regarding how these technologies can be utilised to foster increased transparency, efficiency and equity in strategically managing people resources.*

Keywords: Blockchain, smart contract, Islamic finance, HRM. Transparency.

1. Introduction

Human resources practices (HRMPs) are an asset in business organisations because, even though they don't always lead to a competitive advantage, once they do, they provide a strong barrier to imitation, which helps businesses maintain their advantages over competitors (Sharif et al., 2024). As a result, researchers have focused on how different HR strategies affect business performance. The focus of research has shifted to how businesses use human resource management (HRM) to ease conflicts between innovation-related change and stability (Gyensare et al., 2024). To understand why certain companies have endured and thrived for decades or even centuries while others have not, HRM research has now taken a more comprehensive approach to studying how organisations handle these conflicts (Jose et al., 2024).

Using digital technologies like blockchain, the Fourth Industrial Revolution aimed to disrupt several industries, including manufacturing, services, mining, fashion, and more (Otoo, 2024). According to Subramanian and Suresh (2024), implementing blockchain technology in HRM performance facilitates employee skill and knowledge updates for all parties involved. Policymakers can also utilise the data gathered from the blockchain process as a resource to establish staff competency requirements. Furthermore, an automated method is implemented by the human resources blockchain to facilitate agreement between the parties (Mohammad Saif & Islam, 2024). New blockchain technology offers a novel format for database storage, and a high degree of decentralisation is made possible by the transaction processing pattern in this technology.

Consequently, safe, scalable, and effective resource management is made possible by deploying this technology in various industries because of the dispersed and decentralised control of data (Maheswari et al., 2024). According to Chhibber et al. (2024), a blockchain is a series of interconnected data blocks that form a continuous chain data structure, with each block depending on the one before it. In recent years, there has been a perception that technology has undermined trust, particularly with the increase in cyber dangers. Blockchain technology offers a means of using technology to restore lost confidence. Along with other emerging technologies, blockchain should be considered by human resource techniques when establishing their digital strategy. Along with broader implications for the future of work, evaluating blockchain's potential to improve efficiency and effectiveness is important (Hamouche et al., 2024). It follows that all management and employees of the company should be involved in human resources activities, rather than only managers and human resources specialists who bear no responsibility in this area.

A computer mechanism that may be encoded to digitally enable, validate, or enforce a contract's terms is known as a smart contract. In the long run, smart contracts can prevent human mistakes and enable process automation to reach higher levels of efficiency by executing automatically via programmable codes without manual operation (Neiheiser et al., 2020). Furthermore, security is achieved due to the tamper-proof features, which enable establishing a more reliable operating system. There have been some reported misconceptions about the use of smart contracts, including techniques for storing and retrieving data from the blockchain; nevertheless, academic studies have not yet covered how smart contracts might enhance process automation in the home care sector (Adel et al., 2022).

In contemporary organizations, Human Resources Management (HRM) processes are often characterized by inefficiencies, lack of transparency, and susceptibility to errors and fraud (Fachrunnisa & Assyilah, 2022). Traditional HRM systems frequently rely on centralized databases and manual processes, which can lead to data discrepancies, delays in information retrieval, and challenges in maintaining employee trust (Ramachandran et al., 2023). While

adopting digital technologies is enhancing, many existing HRM practices are still old-fashioned, thus leading to higher operational costs and less organizational efficiency. The arrival of blockchain technology offers the potential to overcome these challenges by delivering a distributed and tamper-proof register to improve data credibility and openness (Chen, 2023).

1.1 Research Gap

Firstly, the literature available to us is limited to providing a theoretical understanding of blockchain technology and how it could be integrated with HRM despite having many potentials uses in this area (Hewa et al., 2021; Mohanta et al., 2018; Vacca et al., 2021). The poor strength is that a dearth of research shows how virtual technology can improve different organisations' HRM practices, including recruitment, employee authentication, and performance evaluation (Khatoon, 2020). This gap hinders assessing the opportunity and risks of implementing blockchain technology in HRM. Secondly, whereas prior research has discussed the application of smart contracts when it comes to processes in various industries, there is still a lack of research that ties these ideas directly to the subject of HRM (Neiheiser et al., 2020). The presented case tracks the possibility of using smart contracts in HR and their capability to minimise the administrative load and adherence to regulation. This deficiency prevents organisations from using such technologies to enhance their HRM strategies (Onik et al., 2018). However, no synthesised framework encompasses the application of blockchain and smart contracts in HRM practices. For example, most previous research lacks a theoretically integrated framework that explains how these technologies engage the conventional HRM strategies for improved efficiency and openness (Mohammad et al., 2024; Rahman et al., 2022; Ramachandran et al., 2023). The lack of a formal framework for any of the above technologies hinders the opportunity for HR professionals to grasp and practice these technologies. Moreover, more studies should be conducted on whether organizational and cultural factors impact the use of blockchain and smart contracts regarding HRM. Knowledge of the factors that could hinder the adoption of these technologies is therefore important to help design ways of ensuring that these technologies enhance implementation of HRM processes successfully.

1.2 Theoretical Framework

This study will be anchored on the Technology Acceptance Model (TAM); Vijh et al., 2023). This theory offers a very strong conceptual foundation for explaining how users come to adopt a technology or not, which is especially helpful in the utilization of blockchain and smart contracts for managing HRM. Technology Acceptance Model then established that perceived ease of use and perceived usefulness influence an individual’s decision to accept or not to use a particular technology (Teo, 2012). In the field of HRM, blockchain technology and particularly smart contracts can build transparency and improve the performance of the processes which include recruitment, employee checking, and payment methods (Drljevic et al., 2022). With the help of TAM, one can understand how it is possible for HR professionals to find blockchain helpful in enhancing data credibility and organizational effectiveness, as well as how easy it is for them to implement these technologies into their current HRM practices. In addition, it is possible to reveal factors that may negatively influence the proposed

technology acceptance, for example, perceptions concerning the technical difficulty of blockchain, or having concerns about data protection and violation. Knowledge of such perceptions is important to come up with key interventions to support the increase success adoption of blockchain and smart contracts in the HRM processes (Islam et al., 2023). For instance, if HR professionals have the right perception that the use of blockchain in their line of business will require many resources, or lots of training then such a team will be closed minded towards the implementation of such technology. In also, the adoption of TAM in this research can give awareness of the organizational culture and support that supports the acceptance of the blockchain technology solutions. The perceived ease of use and perceived usefulness of blockchain in the context of the organisational environment, proper training, and support of innovation will enable the easy integration of the technology into HRM processes.

2. Literature Review

2.1 The Relationship Between Block Chain And HRM

There are many cases of blockchain in the context of HRM, including identity validation and credential storage, payment and remuneration management, and talent measurement and prediction (Mishra & Venkatesan, 2021). In their paper, `HRM 2024', Mohammad Saif and Islam suggest that with real-time control and analytical analysis, blockchain holds the potential for revolutionizing the management of remote workers or improving workplace safety measurement. In addition, Adhiatma's (2022) systematic review presents the new trend of using blockchain in the field of HRM, where they discover that blockchain presents a solution to problems of engagement/talent management and poor performance. In its turn, Deepa (2023) indicated potential in terms of performance efficiency of the role of blockchain in the implementation of practices of HRM, stating that the practical application of this concept can help enhance the effectiveness of an organization. Further, Hamouche et al. (2024) posited that blockchain can transform the HR practice due to improved transparency and accountability, creating a positive organizational culture. Furthermore, Pal et al. (2021) support that special attention to integrating blockchain with HR analytics increases the value of employee management practices, resulting in a better performance paradigm. Anonymity, inherent security and distributed nature of blockchain as the data is distributed across the network, hence making it an ideal technology in an age of big data and increased virtual cyber threats. Further, Nagy (2023) confirmed that there were very few publications in academic journals linking blockchain technology with HR functions, implying that there is a much need for more research to support theoretical propositions. This gap raises the need for more research studies addressing the question of practical application of blockchain in contexts of HRM.

2.2 The Relationship Between Smart Contract And HRM

Smart or self-executing contracts have the provisions of the contracts embedded right into the code. They employ blockchain technology that ensures the data is secure, cannot be altered and is transparent. According to Ramachandran et al. (2023), using smart contracts can facilitate many functions of HRM, such as recruitment, employee verification, and payroll: data immutability, security, and transparency. Ramachandran et al. (2023) emphasize that smart contracts can streamline various HRM functions, including recruitment, employee verification,

and payroll processing. Finally, the mentioned processes are critical since automating them eliminates administrative overheads and improves organizational performance. This is in cognizance with Suman et al. (2024), who have highlighted specific areas of utilization of smart contracts in HRM, including certification recognition and skill matching. Evidence indicates that smart contracts can be very effective when used in the HRM, meaning this is one of the major benefits of using them in the line of business. Kademeteme and Bvuma (2023) explains that due to the properties of the blockchain structure, records cannot be distorted as a result, data will be protected against tampering. This is felt more in HRM for instance in activities such as recruitment and appraisal; trust is of the essence. Kim and Duffy (2022) This is further supported by explaining that since there is no central authority controlling the actions in a blockchain network, there is increased responsibility for the right HRM practices which makes it hard for fraudsters to ply their trade and increase employee's trust in organizational processes. The adoption of smart contracts within the field of HRM can produce efficiency returns and cost savings.

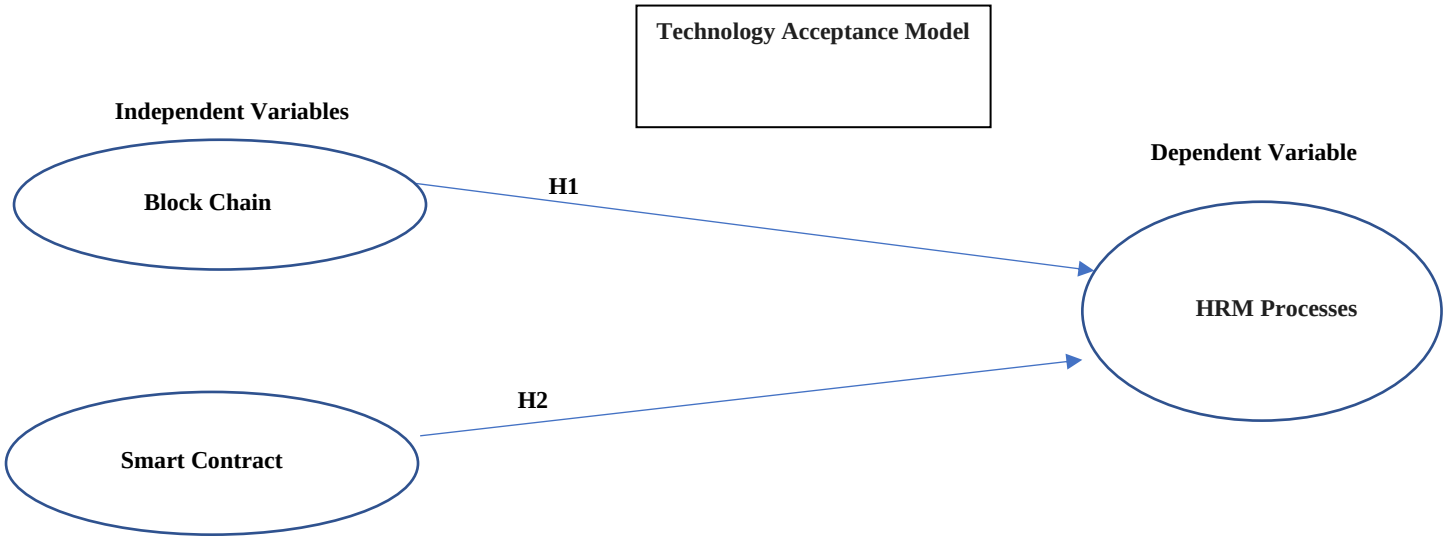

Figure 1. Proposed Conceptual Model

3. Recommendation

Since there is growing awareness of the utilisation of blockchain technology and smart contracts in the field of HRM, this research study brings a good chance to identify to what extent those innovations can improve the aspects of transparency and effectiveness of the processes within the HRM. To this end, it will be necessary to create a general framework that describes the HRM processes that can benefit from blockchain and smart contracts to the extent possible. This framework should also highlight areas of concern, including recruitment, joining instructions, performance appraisal, and payroll. Thus, by using their studies and the data on existing literature regarding the use of blockchain in human resource management, investigators can recognise both the advantages and disadvantages of its implementation (Mishra & Venkatesan, 2021). Each of the following areas of this framework will be a

foundational tool for research and application. Further, though the conceptual approach forms the basis, empirical research is needed to corroborate the theoretical premise advanced here. To do so, researchers may find it beneficial to undertake case studies or pilot projects in organisations that have already integrated blockchain solutions into their HRM systems. This mirrors Chillakuri and Attili's (2022) suggestions that learners should focus on the more practical aspects of HRM. Quantitative data will enable the assessment of the practical applicability of the blockchain applications and their results for increasing transparency, providing efficiency and increasing the level of satisfaction of employees. The following are the research questions. The major research questions that need to be answered in this study are: What factors hinder the adoption of blockchain and smart contracts within HRM? In the same vein, Chapano et al. (2022) note that identifying factors hamper the implementation of digital HRM practices is crucial in influencing efficiency. Future studies must examine general Type II barriers specific to blockchain technology, including technical, structural, cultural, and political barriers. This will enable organisations to find ways to deal with these challenges as they seek to ease the transition to blockchain-enabled HRM.

4. Conclusion

Therefore, examining the possibility of applying blockchain and smart contracts within HRM provides a revolutionary opportunity for organisations. The literature also points out that adopting and applying these technologies can, to a very large extent, enhance the efficiencies of the HRM functions, including recruitment, employee verification, payroll processing and performance management, with a view of reducing the avertant burdens. Due to their self-executive nature, smart contracts bring advantages regarding security and immutability of HR processes alongside increased transparency. This has implications that extend the findings of Negara et al. Negara et al. (2021) on the capabilities of smart contracts to reduce transaction costs and improve stakeholder trust. In this way, many mistakes' personnel can make are eliminated, and the reliability of information, which is the basis of HRM, increases. Further, this paper examines the ethical consideration that should be accorded to the application of blockchain technology in HRM. The principles of blockchain can be used to create a new ethical approach to work and can contribute to establishing greater transparency and responsibility in the HR field. This is especially the case in factors like recruitment and performance management as these issues erode trust and fairness in the company. Nonetheless, a list of difficulties must be considered concerning the application of blockchain and smart contracts in HRM. Challenges like resistance to change, training of employees and data privacy concerns must be dealt with appropriately to achieve implementation. There is a need for subsequent studies to embrace both qualitative and quantitative forms and to formulate larger theoretical frameworks for implementing these technologies into organisation's HRM along with the challenges the particular organisation may encounter.

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