Journal of Posthumanism

2025
Volume: 5, No: 5, pp. 1335–1349
ISSN: 2634-3576 (Print) | ISSN 2634-3584 (Online)
posthumanism.co.uk

DOI: https://doi.org/10.63332/joph.v5i5.1472

Blockchain Technology and Energy: A Decision Support System for the Oil and Gas Industry

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Abstract

Global competition drives industries to enhance their performance by optimizing processes and supply chains. The ability to make quick strategic decisions has become a critical factor in boosting a company's competitiveness and overall performance. The effective integration of blockchain technology (BC) in supply chains, along with the speed of strategic decision-making (SDS), has proven to be instrumental in enhancing organizational performance (OP). This study investigates the links between blockchain adoption, strategic decision speed, and organizational performance in Libyan oil and gas companies, a sector where research on these factors remains limited. A research model was constructed based on existing literature, and data from 289 managers in Libyan oil and gas firms were analyzed using partial least squares structural equation modeling (PLS-SEM). The results indicate a strong positive correlation between BC, SDS, and OP. Furthermore, SDS partially mediates the relationship between BC and OP. This paper offers valuable insights into the role of SDS as a mediator in the BC-OP relationship within the oil and gas industry. Our model could be valuable for industries in emerging economies with similar cultural and socio-economic.

Keywords: *Blockchain Technology, Dirty Energy Strategic, Decision Speed, Organizational Performance, Oil, Gas Industry.*

Introduction

The Libyan region faces numerous serious socioeconomic and institutional challenges that have hindered integration. These challenges include the need to import much of its foodstuffs and industrial products, high unemployment levels, high tariffs, non-tariff barriers, corruption, poor quality of education, inadequate infrastructure, multiple civil wars, and the involvement of numerous decision-makers and intermediaries (Alshaikh et al., 2020; Dabrowski and Dominguez-Jimenez, 2021). Addressing such complex issues requires new and innovative approaches, many of which can be facilitated by information and communication technology (ICT) advances. The application of ICT has been linked to achieving economic development goals (Bilan et al., 2019). ICT is also being utilized to achieve the United Nations Sustainable Development Goals, including economic integration as a key objective (Sachs, 2018; Huawei, 2018). International agencies and NGOs are at the forefront of accelerating ICT development in sectors such as oil and gas (Heeks, 2018; Sachs, 2018). The oil and gas sector has consistently been a leader in exploring, innovating, and upgrading technologies to enhance transaction processes, reduce the resource intensity of operations, and ensure timely service delivery (AlGhanem & Mendy, 2024). Today, the oil and gas industry are exploring blockchain technology applications, which could be

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a potential game-changer in this context. Considered by many authors as one of the most revolutionary and innovative solutions of this century, blockchain is an immutable distributed ledger technology that eliminates intermediaries and revolutionizes and accelerates online transactions. Blockchain has been adopted worldwide (Aini et al., 2023). However, MENA countries remain among the least developed blockchain environments globally (Bran et al., 2024).

The present study contributes to the literature on blockchain capabilities in several ways. The first theoretical contribution of this empirical research is to reinforce the findings regarding blockchain capability in the oil and gas context. The second contribution is the development of the conceptual model and confirmation of the relationships among blockchain, strategic decision speed, and organizational performance. To our knowledge, no study has empirically investigated these relationships in the context of the oil and gas sector. Moreover, this study addresses the literature's call for greater focus on firms based in developing countries, offering important strategic directions that can support the growth of such economies (Kumar and Barua, 2023). Based on the results obtained, our research highlights that blockchain adoption, as a crucial technological resource, enhances the strategic decision-making speed of Libyan oil and gas firms. By embracing these practices, the performance of these firms can be significantly improved. In summary, the present study contributes to the body of knowledge and paves the way for future research on blockchain capabilities in the oil and gas sector. The findings of the study shed light on the positive relationship between blockchain capability (BC), strategic decision speed, and organizational performance. These findings are valuable for Libyan companies that face several roadblocks in their journey to adopt blockchain technology. Consequently, these organizations are unable to fully leverage the potential benefits, including the acceleration of cross-border payments and the streamlining of transaction processes. The results of this study underscore that a deeper integration of smart technologies such as blockchain can enhance firms' strategic decisions, driving new business models and sustainable gains. This insight is also valuable for oil and gas companies that have adopted or are piloting blockchain technology, as it identifies potential activities for further optimization and development. Therefore, a successful adoption of a blockchain system could promote relevant and swift decisions and solutions. In other words, when the adoption of blockchain is accompanied by a rational and targeted approach, stakeholders can derive significant benefits from its advanced capabilities (Bai et al., 2024). Thus, blockchain can assist managers in oil firms by providing access to business knowledge at any time, enabling the analysis of available information, and facilitating quick, deliberate decisions that lead to the selection of the optimal choice (Duan et al., 2019). Thus, blockchain could improve the capacity to swiftly evaluate alternatives and select the automated suitable solution to the problem (Kouhizadeh et al., 2021). To better leverage these capabilities in terms of transaction management and decision-making, managers must have clarity about why blockchain adoption is important, what the business implications of blockchain are, and how blockchain provides strategic benefits. Although obstacles arising from a lack of awareness regarding the usefulness of blockchain in strategic management have been identified as significant barriers to its adoption (Saberi et al., 2019), companies should prioritize raising awareness and fostering interest to ensure successful implementation in strategic activities. To achieve this, Libyan oil companies must acknowledge the critical role of automated decision-making and its impact on business performance. Blockchain-supported automated decision-makers to take rational and timely actions, facilitating quicker adaptation to market fluctuations and organizational demands. Therefore, the success of blockchain systems is not solely contingent upon technological mastery, but also necessitates the integration of organizational culture, which steers users towards leveraging its characteristics

and strategic capacities namely in speed decision making, alongside an effective change management strategic. In summary, blockchain is considered a decision-support tool in oil and gas companies. By leveraging its transparent, secure, and decentralized systems, blockchain can provide rapid solutions that could enhance the ability of management teams to make quick decisions while minimizing biases and errors. By making rapid strategic decisions, oil companies can seize new exploration opportunities, streamline operations, optimize resource allocation, thereby favoring high levels of performance. Overall, this paper underscores the emerging blockchain initiative that empowers the Libyan oil and gas industry to embrace a new business model, positioning blockchain as a vital resource for accelerating the strategic decision-making process. Our findings contribute to the blockchain capabilities framework by illustrating how blockchain adoption enhances the capacity for rapid strategic decision-making, enabling companies to respond swiftly to market demands, secure a competitive advantage, and achieve superior performance. This study aims to address this research gap through empirically investigate and expand scientific knowledge regarding the relationship between blockchain adoption, strategic decision speed, and organizational performance in the Libyan context.

The remainder of the paper is organized as follows: Section 2 outlines the literature review; Section 3 presents the conceptual model and hypotheses development; Section 4 discusses the data and research methodology. Section 5 examines and discusses the empirical findings; and Section 6 concludes the paper.

Literature Review

In this respect, advocates of the strategic decision speed (SDS)–organizational performance hypothesis (Bourgeois & Eisenhardt, 1989; Judge & Miller, 1991) emphasize that decision promptness significantly improves firm performance, particularly in turbulent environments. Additionally, other scholars (Khan et al., 2023; Hugos, 2024; Camargo et al., 2024) argue that speedy decision-making in global supply chains can promote corporate performance by encouraging firms to be more responsive and agile. By making swift decisions, companies can respond quickly to market demands, reduce production time, and improve customer satisfaction. Recent research has highlighted the potential role of strategic decision speed in international supply chains (Dinh Khoa & Mai Anh, 2024). By making quick decisions, streamlining processes, and reducing delays, companies can lower operational costs, making their international supply chains more efficient and profitable. Additionally, it has been demonstrated that strategic decision speed enhances organizational performance by facilitating collaboration among a firm's partners. Thus, increased decision speed fosters better communication and collaboration among stakeholders across the supply chain, enhancing coordination and organizational effectiveness. Nevertheless, recent studies indicate that rapid decision-making can lead to potential information-processing errors, which may reduce firm profits (Barlette & Baillette, 2022). Conversely, other research suggests that quick decisions can increase the likelihood of a firm being imitated by competitors. Critics of the correlation between strategic decision speed (SDS) and organizational performance argue that prompt actions are more prone to failure than carefully planned strategic initiatives. In this context, we assume that SDS is vital for boosting a firm's international performance. By making prompt and pioneering decisions, firms are better able to adapt and allocate resources efficiently to meet their customers' dynamic requirements (Theyel & Hofmann, 2021). By leading in market innovation, businesses aim to uncover and capitalize on new opportunities before competitors, establishing barriers through the implementation of new technologies and the adoption of new business models. This approach increases switching costs for customers, ultimately enhancing profitability. Furthermore, the literature suggests that the

potential impact of rapid decision-making can only be fully understood when its decision support and strategic outcomes are clearly articulated.

Recently, literature has highlighted the crucial impact of blockchain on international supply chains, simplifying cross-border trade and expediting transactions. In response, many oil and gas companies have modernized their supply chains by integrating blockchain into their business processes (Sarir et al., 2023; Vazquez Melendez et al., 2024). Therefore, this technology's adoption has transformed traditional supply chains, which often introduce friction and delay, into faster, digital processes. As blockchain adoption in supply chains is still in its early stages in Libya, inherent uncertainty remains a significant challenge for most industries (Yousefi & Tosarkani, 2022; Bonab et al., 2023). Nevertheless, the uncertainty and reliability of information have not yet been applied to simultaneously promote organizational performance in the oil and gas industry. Many researchers have focused on investigating blockchain's intrinsic characteristics, such as traceability, immutability, and security (Saurabh & Dey, 2021; Bai et al., 2022; Li et al., 2023; Han and Fang, 2024). However, recent studies have explored blockchain's role in engaging external stakeholders and its ability to accelerate existing operations, contributing to improved agility and responsiveness (Kamble et al., 2023; Oliveira, Kamble et al., 2023). Recognizing blockchain's strategic impacts, international oil and gas companies have expanded their application to other partners and industries. This development has prompted Libyan oil companies to redefine their business models and adopt blockchain technology to leverage strategic advantages. Furthermore, several success stories in the oil and gas industry have been published by academia and blockchain vendors, highlighting blockchain's capability to enhance organizational performance and strategic decision-making independently (Vega, 2021). Recent studies suggest that blockchain, as a distributed system, improves data security, transparency, and real-time processing, facilitating more efficient and informed decentralized decision-making (Liu et al., 2024; Theodorakopoulos et al., 2024). However, the relationship between blockchain adoption, strategic decision speed, and organizational performance has not been examined empirically.

Conceptual Model and Hypotheses Development

Blockchain and Organizational Performance

The literature on the impact of blockchain (BC) on organizational performance (OP) is still emerging, with most studies on BC in companies focusing on methods and concepts rather than on blockchain capabilities and their impact on OP, which remains mostly inconclusive. The relationship between IT capabilities and organizational performance has been widely studied by numerous researchers (e.g., Kumari et al., 2024; Rehman et al., 2022). According to Murray et al. (2021), blockchain technology directly reduces transaction costs and mitigates agency costs arising from contracting agents within the firm. Recent research indicates a strong link between business capabilities and financial performance. In this context, some authors emphasize that BC can reduce operational costs and accelerate processes by eliminating multiple third-party intermediaries (Harshini et al., 2022). Although all data is stored in a shared ledger, only relevant information is visible to key stakeholders based on a set of business rules established at the outset. Because data is stored on the immutable blockchain, both parties can view the status of a transaction, thus avoiding multiple data hand-offs and various versions of data (Norta, 2017). Some authors assert that organizational performance is improved through data exchange, optimized business processes with smart contracts, reduced operating costs, and enhanced security and efficiency (Sahibzada et al., 2023; Bai et al.,2024). Blockchain technology can

improve operational performance and effectiveness while also contributing to social and economic growth (Mikalef & Pateli, 2017). More recently, researchers have highlighted the critical role of blockchain in enhancing supply chain management practices and supporting sustainable performance.

Hypothesis 1: Blockchain adoption has a significant impact on organizational performance.

Blockchain and Strategic Speed Decision

The visibility of blockchain allows companies to reinforce their relationships with stakeholders through full transparency and information reliability. Since each block in the blockchain network represents two important pieces of information—showing the list of blocks representing the transactions—and each block is cryptographically chained with a hash value. This smart contract enables stakeholders to stay updated whenever new information is added, allowing them to make quick decisions regarding their business transactions (Norta, 2017). Furthermore, accurate data acquisition, storage, and transmission enable actors to create new solutions and make fast decisions (Irfan et al., 2020). Previous studies have highlighted that blockchain (BC) offers the ability to operate on a decentralized network, facilitating fast access to and transfer of efficient information (Khan et al., 2022). By eliminating the need for third-party intermediaries or control, information can be easily and quickly transferred between parties (Allameh,et al.,2020). An important feature of blockchain in highlighting transaction speed is its ability to bring a distributed network to agreement on the form of data, network rules, and efficient knowledge transfer (Theodorakopoulos et al., 2024). According to Liu et al. (2024), blockchain ensures fast decisions by following a structured approach where immutable blocks are chronologically added to form a chain, through an agreement process commonly known as consensus. Different algorithms have been developed to achieve consensus in BC. Consensus forms an agreed truth among all stakeholders, favors trusted shared information and contributes to the fast-decision-making process (Bodkhe et al., 2020). Some authors underline that blockchain provides trust in transactions and assists decision-making speed through decentralized consensus (Reghuet al.,2024; Bodkhe et al. 2020 and Hughes et al. 2019). The trust developed among stakeholders facilitates communication and the sharing of efficient information needed to make fast decisions and maintain an agile response to flexible market needs. Back et al. (2014) explore the potential use of blockchain technology in the aviation context for managing asset maintenance information. More specifically, it shows the potential use of blockchain at a railway company as a crucial factor in rapid decision-making. Based on blockchain, the right decisions are taken promptly, avoiding domino effects and major disruptions in the network's intrinsic density. Some researchers argue that virtual communication and transactions promote the pace of strategic decision-making and increase the firm's agility (Csaszar et al., 2024).

Hypothesis 2: There is a significant relationship between blockchain adoption and strategic decision speed in the oil and gas sector.

Strategic Decision Speed and Organizational Performance

Literature on strategic decision-making supports the notion that decision speed positively impacts organizational performance (Manolopoulos et al., 2024; Shepherd et al., 2024; Samuel et al., 2021). Several scholars specifically emphasize the connection between strategic decision speed and international performance. Many of them conceptualize swift decision-making as the rapid execution of the internationalization process (Petrou et al., 2020; Qin et al., 2024). This research, however, primarily concentrates on how a firm can rapidly execute all aspects of its

decision-making process—from identifying strategic action alternatives to integrating the final decision—within an international market context. In a dynamic international market context, such as in oil and gas firms, the pace of strategic decision-making is crucial for a firm's capacity to effectively seize business opportunities and achieve sustainable returns (Shapovalo et al., 2024). Conversely, Aversa et al. (2020) posits that rapid decision-making can compromise the quality of valuable information, potentially leading to poor decisions and detrimental performance. Adomako et al. (2021) argue that although rapid decisions might limit comprehensive analysis of available information, there are circumstances in which swift decision-making is crucial. In this regard, Nahyan et al. (2019) found that quick decisions can enhance firm performance in volatile environments. Therefore, in turbulent market conditions, a firm must be ready to anticipate changes and respond promptly by formulating effective strategies. Despite varying perspectives (Dykes et al., 2019; Johanson and Oliveira, 2024) on the link between SDS and international performance, we argue that SDS is vital for success in the competitive and volatile international market. Thus, the quicker a company responds, the more competitive advantage it gains, leading to improved performance. Therefore, we suggest that:

Hypothesis 3: There is a significant relationship between the speed of strategic decisions and organizational performance.

There are very few studies that mainly focus on how blockchain capabilities can generate more profit and sales revenue by enabling fast decisions (Abbad et al., 2024; Grain and Issami, 2024). However, considering the mediating role of SDS, we do not find empirical evidence in the existing literature that adequately demonstrates how blockchain capabilities may improve organizational performance through SDS.

Accordingly, it was hypothesized that:

Hypothesis 4: Strategic decision speed has a mediating role in the relationship between blockchain adoption and organizational performance.

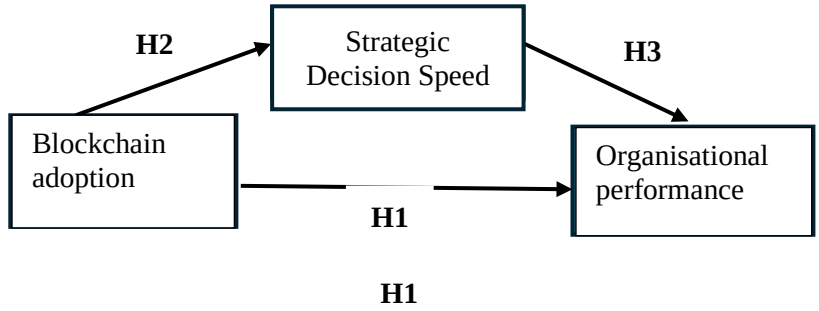

Fig. 1 Conceptuel Model

Data and Methodology

Data Analysis

This research aims to examine the influence of blockchain on organizational performance through strategic decision speed in Libyan oil and gas firms. Manufacturing has enormous

potential to create economic growth and prosperity in Libya (Shahzad et al., 2022a). The survey was administered via email and e-messages to distribute and collect the questionnaires.

Offline survey methods were used to obtain data from managers, who were invited to respond and provide their insights on the performance of the researched factors in their company using a five-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree").

The survey questionnaire was initially written in English before being translated into Arabic by some researchers. During the pilot testing period, language and industry experts double-checked the wording of the questions. A valid response rate of 41% was achieved, with 289 effective responses from professionals who confirmed their participation in the survey.

Methodology

We employed Partial Least Squares Structural Equation Modeling (PLS-SEM) to analyze the collected data, following the guidance provided by Hair et al. (2017). This method functions as a causal prediction system, focusing on forecasts while investigating statistical models to clarify causal relationships (Hair et al., 2017).

The method consisted of two main steps: first, we evaluated the measurement model, also known as the outer model; and second, we assessed the structural model, referred to as the inner model.

Assessment of Common Method Bias

Since all questions were answered by a single informant, we employed the Harman one-factor test to assess common method bias (CMB). The results indicated that the maximum explained variance was 32.14%, which is below the 40% threshold, suggesting that CMB was not a concern in our research (Babin et al., 2016). Following Kock (2015), we performed a full collinearity analysis to assess the variance inflation factors (VIF) of the latent constructs. The findings in Table 4 indicate that the highest inner VIF value was 2.905, which is below the critical threshold of 3.3, suggesting that CMB is not an issue in this study. Additionally, we employed a correlation matrix procedure to investigate the presence of CMB, which would be indicated by significantly high correlations among the primary constructs (i.e., $r > 0.90$) (Bagozzi and Yi, 1990). Table 4 illustrates that the correlations among the latent constructs are not elevated, reinforcing the conclusion that CBM is absent in this research.

Measurement Model Analysis

To ensure the fitness of the measuring tool, reliability guarantees that the results produced by the instrument are consistent, whereas validity indicates how accurately the measures represent the specific variables in question. We assessed the reliability and validity of the constructions using various methods. The results presented in Table 1 indicate that the standardized factor loadings in the outer model exceeded the threshold of 0.70 (Hair et al., 2017). To examine the possibility of multicollinearity, we analyzed the tolerance and variance inflation factor (VIF). The low tolerance values suggest that the measures are robust, indicating a reduced likelihood of multicollinearity. The VIF values were below the critical cut-off of 3.3, confirming that multicollinearity is not an issue in the dataset, as shown in Table 4 (Sarstedt et al., 2017). Additionally, Cronbach's alpha and composite reliability values for all constructs exceeded the threshold, demonstrating that our measurement approach is reliable and convergent. Table 1 highlights the key performance metrics used to evaluate the quality of the measurement model.

	Factor Loading	Cronbach's Alpha	Rho_	Composite Reliability	AVE
BC	0.817 0.810 0.827 0.834	0.842	0.857	0.893	0.676
OP	0.816 0.828 0.816 0.855 0.877 0.848	0.917	0.926	0.935	0.70
SDS	0.873 0.908 0.842 0.891	0.905	0.963	0.931	0.772

Table 1. Measurement Assessment

Evaluation of Discriminant Validity

We evaluated discriminant validity using several methods. We examined the shared variance between constructs and the average variance extracted (AVE) values. Table 2 indicates that the square root of the AVE for all constructs was greater than their corresponding correlation values. Additionally, all items' corrected item-total correlation (CITC) values exceeded the cut-off of 0.5, confirming that our measurement model does not have any issues with discriminant validity.

	BC	SDS	OP
BC	0.822		
SDS	0.377	0.424	0.840
OP	0.251	0.245	0.328

Table 2. Discriminant Validity (Forner and Lacker Criterion)

Moreover, all items' corrected item-total correlation (CITC) values exceeded the cut-off of 0.5, indicating no discriminant validity (DV) issues in our measurement model (Fornell & Larcker, 1981). Additionally, we calculated the Heterotrait-Monotrait (HTMT) ratio using the method proposed by Henseler et al. (2015), which is a contemporary approach to DV analysis. According to Hair et al. (2017), HTMT values greater than 0.90 suggest a potential DV problem, while Henseler et al. (2015) recommend a stricter criterion of 0.85. Table 3 shows that the HTMT values for all assessed constructs do not exceed this threshold. Therefore, we can conclude that there are no DV issues in this study.

	BC	SDS	OP
BC			
SDS	0.409		
OP	0.247	0.231	

Table 3. Discriminant Validity (Htmt)

Empirical Results and Discussion

We used Structural Equation Modeling (SEM) to test the hypotheses and answer the research questions for the structural model analysis. First, we examined the path coefficient values and R^2. Then, we calculated Q^2 to assess the study model's predictive significance. The results align with our hypotheses (Table 5). The path coefficients indicate that the effects of BC on OP (H1, b = 0.153) and BC on SDS (H2, β = 0.171) are both positive and significant. Additionally, the impact of SDS on OP (H3, β = 0.232) is also positive and significant. Regarding the SDS mediation effect, the results show the indirect significant effect of BC on OP via SDS (H4 = 0.235). Therefore, our analysis reveals that SDS partially mediates the relationship between BC and OP in oil and gas firms. Moreover, the research model explains 6.3% of the variance in SDS and 25.9% in OP.

Furthermore, Hair et al. (2017) recommended a more conservative approach to assessing the predictive significance of the model using Q^2, rather than relying solely on R^2. As a result, the Q^2 test was applied, yielding values of 0.041 for SDS and 0.181 for OP, as suggested by Stone (1974). Hence, we conclude that our model has strong predictive relevance for the endogenous constructs, as the Q^2 value is greater than zero.

	BC	SDS	OP	VIF
BC1	0.817	0.175	0.265	2.009
BC2	0.810	0.218	0.336	1.774
BC3	0.827	0.231	0.366	1.675
BC4	0.834	0.286	0.240	1.171
OP1	0.279	0.240	0.816	2.391
OP2	0.254	0.235	0.828	2.451
OP3	0.372	0.287	0.817	2.132
OP4	0.312	0.306	0.855	2.633
OP5	0.363	0.320	0.877	2.856
OP6	0.289	0.246	0.848	2.562
SDS1	0.227	0.873	0.263	2.462
SDS2	0.317	0.908	0.347	2.533
SDS3	0.070	0.842	0.164	2.705
SDS4	0.164	0.891	0.307	2.905

Table 4. Discriminant Validity (Cross Loadings).

	B	T Statistics	P Values	Results
BC-> OP	0.153	3.069	0.001	Supported
BC->SDS	0.171	3.863	0.000	Supported
SDS->OP	0.232	3.645	0.000	Supported
H4: BCC-CA-OP	0.235	3.224	0.001	Supported

Table 5. Discriminant Validity (Forner and Lacker Criterion)

Blockchain technologies have the potential to disrupt current ways of working for companies. Organizations that adopt blockchain in an agile manner at an early stage stand to benefit the most compared to late adopters. Therefore, leadership should initiate groundwork on technology adoption and cultivate a change-driven mindset to ensure early success.

The objective of this research is to explore the new capabilities of blockchain in improving strategic decision speed and organizational performance. Empirically, the findings of the research have established that blockchain leads to faster strategic decision-making in the oil and gas sector, resulting in better organizational performance, which is consistent with the postulations of Abbad et al. (2024) and Grain and Issami (2024). The current study indicates that oil and gas firms have multiple opportunities to redefine their business models and integrate blockchain-enabled business processes to make faster decisions and gain a competitive advantage. Early users of blockchain technology may gain a larger market share, while the absence of blockchain technology will become a competitive disadvantage in the long term. In order to make fast decisions, managers should have access to a business knowledge flow via blockchain technology. This finding is consistent with previous studies (Joos et al., 2020; Holsapple et al., 2019), which highlight that the greater the access to information decision-makers have, the more options and alternatives they will have to make effective and speedy decisions. Thus, by efficiently exploiting the blockchain system, managers can collect and analyze an increasing amount of information. Data analysis would enable them to have comprehensive and accurate information about possible alternatives and solutions. As a result, managers would become more proactive, making rational choices that allow them to reach prompt decisions and act pre-emptively in a turbulent environment. Therefore, the real benefits of blockchain will materialize when Libyan oil and gas firms partner with other firms and regulators, which, in turn, will bring benefits to the firm's stakeholders. The results of this study lead to several important implications.

The maturity of blockchain technology is still in its nascent stage of development and adoption in African countries. Therefore, new dimensions and research topics can be developed to study the strategic blockchain capabilities in the oil and gas sector. Other contingencies related to blockchain, such as environmental dynamism and operational risk, were not covered in this research. Therefore, incorporating these variables to expand our model could provide opportunities for future research. It is also suggested that the results be compared across countries to determine synergies and data gaps, as well as to facilitate cross-border collaboration and international trade. Furthermore, to gain a clearer insight into the relationship between rapid strategic decisions and organizational performance, it is essential to develop a longitudinal research design. In fact, a longitudinal study would be highly beneficial for this research area, offering deeper insights into how strategic decision-making affects both financial and non-financial performance in the oil and gas industry over time.

Conclusions

As one of the most significant emerging technologies, blockchain can rapidly transform the traditional business processes of oil and gas companies, accelerating the speed of transactions and operations. While organizations have not yet fully embraced it, blockchain presents new opportunities for supply chain speed and performance. This research explored the impact of blockchain on organizational performance through strategic decision speed in the Libyan oil and gas sector. We validated our hypotheses using structural equation modeling (SEM) based on

existing literature. Our findings revealed a direct effect of blockchain on organizational performance, with strategic decision speed mediating this relationship.

Furthermore, the results expand the RBV theory by highlighting blockchain technology as a crucial technological resource that drives improved performance for firms. This study provides valuable insights for oil and gas firms to enhance blockchain adoption. Additionally, the findings can serve as a foundation for future studies on blockchain capabilities and organizational performance.

Funding

This work was supported and funded by the Deanship of Scientific Research at Imam Mohammad Ibn Saud Islamic University (IMSIU) (grant number IMSIU-DDRSP2502).

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