Open Access Research Journal of
Science and Technology
Journals home page: https://oarjst.com/
ISSN: 2782-9960 (Online)

OARJ OPEN ACCESS RESEARCH JOURNALS

(REVIEW ARTICLE)

Check for updates

# A governance and risk management framework for project management in the oil and gas industry

Oluwaseun Adeola Bakare [1,*], Onoriode Reginald Aziza [2], Ngozi Samuel Uzougbo [3] and Portia Oduro [4]

[1] *OBAT OIL AND PETROLEUM LIMITED, Lagos, Nigeria.*
[2] *Independent Researcher; Lagos Nigeria.*
[3] *Independent Researcher; Columbus Ohio, USA.*
[4] *Energy Law Center, Paul M. Hebert Law Center, Louisiana State University, USA.*

Open Access Research Journal of Science and Technology, 2024, 12(01), 121–130

Publication history: Received on 17 August 2024; revised on 25 September 2024; accepted on 27 September 2024

Article DOI: https://doi.org/10.53022/oarjst.2024.12.1.0119

## Abstract

The oil and gas industry operates in an environment marked by high risks, complex regulations, and significant financial investments. Effective project management in this sector requires a robust governance and risk management framework to address operational, regulatory, financial, and environmental challenges. This review proposes a comprehensive governance and risk management framework tailored specifically to the unique needs of oil and gas projects. The framework integrates governance structures that define clear roles, responsibilities, and decision-making processes, ensuring that projects align with corporate objectives and compliance standards. Central to this framework is a risk management model that identifies, assesses, and mitigates potential project risks. The model emphasizes continuous risk monitoring, utilizing advanced technologies such as predictive analytics, AI, and digital twins to forecast risks and optimize decision-making. Additionally, it advocates for proactive stakeholder engagement strategies to ensure alignment among diverse stakeholders, including government agencies, investors, and local communities. The governance aspect of the framework promotes transparency, accountability, and sustainability, ensuring that projects meet both operational goals and regulatory requirements. It also introduces agile project management techniques to enhance flexibility and responsiveness throughout the project lifecycle. By integrating technological tools like blockchain for contract management and AI for predictive maintenance, the framework addresses both governance and risk management challenges. Ultimately, the review serves as a guide for oil and gas companies to enhance project efficiency, minimize risks, and meet the demands of an increasingly complex industry landscape.

**Keywords:** Risk Management; Project Management; Oil and Gas; Review

## 1. Introduction

The oil and gas industry is characterized by its vast and complex project management requirements, particularly in large-scale, capital-intensive projects (Uzougbo *et al*., 2024). These projects often involve significant financial investments, intricate logistical operations, and extensive coordination among various stakeholders, including government bodies, regulatory agencies, contractors, and local communities. The multifaceted nature of these operations means that effective project management is crucial for ensuring successful outcomes (Adanma and Ogunbiyi, 2024). From exploration and drilling to transportation and refining, each phase of a project entails its own set of challenges and intricacies, making it essential for companies to adopt robust project management strategies (Adejugbe, 2018). The oil and gas sector faces unique challenges, including stringent regulatory requirements, fluctuating market conditions, and high-risk factors associated with environmental and safety concerns. Regulatory frameworks can vary significantly across different regions and jurisdictions, necessitating a comprehensive understanding of local laws and international standards (Adewusi *et al*., 2024). Furthermore, the financial stakes are incredibly high, as even minor project delays or mismanagement can lead to substantial financial losses. The complexity of operations often

* Corresponding author: Oluwaseun Adeola Bakare.

exacerbates these challenges, as organizations must navigate competing priorities while maintaining compliance with safety and environmental regulations. Given these complexities, the need for a structured governance and risk management framework becomes increasingly apparent (Abiona *et al*., 2024). Effective governance ensures that decision-making processes are transparent and accountable, while a robust risk management strategy identifies potential risks and develops mitigation plans to address them proactively. The absence of a coherent framework can lead to significant operational inefficiencies, regulatory non-compliance, and financial setbacks (Oyeniran *et al*., 2024). Therefore, implementing a governance and risk management framework is not just beneficial but essential for organizations operating in the oil and gas industry (Sonko *et al*., 2024).

The objective of this review is to present a comprehensive governance and risk management approach tailored specifically for project management in the oil and gas sector. This will provide guidelines for integrating governance structures with risk management practices, ultimately enhancing project performance and ensuring compliance with regulatory requirements. By establishing clear roles and responsibilities, fostering collaboration among stakeholders, and implementing effective risk assessment and mitigation strategies, organizations can significantly improve their project outcomes (Modupe *et al*., 2024). The oil and gas industry presents a challenging yet rewarding landscape for project management. The complexities of large-scale projects demand a structured approach to governance and risk management that can adapt to the unique challenges faced by this sector. This aims to equip organizations with the necessary tools and strategies to navigate the intricacies of oil and gas projects, ensuring not only regulatory compliance but also the successful delivery of projects within scope, time, and budget constraints. As the industry continues to evolve, the implementation of an effective governance and risk management framework will be pivotal in driving sustainable growth and operational excellence.

## 2. Key Challenges in Oil and Gas Project Management

The oil and gas industry are a cornerstone of the global economy, providing essential energy resources and driving economic development (Adewusi *et al*., 2024). However, managing projects within this sector is fraught with challenges that can significantly impact success. Understanding these challenges is crucial for developing effective strategies to navigate the complexities of oil and gas project management. This examines four key challenges: regulatory and compliance risks, financial and investment risks, operational and technical risks, and stakeholder management and communication issues.

One of the foremost challenges in oil and gas project management is navigating the stringent local and international regulations that govern the industry. Regulatory frameworks are designed to ensure safety, environmental protection, and operational integrity (Komolafe *et al*., 2024). However, the complexity and variability of these regulations can pose significant compliance challenges. Companies must adhere to multiple sets of regulations, which may differ not only by country but also by region within a country. This multiplicity can lead to confusion and increase the risk of non-compliance, which can result in severe financial penalties and damage to reputation. Moreover, the oil and gas sector are subject to rigorous environmental regulations aimed at minimizing the ecological impact of exploration and production activities. Compliance with these regulations often requires extensive environmental assessments, continuous monitoring, and investment in sustainable technologies (Latilo *et al*., 2024). Safety regulations further complicate matters, as companies must implement comprehensive safety management systems to protect workers and surrounding communities. Failure to meet these requirements can lead to accidents, legal liabilities, and operational shutdowns.

The financial landscape of the oil and gas industry is characterized by high capital investment and significant exposure to fluctuating commodity prices (Uzougbo *et al*., 2024). Projects often require substantial upfront capital to cover exploration, drilling, and production costs. However, the volatile nature of oil and gas prices means that these investments carry inherent financial risks. Sudden price declines can render projects economically unviable, leading to losses for investors and stakeholders. Economic uncertainties, such as geopolitical instability and changing market dynamics, further exacerbate financial risks. Companies must develop robust financial models to assess the viability of projects under various scenarios, including worst-case outcomes. Cost overruns are also a prevalent issue in oil and gas projects, often stemming from inaccurate estimates, project delays, and unforeseen challenges (Adejugbe, 2024). Effective financial risk management strategies are essential to mitigate these risks and ensure project sustainability.

Managing operational and technical risks is another critical challenge in oil and gas project management (Adanma and Ogunbiyi, 2024). The industry relies heavily on complex infrastructure, advanced technology, and specialized equipment to operate effectively. However, the intricacies involved in managing these assets can lead to various operational challenges (Adewusi *et al*., 2024). For instance, maintaining operational efficiency in offshore and remote locations is particularly difficult, given the logistical complexities and harsh environmental conditions. Technical

failures can have catastrophic consequences, leading to production downtime, costly repairs, and environmental incidents. Companies must implement rigorous maintenance programs and invest in advanced monitoring technologies to detect issues before they escalate. Additionally, the integration of new technologies, such as automation and digitalization, while offering potential efficiency gains, also presents its own set of risks, including cybersecurity threats and the need for skilled personnel (Adejugbe, 2019; Oyeniran *et al*., 2024).

The oil and gas industry operates within a complex web of stakeholders, including government agencies, contractors, local communities, and environmental organizations (Uzougbo *et al*., 2024). Effective stakeholder management is crucial for project success, yet it often presents significant challenges. Diverse stakeholder interests can lead to conflicts, particularly when it comes to environmental concerns, economic benefits, and community rights. Miscommunication among stakeholders can further complicate project management. For instance, differing expectations regarding project timelines, environmental impact, and community engagement can result in misunderstandings and disputes. Establishing clear communication channels and engaging stakeholders early in the project lifecycle are essential strategies for mitigating these risks. Regular updates, transparent reporting, and inclusive decision-making processes can help build trust and ensure alignment among stakeholders (Adewusi *et al*., 2024). Oil and gas project management is a multifaceted discipline characterized by significant challenges that require careful navigation. Regulatory and compliance risks demand vigilant adherence to stringent standards, while financial and investment risks necessitate robust economic modeling and risk assessment. Operational and technical risks call for meticulous management of complex systems and technologies, and stakeholder management is essential for aligning diverse interests and fostering collaboration. Addressing these challenges effectively is critical for ensuring the successful execution of oil and gas projects, ultimately contributing to the industry's sustainability and resilience in an ever-changing landscape (Oyeniran *et al*., 2022; Uzougbo *et al*., 2024).

### 2.1. Principles of Governance in Oil and Gas Project Management

Effective governance in oil and gas project management is essential for navigating the complexities of this capital-intensive industry (Okoli *et al*., 2024). With substantial financial investments, regulatory scrutiny, and environmental implications, governance principles play a crucial role in ensuring project success and sustainability. This explores four key principles of governance: establishing a robust project governance structure, implementing transparent decision-making processes, developing an effective stakeholder engagement and communication strategy, and prioritizing ethical and environmental considerations.

A well-defined project governance structure is fundamental to the successful management of oil and gas projects (Oyeniran *et al*., 2023). This structure establishes clear roles and responsibilities for project teams and leadership, ensuring that all stakeholders understand their functions and expectations. Effective governance begins with defining a hierarchy that outlines authority and accountability across various project levels. This may include project managers, functional leaders, and executive sponsors, each tasked with specific responsibilities that align with project objectives. Moreover, the establishment of governance boards and committees is critical for oversight and decision-making. These bodies facilitate strategic direction, resource allocation, and risk management, providing an essential framework for project governance. Regular meetings of these committees enable timely discussions on project progress, challenges, and decision-making, fostering an environment of collaboration and transparency. By implementing a clear governance structure, organizations can enhance accountability and ensure that project objectives align with corporate strategies (Ogunleye *et al*., 2024).

Transparent decision-making processes are another cornerstone of effective governance in oil and gas project management. Ensuring that decisions are data-driven and aligned with strategic objectives is vital for maintaining project integrity and stakeholder trust (Uzougbo *et al*., 2024). Utilizing analytical tools and performance metrics allows project managers to make informed choices that reflect the project's best interests. Regular project reviews and audits are essential components of this principle. These reviews provide opportunities to assess project performance, identify deviations from plans, and implement corrective actions. By instituting a culture of accountability through frequent evaluations, organizations can ensure that decisions are continually aligned with project goals and regulatory requirements. This transparency not only enhances stakeholder confidence but also minimizes risks associated with unforeseen challenges.

Developing a proactive stakeholder engagement framework is crucial for effective governance in oil and gas project management (Latilo *et al*., 2024). The industry involves a diverse array of stakeholders, including regulatory bodies, investors, local communities, and environmental organizations. A comprehensive engagement strategy ensures that all relevant parties are informed and consulted throughout the project lifecycle. Continuous communication is vital for managing stakeholder expectations and building trust. Establishing regular channels for interaction, such as community

meetings, investor briefings, and regulatory consultations, enables stakeholders to voice their concerns and contribute to project development. This two-way communication fosters collaboration and ensures that stakeholder interests are considered in decision-making processes (Adejugbe, 2021). Furthermore, engaging local communities can lead to better social license to operate, which is essential for the long-term sustainability of oil and gas projects. By actively involving stakeholders, organizations can mitigate potential conflicts and enhance project acceptance, ultimately contributing to the project's success.

Ethical and environmental considerations are increasingly becoming integral to governance in the oil and gas sector (Adewusi *et al*., 2023). As global awareness of climate change and environmental degradation grows, governance standards must prioritize sustainability, safety, and ethical practices. This involves not only compliance with existing environmental protection laws but also the establishment of internal policies that promote responsible resource management. Governance frameworks should incorporate strategies for reducing carbon footprints and minimizing environmental impacts (Oyeniran *et al*., 2023). Organizations can achieve this by setting clear sustainability targets, implementing environmental management systems, and fostering a culture of environmental responsibility among employees and stakeholders. Additionally, regular reporting on environmental performance and compliance with carbon reduction targets enhances transparency and accountability. Moreover, ethical governance extends beyond environmental concerns to encompass social responsibility and corporate ethics. Establishing a code of conduct that outlines expectations for ethical behavior, transparency, and integrity is vital for fostering a culture of accountability within project teams. Training programs and awareness campaigns can further reinforce these principles, ensuring that all stakeholders uphold the highest ethical standards (Uzougbo *et al*., 2023). The principles of governance in oil and gas project management are vital for ensuring project success and sustainability in a complex and dynamic industry. A well-defined project governance structure establishes clear roles and responsibilities, while transparent decision-making processes foster accountability and data-driven choices. Proactive stakeholder engagement and communication strategies enhance trust and collaboration among diverse stakeholders, while ethical and environmental considerations ensure that projects align with broader societal and ecological goals. By adhering to these governance principles, organizations can navigate the challenges of oil and gas project management more effectively, ultimately contributing to the long-term viability and acceptance of their projects (Adejugbe, 2019).

## 3. Integration of Governance and Risk Management with Project Management

In the dynamic landscape of project management, particularly within complex industries like oil and gas, the integration of governance and risk management is crucial for ensuring project success. This integration not only enhances project outcomes but also mitigates potential pitfalls associated with operational and regulatory challenges (Adewusi *et al*., 2023). By aligning governance and risk management with established project management methodologies, organizations can foster a more structured approach that addresses the multifaceted nature of projects. The first step in integrating governance and risk management is to align these functions with recognized project management frameworks, such as PMBOK (Project Management Body of Knowledge), Agile, or PRINCE2. Each of these methodologies emphasizes the need for structured processes, but the inclusion of governance and risk management creates a comprehensive framework that spans all project phases initiation, planning, execution, monitoring, and closure. In the initiation phase, governance provides a foundation by establishing clear roles, responsibilities, and decision-making protocols (Ogunleye, 2024). Risk management identifies potential obstacles and uncertainties that could impact project viability. During planning, governance ensures that risk assessments inform project strategies and resource allocations, while execution focuses on adherence to governance standards and proactive risk monitoring. In the monitoring phase, regular reviews facilitate adjustments based on risk developments, and closure allows for reflective evaluations of governance effectiveness and risk management outcomes (Ogedengbe *et al*., 2023).

A systematic approach to integrating governance and risk management also involves mapping governance checkpoints and risk assessments to critical stages of the project lifecycle. This ensures that project teams regularly evaluate both governance and risk factors throughout the project's duration (Adanma and Ogunbiyi, 2024). For example, during key project transitions, such as from planning to execution, governance protocols can include formal reviews to confirm that risks have been adequately addressed and that all stakeholders are aligned. Establishing clear governance protocols for project handovers is essential for maintaining continuity and accountability. These protocols facilitate seamless transitions between project phases, ensuring that all relevant documentation, risk assessments, and governance frameworks are communicated effectively (Oyeniran *et al*., 2023). This proactive approach helps mitigate the risk of oversights that could lead to project delays or compliance issues.

The integration of technology plays a pivotal role in enhancing the governance and risk management framework within project management (Adejugbe, 2016). Utilizing project management software can streamline the integration of risk management processes, allowing for real-time data sharing and collaboration among project teams. These tools can

automate risk reporting, making it easier to track risk metrics and generate insights that inform decision-making. Additionally, technology enables real-time monitoring of project progress and risk factors, allowing teams to respond swiftly to emerging challenges (Ogedengbe *et al*., 2024). Tools equipped with analytics capabilities can assess risk probabilities and impacts, providing valuable foresight that enhances governance. Furthermore, governance audits can be facilitated through technology, ensuring that compliance with established protocols is continuously assessed and improved. The integration of governance and risk management within project management is essential for navigating the complexities of modern projects. By aligning these functions with established methodologies, mapping governance and risk assessments to project lifecycles, and leveraging technology, organizations can enhance their ability to manage risks effectively while maintaining strong governance standards (Latilo *et al*., 2024; Ogunleye, 2024). This holistic approach not only drives project success but also builds resilience against the uncertainties inherent in complex project environments.

## 4. Technology's Role in Enhancing Governance and Risk Management

In an increasingly complex and regulated environment, technology plays a pivotal role in enhancing governance and risk management across various industries, particularly in capital-intensive sectors like oil and gas (Adejugbe, 2020). The integration of advanced technologies, such as data analytics, blockchain, artificial intelligence (AI), and digital twins, offers significant advantages in identifying, mitigating, and managing risks while ensuring accountability and transparency in project management.

One of the most transformative aspects of modern governance and risk management is the use of data analytics and predictive modeling. By leveraging vast amounts of historical and real-time data, organizations can enhance their risk identification processes significantly. Data analytics allows for the thorough examination of trends and patterns that may indicate potential risks, enabling teams to take proactive measures before issues escalate (Latilo *et al*., 2024). Predictive modeling further enhances this capability by forecasting project risks based on identified data trends. For instance, organizations can analyze past project performance, market fluctuations, and external factors to anticipate future challenges. This proactive approach allows project managers to allocate resources more effectively, implement preventive measures, and make informed decisions that align with strategic objectives.

Blockchain technology has emerged as a powerful tool for ensuring transparency and accountability in governance and risk management (Adanma and Ogunbiyi, 2024). By maintaining immutable records of contracts, agreements, and transactions, blockchain technology provides a reliable source of truth that stakeholders can trust. This transparency is particularly vital in industries with extensive regulatory requirements, as it simplifies compliance and audit processes. Moreover, blockchain-enabled governance facilitates enhanced project accountability by creating a decentralized ledger where all stakeholders have access to relevant information. This access helps to mitigate risks associated with miscommunication and misalignment among stakeholders, as everyone operates from the same set of verified data. The resulting increase in trust can foster stronger collaborations among project teams, contractors, and regulatory bodies (Adejugbe, 2024).

Artificial intelligence and machine learning are revolutionizing risk management through predictive maintenance, risk assessment, and operational decision-making (Latilo *et al*., 2024). AI can analyze historical data to identify potential failure points in infrastructure or equipment, enabling organizations to perform maintenance before a failure occurs. This shift from reactive to proactive maintenance not only minimizes downtime but also reduces operational costs and enhances safety. Additionally, AI-driven simulations can facilitate scenario planning and risk evaluation. By simulating various risk scenarios, organizations can assess potential impacts and develop strategies to mitigate them effectively (Ogunleye *et al*., 2024). This capacity for real-time risk assessment enhances decision-making processes, allowing teams to respond swiftly to emerging threats.

Digital twin technology is another innovative solution that significantly enhances governance and risk management (Adanma and Ogunbiyi, 2024). By creating a virtual replica of physical assets, digital twins allow organizations to monitor infrastructure, equipment, and operations in real-time. This capability provides a continuous stream of data that informs risk assessments and operational strategies. Through virtual simulations, organizations can predict how changes in operations or environmental conditions might affect performance and safety. For example, a digital twin can model how equipment will react to different stressors, helping managers make informed decisions about operational adjustments. This real-time monitoring and predictive capability contribute to improved operational efficiency and reduced risks, ensuring that projects remain on track and compliant with governance standards (Aiguobarueghian *et al*., 2024). The integration of advanced technologies into governance and risk management practices offers significant opportunities for organizations to enhance their operational effectiveness. By leveraging data analytics and predictive modeling, employing blockchain for transparency, utilizing AI for proactive risk mitigation, and implementing digital

twin technology, organizations can navigate the complexities of modern project management with greater confidence. These technologies not only improve risk identification and mitigation strategies but also foster a culture of accountability and collaboration among stakeholders. As industries continue to evolve, embracing these technological advancements will be critical for achieving sustainable success and maintaining compliance in a rapidly changing environment (Ogunbiyi *et al*., 2024).

## 5. Challenges in Implementing Governance and Risk Management

Implementing effective governance and risk management (GRM) in project management, particularly in capital-intensive sectors like oil and gas, presents several challenges (Kupa *et al*., 2024). These challenges stem from cultural resistance, regulatory complexities, financial constraints, and the need for coordination among multiple stakeholders. Understanding these obstacles is critical for organizations striving to create a robust governance framework that aligns with risk management strategies.

One of the most significant barriers to implementing governance protocols and risk management strategies is cultural resistance within project teams. Organizations often have established practices and norms that may not prioritize proactive risk management (Coker *et al*., 2023). Employees might view new governance measures as unnecessary or burdensome, leading to reluctance in adoption. This resistance can be further exacerbated by a lack of understanding of the benefits that effective governance can bring, such as enhanced decision-making and reduced operational risks. To overcome this cultural resistance, organizations must prioritize change management initiatives that foster a culture of accountability and proactive risk management. This involves engaging team members early in the process, providing comprehensive training on the importance of governance, and demonstrating how risk management can enhance overall project success. Effective leadership is essential in facilitating this cultural shift, as leaders must exemplify the values of transparency, collaboration, and risk awareness to inspire their teams (Oguejiofor *et al*., 2023).

Navigating the intricate landscape of local and international regulations poses another significant challenge in implementing governance and risk management (Oduro *et al*., 2024). The oil and gas sector are particularly susceptible to stringent environmental regulations and compliance requirements, which can vary significantly across jurisdictions. Organizations must stay informed about evolving regulations, which often demand significant resources and expertise. Balancing governance requirements with operational demands can be particularly challenging (Odulaja *et al*., 2023). For instance, ensuring compliance with environmental standards while meeting project deadlines and cost constraints can create tension within project teams. To effectively manage this complexity, organizations need to adopt a proactive approach to regulatory compliance. This involves continuous monitoring of regulatory changes, integrating compliance checks into project workflows, and fostering open communication channels with regulatory bodies to stay aligned with requirements (Popo-Olaniyan *et al*., 2022; Udeh *et al*., 2023).

The financial burden associated with implementing advanced risk management technologies, such as artificial intelligence (AI) and blockchain, is a critical challenge that organizations face. While these technologies can significantly enhance governance and risk management processes, their initial investment and ongoing operational costs can be substantial. Many organizations, particularly smaller firms, may struggle to justify the expense, especially in a volatile market characterized by fluctuating commodity prices (Eleogu *et al*., 2024). To address these financial constraints, organizations must evaluate cost-effective solutions that do not compromise governance standards. This may involve adopting phased implementation strategies that allow for gradual integration of technology while assessing its effectiveness. Additionally, organizations can explore partnerships or collaborations that enable shared access to advanced technologies, thereby spreading the financial burden while enhancing governance capabilities.

Effective governance and risk management require the alignment of interests among a diverse range of stakeholders, including project teams, contractors, regulatory bodies, and local communities (Popo-Olaniyan *et al*., 2022). However, coordinating governance efforts across multinational teams can be complex, given the varying priorities and expectations of each stakeholder group. Misalignment can lead to misunderstandings, increased risks, and project delays. To enhance coordination, organizations must establish clear communication protocols and governance structures that facilitate collaboration among stakeholders. This includes regular stakeholder meetings, transparency in decision-making processes, and the integration of stakeholder feedback into governance strategies. By fostering a collaborative environment, organizations can ensure that all parties are aligned on governance objectives and risk management strategies, ultimately enhancing project success. Implementing effective governance and risk management in project management is fraught with challenges that can impede progress and impact project outcomes (Kupa *et al*., 2024). Overcoming cultural resistance, navigating regulatory complexities, managing financial constraints, and ensuring stakeholder alignment are all critical factors that organizations must address. By adopting proactive change management strategies, fostering a culture of compliance, evaluating cost-effective technology solutions, and enhancing

stakeholder coordination, organizations can mitigate these challenges and create a robust governance framework. Ultimately, embracing these strategies will enhance project resilience and success in an increasingly complex operational landscape (Oduro *et al*., 2024).

## 6. Conclusion

The integration of governance and risk management (GRM) into oil and gas project management is crucial for ensuring the success and sustainability of large-scale, capital-intensive projects. A comprehensive GRM framework not only enhances accountability and compliance but also mitigates the myriad risks associated with complex operations. By establishing clear governance structures, aligning risk management practices with project methodologies, and utilizing technology to streamline processes, organizations can significantly improve project outcomes and stakeholder trust.

Looking ahead, the role of technology in enhancing governance and risk management is poised to expand dramatically. Innovations such as data analytics, artificial intelligence, and blockchain are transforming how organizations identify, assess, and mitigate risks. These technologies provide real-time insights and predictive capabilities that enable proactive decision-making. Furthermore, the emerging trends in sustainability and digital transformation in the oil and gas sector emphasize the need for governance frameworks that not only address compliance but also incorporate environmental and social governance (ESG) criteria. This shift will likely reshape project management practices, making sustainability a core component of strategic planning.

For oil and gas companies aiming to implement effective governance and risk management frameworks, several recommendations emerge. First, organizations should prioritize a culture of transparency and accountability, ensuring that all team members understand the importance of GRM practices. Continuous training and engagement are essential in fostering this mindset. Second, integrating GRM processes with established project management methodologies, such as PMBOK or Agile, ensures that governance and risk considerations are incorporated throughout the project lifecycle, from initiation to closure. Finally, leveraging technology for real-time monitoring and data-driven decision-making will enhance the effectiveness of GRM efforts. The long-term benefits of adopting structured governance and risk management strategies are substantial. Companies that invest in these frameworks can expect improved project resilience, reduced operational risks, and enhanced stakeholder confidence. As the oil and gas industry continues to evolve, embracing these practices will be essential for navigating the complexities of modern project management while contributing to a sustainable future.

## Compliance with ethical standards

### *Disclosure of conflict of interest*

No conflict of interest to be disclosed.

## References

[1] Abiona, O.O., Oladapo, O.J., Modupe, O.T., Oyeniran, O.C., Adewusi, A.O. and Komolafe, A.M., 2024. The emergence and importance of DevSecOps: Integrating and reviewing security practices within the DevOps pipeline. World Journal of Advanced Engineering Technology and Sciences, 11(2), pp.127-133.

[2] Adanma, U.M. and Ogunbiyi, E.O., 2024. A comparative review of global environmental policies for promoting sustainable development and economic growth. *International Journal of Applied Research in Social Sciences*, *6*(5), pp.954-977.

[3] Adanma, U.M. and Ogunbiyi, E.O., 2024. Artificial intelligence in environmental conservation: evaluating cyber risks and opportunities for sustainable practices. *Computer Science & IT Research Journal*, *5*(5), pp.1178-1209.

[4] Adanma, U.M. and Ogunbiyi, E.O., 2024. Assessing the economic and environmental impacts of renewable energy adoption across different global regions. *Engineering Science & Technology Journal*, *5*(5), pp.1767-1793.

[5] Adanma, U.M. and Ogunbiyi, E.O., 2024. Evaluating the effectiveness of global governance mechanisms in promoting environmental sustainability and international relations. *Finance & Accounting Research Journal*, *6*(5), pp.763-791.

[6] Adanma, U.M. and Ogunbiyi, E.O., 2024. The public health benefits of implementing environmental policies: A comprehensive review of recent studies. *International Journal of Applied Research in Social Sciences*, *6*(5), pp.978-1004.

[7] Adejugbe, A. and Adejugbe, A., 2016. A Critical Analysis of the Impact of Legal Restriction on Management and Performance of an Organisation Diversifying into Nigeria. *Available at SSRN 2742385*.

[8] Adejugbe, A. and Adejugbe, A., 2018. Women and discrimination in the workplace: A Nigerian perspective. *Available at SSRN 3244971*.

[9] Adejugbe, A. and Adejugbe, A., 2019. Constitutionalisation of Labour Law: A Nigerian Perspective. *Available at SSRN 3311225*.

[10] Adejugbe, A. and Adejugbe, A., 2019. The Certificate of Occupancy as a Conclusive Proof of Title: Fact or Fiction. *Available at SSRN 3324775*.

[11] Adejugbe, A., 2020. A Comparison between Unfair Dismissal Law in Nigeria and the International Labour Organisation's Legal Regime. *Available at SSRN 3697717*.

[12] Adejugbe, A., 2024. TERMINATION OF EMPLOYMENT IN THE PUBLIC SECTOR–CASE STUDY ON NIGERIA AND SOUTH AFRICA. *Available at SSRN 4881056*.

[13] Adejugbe, A., 2024. The Trajectory of The Legal Framework on The Termination of Public Workers in Nigeria. *Available at SSRN 4802181*.

[14] Adejugbe, A.A., 2021. From contract to status: Unfair dismissal law. *Journal of Commercial and Property Law*, *8*(1).

[15] Adewusi, A. O., Asuzu, O. F., Olorunsogo, T., Iwuanyanwu, C., Adaga, E., & Daraojimba, O. D., 2024. A Review of Technologies for Sustainable Farming Practices: AI in Precision Agriculture. World Journal of Advanced Research and Reviews, 21(01), pp 2276-2895

[16] Adewusi, A. O., Okoli. U. I., Olorunsogo, T., Adaga, E., Daraojimba, O. D., & Obi, C. O. (2024). A USA Review: Artificial Intelligence in Cybersecurity: Protecting National Infrastructure. World Journal of Advanced Research and Reviews, 21(01), pp 2263-2275

[17] Adewusi, A.O., Chikezie, N.R. & Eyo-Udo, N.L. (2023) Blockchain technology in agriculture: Enhancing supply chain transparency and traceability. Finance & Accounting Research Journal, 5(12), pp 479-501

[18] Adewusi, A.O., Chikezie, N.R. & Eyo-Udo, N.L. (2023) Cybersecurity in precision agriculture: Protecting data integrity and privacy. International Journal of Applied Research in Social Sciences, 5(10), pp. 693-708

[19] Adewusi, A.O., Komolafe, A.M., Ejairu, E., Aderotoye, I.A., Abiona, O.O. and Oyeniran, O.C., 2024. The role of predictive analytics in optimizing supply chain resilience: a review of techniques and case studies. International Journal of Management & Entrepreneurship Research, 6(3), pp.815-837.

[20] Adewusi, A.O., Okoli, U.I., Adaga, E., Olorunsogo, T., Asuzu, O.F. and Daraojimba, D.O., 2024. Business intelligence in the era of big data: a review of analytical tools and competitive advantage. Computer Science & IT Research Journal, 5(2), pp.415-431.

[21] Aiguobarueghian, I., Adanma, U.M., Ogunbiyi, E.O. and Solomon, N.O., 2024. Waste management and circular economy: A review of sustainable practices and economic benefits. *World Journal of Advanced Research and Reviews*, *22*(2), pp.1708-1719.

[22] Coker, J.O., Uzougbo, N.S., Oguejiofor, B.B. and Akagha, O.V., 2023. The role of legal practitioners in mitigating corporate risks in Nigeria: a comprehensive review of existing literature on the strategies and approaches adopted by legal practitioners in Nigeria to mitigate corporate risks. *Finance & Accounting Research Journal*, *5*(10), pp.309-332.

[23] Eleogu, T., Okonkwo, F., Daraojimba, R.E., Odulaja, B.A., Ogedengbe, D.E. and Udeh, C.A., 2024. Revolutionizing Renewable Energy Workforce Dynamics: HRâ€™ s Role in Shaping the Future. *International Journal of Research and Scientific Innovation*, *10*(12), pp.402-422.

[24] Komolafe, A.M., Aderotoye, I.A., Abiona, O.O., Adewusi, A.O., Obijuru, A., Modupe, O.T. and Oyeniran, O.C., 2024. Harnessing business analytics for gaining competitive advantage in emerging markets: a systematic review of approaches and outcomes. International Journal of Management & Entrepreneurship Research, 6(3), pp.838-862.

[25] Kupa, E., Adanma, U.M., Ogunbiyi, E.O. and Solomon, N.O., 2024. Assessing agricultural practices in seismically active regions: Enhancing HSE protocols for crop and livestock safety. *International Journal of Applied Research in Social Sciences*, *6*(6), pp.1084-1102.

[26] Kupa, E., Adanma, U.M., Ogunbiyi, E.O. and Solomon, N.O., 2024. Environmental stewardship in the oil and gas industry: A conceptual review of HSE practices and climate change mitigation strategies. *Engineering Science & Technology Journal*, *5*(6), pp.1826-1844.

[27] Latilo, A., Uzougbo, N.S., Ugwu, M.C. and Oduro, P., 2024. Role and effectiveness of advance payment guarantees in construction contracts.

[28] Latilo, A., Uzougbo, N.S., Ugwu, M.C. and Oduro, P., 2024. Strategies for corporate compliance and litigation avoidance in multinational enterprises.

[29] Latilo, A., Uzougbo, N.S., Ugwu, M.C., Oduro, P. and Aziza, O.R., 2024. Developing legal frameworks for successful engineering, procurement, and construction projects.

[30] Latilo, A., Uzougbo, N.S., Ugwu, M.C., Oduro, P. and Aziza, O.R., 2024. Management of complex international commercial arbitrations: Insights and strategies.

[31] Latilo, A., Uzougbo, N.S., Ugwu, M.C., Oduro, P. and Aziza, O.R., 2024. Managing cross-border disputes in telecommunications: A case study approach.

[32] Modupe, O.T., Otitoola, A.A., Oladapo, O.J., Abiona, O.O., Oyeniran, O.C., Adewusi, A.O., Komolafe, A.M. and Obijuru, A., 2024. Reviewing the transformational impact of edge computing on real-time data processing and analytics. Computer Science & IT Research Journal, 5(3), pp.693-702.

[33] Odulaja, B.A., Ihemereze, K.C., Fakeyede, O.G., Abdul, A.A., Ogedengbe, D.E. and Daraojimba, C., 2023. Harnessing blockchain for sustainable procurement: opportunities and challenges. *Computer Science & IT Research Journal*, *4*(3), pp.158-184.

[34] Oduro, P., Uzougbo, N.S. and Ugwu, M.C., 2024. Navigating legal pathways: Optimizing energy sustainability through compliance, renewable integration, and maritime efficiency. *Engineering Science & Technology Journal*, *5*(5), pp.1732-1751.

[35] Oduro, P., Uzougbo, N.S. and Ugwu, M.C., 2024. Renewable energy expansion: Legal strategies for overcoming regulatory barriers and promoting innovation. *International Journal of Applied Research in Social Sciences*, *6*(5), pp.927-944.

[36] Ogedengbe, D.E., James, O.O., Afolabi, J.O.A., Olatoye, F.O. and Eboigbe, E.O., 2023. Human resources in the era of the fourth industrial revolution (4ir): Strategies and innovations in the global south. *Engineering Science & Technology Journal*, *4*(5), pp.308-322.

[37] Ogedengbe, D.E., Olatoye, F.O., Oladapo, J.O., Nwankwo, E.E., Soyombo, O.T. and Scholastica, U.C., 2024. Strategic HRM in the logistics and shipping sector: Challenges and opportunities. *International Journal of Science and Research Archive*, *11*(1), pp.2000-2011.

[38] Oguejiofor, B.B., Uzougbo, N.S., Kolade, A.O., Raji, A. and Daraojimba, C., 2023. Review of successful global public-private partnerships: extracting key strategies for effective US financial collaborations. *International Journal of Research and Scientific Innovation*, *10*(8), pp.312-331.

[39] Ogunbiyi, E.O., Kupa, E., Adanma, U.M. and Solomon, N.O., 2024. Comprehensive review of metal complexes and nanocomposites: Synthesis, characterization, and multifaceted biological applications. *Engineering Science & Technology Journal*, *5*(6), pp.1935-1951.

[40] Ogunleye, A. Exploring Study Abroad with Traditionally Underrepresented Populations: Impacts of Institutional Types. International Journal of Research and Scientific Innovation 2024, XI, 170–181, https://doi:10.51244/ijrsi.2024.1106013.

[41] Ogunleye, A. Exploring Study Abroad with Traditionally Underrepresented Populations: Impacts of Institutional Types. International Journal of Research and Scientific Innovation 2024, XI, 170–181, doi:10.51244/ijrsi.2024.1106013.

[42] Ogunleye, A. Leveling Up the Mission: HBCUs' Potentials towards a Global U.S. Study Abroad. Preprints 2024, 2024061632. https://doi.org/10.20944/preprints202406.1632.v1

[43] Ogunleye, A. Leveling Up the Mission: HBCUs' Potentials towards a Global U.S. Study Abroad. Preprints 2024, 2024061632. https://doi.org/10.20944/preprints202406.1632.v1

[44] Okoli. U. I., Obi, C. O. Adewusi, A. O., & Abrahams, T. O., 2024. A Review of Threat Detection and Defense Mechanisms: Machine Learning in Cybersecurity. World Journal of Advanced Research and Reviews, 21(01), pp 2286-2295

[45] Oyeniran, C.O., Adewusi, A.O., Adeleke, A. G., Akwawa, L.A., Azubuko, C. F. (2024) Microservices architecture in cloud-native applications: Design patterns and scalability. Computer Science & IT Research Journal, 5(9), pp. 2107-2124

[46] Oyeniran, C.O., Adewusi, A.O., Adeleke, A. G., Akwawa, L.A., Azubuko, C. F. (2022). Ethical AI: Addressing bias in machine learning models and software applications. Computer Science & IT Research Journal, 3(3), pp. 115-126

[47] Oyeniran, C.O., Adewusi, A.O., Adeleke, A. G., Akwawa, L.A., Azubuko, C. F. (2023) Advancements in quantum computing and their implications for software development. Computer Science & IT Research Journal, 4(3), pp. 577-593

[48] Oyeniran, C.O., Adewusi, A.O., Adeleke, A. G., Akwawa, L.A., Azubuko, C. F. (2023) 5G technology and its impact on software engineering: New opportunities for mobile applications. Computer Science & IT Research Journal, 4(3), pp. 562-576

[49] Oyeniran, C.O., Adewusi, A.O., Adeleke, A. G., Akwawa, L.A., Azubuko, C. F. (2023) AI-driven devops: Leveraging machine learning for automated software development and maintenance. Engineering Science & Technology Journal, 4(6), pp. 728-740

[50] Oyeniran, O. C., Modupe, O.T., Otitola, A. A., Abiona, O.O., Adewusi, A.O., & Oladapo, O.J., 2024. A comprehensive review of leveraging cloud-native technologies for scalability and resilience in software development. International Journal of Science and Research Archive, 2024, 11(02), pp 330–337

[51] Popo-Olaniyan, O., James, O.O., Udeh, C.A., Daraojimba, R.E. and Ogedengbe, D.E., 2022. A review of us strategies for stem talent attraction and retention: challenges and opportunities. *International Journal of Management & Entrepreneurship Research*, *4*(12), pp.588-606.

[52] Popo-Olaniyan, O., James, O.O., Udeh, C.A., Daraojimba, R.E. and Ogedengbe, D.E., 2022. Future-Proofing human resources in the US with AI: A review of trends and implications. *International Journal of Management & Entrepreneurship Research*, *4*(12), pp.641-658.

[53] Sonko, S., Adewusi, A.O., Obi, O. O., Onwusinkwue, S. & Atadoga, A. Challenges, ethical considerations, and the path forward: A critical review towards artificial general intelligence. World Journal of Advanced Research and Reviews, 2024, 21(03), pp 1262–1268

[54] Udeh, C.A., Daraojimba, R.E., Odulaja, B.A., Afolabi, J.O.A., Ogedengbe, D.E. and James, O.O., 2023. Youth empowerment in Africa: Lessons for US youth development programs. *Journal Title, Volume (Issue), pages*.

[55] Uzougbo, N.S., Akagha, O.V., Coker, J.O., Bakare, S.S. and Ijiga, A.C., 2023. Effective strategies for resolving labour disputes in the corporate sector: Lessons from Nigeria and the United States. *World Journal of Advanced Research and Reviews*, *20*(3), pp.418-424.

[56] Uzougbo, N.S., Ikegwu, C.G. and Adewusi, A.O., 2024. Cybersecurity compliance in financial institutions: a comparative analysis of global standards and regulations. *International Journal of Science and Research Archive*, *12*(1), pp.533-548.

[57] Uzougbo, N.S., Ikegwu, C.G. and Adewusi, A.O., 2024. Enhancing consumer protection in cryptocurrency transactions: legal strategies and policy recommendations. *International Journal of Science and Research Archive*, *12*(01), pp.520-532.

[58] Uzougbo, N.S., Ikegwu, C.G. and Adewusi, A.O., 2024. International enforcement of cryptocurrency laws: jurisdictional challenges and collaborative solutions. *Magna Scientia Advanced Research and Reviews*, *11*(1), pp.068-083.

[59] Uzougbo, N.S., Ikegwu, C.G. and Adewusi, A.O., 2024. Legal accountability and ethical considerations of AI in financial services. *GSC Advanced Research and Reviews*, *19*(2), pp.130-142.

[60] Uzougbo, N.S., Ikegwu, C.G. and Adewusi, A.O., 2024. Regulatory frameworks for decentralized finance (DEFI): challenges and opportunities. *GSC Advanced Research and Reviews*, *19*(2), pp.116-129.