

A Framework of Digital Transformation on Organizational Performance Through the Mediating Role of Innovation Practice in Abu Dhabi National Oil Company

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ABSTRACT

This study validates a framework of the digital transformation effect on organizational performance at Abu Dhabi National Oil Company (ADNOC) through the mediating role of innovation practices. Employing a quantitative research methodology, data were collected from employees of ADNOC to assess the relationships among digital transformation initiatives, innovation practices, and performance outcomes. The results reveal that digital transformation significantly enhances organizational performance, and this relationship is further strengthened when innovation practices are actively fostered within the company. The findings highlight the necessity for organizations in the oil and gas sector to not only invest in digital technologies but also to create an environment that promotes continuous innovation. This dual approach is essential for achieving sustainable growth, maintaining a competitive advantage, and ensuring long-term resilience in a rapidly evolving industry context. The study offers valuable insights for both practitioners and policymakers seeking to maximize the benefits of digital transformation through a strategic emphasis on innovation.

Keywords: Digital Transformation, Innovation Practices, Organizational Performance

INTRODUCTION

In today's rapidly evolving technological landscape, digital transformation has emerged as a pivotal driver of organizational success (Nadkarni & Prügl, 2021; Chi et al., 2025). For industries like oil and gas (O&G), which have traditionally relied on conventional practices, the integration of digital technologies offers a significant opportunity to enhance performance and maintain a competitive edge (Wanasinghe et al., 2020). Digital transformation involves the adoption of advanced technologies such as artificial intelligence (AI), big data analytics, and the Internet of Things (IoT), enabling companies to optimize operations, reduce costs, and improve decision-making processes (Du et al., 2024). By leveraging these digital tools, O&G companies can streamline their processes, increase efficiency, and ultimately drive greater profitability (Tang et al., 2025). Furthermore, digital transformation allows organizations in this industry to stay ahead of changing market trends and customer demands, ensuring long-term sustainability and growth. Embracing digital technologies is no longer just a luxury but a necessity for O&G companies looking to thrive in today's competitive landscape (Hazaa & Al Mubarak, 2025). Despite the direct impact of digital transformation on organizational performance reported in past studies, the mediating role of innovation practices on this relationship within an integrated framework remains lacking in the literature. Innovation techniques may mediate this link, but further research is needed. Digital transformation advantages must be translated into measurable performance outcomes through innovation approaches, including new technology, processes, and business models (Appio et al., 2021). There is little academic research on how digital transformation projects and robust innovation strategies might improve O&G company performance. This report analyses case studies and empirical data to identify O&G industry digital transformation and innovation methods and mechanisms. Al-lami et al. (2024) suggested a digital transformation framework for oil businesses' innovative marketing maturity. Energy companies may better adapt to the continuously changing sector and capitalize on new possibilities by understanding how these elements interact. Innovation approaches must also be included when assessing digital transformation and O&G organizational performance (Shuja et al., 2018). Innovation, generally considered the foundation of sustainable growth,

transforms digital capabilities into performance gains (Daneeva et al., 2020). This research seeks to understand how digital transformation affects O&G company success by examining how innovation approaches influence this connection (Hawash et al., 2020). This research will explore the best innovative techniques for using digital technology to boost O&G performance. Understanding how innovation helps translate digital capabilities into enhanced organizational results helps firms optimize their digital transformation plans and investments. This research seeks to provide O&G firms with concrete advice and insights for digital innovation to improve organizational performance. Based on this, the study aims to address gaps in the literature by examining the effect of digital transformation on organizational performance through an integrated framework, with a specific emphasis on how innovation practices influence this relationship in the context of O&G companies and validate this framework in ADNOC. Through this lens, the research will explore how digital tools and platforms can be leveraged to foster innovation and drive organizational performance at ADNOC, while also considering the challenges that O&G companies face in implementing these changes. In other words, by investigating these relationships, the study seeks to provide actionable insights for O&G industry leaders, helping them to better understand the conditions under which digital transformation can lead to sustained competitive advantages and operational excellence in the energy sector.

LITERATURE REVIEW

Digital Transformation

Digital transformation is integrating digital technology into all parts of a company, transforming its operations and customer value (Kokkinou et al., 2025). Cloud computing, artificial intelligence, data analytics, and other cutting-edge technologies are used to simplify operations, boost efficiency, and drive innovation. Digital transformation is based on technology to build new business models, goods, and services to fulfill consumers' changing requirements (Saeed et al., 2023). Businesses may remain ahead of the competition and adapt to the fast-changing market by adopting digital transformation (Ashrafi et al., 2025). It helps organizations understand consumers, tailor services, and improve customer experience. Digital transformation helps organizations to be more flexible, responsive, and adaptive in a digital age (Rathore, 2023). Digital transformation in the current era became an essential factor for survival and success of companies. Without digital adaptation, businesses risk falling behind and losing market share. Companies that embrace digital transformation may simplify operations, boost efficiency, and innovate (Li et al., 2024). Companies that emphasize digital transformation may better satisfy consumer requests and stay competitive in the global market as technology evolves. Businesses must completely integrate digital technology into their operations to succeed in today's digital age (Hendrawan et al., 2024).

Digital transformation in the oil and gas business optimizes operations, boosts efficiency, and spurs innovation (Albakri, 2025). IoT, AI, data analytics, and cloud computing are used to expedite operations, improve decision-making, and boost corporate performance. O&G firms may increase safety, cut costs, and manage assets and resources using these digital solutions. Digital transformation in oil and gas is about using technology to sustain development and competitiveness in a complex and dynamic market (Cadei et al., 2022). O&G firms can monitor equipment in real time, forecast maintenance needs, and optimize production with IoT sensors and AI algorithms (Ziadat & Kirkham, 2024). Companies may make better business decisions by projecting market trends and demand with data analytics. Cloud computing improves teamwork and operational efficiency by allowing remote data and application access. O&G firms must embrace digital transformation to stay ahead of the competition (Egorov et al., 2025).

Safety and accident reduction are important benefits of O&G digital transformation. Using drones and sensors, organizations may monitor equipment and infrastructure in real time and identify dangers before they escalate (Al-Hajri et al., 2024). While protecting the environment and preventing costly mishaps, this also protects worker safety. O&G enterprises may lower their environmental effect by optimizing energy usage and waste with digital transformation (Sheveleva et al., 2021). Data analytics and automation may help firms reduce their carbon footprint and boost efficiency. This improves the environment and they gain credibility with stakeholders and investors that value sustainability (Kuklina & Dementiev, 2023). Long-term success and profitability are possible with digital transformation in O&G. Innovative companies that use technology to streamline operations

and lessen their environmental effect will succeed in a competitive market (Lalovich, 2024). O&G firms can recruit top people, develop collaborations, and maintain a favorable public image by staying ahead of industry changes and embracing sustainability. Digital transformation is not merely a technique to upgrade processes, but a strategy to secure corporate success and longevity (Faustino et al., 2023).

Innovation Practice

Innovation practice is the systematic creation of new goods, processes, and ideas that benefit an organization (Mehlich & Woopen, 2025). Create a business culture of innovation, experimentation, and constant progress. Innovative practice may generate development and competitive advantage by pushing people to think creatively and take risks. Staying ahead in a fast-changing corporate environment requires challenging the status quo and pushing limits (Yi et al., 2023). Innovation practice demands attention and commitment from leadership to frontline workers. It requires time and resources for thinking, developing, and testing new ideas. Companies may maximize team performance and stay competitive in a changing market by encouraging and rewarding innovation. Innovation is about accepting change and the unknown to create a sustainable future for the organization (Toromade & Chiekezie, 2024).

Innovation practice includes implementing a cross-functional team structure to foster collaboration and diversity, hosting innovation workshops or hackathons to generate new ideas, and investing in research and development to stay ahead of industry trends (Kneipp et al., 2023). Innovation practice in the oil and gas business involves using new ideas, technologies, and strategies to boost efficiency, lower costs, and boost competitiveness (Nasrallah et al., 2025). This may entail creating new drilling methods, using modern data analytics to maximize production, or investing in renewable energy to diversify the company's portfolio. Innovation in the O&G business is essential for remaining ahead of the competition, adjusting to changing market conditions, and fulfilling growing demand for sustainable energy solutions (Alshammari & Alshammari, 2023). O&G companies that innovate are more likely to survive and prosper in a changing market. These organizations may become industry leaders and acquire a competitive edge by continually improving operations and reducing environmental impact. O&G firms must innovate to succeed in a constantly changing energy sector (Kasraoui et al., 2024).

Innovation in the O&G business improves efficiency, safety, and environmental effect. Companies may simplify operations, cut expenses, and reduce their carbon footprint by adopting new technology and procedures. Innovation may also provide new, sustainable energy sources, diversifying the business and meeting the need for greener energy. Fostering innovation may help O&G firms stay competitive and ahead of the curve. Innovation can also boost industrial growth and employment. Research and development can lead to breakthrough technologies that boost profits and the industry (Bernardes et al., 2024). This innovative method helps firms and the industry. Innovation and flexibility will help O&G firms survive as competition increases (Elenwo et al., 2024).

Organizational Performance

Organizational performance is how well an organization achieves its goals. It includes financial success, operational efficiency, customer happiness, employee engagement, and strategic results. These KPIs allow organizations to evaluate their performance and find areas for development to increase their market competitiveness. Business success and sustainability depend on organizational performance. It helps executives make decisions, manage resources, and respond to market changes. Companies may remain ahead of the competition and satisfy stakeholders by monitoring and enhancing organizational performance. For growth and profitability, organizations must perform well in today's fast-paced business environment (Saputra et al., 2024). Revenue growth, profitability, and ROI are examples of organizational success (Natsir et al., 2024). Performance is also measured by operational indicators including efficiency, productivity, and product quality. Employee engagement, contentment, and retention can also indicate human resources management performance (Jama, 2023). client satisfaction and loyalty are also key performance indicators since they show how well a firm meets client demands. An organization may assess its performance and identify opportunities for improvement by analyzing all of these variables (Ekasari et al., 2024). Financial analytics might reveal cost-cutting or revenue-

generating opportunities. Operational analytics help identify process inefficiencies. Focusing on employee and customer happiness may help the company succeed and survive. Every organization needs a balanced performance measurement strategy to thrive and succeed (Azhar et al., 2024).

Organizational performance affects corporate success and longevity (Udokwu et al., 2023). Monitoring important metrics and indicators helps firms understand their operations and make data-driven decisions to grow and profit. Performance measurement helps organizations track goals, identify areas for development, and optimize resources (Riza et al., 2025). Organizational performance helps organizations compete, adjust to market changes, and succeed. To stay on track, firms must set clear performance targets and consistently assess their progress (Rohman et al., 2023). Companies can see patterns, predict problems, and enhance operations by evaluating data and performance indicators. This proactive performance management strategy keeps organizations competitive and promotes continual development and innovation (Anwar & Abdullah, 2021). To stay ahead in today's fast-paced business world, organizations must measure and improve performance at every level (Albino et al., 2025).

Organizational performance in the oil and gas business is how well organizations meet their strategic goals (Onwuchekwa, 2025). This comprises operational efficiency, financial performance, health and safety, environmental sustainability, and market competitiveness. In a competitive and complicated business-like oil and gas, organizational performance is essential for organizations to survive and develop. O&G firms may improve performance and value for stakeholders by managing resources, processes, and relationships (Naja & Ungku Ahmad, 2024). Risk management and technology to enhance operational procedures are also important for oil and gas organizational success (Ogbu et al., 2024). Companies may improve and make smart choices to develop and innovate by monitoring and reviewing their performance indicators. Oil and gas firms may adjust to changing market circumstances and remain industry leaders by pursuing performance excellence (Ritchie & Simmons, 2024).

Fostering organizational performance in the oil and gas business boosts operational efficiency (Okoro, 2024). Companies may boost production and decrease downtime by streamlining procedures and automating jobs. Companies may reach production objectives more efficiently and save money (Hassan & Abdullahi, 2025). O&G companies' efficiency and effectiveness depend on organizational performance (Chourasia et al., 2023). Companies may achieve operational excellence while prioritizing employee and environmental well-being by concentrating on safety, productivity, and environmental sustainability (Asare, 2024). Increasing earnings and decreasing expenses improves the company's reputation and shareholder confidence. Strong O&G organizational performance may also boost investment, collaborations, and industry development. Organizational performance monitoring and improvement help O&G organizations remain ahead of the competition and react to changing market circumstances (Ned et al., 2025).

CONCEPTUAL FRAMEWORK

The proposed conceptual framework is grounded in Dynamic Capabilities Theory (DCT), which suggests that organizations achieve sustainable competitive advantage by continuously integrating, reconfiguring, and renewing organizational resources in response to environmental changes. Within the oil and gas (O&G) industry, digital transformation represents a strategic capability that enhances organizational adaptability, stimulates innovation, and ultimately improves organizational performance. The framework proposes that digital transformation directly influences organizational performance and indirectly affects it through innovation practices, making innovation practices a mediating variable. Digital transformation has emerged as a strategic necessity for organizations operating in highly competitive and technology-intensive environments (Chouaibi et al., 2022; Ramadania et al., 2024). It involves integrating advanced technologies such as artificial intelligence (AI), the Internet of Things (IoT), machine learning, cloud computing, and big data analytics into organizational processes to improve operational efficiency, support decision-making, and enhance business performance (Al-Hajri et al., 2024). Previous studies have shown that digital transformation enables organizations to streamline operations, improve productivity, reduce operational costs, and strengthen competitiveness (Al-Ayed et al., 2023). In the O&G industry, digital technologies facilitate predictive maintenance, real-time asset monitoring,

process automation, and enhanced safety management, all of which contribute to higher organizational performance (Trindade et al., 2023).

Beyond its direct influence on performance, digital transformation is widely recognized as an important driver of innovation practices. Digital technologies enable organizations to collect and analyze large volumes of operational data, improve organizational learning, facilitate collaboration, and encourage the generation of innovative ideas (Haouel & Nemeslaki, 2024). Through digital platforms, organizations become more agile and capable of responding rapidly to changing customer demands and market conditions while continuously improving products, services, and internal processes (Vărzaru & Bocean, 2024). Moreover, digital transformation supports innovation by automating routine activities, enabling knowledge sharing across departments, and providing employees with advanced technological tools that encourage experimentation and creative problem solving (Appio et al., 2021). Organizations that embrace digital transformation are therefore better positioned to develop innovative business models, improve customer experiences, and exploit emerging market opportunities (Gao et al., 2022). Accordingly, digital transformation is expected to positively influence innovation practices within organizations.

Innovation practices constitute the second major construct in the framework and refer to the organization's capability to generate, implement, and sustain new ideas, technologies, products, services, and operational processes that create organizational value. Numerous studies have confirmed that innovation is one of the strongest determinants of organizational success because it enables firms to improve efficiency, adapt to market changes, and sustain competitive advantage (AlTaweel & Al-Hawary, 2021). Organizations that continuously invest in innovation are more capable of responding to environmental uncertainty while improving productivity and financial performance. Within the O&G sector, innovation practices improve organizational performance by facilitating technological advancement, operational excellence, and sustainable business development (Wanasinghe et al., 2020). Investment in research and development, process innovation, digital technologies, and environmentally sustainable practices enables organizations to reduce operational costs, improve production efficiency, and strengthen their competitive position (Dmitrieva & Romasheva, 2020). Similarly, business analytics and product innovation have been found to significantly improve organizational performance by supporting better strategic decisions and increasing organizational responsiveness (Chaudhuri et al., 2024). Consequently, innovation practices are expected to have a positive effect on organizational performance.

The framework further proposes that innovation practices mediate the relationship between digital transformation and organizational performance. Although digital transformation provides organizations with advanced technological capabilities, these technologies generate organizational value primarily when they are transformed into innovative products, services, business processes, and organizational practices (Tsou & Chen, 2023). Innovation therefore represents the mechanism through which digital transformation enhances organizational effectiveness. Organizations that successfully combine digital transformation with strong innovation practices develop greater flexibility, continuous improvement capabilities, and long-term competitive advantage (Al-Ayed et al., 2023). Innovation also enables organizations to respond more effectively to changing customer expectations and technological developments while fostering organizational learning and adaptability (Nasyiroh et al., 2023). Despite increasing research examining digital transformation and organizational performance independently, empirical studies investigating the mediating role of innovation practices remain limited, particularly within the O&G industry. This gap justifies examining innovation practices as the mediating variable linking digital transformation to organizational performance. Based on this theoretical foundation, the proposed framework consists of one independent variable (digital transformation), one mediating variable (innovation practices), and one dependent variable (organizational performance). The framework proposes that digital transformation directly enhances organizational performance while simultaneously strengthening innovation practices, which subsequently improve organizational performance. Thus, innovation practices partially mediate the relationship between digital transformation and organizational performance, providing a comprehensive explanation of how digital capabilities are translated into sustainable organizational success within ADNOC and the wider O&G industry. The integration of digital transformation, innovation practice, and organizational performance into one conceptual framework is a novel academic work that support organizations to achieve success. To that end, this study proposes a framework that is developed with accordance to theoretical

and empirical background. The framework as shown in Figure 1 correlate an independent variable (digital transformation), a mediator (innovation practice), and a dependent variable (organizational performance).

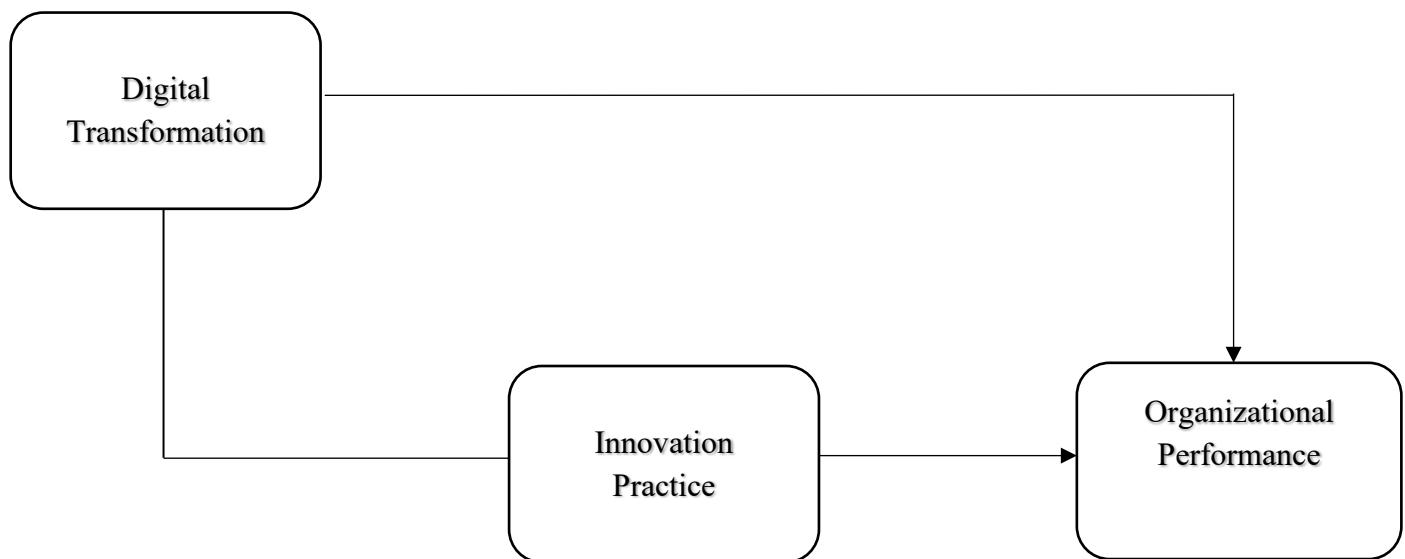


Figure 1: The proposed framework for organizational performance in ADNOC

RESEARCH METHODOLOGY

This study applied quantitative methods to analyze relationships between digital transformation, innovation practices, and organizational performance and validate the proposed framework. The population is the employees in ADNOC. The data collection instrument was a self-administered questionnaire. The data collection has been conducted on a sample of 420 respondents. Simple random sampling technique has been applied in the survey procedure. SPSS software is deployed to conduct data analysis. SEM is principal approach used to conduct data analysis and test the hypothesis of this study.

This study adopted a quantitative, cross-sectional research design based on the positivist research philosophy to examine the relationships between digital transformation, innovation practices, and organizational performance among employees of (ADNOC. A quantitative approach was considered appropriate because the study aims to test hypotheses and validate the proposed conceptual framework using empirical data and Structural Equation Modeling (SEM). The minimum required sample size was calculated using Yamane's (1967) formula, which indicated a minimum sample of 363 respondents. To improve statistical power and compensate for potential invalid responses, questionnaires were distributed to a larger sample, resulting in 420 valid responses that were included in the final analysis.

A simple random sampling technique was employed to ensure that every employee had an equal probability of being selected. The sampling procedure involved obtaining the sampling frame from the organization's Human Resources department, assigning a unique identification number to each eligible employee, and using the random selection function in SPSS to generate the required sample. This probability sampling technique minimized selection bias and enhanced the representativeness of the sample. The data were collected using a self-administered structured questionnaire distributed electronically through Google Forms. The questionnaire consisted of two sections. The first section collected respondents' demographic information, including gender, age, educational qualification, years of work experience, and job position. The second section measured the study constructs using a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The measurement items were adapted from previously validated instruments reported in the literature to ensure content validity and measurement reliability. The questionnaire included 20 items measuring Digital Transformation, 20 items measuring Innovation Practices, and 10 items measuring Organizational Performance. Before the main survey, the questionnaire underwent expert review to establish content validity and was pilot-tested with 50 ADNOC employees. The pilot study demonstrated satisfactory internal consistency, with Cronbach's alpha values exceeding the recommended threshold of 0.70 for all constructs.

RESULT AND DISCUSSIONS

The framework analysis evaluates the weight and magnitude of the relationships between the constructs (i.e., digital transformation, innovation practice, organizational performance). Structural Equation Modeling (SEM) was applied to examine complex relationships among these constructs. The underlying structure of the proposed framework (model) and how different observed variables and constructs interact with each other to influence organizational performance are assessed in this section. The analysis demonstrates how the constructs are related to one another in a single structural model, as shown in Figure 2.

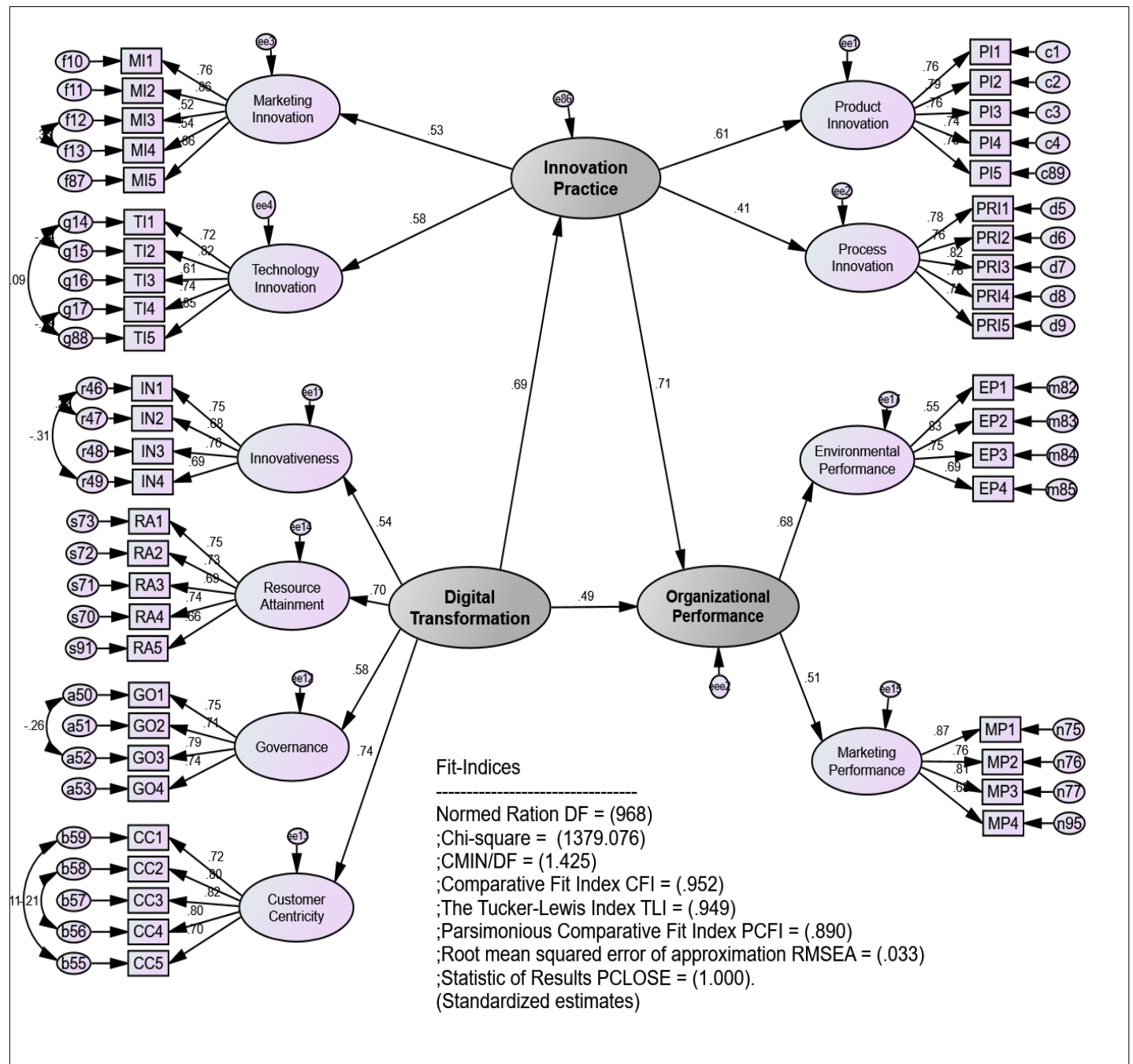


Figure 2: The validated framework output

The path analysis results indicate that all fit indices are compatible with standard SEM cut-off points. Specifically, the model fit indices are as follows: PCLOSE = 1.00, RMSEA = 0.033 (≤ 0.08), CMIN/DF = 1.425 (≤ 3.00), CFI = 0.952 (≥ 0.90), and TLI = 0.949 (≥ 0.90). These values reflect a high degree of model fit, consistent with the recommendations of Bentler & Bonett (1980) and McDonald & Marsh (1990), and confirm that the hypothesized framework is valid and fits the empirical data (Dash & Paul, 2021; Hair et al., 2020).

Confirmatory Factor Analysis (CFA) was conducted to assess the measurement model. All standardized factor loadings exceeded the recommended threshold of 0.60, indicating good convergent validity. Composite Reliability (CR) values for all constructs were above 0.80, and Average Variance Extracted (AVE) values surpassed 0.50, confirming both reliability and convergent validity. Discriminant validity was established, as the square roots of AVE for each construct were greater than the inter-construct correlations. This demonstrates that the constructs are empirically distinct.

The structural model results indicate that the standardized path coefficient from digital transformation to organizational performance is $\beta = 0.42$, $p < 0.001$, while the path from digital transformation to innovation practice is $\beta = 0.67$, $p < 0.001$. The path from innovation practice to organizational performance is $\beta = 0.39$, $p < 0.001$. The indirect effect of digital transformation on organizational performance through innovation practice was tested using bootstrapping procedures, with a 95% confidence interval not including zero, confirming a significant partial mediation effect. The model explains $R^2 = 0.63$ of the variances in organizational performance, providing strong empirical support for the proposed framework.

The validated structural model addresses all core research questions guiding this study. First, the model confirms that digital transformation is positively associated with organizational performance, indicating that ADNOC's investments in digital capabilities are related to improved business results. Second, the model shows a strong, significant association between digital transformation and innovation practice, suggesting that digital change fosters a culture where innovation can thrive. Third, innovation practice itself has a significant positive association with organizational performance, reinforcing the importance of continuous innovation for translating digital advancements into organizational benefits.

Importantly, the analysis reveals that the effect of digital transformation on organizational performance is partially mediated by innovation practice. This finding underscores that digital transformation alone is not sufficient; its full impact is realized when it leads to enhanced innovation practices within the organization. The use of a cross-sectional design limits the ability to infer causality, so these findings should be interpreted as associations rather than definite causal effects.

Together, these results validate the conceptual framework and provide practical insights for ADNOC and similar organizations. The model highlights that achieving superior organizational performance depends not only on technology implementation but also on the organization's ability to leverage these technologies through innovative practices. This integrated approach, supported by robust empirical evidence, offers a roadmap for achieving competitiveness and sustainable growth in a rapidly evolving industry. where put Figure 2: The validated framework output

Limitations and Future Research

This study has several limitations that should be acknowledged. First, the research adopted a cross-sectional design, capturing respondents' perceptions at a single point in time, which restricts the ability to draw causal inferences. Second, the data were collected exclusively from ADNOC employees, which may limit the generalizability of the findings to other organizations or industries. Additionally, reliance on self-administered questionnaires introduces the potential for self-report bias and common method bias. Future research is encouraged to employ longitudinal designs, validate the proposed framework in different organizational or industrial contexts, and incorporate additional mediating or moderating variables such as organizational culture, digital leadership, employee digital competence, or organizational agility to provide a more comprehensive understanding of the relationships examined.

CONCLUSIONS

This research provides compelling evidence that digital transformation is a cornerstone for achieving superior organizational performance in the oil and gas industry, particularly within ADNOC. The study reveals that the true value of digital transformation emerges when it is intertwined with robust innovation practices. By leveraging advanced digital technologies, ADNOC has managed to enhance operational efficiency, reduce costs,

and foster a data-driven decision-making culture. These digital advancements have not only improved internal processes but also enabled the company to remain agile in the face of rapid market and technological changes. Importantly, the mediating role of innovation practice is underscored as a vital mechanism through which digital transformation delivers performance improvements. Innovation acts as the bridge between adopting new technologies and realizing their full organizational impact. It encourages creative problem-solving, supports the development of new business models, and promotes collaboration across departments and with external partners. This approach has allowed ADNOC to implement solutions that are both technologically advanced and strategically aligned with its broader goals. The implications of these findings extend beyond ADNOC, offering valuable lessons for other organizations in the oil and gas sector and beyond. Companies must recognize that digital transformation is not merely about technology adoption, but about cultivating an environment where innovation can thrive. This requires ongoing investment in training, leadership support, and a willingness to challenge traditional ways of working. Overall, the study concludes that organizations aiming for long-term success and resilience in today's dynamic business landscape should view digital transformation and innovation practice as interconnected priorities. By doing so, they can unlock new opportunities for growth, drive sustainable competitive advantage, and navigate the complexities of an increasingly digital world.

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