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The ADNOC Model of Crisis Management and Cultural Mediation in the Energy Sector

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Abstract

In high-stakes industries such as energy, a single crisis can disrupt operations, threaten safety, and erode trust. For Abu Dhabi National Oil Company (ADNOC), the challenge is not only to respond effectively but also to turn crisis capabilities into lasting organizational strength. This study presents the ADNOC Model, a framework that connects four critical capabilities which are communication, leadership, resilience, and technology to organizational performance, with culture acting as the vital bridge. Drawing on responses from 405 ADNOC employees and applying PLS-SEM analysis, the results show that crisis management exerts a powerful direct influence on performance ($\beta = 0.533$) and that a strong, adaptive culture amplifies this effect through partial mediation ($\beta = 0.167$). These findings demonstrate that when crisis management is culturally embedded, it does more than contain disruptions. It strengthens resilience, accelerates recovery, and safeguards continuity. The ADNOC Model offers both scholars and industry leaders a tested blueprint for institutionalizing crisis readiness in complex and high-risk environments.

Keywords: Crisis Management, Organizational Culture, Crisis Organizational Performance, Resilience, Leadership, Communication, Technology,

1. Introduction

The impact of crisis management on organizational performance remains a critical area of inquiry, particularly within high-risk industries such as oil and gas. In this context, firms like the Abu Dhabi National Oil Company (ADNOC) face complex operational challenges that demand robust crisis response mechanisms. Workplace conflict in the energy sector has been linked to significant productivity losses and elevated employee attrition. Although specific data for ADNOC is limited, broader industry statistics reveal that unresolved workplace conflicts can lead to a 67% decline in employee performance and a 51% increase in turnover rates. On average, such disputes result in 2.1 hours of lost productivity per employee each week. Within the UAE's oil and gas sector, factors such as job burnout and emotional intelligence have been shown to influence turnover intentions, underscoring the importance of conflict resolution in enhancing organizational effectiveness and employee retention (Abudaqa et al., 2022; Worldmatrics, 2024).

Poor crisis management can severely impair organizational performance, leading to prolonged disruptions in critical operations, increased financial strain, and reputational damage. Ineffective communication during crises often results in delayed decision-making and misallocation of resources, which in turn escalates response costs and undermines operational continuity (Li & Wei, 2016; John-Eke & Eke, 2020). Moreover, inadequate crisis leadership erodes employee morale and public trust. Employees rely on clear guidance during emergencies, and the absence of effective leadership can foster disengagement, anxiety, and reduced productivity (Adegoke, 2023). Public perception may also deteriorate due to perceived incompetence, further diminishing stakeholder confidence and long-term support (Buhagiar & Anand, 2023).

ADNOC, as a strategic player in the global energy market, faces multifaceted crisis management challenges stemming from technological, environmental, and geopolitical pressures. In response, the company has made substantial investments in technology resilience. For instance, ADNOC's integration of over 30 artificial intelligence (AI) solutions in 2023 led to a reduction of nearly one million tonnes of CO_2 emissions compared to the previous year. Its Real-Time Data Monitoring Centre, which oversees up to 120 well sites simultaneously, has contributed to a 30% reduction in well duration, yielding significant cost savings (ADNOC, 2024). These initiatives reflect ADNOC's commitment to enhancing operational efficiency and crisis responsiveness through digital innovation.

Timely and coordinated responses to operational disruptions such as oil spills, equipment failures, and cyber threats that are essential to maintaining production and environmental integrity (Awadh Alseiari et al., 2020). ADNOC must also navigate reputational risks associated with environmental sustainability, especially amid rising global demand for cleaner energy. Additionally, geopolitical instability and supply chain vulnerabilities pose ongoing threats to operational continuity (Aljneibi et al., 2022). Effective crisis management in this context requires comprehensive contingency planning, cross-departmental collaboration, and continuous stakeholder engagement to mitigate both immediate and long-term impacts.

Central to this study is the mediating role of organizational culture, which shapes how crisis management strategies are implemented and internalized. A proactive and resilient culture fosters preparedness, facilitates transparent communication, promotes teamwork, and encourages adaptive learning, thereby enhancing the effectiveness of crisis response (Mirzapour et al., 2019). Conversely, a reactive or fragmented culture can hinder crisis efforts through resistance to change, poor coordination, and delayed action (Al-Khrabsheh et al., 2022). In the UAE, government organizations remain vulnerable to a range of crises that threaten operational stability and public trust (Abbas Zaher et al., 2021). Despite the country's advanced infrastructure and strategic planning, crisis response models often lack contextual adaptability, particularly in relation to communication and technology resilience.

This study aims to address these gaps by developing a comprehensive structural model that examines the impact of crisis management factors, namely external communication, internal communication, leadership, technology resilience, and organizational resilience on crisis organizational performance, with organizational culture serving as a mediating variable. By focusing on ADNOC as a case study, the research contributes empirical insights into the mechanisms through which crisis management influences performance outcomes in the energy sector. It also advances theoretical understanding of cultural mediation in crisis contexts, offering practical recommendations for enhancing resilience and strategic alignment within UAE government and energy organizations.

2. Literature Review

2.1 Crisis Management Factors

2.1.1 Internal Crisis Communication

In an increasingly interconnected and volatile business environment, organizations face heightened exposure to crises that threaten operational continuity, reputational integrity, and stakeholder trust. Within this context, a well-structured Crisis Communication Plan Model serves as a foundational element of organizational resilience, enabling firms to respond to disruptions with strategic clarity and coordinated messaging (Lukaszewski, 1999; Coombs & Holladay, 1996). This model provides a proactive framework for managing the flow of information during periods of uncertainty, ensuring that communication efforts are timely, coherent, and aligned with organizational objectives. The initial phase of the model involves a comprehensive risk assessment, in which potential crises are identified, evaluated for severity, and prioritized based on their projected impact. This assessment informs the development of tailored communication strategies that address the specific characteristics of each crisis scenario (Haupt & Azevedo, 2021; Evans et al., 2001). A critical structural component is the formation of a dedicated Crisis Communication Team, composed of individuals with clearly defined roles and responsibilities. This team functions as the central command unit, coordinating both internal and external communication efforts, making informed decisions, and serving as the primary liaison for stakeholders. Its agility and preparedness are essential for managing the dynamic nature of crises and ensuring rapid, strategic responses (Heide & Simonsson, 2014).

Internal crisis communication is vital for maintaining operational coherence and employee alignment during disruptive events. It focuses on three key aspects: timely information flow within the organization to ensure prompt dissemination of accurate updates across all levels, reducing uncertainty and confusion; clarity of internal directives to provide unambiguous instructions that guide employee behaviour and decision-making; and cross-functional coordination to facilitate collaboration across departments, enabling unified responses and optimal resource utilization. Research underscores that effective internal crisis communication not only reduces confusion but also strengthens employee trust in the organization's leadership, particularly when messages are transparent, consistent, and empathetic (Mazzei & Ravazzani, 2015; Mazzei et al., 2022). These elements are supported by formal communication protocols that define decision-making hierarchies, chains of command, and designated communication channels (Mazzei & Ravazzani, 2022). Such protocols promote consistency, minimize misinformation, and enhance organizational agility during crisis scenarios (Bukar et al., 2020).

2.1.2 External Crisis Communication

External crisis communication plays a pivotal role in shaping public perception, engaging stakeholders, and managing media relations. It involves crafting clear, empathetic, and values-driven messages that reflect the organization's commitment to resolution and transparency, ensuring that external stakeholders receive timely and accurate information (Coombs & Holladay, 1996; Liu et al., 2011). Stakeholder engagement is central to this process, as it promotes open and consistent communication with customers, partners, regulators, and community groups, thereby reinforcing trust and accountability (Valvi & Fragkos, 2013). Media coordination is equally essential for managing interactions with journalists and news outlets, helping to disseminate accurate information and maintain a coherent narrative that aligns with organizational objectives (Evans et al., 2001).

A core element of external communication is the selection and training of spokespersons who represent the organization publicly during crises. These individuals convey official messages, respond to media inquiries, and influence public perceptions. Effective media training equips spokespersons to handle challenging questions, maintain message discipline, and project competence and control, thereby reinforcing the organization's credibility (Sulistyanto et al., 2020; Valvi & Fragkos, 2013). The model also highlights the strategic use of diverse communication channels, including traditional media, digital platforms, websites, and direct contact methods. In cases where primary channels are compromised, alternative pathways must be employed to maintain uninterrupted information flow. Additionally, embedded monitoring and evaluation mechanisms enable organizations to track message dissemination, assess public sentiment, and adapt communication strategies in real time, which enhances responsiveness and overall effectiveness (Haupt & Azevedo, 2021; Liu et al., 2011).

While internal crisis communication focuses on maintaining operational stability, aligning employees, and ensuring coordinated responses within the organization, external crisis communication extends these efforts to the public sphere, where perceptions, trust, and stakeholder relationships are at stake. Both dimensions are interdependent, as a breakdown in

internal communication can undermine external messaging, and poorly managed external communication can in turn affect internal morale and confidence. A truly effective crisis communication plan integrates both aspects to create a unified, consistent, and credible narrative throughout all stages of a crisis. This integration becomes especially critical in the post-crisis phase, when organizations must not only continue delivering clear internal updates but also manage external recovery messaging that rebuilds trust, communicates corrective actions, and reinforces the organization's long-term commitment to resilience (Heide & Simonsson, 2014; Mazzei & Ravazzani, 2015).

Importantly, the scope of external crisis communication extends beyond the immediate response phase. Post-crisis communication and recovery messaging are essential for rebuilding stakeholder confidence and restoring the organization's reputation. Providing transparent updates on corrective actions, preventive measures, and recovery progress contributes to long-term resilience (Coombs & Holladay, 1996).

2.1.3 Technology Resilience

In the digital age, technology resilience has emerged as a crucial pillar of organizational sustainability, encompassing the robustness of IT infrastructure, the effectiveness of data recovery systems, and the preparedness of cybersecurity frameworks. These capabilities ensure operational continuity, safeguard digital assets, and provide reliable support for strategic decision-making during emergencies (Pironti et al., 2018; Comin et al., 2022). Robust technology resilience enables rapid restoration of services, minimizes downtime, and sustains business operations even in the face of disruptive events.

Moreover, advanced analytics and communication technologies empower organizations to respond quickly and intelligently to evolving threats. Technology resilience also entails proactive measures, such as regular system testing, security audits, and scenario-based simulations, which prepare organizations for various crisis scenarios. These investments in resilience not only protect critical systems but also enhance adaptability, ensuring that organizations can seize opportunities arising from disruption. Finally, the recovery and rejuvenation phase leverages lessons learned to drive innovation, process improvements, and strategic pivots that strengthen competitive advantage beyond the immediate crisis (Barasa et al., 2018).

2.1.4 Organizational Resilience

Organizational resilience is a strategic capability that enables institutions to anticipate, absorb, adapt to, and recover from disruptions while maintaining core functions and pursuing long-term goals (Koronis & Ponis, 2018; Ingram et al., 2023). It integrates cultural, structural, and strategic dimensions, with a resilient culture fostering adaptability, innovation, and proactive problem-solving across all levels. Risk assessment and management form the foundation of resilience, involving the identification of potential threats, evaluation of their impacts, and prioritization of mitigation strategies.

Adaptive capacity reflects an organization's ability to pivot strategies, restructure processes, and remain agile in dynamic environments. Effective leadership and governance further

reinforce resilience by guiding informed decision-making, ensuring transparent communication, and embedding resilience objectives into strategic planning (Barasa et al., 2018). Business continuity planning, resource flexibility, and supply chain diversification strengthen operational stability during crises.

Post-crisis, resilient organizations engage in structured recovery efforts and continuous improvement cycles, learning from disruptions to enhance future preparedness. They extend resilience beyond internal systems by engaging stakeholders and communities, fostering shared readiness and coordinated response mechanisms. This holistic approach positions resilience not merely as a crisis response but as an enduring capability for sustained performance and competitive advantage (Hillmann & Guenther, 2021).

2.1.5 Crisis Leadership

Crisis leadership is a strategic framework that equips organizations to navigate uncertainty through decisive, adaptive, and ethically grounded leadership. It emphasizes three core dimensions: decision-making under pressure (LD1), where leaders act swiftly and effectively amid volatility (Balasubramanian & Fernandes, 2022); visionary guidance (LD2), which ensures long-term strategic positioning beyond immediate crisis containment (Wu et al., 2021); and crisis team coordination (LD3), which enables cross-functional collaboration and resource alignment (Bhaduri, 2019).

Effective crisis leaders also demonstrate emotional intelligence and transparent communication, which foster trust and resilience across the organization (DuBrin, 2013). Adaptability is essential for real-time strategic pivots, while ethical integrity provides a compass for decision-making under pressure (Probert & Turnbull James, 2011). In addition, continuous learning and preparedness through scenario planning and post-crisis evaluation reinforce leadership credibility and institutional readiness (Saltz, 2017). Collectively, these attributes position crisis leadership as a vital driver of organizational resilience, stakeholder confidence, and sustained performance during and after disruptive events.

2.2 Organizational Performance in Crisis Management

Organizational performance during crisis management is a multifaceted construct that reflects an organization's ability to maintain operational continuity, safeguard stakeholder interests, and adapt to rapidly changing environments. Performance is not merely measured by short-term survival but also by the capacity to emerge stronger in the aftermath of a crisis. Zehir and Yavuz (2014) emphasize that crisis management capability, when supported by organizational learning, significantly enhances firm performance by enabling timely decision-making and resource optimization. Tworek et al. (2023) further argue that employees' dynamic capabilities are central to sustaining organizational performance during unpredictable "Black Swan" events, as they foster adaptability and innovation under pressure. In turbulent contexts, performance outcomes are also shaped by resilience, which serves as a critical intermediary between organizational assets, such as brand strength, and overall performance results (Zabłocka-Kluczka & Sałamacha, 2023). Effective crisis management therefore requires integrating preparedness with continuous learning, employee adaptability,

and resilience-building strategies to ensure not only stability during disruption but also competitive advantage in the recovery phase.

2.3 Organizational Culture in Crisis Management

Organizational culture plays a decisive role in shaping how crises are perceived, addressed, and resolved within institutions. It influences strategic choices, adaptability, and the speed of response during emergencies. Deverell and Olsson (2010) note that organizational culture affects both the selection of crisis strategies and the organization's capacity to adapt under stress. In some cases, a strong, cohesive culture has been credited with enabling organizations to navigate crises successfully, as illustrated by Joyner et al. (2013), who describe instances where shared values and norms facilitated rapid, coordinated action. Firestone (2020) also highlights the importance of culture in fostering effective crisis leadership, as leaders draw on established values to inspire trust and guide decision-making. Petitta and Martínez-Córcoles (2023) expand on this by introducing a model of mindful organizing, where culture serves as the foundation for effective safety and crisis management through heightened awareness, communication, and collective problem-solving. As Koronis and Ponis (2018) argue in related work on resilience, nurturing a culture that promotes adaptability, transparency, and mutual support is essential for long-term crisis preparedness. Ultimately, organizational culture acts as both a stabilizing force and a catalyst for adaptive change, enabling organizations to respond effectively and recover sustainably from disruptive events.

2.4 Crisis Management Models

Crisis management scholarship has produced a range of conceptual models that offer structured approaches to anticipating, responding to, and recovering from organizational disruptions. Among the foundational contributions is Augustine's (1995) six-stage model, which outlines the phases of avoiding the crisis, preparing for crisis management, recognizing the crisis, containing the crisis, resolving the crisis, and profiting from the crisis. Augustine emphasizes the importance of early detection and avoidance, noting that managers often neglect this phase due to a belief in the inevitability of disasters. His model advocates for the formation of crisis teams, contingency planning, and rapid resolution, culminating in the opportunity to recover losses and learn from the event.

Burnett's (1998) model introduces four constraints that shape crisis response: time pressure, control limitations, threat level concerns, and restricted response options. The model is structured around three core processes: identification, confrontation, and reconfiguration, each involving strategic planning and environmental analysis. During confrontation, organizations must design and evaluate crisis strategies, while reconfiguration entails implementing and controlling these strategies to restore stability. Burnett's framework is particularly focused on the operational dynamics of crisis intervention.

González-Herrero and Pratt (1996) offer a lifecycle perspective, conceptualizing crisis evolution through four stages: birth, growth, maturity, and decline. Rather than prescribing management actions, this model illustrates the temporal progression of crises and their enduring effects. It suggests that crises do not simply end with resolution but continue to

influence organizational dynamics long after the immediate threat has subsided.

Moore's model, as presented by Lakha and Moore (2002), delineates six sequential tasks: situation monitoring, crisis detection, containment, response, de-escalation, and recovery. The model emphasizes continuous environmental scanning to identify emerging threats, followed by containment strategies aimed at diagnosing root causes and formulating appropriate responses. De-escalation involves planning a return to normalcy, while recovery focuses on restoring operations to a level potentially superior to the pre-crisis state. Moore's framework integrates strategic flexibility and iterative decision-making throughout the crisis cycle.

Coombs (2007) advances a widely adopted three-staged model comprising pre-crisis, crisis, and post-crisis phases. The pre-crisis stage includes signal detection, prevention, and preparation, with emphasis on training spokespersons and developing contingency plans. The crisis stage involves recognition, containment, stakeholder communication, message development, and reputation management. The post-crisis phase focuses on fulfilling commitments made during the crisis, updating stakeholders on recovery efforts, and evaluating the crisis response for future improvement. Coombs underscores the centrality of crisis communication across all stages, positioning it as a critical component of effective crisis management.

Finally, Boin, Hart, Stern, and Sundelius (2005) present a strategic leadership model tailored to the public sector, identifying five key challenges: sense making, decision making, meaning making, termination, and learning. Their model spans three temporal stages: incubation, onset, and aftermath, and highlights the difficulties public leaders face in detecting crises, coordinating multi-agency responses, and managing public narratives. The framework emphasizes the importance of framing, rituals, and symbolic actions in meaning making, as well as the risks of premature or prolonged crisis termination. Post-crisis learning is categorized into experience-based, explanation-based, and competence-based forms, with a call for institutionalizing lessons within core decision-making structures.

2.5 Conceptual Model Development

Building on the principles derived from these crisis management models, this study develops a comprehensive structural model, as illustrated in Figure 1, to examine the impact of key crisis management factors. These include external communication, internal communication, leadership, technology resilience, and organizational resilience, each hypothesized to influence crisis organizational performance. Organizational culture is positioned as a mediating variable that shapes the effectiveness of these factors. The integration of established theoretical frameworks provides a robust foundation for construct selection and operationalization, capturing both the temporal and strategic dimensions of crisis response. By focusing on ADNOC as a case study, the research offers empirical insights into the mechanisms through which crisis management practices affect performance outcomes in the energy sector. This conceptual model contributes to advancing scholarly understanding of organizational resilience and provides a validated pathway for enhancing crisis preparedness and strategic agility through culturally embedded practices.

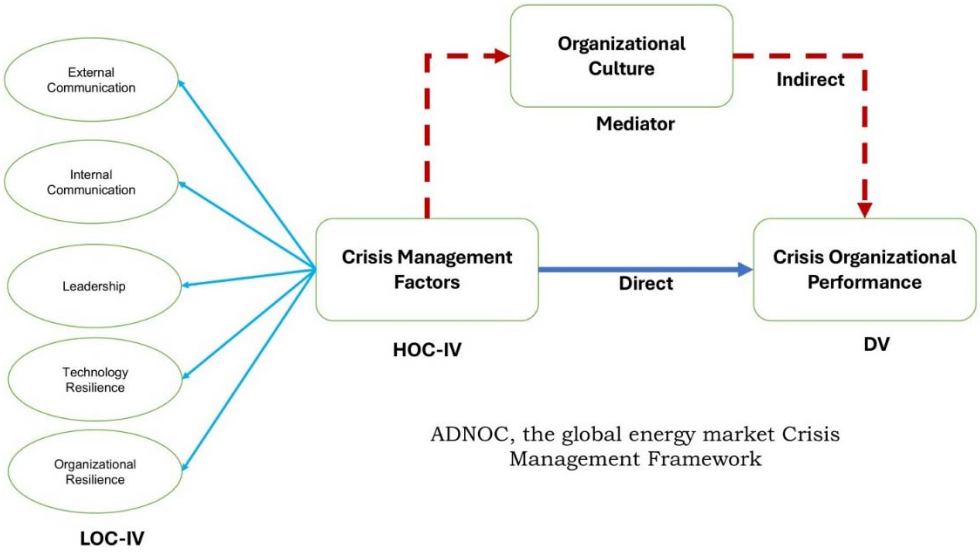

Figure 1. Conceptual framework

Figure 1 presents the ADNOC Global Energy Market Crisis Management Framework. It illustrates the structural relationships among key crisis management dimensions and their influence on crisis organizational performance. The model incorporates five lower-order constructs (LOCs) which are external communication, internal communication, leadership, technology resilience, and organizational resilience. These LOCs represent distinct, measurable components of crisis management capability. Collectively, they form a higher-order construct (HOC) labelled as crisis management factors, which serves as an overarching latent dimension capturing the integrated effect of these capabilities.

The HOC is modelled to exert a direct influence on crisis organizational performance. Additionally, organizational culture is introduced as a mediating variable, shaping the pathway between crisis management factors and performance outcomes. The framework thus captures both direct and mediated effects, offering a nuanced understanding of how strategic crisis capabilities and cultural dynamics interact to drive performance in the energy sector context.

3. Modelling Analysis of the Conceptual Framework

The structural framework proposed in this study is empirically validated using quantitative data collected from a sample of 405 ADNOC employees. These respondents were selected using a simple random sampling technique to ensure representation across a broad spectrum of personnel trained in crisis management. This sampling approach enhances the generalizability of the findings within the organizational context of ADNOC.

To validate the framework, Partial Least Squares Structural Equation Modelling (PLS-SEM) was employed using SmartPLS 4 software. This method is particularly well-suited for the present research context, as it accommodates complex models involving higher-order constructs and mediating relationships (Hair et al., 2019; Sarstedt et al., 2020). Moreover,

PLS-SEM is appropriate for exploratory and theory-building studies, especially within social science domains where sample sizes may be modest and data distributions may deviate from normality (Hair Jr et al., 2017; Memon et al., 2021; Zeng et al., 2021).

The modelling analysis was conducted in two key stages. The first stage involved the assessment of the measurement model, focusing on reliability, convergent validity, and discriminant validity. The second stage evaluated the structural model, testing the hypothesized relationships among constructs and examining mediation effects. The following subsections present a detailed analysis of both components.

3.1 Measurement Model Assessment

This stage involved a rigorous evaluation of the measurement model to establish the reliability and validity of the latent constructs. Internal consistency reliability was assessed using Cronbach's Alpha and Composite Reliability (CR), confirming that the indicators consistently reflect their respective constructs (Hair Jr et al., 2017). All CR values exceeded the recommended threshold of 0.70, indicating satisfactory reliability across constructs.

Convergent validity was examined through the Average Variance Extracted (AVE), with values above 0.50 demonstrating that each construct accounts for more than half of the variance in its indicators (Memon et al., 2021). This affirms that the indicators are adequately correlated with their underlying latent variable.

To ensure discriminant validity, two complementary criteria were employed: the Fornell-Larcker criterion and the Heterotrait-Monotrait ratio (HTMT). The Fornell-Larcker approach requires that the square root of the AVE for each construct exceeds its correlations with other constructs, thereby confirming construct distinctiveness (Sarstedt et al., 2020). Concurrently, HTMT values below the conservative threshold of 0.90 further support discriminant validity, indicating that the latent constructs are empirically distinct from one another (Henseler et al., 2015; Zeng et al., 2021).

3.1.1 Construct Reliability and Validity

The evaluation of construct reliability and validity was conducted using the PLS Algorithm procedure in SmartPLS. This procedure assessed the internal consistency and measurement accuracy of the latent constructs employed in the model. The assessment followed established guidelines outlined by Hair et al. (2019), Memon et al. (2021), and Sarstedt et al. (2020), ensuring the robustness and credibility of the results.

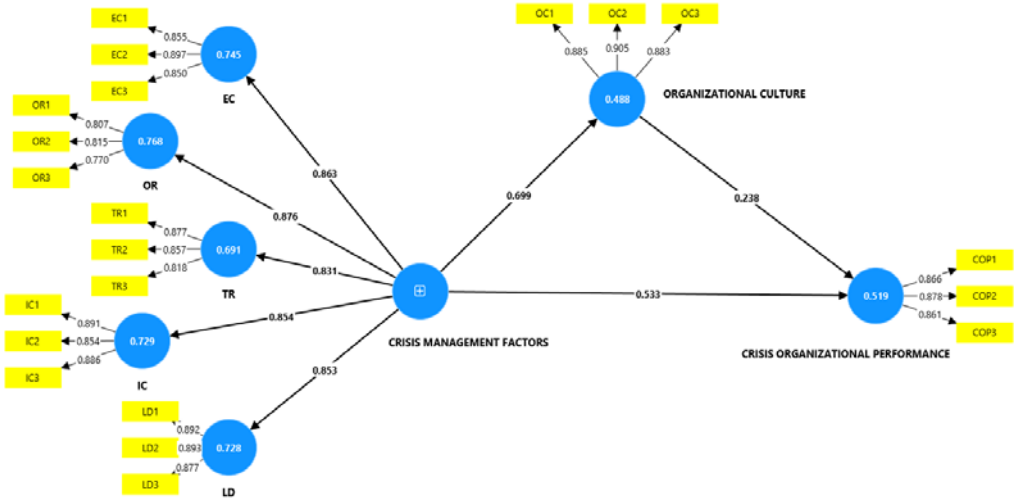

Figure 2. Model after PLS Algorithm procedure

The results of the reliability and validity assessment are presented in Table 3. These include values for Cronbach's Alpha, Composite Reliability, and Average Variance Extracted (AVE) for each construct. As recommended by Hair et al. (2019) and Zeng et al. (2021), all constructs met or exceeded the commonly accepted thresholds (e.g., $\alpha \geq 0.70$, CR ≥ 0.70, AVE ≥ 0.50), confirming acceptable levels of internal consistency reliability and convergent validity.

Table 1. Construct reliability and validity

	Cronbach's alpha	Average Variance Extracted (AVE)
CRISIS MANAGEMENT FACTORS	0.938	0.537
CRISIS ORGANIZATIONAL PERFORMANCE	0.837	0.754
ORGANIZATIONAL CULTURE	0.870	0.794

Table 1 presents the results for construct reliability and validity, indicating that all three constructs meet the accepted thresholds for internal consistency and convergent validity. Crisis Management Factors exhibit a high level of reliability, with a Cronbach's alpha of 0.938, and an Average Variance Extracted (AVE) of 0.537, which is above the minimum acceptable value of 0.50. This suggests that the items within this construct are consistently measuring the intended concept and possess adequate convergent validity.

Crisis Organizational Performance also demonstrates strong psychometric properties, with a Cronbach's alpha of 0.837 and an AVE of 0.754. These values reflect both reliable measurement and a high degree of shared variance among the indicators, confirming that the construct is well-defined. Similarly, Organizational Culture shows good reliability, with a Cronbach's alpha of 0.870, and excellent convergent validity, as evidenced by an AVE of

0.794. Overall, the results affirm that the measurement model is robust, with constructs that are both internally consistent and conceptually valid.

3.1.2 Discriminant Validity

Discriminant validity assesses whether each construct in the model is truly distinct from the others, ensuring that concepts measured are not overlapping. In this study, both the Heterotrait-Monotrait ratio (HTMT) and Fornell-Larcker criterion values confirmed adequate discriminant validity, indicating clear separation between constructs such as Agile Leadership, Innovation Capability, and Organizational Transformation (Hair et al., 2019; Sarstedt et al., 2020). HTMT is considered a more reliable and stringent criterion compared to the Fornell-Larcker approach, especially in detecting lack of discriminant validity (Henseler, Ringle, & Sarstedt, 2015; Memon et al., 2021). According to Hair et al. (2019), HTMT values below 0.90 generally indicate acceptable discriminant validity, while values above 0.90 may suggest a lack of distinction between constructs

Table 2. HTMT values

	CRISIS MANAGEMENT FACTORS	**CRISIS ORGANIZATIONAL PERFORMANCE**	**ORGANIZATIONAL CULTURE**
CRISIS MANAGEMENT FACTORS	-		
CRISIS ORGANIZATIONAL PERFORMANCE	0.790	-	-
ORGANIZATIONAL CULTURE	0.774	0.714	-

Table 2 presents the Heterotrait-Monotrait (HTMT) ratio values to assess discriminant validity among the study constructs. All HTMT values fall below the recommended threshold of 0.85, indicating that the constructs are empirically distinct from one another. The HTMT value between Crisis Management Factors and Crisis Organizational Performance is 0.790, while the value between Crisis Management Factors and Organizational Culture is 0.774. Additionally, the HTMT ratio between Organizational Culture and Crisis Organizational Performance is 0.714. These results confirm that each construct captures a unique dimension of the conceptual framework, thereby supporting the discriminant validity of the measurement model.

Table 3. Fornell Larcker criterion

	CRISIS MANAGEMENT FACTORS	CRISIS ORGANIZATIONAL PERFORMANCE	ORGANIZATIONAL CULTURE
CRISIS MANAGEMENT FACTORS	0.733	-	-
CRISIS ORGANIZATIONAL PERFORMANCE	0.700	0.868	-
ORGANIZATIONAL CULTURE	0.699	0.611	0.891

Table 3 reports the results of the Fornell-Larcker criterion, which is employed to evaluate discriminant validity within the measurement model. According to this criterion, the square root of the Average Variance Extracted (AVE) for each construct should be greater than its correlations with other constructs. The findings demonstrate that the square root of AVE for Crisis Management Factors is 0.733, which exceeds its correlations with Crisis Organizational Performance (0.700) and Organizational Culture (0.699). Similarly, Crisis Organizational Performance exhibits a square root of AVE of 0.868, surpassing its correlations with Crisis Management Factors (0.700) and Organizational Culture (0.611). Organizational Culture also meets the criterion, with a square root of AVE of 0.891, which is higher than its correlations with Crisis Management Factors (0.699) and Crisis Organizational Performance (0.611). These results provide strong evidence of discriminant validity, indicating that each construct is empirically distinct and captures a unique aspect of the conceptual framework.

3.2 Structural Model Assessment

The second stage of the modelling process involved the evaluation of the structural model, which tested the hypothesized relationships and mediation effects among the constructs. Statistical power considerations were guided by Cohen's (1988) recommendations to ensure adequate sensitivity in detecting meaningful effects. The study adhered to established best practices for reporting PLS-SEM results, as outlined in recent methodological literature (Hair et al., 2019; Aburumman et al., 2022).

Key statistical outputs included path coefficients, t-values, and p-values, all generated through bootstrapping procedures to assess the significance of the hypothesized paths. The model's explanatory power was evaluated using R^2 values, which indicate the proportion of variance explained in the endogenous constructs. In addition, effect sizes (f^2) were calculated to determine the practical significance and predictive relevance of each exogenous construct within the model (Hair et al., 2017; Aburumman et al., 2022).

This study also employed a higher-order construct (HOC) modelling approach. The

HOC–LOC design enhances construct validity by capturing the multidimensional nature of complex concepts and provides a more granular understanding of how subdimensions contribute to broader strategic outcomes. This approach is particularly valuable in organizational research, where constructs such as crisis management and leadership encompass multiple interrelated facets.

3.2.1 R-square for Model Strength and Relevance

The R-square (R^2) value indicates the proportion of variance in an endogenous construct that is explained by its predictor variables, serving as a key indicator of model strength and relevance. Higher R^2 values suggest that the model has strong explanatory power, meaning the independent constructs effectively predict outcomes.

Table 4. R-square value

Endogenous construct	R-square
CRISIS ORGANIZATIONAL PERFORMANCE	0.519
ORGANIZATIONAL CULTURE	0.488

Table 4 reports the R-square values, which indicate the proportion of variance explained by the exogenous constructs in the structural model. The R-square value for Crisis Organizational Performance is 0.519, suggesting that 51.9% of the variance in organizational performance during crises is explained by the combined influence of Crisis Management Factors and Organizational Culture. Similarly, the R-square value for Organizational Culture is 0.488, indicating that 48.8% of the variance in organizational culture is accounted for by Crisis Management Factors. These values reflect moderate explanatory power and demonstrate that the model possesses sufficient predictive relevance for the endogenous constructs, thereby supporting the robustness of the proposed framework.

3.2.2 f-square for Identifying Which Relationships Are Most Impactful

The f-square (f^2) value is a key metric in PLS-SEM used to assess the effect size of an exogenous construct on an endogenous construct. It quantifies how much a specific predictor contributes to explaining the variance of a dependent variable, offering insight into which relationships are most influential in the structural model (Hair et al., 2019; Sarstedt et al., 2020).

According to established thresholds, f^2 values of 0.02, 0.15, and 0.35 indicate small, medium, and large effect sizes, respectively (Cohen, 1988; Hair et al., 2017). Higher f^2 values suggest stronger contributions of a particular construct to the model's explanatory power, helping to prioritize which variables are most impactful for practical and theoretical considerations.

Table 5. f-square values

	CRISIS MANAGEMENT FACTORS	CRISIS ORGANIZATIONAL PERFORMANCE	ORGANIZATIONAL CULTURE
CRISIS MANAGEMENT FACTORS	-	0.303	0.953
CRISIS ORGANIZATIONAL PERFORMANCE	-	-	-
ORGANIZATIONAL CULTURE	-	0.060	-

Table 5 presents the f-square values, which assess the effect size of each exogenous construct on the endogenous variables within the structural model. The results indicate that Crisis Management Factors exert a substantial effect on Organizational Culture, with an f-square value of 0.953, signifying a large effect size. Additionally, Crisis Management Factors have a moderate effect on Crisis Organizational Performance, as reflected by an f-square value of 0.303. In contrast, Organizational Culture demonstrates a small effect on Crisis Organizational Performance, with an f-square value of 0.060. These findings suggest that while both constructs contribute to performance outcomes, Crisis Management Factors play a more dominant role in shaping both organizational culture and performance during crisis conditions. The magnitude of these effects reinforces the strategic importance of crisis management capabilities in organizational resilience frameworks.

3.2.3 Path Analysis

Path analysis examines the hypothesized relationships among constructs by estimating the magnitude, direction, and statistical significance of the path coefficients. In this study, path analysis was conducted using the bootstrapping procedure within the PLS-SEM framework, which is particularly suitable for complex models with hierarchical constructs and small to medium sample sizes (Hair et al., 2019; Memon et al., 2021).

Bootstrapping, a non-parametric resampling technique, generated t-statistics and p-values to determine the significance of each path. These statistical outputs were used to confirm whether the direct and indirect effects between the constructs are both statistically and practically significant. The structural model after bootstrapping is illustrated in Figure 3, which visualizes the validated path coefficients and their significance levels.

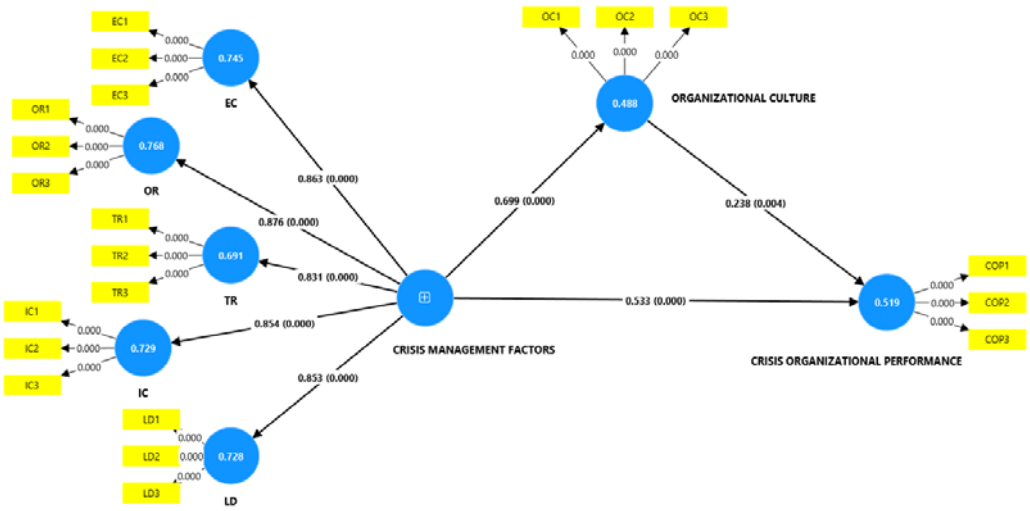

Figure 3. After bootstrapping procedure

This analysis provides empirical validation of the theoretical framework by confirming the strength of the causal relationships, thereby contributing to a deeper understanding of how ORGANIZATIONAL CULTURE mediates between CRISIS MANAGEMENT FACTORS and CRISIS ORGANIZATIONAL PERFORMANCE (Sarstedt et al., 2020; Hair et al., 2017). The results of the hypothesis testing are as in Tables 6 and 7.

Table 6. Results of direct relationship

Direct relationship	Path strength	P values
CRISIS MANAGEMENT FACTORS -> CRISIS ORGANIZATIONAL PERFORMANCE	0.533	0.000
CRISIS MANAGEMENT FACTORS -> ORGANIZATIONAL CULTURE	0.699	0.000
ORGANIZATIONAL CULTURE -> CRISIS ORGANIZATIONAL PERFORMANCE	0.238	0.004

Table 6 presents the results of the direct relationships among the study constructs, highlighting the strength and significance of each path within the structural model. The path from Crisis Management Factors to Crisis Organizational Performance is statistically significant, with a path coefficient of 0.533 and a p-value of 0.000, indicating a strong and positive influence. Similarly, Crisis Management Factors exhibit a robust direct effect on Organizational Culture, with a path strength of 0.699 and a p-value of 0.000, suggesting that effective crisis management practices substantially shape organizational cultural attributes. Furthermore, Organizational Culture demonstrates a significant positive impact on Crisis Organizational Performance, with a path coefficient of 0.238 and a p-value of 0.004. These findings confirm the hypothesized relationships and underscore the mediating role of

organizational culture in enhancing performance outcomes during crisis conditions.

Table 7. Results of indirect relationship

Indirect relationship	Path strength	P values
CRISIS MANAGEMENT FACTORS -> ORGANIZATIONAL CULTURE -> CRISIS ORGANIZATIONAL PERFORMANCE	0.167	0.005

Table 7 presents the results of the indirect relationship analysis, specifically examining the mediating role of Organizational Culture in the link between Crisis Management Factors and Crisis Organizational Performance. The indirect path from Crisis Management Factors through Organizational Culture to Crisis Organizational Performance yields a path coefficient of 0.167 with a statistically significant p-value of 0.005. This finding indicates that Organizational Culture partially mediates the relationship, suggesting that the influence of crisis management practices on organizational performance is not only direct but also operates through cultural mechanisms. The significance of this indirect effect highlights the importance of fostering a resilient and adaptive organizational culture to fully leverage the benefits of crisis management strategies in enhancing performance outcomes.

3.2.4 Predictive Relevance

The predictive relevance of the structural model was evaluated using the blindfolding procedure, which assesses the model's capacity to predict data points of the endogenous constructs (Hair et al., 2021). This method generates two key indicators: Cross-Validated Communality (CCVC) and Cross-Validated Redundancy (CCVR). The CCVC evaluates the model's ability to predict the manifest indicators (measurement model), while the CCVR reflects the model's predictive performance at the construct level (structural model). Both indicators are measured using Stone-Geisser's Q^2 values, where values greater than zero indicate that the model exhibits acceptable predictive relevance (Stone, 1974; Geisser, 1975).

Table 8. CCVR values

	SSO	SSE	Q^2 (=1-SSE/SSO)
CRISIS MANAGEMENT FACTORS	5970.000	5970.000	0.000
CRISIS ORGANIZATIONAL PERFORMANCE	1194.000	738.261	0.382
ORGANIZATIONAL CULTURE	1194.000	740.356	0.380

Table 8 shows that Crisis Organizational Performance has a Q^2 value of 0.382, and Organizational Culture has a Q^2 value of 0.380, both of which exceed the threshold of 0, indicating acceptable predictive relevance. These values suggest that the model has moderate

predictive capability for these constructs. In contrast, Crisis Management Factors yield a Q^2 value of 0.000, as the SSO and SSE are equal, confirming that this construct is exogenous and not subject to predictive assessment within the blindfolding procedure.

Overall, the Q^2 values affirm that the structural model possesses meaningful predictive relevance for the endogenous constructs, thereby supporting its practical applicability in crisis management contexts.

Table 9. CCVM values

	SSO	SSE	Q^2 (=1-SSE/SSO)
CRISIS MANAGEMENT FACTORS	5970.000	3112.098	0.479
CRISIS ORGANIZATIONAL PERFORMANCE	1194.000	616.217	0.484
ORGANIZATIONAL CULTURE	1194.000	532.971	0.554

Table 9 shows that the Q^2 value for Crisis Management Factors is 0.479, suggesting moderate predictive relevance for its indicators. Similarly, Crisis Organizational Performance yields a Q^2 value of 0.484, while Organizational Culture demonstrates the highest predictive relevance with a Q^2 value of 0.554. All values exceed the threshold of zero, confirming that the measurement model has satisfactory predictive capability across all constructs.

These results reinforce the robustness of the measurement model, indicating that the observed indicators are well-represented by their respective latent constructs and that the model is suitable for predictive applications in crisis management and organizational resilience research.

4. Conclusion

This study examined the indirect relationship between selected crisis management factors and crisis organizational performance, emphasizing the mediating role of organizational culture. Drawing on data from 405 ADNOC employees and analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM), the findings confirmed that organizational culture serves as a critical conduit through which crisis management capabilities translate into enhanced performance outcomes.

Crisis management factors demonstrated a strong direct effect on crisis organizational performance ($\beta = 0.533$), indicating their immediate and substantial contribution to organizational effectiveness during crisis conditions. Additionally, these factors exhibited a significant indirect effect on performance ($\beta = 0.167$) through organizational culture, confirming a partial mediation effect. This reinforces the strategic importance of organizational culture in shaping how crisis management practices are internalized and operationalized across the organization.

The partial mediation suggests that while crisis management systems can directly enhance performance, their impact is amplified when embedded within a resilient and adaptive

cultural framework. These findings offer practical implications for organizations operating in high-risk sectors, emphasizing the need to align crisis preparedness with cultural development to ensure sustained performance under pressure.

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