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Navigating VUCA: Strategic Decision-Making in Iraqi Startups from a Dynamic Capabilities Perspective

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ABSTRACT

Iraq's fragile and resource-constrained entrepreneurial ecosystem exposes startups to persistent environmental turbulence that challenges conventional decision-making structures. Drawing on the theory of dynamic capability, this study examines how the four dimensions of the VUCA environment—volatility, uncertainty, complexity, and ambiguity—shape the strategic decision-making process in Iraqi startups. A quantitative cross-sectional research design was employed, and survey data were collected from 200 founders and senior managers using validated five-point Likert-type scales. Partial least squares structural equation modeling (PLS-SEM) was applied to assess the measurement and structural models. The results indicate that all four VUCA dimensions exert a positive and significant effect on the effectiveness of the strategic decision-making process. Rather than treating VUCA conditions solely as constraints, Iraqi startups appear to leverage them as catalysts for agility, experimentation, and learning-oriented decision behavior. These findings extend dynamic capabilities theory to an emerging, post-conflict context by suggesting that relational and intuitive forms of competence—such as improvisation, experiential learning, and trust-based collaboration—can partially substitute for formal structures and analytical routines. Practically, the study offers insights for entrepreneurs, incubators, and policymakers on how to strengthen startups' strategic responsiveness through flexible planning, continuous environmental sensing, and dynamic learning mechanisms.

Keywords: Strategic decision-making, VUCA, dynamic capabilities, startups, Iraq

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INTRODUCTION

The accelerating pace of digital transformation, socio-economic change, and globalization has created a business environment widely characterized by volatility, uncertainty, complexity, and ambiguity (VUCA). Originating from military terminology, VUCA has become a central concept in management and entrepreneurship, capturing the rapidly changing and unpredictable conditions that organizations must navigate to survive and grow. In such an environment, organizational success—particularly for startups, which inherently operate with scarce resources and high risk—depends heavily on the ability to make informed, adaptive, and agile strategic decisions.

Background of the Study

Startups play a central role in driving innovation, employment, and economic diversification, especially in emerging and developing economies. Their dynamic nature and need for rapid market adaptation, however, make them especially vulnerable in a VUCA world. Unlike established corporations with formalized decision-making systems and stable access to resources, startups often operate in fluid contexts where shifts in technology, customer preferences, or political stability can threaten business survival almost overnight. Consequently, the strategic decision-making process within startups must be iterative, forward-looking, and supported by entrepreneurial alertness and foresight (Quotb, 2024).

Globally, numerous studies have examined how organizations navigate uncertainty through strategic planning, foresight, and scenario analysis (Biloslavo, Edgar, Aydin, & Bulut, 2024). Yet much of this work has been conducted in advanced economies where institutional stability, regulatory clarity, and support infrastructures provide a relatively predictable operating environment (Dhillon & Nguyen, 2021). In contrast, emerging and post-conflict countries such as Iraq confront multiple layers of uncertainty—ranging from political instability and security concerns to fragile regulatory frameworks and infrastructural deficits—which profoundly shape how entrepreneurs and startups make strategic decisions.

In recent years, Iraq has witnessed a steady rise in entrepreneurial activity, driven by youth innovation and the emergence of incubators and startup support programs. Nevertheless, the entrepreneurial ecosystem remains fragmented and fragile (Salih, 2024). Iraqi startups frequently confront volatile market conditions, limited access to finance, and insufficient government support. These constraints often push entrepreneurs to rely on intuition, experience, and informal networks rather than on formal strategic planning. Despite these

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challenges and the growing policy interest in entrepreneurship, limited academic attention has been devoted to understanding how Iraqi startups adapt their strategic decision-making processes under such volatile and uncertain conditions.

Problem Statement

While international studies provide valuable insights into managing complexity and uncertainty, there remains a substantial gap in understanding how startups in Iraq formulate, evaluate, and implement strategic decisions under VUCA conditions. Existing research in the Iraqi context has largely focused on macro-level issues, such as decision-making in the public sector or governmental strategic foresight (Jaber, 2024), rather than on micro-level business strategy and entrepreneurial decision-making. Consequently, little is known about how Iraqi startup founders perceive uncertainty, develop strategic agility, and build resilience in the face of environmental turbulence.

Moreover, prior work in other contexts has highlighted the role of big data, artificial intelligence, and digital tools in supporting strategic decision-making (Biloslavo et al., 2024). Yet Iraqi startups often lack access to such technologies due to infrastructural limitations and resource constraints. This digital divide restricts their ability to gather timely information, make evidence-based decisions, and respond proactively to market shifts. In addition, institutional and cultural dynamics specific to Iraq—such as legacy socialist norms, informal professional networks, and reliance on interpersonal trust—play a significant role in shaping decision processes, but remain underexplored within the VUCA framework.

The absence of contextual, empirical research on strategic decision-making in Iraqi startups thus represents a critical gap in both the academic literature and practical strategy formulation. Understanding how entrepreneurs in Iraq navigate VUCA challenges can contribute to the development of adaptive decision-making models that enhance startup resilience, advance entrepreneurship scholarship, and inform policy support mechanisms. This study seeks to address this gap by investigating how the four dimensions of VUCA—volatility, uncertainty, complexity, and ambiguity—affect the effectiveness of the strategic decision-making process in Iraqi startups.

Research Objectives

In light of the above, the literature still offers limited empirical evidence on how VUCA conditions shape strategic decision-making processes in startups operating in fragile, post-

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conflict environments such as Iraq. Most prior studies focus on large firms in relatively stable institutional settings and tend to examine VUCA and dynamic capabilities separately rather than as interrelated phenomena.

Accordingly, this study pursues the following objectives:

1. To examine how the four dimensions of VUCA—volatility, uncertainty, complexity, and ambiguity—affect the effectiveness of the strategic decision-making process in Iraqi startups.
2. To interpret these effects through the lens of dynamic capabilities theory, thereby illuminating how sensing, seizing, and transforming activities may be embedded in the decision practices of startup founders and managers.

By addressing these objectives, the study aims to enrich understanding of strategic decision-making in emerging entrepreneurial ecosystems exposed to high levels of environmental turbulence.

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

VUCA and Strategic Decision-Making

The diffusion of the VUCA concept has reshaped how organizations—particularly startups—approach strategic decision-making. In environments where market conditions shift rapidly, information is incomplete, and causal relationships are difficult to discern, traditional rational and linear decision-making models often prove inadequate. Volatility refers to the speed and magnitude of change in the environment; uncertainty to the unpredictability of future events; complexity to the multiplicity and interdependence of environmental factors; and ambiguity to the lack of clarity about cause–effect relationships (Soltani, Souri, & Hajipour, 2024).

In volatile conditions, decision-makers must continuously monitor markets and adopt flexible decision-making cycles that can absorb sudden shocks. Uncertainty, characterized by limited or unreliable information about future outcomes, pushes entrepreneurs to make decisions under risk and ambiguity, often increasing reliance on intuition and experiential knowledge rather than purely formal analysis (Quotb, 2024). Complexity adds further pressure as decision-makers must navigate intertwined technological, social, and political factors that jointly influence outcomes (Dhillon & Nguyen, 2021). Ambiguity blurs the link between actions and

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consequences, making it difficult for entrepreneurs to predict the implications of strategic moves and to learn from experience.

Taken together, VUCA conditions disrupt structured decision-making tools and call for adaptive, iterative processes grounded in learning and flexibility. In this respect, VUCA is not merely a descriptor of environmental turbulence; it is a key driver of how strategic decisions are framed, processed, and implemented within organizations.

Dynamic Capabilities Theory

Dynamic capabilities theory (DCT), first articulated by Teece, Pisano, and Shuen (1997), provides a powerful lens for understanding how firms adapt, innovate, and sustain competitive advantage under turbulent conditions. Building on the resource-based view, DCT emphasizes not only the possession of valuable resources, but also the firm's ability to integrate, reconfigure, and renew these resources in response to environmental change.

Teece (2007) conceptualizes dynamic capabilities as comprising three interrelated components:

1. **Sensing:** Identifying and interpreting emerging opportunities and threats in the environment;
2. **Seizing:** Mobilizing resources and making commitments to capture identified opportunities;
3. **Transforming:** Reconfiguring the organization's resource base and structures to maintain competitiveness over time.

In high-VUCA settings, these capabilities become particularly critical. Firms must sense weak signals in volatile markets, seize opportunities despite uncertainty, and transform organizational routines to cope with complexity and ambiguity. For startups, which often lack established routines and formal structures, dynamic capabilities may manifest through entrepreneurial alertness, improvisation, rapid learning, and the strategic use of social networks.

VUCA, Dynamic Capabilities, and Startups in Iraq

The interaction of VUCA conditions and dynamic capabilities has distinct implications in fragile, emerging ecosystems such as Iraq. The Iraqi entrepreneurial environment is characterized by persistent volatility, regulatory gaps, and infrastructural deficiencies. These

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factors compel entrepreneurs to make decisions under severe constraints, often relying on emergent strategies rather than formal planning.

Empirical evidence suggests that firms with more developed dynamic capabilities are better able to convert environmental turbulence into strategic advantage (Araújo, Reis, & Morais, 2021). Enwereji and colleagues (2024) show that entrepreneurial resilience—a behavioral expression of dynamic capabilities—mediates the link between VUCA conditions and strategic outcomes. In the Iraqi context, however, dynamic capabilities may take more relational and cognitive forms, such as trust-based collaboration, intuitive judgment, and improvisational problem-solving. Jaber (2024) notes that strategic agility remains underdeveloped in many Iraqi institutions, leaving startups vulnerable to external shocks. Nonetheless, when startups invest in sensing (e.g., market intelligence), learning, and digital transformation, they can enhance decision accuracy and long-term resilience.

For Iraqi startups, cultivating dynamic capabilities is not a luxury but a strategic imperative for survival. DCT thus bridges the gap between environmental disorder and entrepreneurial strategy, positioning flexibility and learning as the cornerstone of effective decision-making in a VUCA world.

Conceptual Framework and Hypotheses

This study adopts dynamic capabilities theory as an overarching lens for interpreting how Iraqi startups respond to VUCA conditions in their strategic decision-making processes. The four VUCA dimensions are conceptualized as distinct yet interrelated features of the external environment that stimulate different aspects of the strategic decision-making process. Volatility and uncertainty intensify the need for continuous environmental sensing and rapid information processing. Complexity demands the integration of heterogeneous knowledge sources and coordination across multiple stakeholders. Ambiguity pushes startups toward experimentation, improvisation, and learning-oriented decision behaviors.

Within this framework, the study proposes that higher perceived levels of volatility, uncertainty, complexity, and ambiguity are associated with more adaptive and effective strategic decision-making processes in Iraqi startups, as decision-makers mobilize dynamic capabilities to interpret and respond to environmental signals. Accordingly, the following hypotheses are formulated:

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1. **H1:** Perceived environmental volatility has a positive effect on the effectiveness of the strategic decision-making process in Iraqi startups.
2. **H2:** Perceived environmental uncertainty has a positive effect on the effectiveness of the strategic decision-making process in Iraqi startups.
3. **H3:** Perceived environmental complexity has a positive effect on the effectiveness of the strategic decision-making process in Iraqi startups.
4. **H4:** Perceived environmental ambiguity has a positive effect on the effectiveness of the strategic decision-making process in Iraqi startups.

RESEARCH METHODOLOGY

Research Design

This study employs a quantitative cross-sectional research design, collecting data from founders and managers of Iraqi startups at a single point in time. A cross-sectional design is appropriate for examining the current relationships between VUCA dimensions (exogenous constructs) and the effectiveness of the strategic decision-making process (endogenous construct) without manipulating any variables. The design allows the identification of patterns and associations across organizations and provides a basis for hypothesis testing and interpretation. The use of cross-sectional surveys is consistent with empirical work in strategic management that explores the impact of environmental turbulence on organizational adaptability and decision-making agility (Enwereji & van Rooyen, 2024).

Research Approach

The study adopts a deductive quantitative approach grounded in dynamic capabilities theory (Teece et al., 1997). The deductive approach is suitable for testing hypotheses derived from established theoretical propositions. Data were collected using structured questionnaires with five-point Likert-type scales, which facilitate statistical analysis and support generalization across the sample.

Population and Sampling

The population of the study comprises startups operating in Iraq, particularly those that are innovation-driven and active in technology-related services. Startups were chosen because they operate in highly uncertain environments and represent a critical component of Iraq’s evolving entrepreneurial ecosystem.

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A purposive sampling strategy was employed to select respondents who are directly involved in strategic decision-making, including founders, chief executive officers, and strategic managers. The sampling frame was constructed in collaboration with startup innovation hubs and entrepreneurial networks such as Five One Labs, Orange Corners Iraq, and The Station Baghdad. A total of 250 questionnaires were distributed; 212 were returned, and 200 were deemed complete and valid for analysis. This sample size is statistically adequate for structural equation modeling and exceeds commonly recommended minimum thresholds for PLS-SEM.

Measures

VUCA was measured using a 24-item scale comprising four sub-dimensions—volatility, uncertainty, complexity, and ambiguity—each captured by six items developed by Çepni, Önalan, Yıldıran, and Önalan (2024). The strategic decision-making process (SDMP) was measured using 23 items adapted from Nooraie (2008), capturing aspects such as information use, participation, flexibility, and decision quality. All items were assessed on five-point Likert scales ranging from “strongly disagree” to “strongly agree.”

Data Analysis Techniques

Data were analyzed using SmartPLS to estimate both the measurement model and the structural model. The analysis proceeded in two stages: (1) evaluation of the reliability and validity of the measurement model; and (2) assessment of the structural relationships among the VUCA dimensions and strategic decision-making effectiveness. Standard criteria were applied for internal consistency reliability (Cronbach’s alpha and composite reliability), convergent validity (average variance extracted, AVE), and discriminant validity (Fornell–Larcker criterion and HTMT ratios).

RESULTS

Measurement Model

Table 1 presents the results of the internal consistency and convergent validity assessment. All factor loadings exceeded the commonly accepted threshold of 0.50. Cronbach’s alpha values range from 0.821 to 0.942, and composite reliability values range from 0.869 to 0.948, indicating satisfactory internal consistency for all constructs. The AVE values for all constructs are above 0.50, confirming adequate convergent validity and indicating that each construct explains more than half of the variance in its indicators (Hair et al., 2014).

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Table 1: *Internal Consistency*

	Cronbach's alpha	Composite Reliability	Average variance extracted (AVE)
Ambiguity	0.831	0.888	0.665
Complexity	0.920	0.938	0.715
SDMP	0.942	0.948	0.506
Uncertainty	0.821	0.869	0.529
Volatility	0.866	0.903	0.65

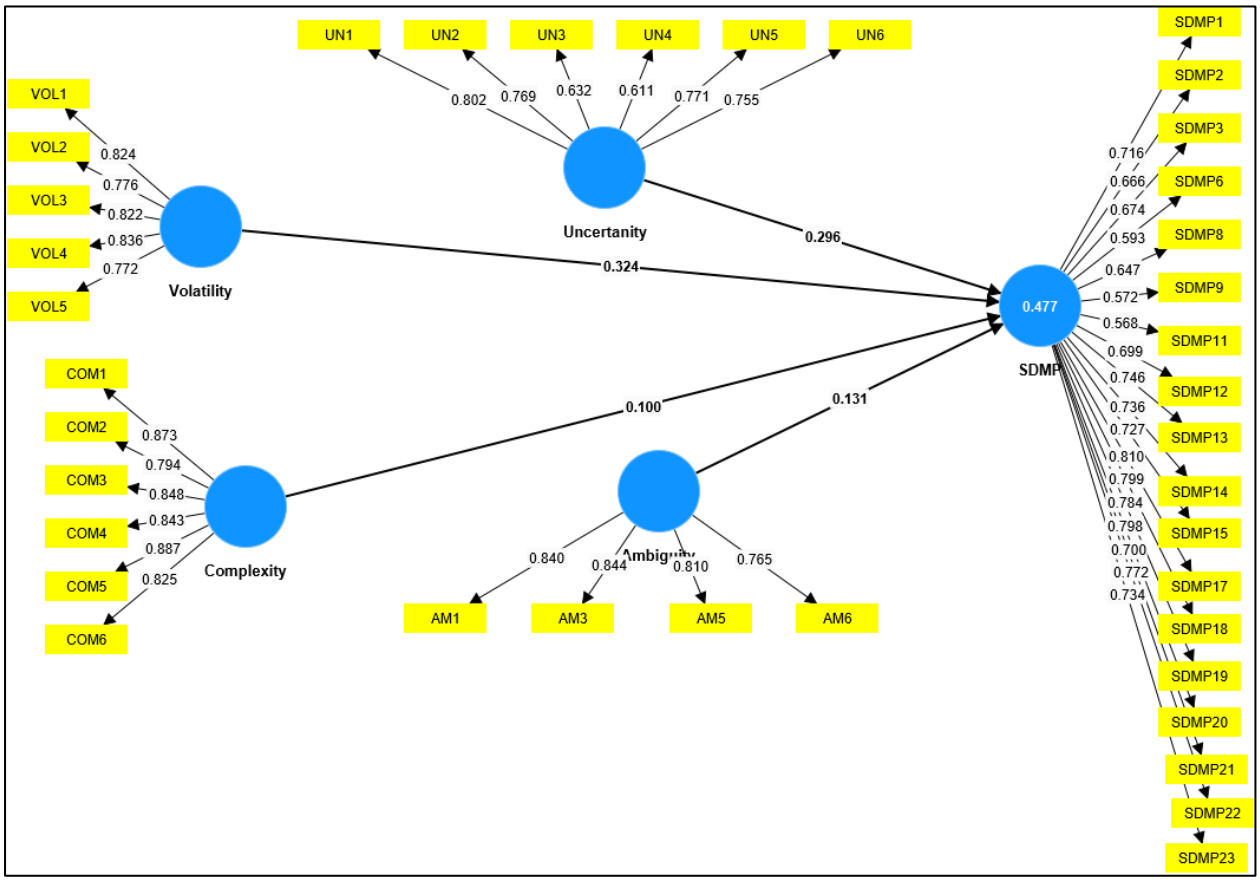

Figure 1: Internal Consistency

Discriminant Validity

Discriminant validity was assessed using both the Fornell–Larcker criterion and the heterotrait–monotrait (HTMT) ratio of correlations (Henseler et al., 2015). As shown in Table 2, the square root of AVE for each construct is greater than its correlations with other constructs, consistent

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with the Fornell–Larcker criterion. In addition, all HTMT values are below the recommended threshold of 0.90, indicating that each construct is empirically distinct from the others. These results confirm that the measurement model exhibits satisfactory discriminant validity.

Table 2: *Discriminant Validity*

	Ambiguity	Complexity	SDMP	Uncertainty	Volatility
Ambiguity					
Complexity	0.746				
SDMP	0.625	0.504			
Uncertainty	0.834	0.569	0.636		
Volatility	0.545	0.473	0.615	0.513	

Structural Model

The structural model assesses the direct effects of the four VUCA dimensions on strategic decision-making effectiveness (SDMP). Table 3 reports the R^2 and adjusted R^2 values for the endogenous construct. The model explains 47.7% of the variance in SDMP ($R^2 = 0.477$; adjusted $R^2 = 0.472$), indicating a moderate level of explanatory power.

Table 4 and Figure 2 summarize the path coefficients, standard deviations, t-values, and p-values for the hypothesized relationships. All four VUCA dimensions have positive and statistically significant effects on SDMP:

1. **Volatility → SDMP:** $\beta = 0.324$, $p < 0.001$
2. **Uncertainty → SDMP:** $\beta = 0.296$, $p < 0.001$
3. **Complexity → SDMP:** $\beta = 0.100$, $p < 0.05$
4. **Ambiguity → SDMP:** $\beta = 0.131$, $p < 0.05$

These results support all four hypotheses (H1–H4) and demonstrate that higher perceived volatility, uncertainty, complexity, and ambiguity are associated with more effective strategic decision-making processes in Iraqi startups.

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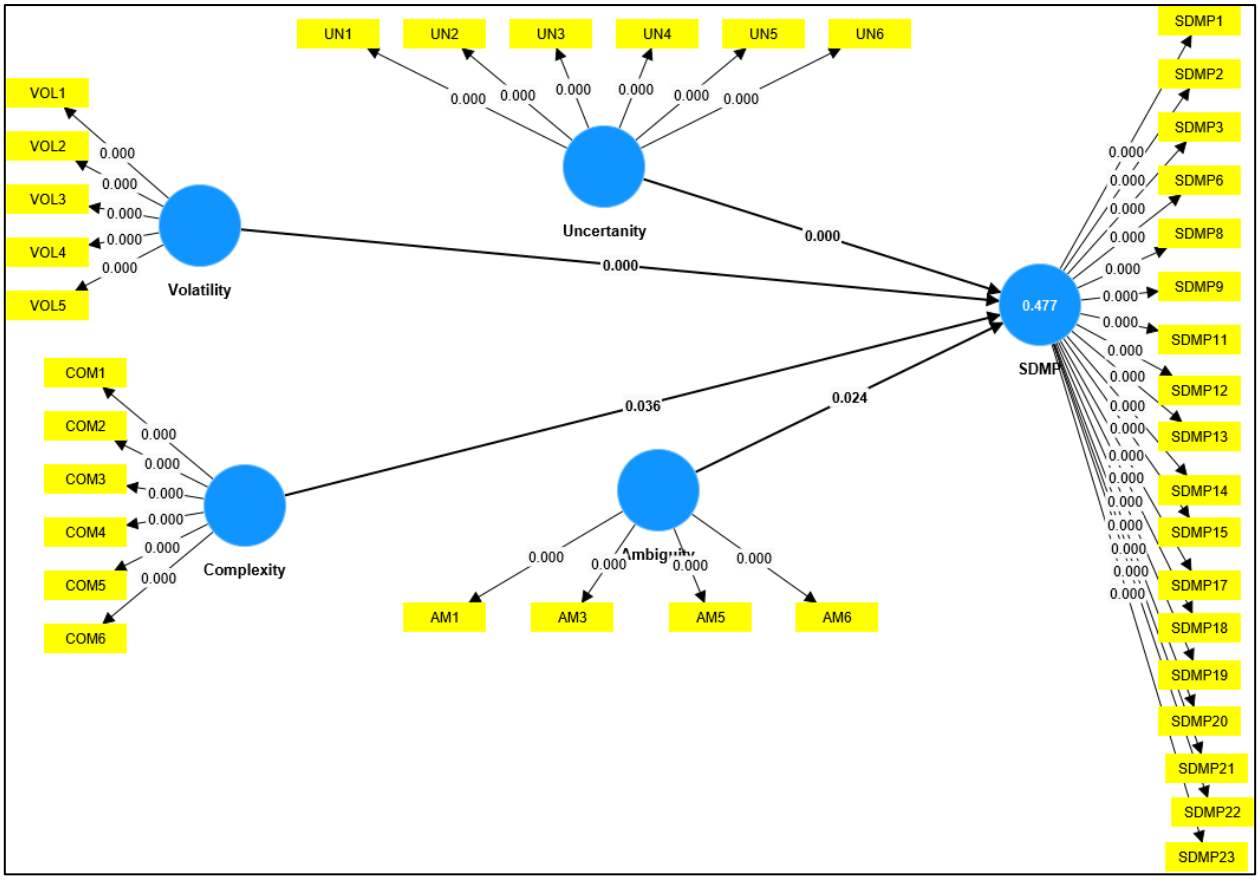

Figure 2: Path Coefficient

Table 3: *R-square and Adjusted R-square*

	R-square	R-square adjusted
SDMP	0.477	0.472

Table 4: *Path coefficient*

Hypothesis	β	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Ambiguity -> SDMP	0.131	0.066	1.972	0.024
Complexity -> SDMP	0.100	0.055	1.803	0.036
Uncertainty -> SDMP	0.296	0.058	5.137	0

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Volatility -> SDMP	0.324	0.049	6.588	0

DISCUSSION

This section discusses the empirical findings in light of the existing literature and the theoretical lens of dynamic capabilities. The analysis reveals that all four VUCA dimensions exert significant and positive effects on the strategic decision-making process in Iraqi startups, suggesting that environmental turbulence can stimulate, rather than paralyze, strategic action.

The positive and significant effect of volatility on SDMP ($\beta = 0.324$, $p < 0.001$) indicates that as market conditions become more unstable—due to shifting technologies, fluctuating customer preferences, and inconsistent regulations—startups are compelled to adopt more adaptive and rapid decision processes. This finding aligns with Minciu, Berar, and Dobrea (2020), who argue that volatility forces firms to shift from static planning to continuous strategic adaptation. It also resonates with Enwereji and van Rooyen (2024), who show that volatile environments can trigger entrepreneurial resilience and activate strategic agility.

Similarly, the significant positive effect of uncertainty on SDMP ($\beta = 0.296$, $p < 0.001$) suggests that Iraqi startups respond to unpredictable conditions by relying on intuition, rapid information integration, and proactive foresight. Rather than viewing uncertainty as an insurmountable barrier, these startups treat it as a condition that demands experimentation and flexibility. This pattern is consistent with Quotb (2024), who finds that strategic intelligence systems enhance adaptability under uncertainty, and with Soltani et al. (2024), who emphasize the role of strategic foresight in mitigating the impact of uncertain futures.

The positive effect of complexity on SDMP ($\beta = 0.100$, $p < 0.05$) indicates that the intertwined technological, socio-economic, and political factors facing Iraqi startups lead entrepreneurs to adopt multidimensional and collaborative decision strategies. This finding aligns with Araújo et al. (2021), who highlight that management in complex environments depends on adaptive experimentation and collective intelligence. It is also consistent with Biloslavo et al. (2024), who show that cross-functional collaboration and integrated data use improve decision accuracy in complex settings. The present study extends this understanding to the Iraqi context, suggesting that complexity can stimulate innovative problem-solving and the “transforming” component of dynamic capabilities.

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Finally, the significant positive effect of ambiguity on SDMP ($\beta = 0.131$, $p < 0.05$) shows that even when causal relationships are unclear and outcomes are difficult to predict, Iraqi entrepreneurs do not retreat from decision-making. Instead, they interpret ambiguity as a condition that requires experimentation, trial-and-error, and iterative learning. This is consistent with Soltani et al. (2024), who argue that ambiguity can foster strategic foresight and creative search, and with Enwereji and van Rooyen (2024), who link ambiguous environments to creative thinking and entrepreneurial resilience. In Iraq, where data are often incomplete and institutional processes opaque, entrepreneurs frequently rely on personal experience and interpersonal trust to make strategic decisions.

Taken together, these findings strongly support the relevance of dynamic capabilities theory (Teece et al., 1997) for understanding startup behavior in VUCA contexts. Iraqi startups appear to possess varying degrees of sensing, seizing, and transforming capabilities that enable them to interpret volatility, manage uncertainty, navigate complexity, and adapt to ambiguity.

Theoretical Implications

This study makes several contributions to theory. First, it enriches the literature on VUCA by providing empirical evidence on how volatility, uncertainty, complexity, and ambiguity are perceived and navigated by startups operating in a fragile, post-conflict environment. Rather than treating VUCA solely as an external constraint, the findings show that Iraqi startups can leverage turbulent conditions as triggers for adaptability, experimentation, and continuous learning.

Second, the study extends dynamic capabilities theory to early-stage ventures in an emerging economy. It demonstrates that dynamic capabilities can manifest not only through formal analytical routines and advanced systems, but also through cognitive and behavioral mechanisms such as creativity, intuition, experiential learning, and trust-based collaboration. This perspective broadens the conceptualization of dynamic capabilities to include relational and human capital elements, which are particularly salient in contexts where formal institutions and infrastructures are weak.

Third, the study contributes to the literature on strategic decision-making processes by shifting attention from large, established organizations in stable markets to young, growth-oriented ventures in highly turbulent environments. The evidence suggests that exposure to VUCA conditions can encourage more flexible, adaptive, and learning-oriented decision processes.

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This nuanced understanding refines existing models of SDMP by showing how decision-making evolves when firms are continuously exposed to uncertainty and ambiguity.

7. Practical Implications

The findings also generate important practical implications for entrepreneurs, incubators, policymakers, and investors.

For Iraqi entrepreneurs, the results highlight the importance of cultivating flexibility, learning, and strategic foresight as core capabilities. Startups should adopt iterative planning approaches, integrating regular experimentation and review into their strategy processes. Investing in environmental scanning, informal market intelligence, and scenario thinking can enhance their capacity to sense and respond to VUCA conditions.

For incubators and support organizations, the study underscores the need to focus on building dynamic capabilities among entrepreneurs. Training programs should prioritize real-time decision-making skills, digital literacy, risk assessment, and data-informed judgment. Providing access to market intelligence tools, analytics platforms, and peer-learning networks can enhance startups' ability to capitalise on opportunities in turbulent markets.

For policymakers, the results suggest that creating an enabling environment that reduces unnecessary complexity and uncertainty is crucial. Streamlining regulatory procedures, enhancing access to finance, and investing in digital and physical infrastructure would enable startups to make more informed and timely strategic decisions. Recognizing adaptability and resilience as key performance indicators for startups is also important for designing targeted support policies.

For investors, the study implies that traditional performance metrics may be insufficient in high-VUCA contexts. Assessing startups' dynamic capabilities—such as their responsiveness, learning orientation, and network strength—can offer a more accurate picture of their long-term potential than short-term financial indicators alone.

Limitations and Directions for Future Research

Despite its contributions, this study has several limitations that open avenues for future research. First, its cross-sectional design captures perceptions and decision processes at a single point in time, limiting strong causal inferences. Longitudinal studies would enable researchers

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to trace how dynamic capabilities and decision-making processes evolve as startups mature and as the institutional environment changes.

Second, the use of non-probability purposive sampling restricts the generalizability of the findings beyond the specific group of Iraqi startups studied. Future research could employ probability sampling and replicate the model in other regions or countries to test the robustness and external validity of the results.

Third, the study relies primarily on self-reported, perceptual measures obtained from single respondents in each startup. Although the constructs were measured using established scales and the measurement model shows good reliability and validity, multi-source data and objective performance indicators would further strengthen the conclusions. Future work could also explore additional mediating or moderating variables—such as leadership style, organizational culture, or the extent of digital transformation—to gain deeper insight into how VUCA conditions translate into specific strategic outcomes.

Finally, comparative studies between Iraq and other emerging or post-conflict economies could reveal whether the patterns of adaptation observed here are unique or consistent across similar VUCA environments. Qualitative research, such as interviews or case studies, could complement the quantitative findings by illuminating the cognitive and emotional aspects of entrepreneurial decision-making under extreme uncertainty.

CONCLUSION

This study has examined how VUCA conditions shape the strategic decision-making process in Iraqi startups, using dynamic capabilities theory as a guiding framework. The empirical results show that volatility, uncertainty, complexity, and ambiguity all exert significant and positive effects on strategic decision-making effectiveness. Rather than paralyzing startups, VUCA conditions appear to stimulate adaptability, resilience, and creativity.

Anchored in dynamic capabilities theory, the findings suggest that startups equipped with the ability to sense, seize, and transform are better positioned to convert environmental turbulence into strategic advantage. In Iraq’s fragile yet evolving entrepreneurial ecosystem, strengthening dynamic capabilities emerges as a cornerstone of sustainable competitiveness. Startups that embrace change, learn from experience, and innovate continuously are more likely not only to survive, but to thrive amid persistent unpredictability.

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Even in a high-VUCA environment, the combination of foresight, strategic agility, and learning-oriented management remains one of the most powerful levers for achieving long-term success and resilience.

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