


## Decision-Making Under Uncertainty: How Organizations Adapt to Environmental Changes?

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### ABSTRACT

In an increasingly volatile global business environment, organizations must navigate complex and unpredictable changes. This study aims to explore the adaptive strategies organizations employ to manage decision-making under uncertainty, focusing on how these strategies enhance organizational resilience and effectiveness in the face of environmental changes. This qualitative study collected data through semi-structured interviews with 26 participants from various industries including technology, healthcare, manufacturing, financial services, and retail. Participants ranged from senior management to operational staff, ensuring a comprehensive view of organizational strategies across different levels. The interviews continued until theoretical saturation was achieved, ensuring depth and breadth in the collected data. Thematic analysis was employed to identify and analyze patterns within the data. Three main themes were identified as central to organizational adaptation: Strategic Adaptation, Operational Responses, and Organizational Learning. Strategic Adaptation included subthemes such as Scenario Planning, Resource Allocation, Communication Strategies, and Leadership and Governance. Operational Responses covered Change Management, Innovation and Creativity, Process Optimization, and Risk Management. Organizational Learning focused on Knowledge Management and Employee Engagement. Each theme encapsulated several strategies and practices crucial for navigating uncertainty effectively. The study concludes that effective adaptation to environmental changes relies heavily on a cohesive strategy that integrates strategic foresight, operational agility, and a continuous learning culture. These elements are crucial for building resilience and ensuring sustained organizational performance in uncertain environments. The findings suggest that a proactive approach to strategic planning, coupled with robust operational responses and an emphasis on organizational learning, forms the backbone of successful adaptive strategies.

**Keywords:** *Organizational Adaptation, Decision-Making, Uncertainty, Strategic Planning, Operational Responses, Organizational Learning, Environmental Changes.*

## 1. Introduction

Understanding how entities adapt to environmental changes remains a paramount concern. This interest is fueled by the accelerating pace of technological advancement, economic shifts, and unpredictable geopolitical landscapes, which together contribute to a climate of heightened uncertainty. In such environments, the efficacy of decision-making processes is not only crucial for immediate survival but also for long-term sustainability. Historically, organizations have faced challenges in adapting to rapid changes in their external environments (Matthijs et al., 2010; Miller, 1991; Olson et al., 2005; Ostos et al., 2016; Xue & Deng, 2021). Daft and Lengel (1986) posited that the richness of information within an organization greatly influences its structural design and decision-making capacity under varying levels of uncertainty. Their seminal work underscores the importance of communication channels that can convey complex messages promptly and effectively to facilitate swift decision-making. In today's context, this theory suggests that adapting communication strategies in response to environmental complexity is crucial for organizational agility (Daft & Lengel, 1986).

Recent studies have expanded on this foundation, exploring how middle managers interpret and respond to uncertainty within the strategic process (Duarte & Aktaş, 2022). These insights are invaluable as they highlight the pivotal role of middle management in bridging the gap between strategic directives and operational execution, particularly in uncertain environments. Middle managers' capacity to deal with ambiguity directly impacts organizational responsiveness and adaptability.

Furthermore, the interplay between organizational structure and environmental uncertainty has been explored in various contexts, demonstrating significant impacts on managerial performance. Hadiano and Djuminah (2023) revealed how decentralization, coupled with the strategic use of information technology, enhances managerial performance in uncertain environments, mediated by robust management accounting systems (Hadiano & Djuminah, 2023). This finding aligns with Hartmann's (2005) research on the influence of managers' tolerance for ambiguity on the selection of appropriate performance measures, illustrating how personal and organizational capacities for handling uncertainty can shape accounting and performance evaluation practices (Hartmann, 2005).

On a broader scale, the relationship between environmental uncertainty and innovation adoption has been

extensively documented. Kaya, Ataman, and Elbaşı (2019) investigated this dynamic within the Turkish market, illustrating how perceived environmental uncertainties drive organizations towards embracing innovative technologies and processes to maintain competitive advantage. This perspective is crucial for understanding the mechanisms through which organizations can leverage uncertainty for innovation rather than viewing it solely as a threat (Kaya et al., 2019).

The role of information technology in enhancing organizational agility, particularly in environments characterized by high uncertainty and information intensity, has also been substantiated in recent literature (Mao et al., 2014). Their study emphasizes how IT capabilities, when aligned with organizational knowledge practices, significantly bolster agility, thus providing a strategic buffer against environmental volatility.

Furthermore, the cultural dimensions of organizational adaptability to environmental changes have also been examined. Salehi, Mirsepasi, and Farhangi (2015) focused on how the adaptability of organizational culture within a broadcasting firm could respond dynamically to external pressures. Their findings underscore the need for cultural flexibility to effectively manage the external informational milieu (Salehi et al., 2015).

Lastly, the theoretical reflections on safety management by Moorkamp et al. (2014) and the challenges of sustaining talent management systems highlighted by Sulistyorini (2023) provide additional layers of understanding about the internal adaptations necessary for dealing with external uncertainties. These studies collectively suggest that safety management and talent retention are critical underpinnings of successful adaptation strategies (Moorkamp et al., 2014; Sulistyorini, 2023).

This study builds upon these diverse perspectives by focusing on qualitative insights gathered through semi-structured interviews with organizational members from various industries. By examining how different levels of an organization perceive and respond to uncertainty, this research aims to contribute a nuanced understanding of adaptive strategies in complex environments.

## 2. Methods and Materials

### 2.1. Study Design and Participants

This study adopts a qualitative research methodology to explore how organizations adapt to environmental changes, focusing on decision-making under uncertainty. The

qualitative approach was chosen due to its strength in uncovering the depth and diversity of participants' perspectives and experiences, allowing for a richer understanding of complex organizational behaviors.

Participants were selected using a purposive sampling strategy to include a diverse array of organizational roles—from senior management to operational staff—across various industries impacted by environmental changes. This sampling method ensured the collection of comprehensive insights across different levels of decision-making and organizational contexts.

All participants were provided with an information sheet detailing the study's purpose, their role in it, and how their data would be used. Informed consent was obtained from each participant prior to the interviews. Confidentiality and anonymity were strictly upheld, with all identifying information being removed from the transcripts before analysis.

2.2. Measures

2.2.1. Semi-Structured Interview

Data were collected exclusively through semi-structured interviews, which were designed to allow both the interviewer and the interviewee flexibility in addressing the central questions while also enabling the emergence of new themes that were not initially anticipated. The interviews ranged from 45 to 60 minutes and were conducted until theoretical saturation was achieved—that is, the point at which no new significant data emerged to influence the research outcomes.

The interview protocol comprised open-ended questions crafted to elicit detailed responses on how organizations identify, react to, and integrate changes in their environments into their strategic planning and operations. Questions also probed the challenges and barriers faced in

adapting to these changes, as well as the strategies deemed most effective in managing uncertainty.

2.3. Data Analysis

Transcripts from the interviews were analyzed using thematic analysis to identify common patterns and themes across the data. This analysis was conducted in several phases: initial coding, theme development, and refinement of themes. Codes were initially generated inductively from the data and later clustered into potential themes. These themes were reviewed and refined repeatedly, ensuring they accurately represented the data. The reliability of the coding process was maintained through regular peer debriefings.

3. Findings and Results

In the study, a total of 26 participants were interviewed to gather insights into organizational decision-making under uncertainty. The demographic breakdown of the participants included 12 females and 14 males, ensuring a balanced gender representation. The age range of the participants varied, with 8 participants between the ages of 25 and 34, 10 participants between the ages of 35 and 44, and 8 participants over the age of 45, providing a broad perspective across different career stages. The participants represented a diverse set of industries including technology (6 participants), healthcare (5 participants), manufacturing (5 participants), financial services (4 participants), and retail (6 participants). This diversity across industries was intentional, aimed at capturing a wide range of responses to environmental uncertainties. Participants held a variety of roles within their organizations, from senior management (9 participants) to middle management (10 participants) and operational staff (7 participants), ensuring that the study captured insights from multiple levels of organizational hierarchies.

Table 1

The Results of Qualitative Analysis

Categories	Subcategories	Concepts (Open Codes)
1. Strategic Adaptation	1.1 Scenario Planning	- Contingency planning- Future forecasting- Risk assessment- Scenario development- Probabilistic thinking
	1.2 Resource Allocation	- Budget flexibility- Resource prioritization- Crisis resource management- Cost-benefit analysis
	1.3 Communication Strategies	- Information dissemination- Stakeholder engagement- Feedback loops- Crisis communication
	1.4 Leadership and Governance	- Decision authority- Leadership styles- Organizational hierarchy- Governance structures
2. Operational Responses	2.1 Change Management	- Change readiness- Employee training- Adaptation strategies- Implementation challenges

3. Organizational Learning	2.2 Innovation and Creativity	- Creative problem solving- Innovation adoption- R&D investments- Leveraging technology
	2.3 Process Optimization	- Workflow adjustments- Efficiency improvements- Lean practices- Automation integration
	2.4 Risk Management	- Risk identification- Mitigation strategies- Resilience building- Vulnerability assessment
	3.1 Knowledge Management	- Knowledge sharing- Best practices- Information storage- Learning organization
	3.2 Employee Engagement	- Team dynamics- Motivation techniques- Staff empowerment- Role adjustments

### 3.1. Strategic Adaptation

Strategic adaptation emerged as a crucial theme, reflecting how organizations plan and adjust their strategies in response to environmental changes. This theme encompasses several subthemes:

**Scenario Planning:** Organizations engaged in scenario planning to anticipate possible future challenges. Participants described the use of "contingency planning" and "risk assessment" as essential to navigating uncertainty. One manager noted, "We regularly develop multiple scenarios to forecast possible futures and prepare accordingly."

**Resource Allocation:** Effective allocation of resources was identified as a critical adaptive strategy. "Budget flexibility and crisis resource management have been pivotal during unexpected shifts," remarked a finance officer, highlighting the need for "cost-benefit analysis" in resource prioritization.

**Communication Strategies:** Communication within and outside the organization plays a vital role during crises. As one executive explained, "Our crisis communication plans involve regular information dissemination and active stakeholder engagement to maintain transparency and trust."

**Leadership and Governance:** The style and structure of leadership and governance significantly influence strategic responses. "Leadership styles need to be adaptive; our decision authority is structured to enable quick responses to emerging challenges," a senior leader mentioned.

### 3.2. Operational Responses

Operational responses focus on how organizations manage and implement changes at the operational level, with the following subthemes identified:

**Change Management:** Organizations emphasized the importance of "change readiness" and "adaptation strategies". A project manager shared, "Employee training on new systems and processes is crucial for smooth transitions."

**Innovation and Creativity:** Innovation is vital for adaptation. "We invest in R&D to keep ahead of

technological advancements and encourage creative problem-solving among staff," an R&D head detailed.

**Process Optimization:** Streamlining processes to enhance efficiency was commonly reported. "By adjusting our workflows and integrating automation, we've significantly improved our operational efficiency," stated an operations director.

**Risk Management:** Identifying and mitigating risks is essential for organizational resilience. "We focus on building resilience by regularly updating our risk mitigation strategies," a risk manager shared.

### 3.3. Organizational Learning

Organizational learning was recognized as a key driver of sustained adaptation and improvement:

**Knowledge Management:** The capture and dissemination of knowledge help organizations learn and adapt. "We have systems in place for knowledge sharing that help us leverage best practices across the organization," explained a knowledge manager.

**Employee Engagement:** Engaging employees effectively fosters an adaptable organizational culture. "Motivating and empowering staff to take on new roles and challenges is part of our core strategy for fostering a dynamic work environment," commented an HR specialist.

## 4. Discussion and Conclusion

The qualitative analysis of the interview data revealed three main themes that characterize how organizations adapt to environmental changes under uncertainty. These themes are Strategic Adaptation, Operational Responses, and Organizational Learning. Each theme is comprised of multiple categories, illustrating the multifaceted approach organizations adopt to navigate uncertainties. Strategic Adaptation includes Scenario Planning, Resource Allocation, Communication Strategies, and Leadership and Governance. Operational Responses are characterized by Change Management, Innovation and Creativity, Process Optimization, and Risk Management. Organizational

Learning encompasses Knowledge Management and Employee Engagement.

Strategic Adaptation is crucial for organizations facing environmental uncertainties. The category of Scenario Planning involves contingency planning, future forecasting, risk assessment, scenario development, and probabilistic thinking, enabling organizations to prepare for various future scenarios. Resource Allocation is focused on budget flexibility, resource prioritization, crisis resource management, and cost-benefit analysis, ensuring that resources are efficiently used during uncertain times. Communication Strategies include information dissemination, stakeholder engagement, feedback loops, and crisis communication, critical for maintaining transparency and coordination in tumultuous periods. Lastly, Leadership and Governance covers decision authority, leadership styles, organizational hierarchy, and governance structures, all pivotal in guiding the organization through uncertainties.

Operational Responses deal with the immediate tactical adjustments organizations make to manage changes effectively. Change Management focuses on change readiness, employee training, adaptation strategies, and implementation challenges, facilitating smooth transitions during upheavals. Innovation and Creativity are vital for maintaining competitiveness, encompassing creative problem solving, innovation adoption, R&D investments, and leveraging technology. Process Optimization involves workflow adjustments, efficiency improvements, lean practices, and automation integration, which enhance operational efficiency. Risk Management is about risk identification, mitigation strategies, resilience building, and vulnerability assessment, essential for safeguarding organizational assets and functions.

Organizational Learning is identified as the ongoing process that enhances an organization's ability to adapt and evolve continuously. Knowledge Management includes knowledge sharing, best practices, information storage, and learning organization techniques that help in retaining and utilizing critical information. Employee Engagement involves team dynamics, motivation techniques, staff empowerment, and role adjustments, crucial for keeping the workforce aligned and responsive to the organizational needs and changes.

The theme of strategic adaptation, particularly through scenario planning and resource allocation, underscores the necessity of foreseeing potential futures and preparing accordingly. Daft and Lengel's (1986) concept of media richness supports this finding, highlighting the importance

of effective communication channels that can handle the complexity of information required for strategic foresight (Daft & Lengel, 1986). In a similar vein, the adaptability in leadership and governance structures as noted in our findings resonates with the work by Duarte and Aktaş (2022), who emphasize the role of middle managers in adapting organizational strategies. These managers act as pivotal connectors between the strategic foresight provided by top management and its execution at operational levels, effectively navigating through uncertain terrains by leveraging structured yet flexible governance (Duarte & Aktaş, 2022).

Operational responses, such as innovation and process optimization, are aligned with Kaya, Ataman, and Elbaşı's (2019) observations on the impact of perceived environmental uncertainty driving innovation adoption. Organizations in our study reported leveraging technological advancements and optimizing processes as key strategies to maintain competitive edge and operational efficiency in uncertain environments (Kaya et al., 2019). This is further supported by Mao, Liu, and Zhang (2014), who found that information technology enhances organizational agility, particularly in uncertain environments marked by high information intensity (Mao et al., 2014). The integration of advanced IT solutions facilitates quicker adaptation processes, allowing organizations to respond more effectively to environmental changes.

The emphasis on organizational learning, particularly through knowledge management and employee engagement, reflects a strategic approach to cultivating a learning culture that can rapidly assimilate and respond to new information. This finding is akin to the insights provided by Sulistyorini (2023), who discusses the importance of a robust talent management system in sustaining organizational practices that support continuous learning and adaptation (Sulistyorini, 2023). Furthermore, the role of cultural adaptability in enhancing responsiveness to environmental changes, as explored by Salehi, Mirsepasi, and Farhangi (2015), reinforces our observations that a flexible and dynamic organizational culture is crucial for effective adaptation (Salehi et al., 2015).

These findings contribute to the existing literature by providing empirical support for the theoretical propositions posited by earlier studies and offer practical insights for managers. The alignment between strategic planning and operational execution, facilitated by effective communication and governance as suggested by Daft and Lengel (1986), is crucial in uncertain environments.

Additionally, the role of IT in enhancing organizational agility (Mao et al., 2014) highlights the need for ongoing investments in technology as a strategic priority for dealing with uncertainty.

This study explored how organizations adapt to environmental changes under conditions of uncertainty, focusing on strategic adaptation, operational responses, and organizational learning. Key findings demonstrate that strategic adaptation is central to preparing for and mitigating the effects of environmental uncertainties, encompassing elements such as scenario planning, resource allocation, and adaptive leadership. Operational responses highlighted the importance of innovation, process optimization, and risk management to maintain efficacy under shifting conditions. Lastly, organizational learning emerged as a critical theme, with knowledge management and employee engagement being pivotal in fostering an adaptable organizational culture capable of continuous improvement and responsiveness to change.

The findings underscore the complex interplay between strategic foresight, operational agility, and organizational learning in navigating uncertainty. By integrating these elements, organizations can enhance their resilience and flexibility, better positioning themselves to face both current and future challenges. This study contributes to a deeper understanding of the adaptive processes that underpin successful organizational strategies in uncertain environments, highlighting the importance of a holistic approach that encompasses both strategic and operational dimensions.

This study, while insightful, has limitations primarily due to its qualitative nature and the sample size. The reliance on semi-structured interviews, though rich in detail, limits the generalizability of the findings across different industries and geographical regions. Moreover, the theoretical saturation point in qualitative research, while providing depth, may not capture the full spectrum of organizational responses to uncertainty.

Future research should consider employing a mixed-methods approach to validate and extend the findings of this study. Quantitative research could be particularly useful in measuring the impact of specific adaptation strategies on organizational performance across various sectors and cultural contexts. Additionally, longitudinal studies could provide insights into the long-term effects of strategic and operational adaptations, offering a dynamic perspective on how adaptability influences organizational sustainability.

For practitioners, this study highlights the critical role of integrating adaptive strategies across all levels of the organization. Leaders should prioritize the development of robust scenario planning capabilities, invest in technology to enhance operational agility, and foster a culture of continuous learning and innovation. Additionally, organizations should focus on enhancing communication channels to ensure timely and effective dissemination of crucial information during times of change. By adopting these strategies, organizations can better manage the complexities associated with environmental uncertainty and position themselves for sustained success.

### Authors' Contributions

Authors contributed equally to this article.

### Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

### Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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### Declaration of Interest

The authors report no conflict of interest.

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### Ethics Considerations

In this research, ethical standards including obtaining informed consent, ensuring privacy and confidentiality were considered.

### References

- Daft, R. L., & Lengel, R. H. (1986). Organizational Information Requirements, Media Richness and Structural Design. *Management Science*. <https://doi.org/10.1287/mnsc.32.5.554>

- Duarte, H., & Aktaş, H. E. (2022). How Do Middle Managers Deal With Uncertainty in the Strategy Process. *International Journal of Management and Decision Making*. <https://doi.org/10.1504/ijmdm.2022.10037088>
- Hadianto, A. W., & Djuminah, D. (2023). The Impact of Decentralization, Environmental Uncertainty, and Information Technology on Managerial Performance With Management Accounting System as a Mediator. *Journal of Economics Finance and Accounting Studies*. <https://doi.org/10.32996/jefas.2023.5.1.12>
- Hartmann, F. (2005). The Effects of Tolerance for Ambiguity and Uncertainty on the Appropriateness of Accounting Performance Measures. *Abacus*. <https://doi.org/10.1111/j.1467-6281.2005.00181.x>
- Kaya, Ç., Ataman, G., & Elbaşı, İ. b. H. (2019). Perceived Environmental Uncertainty and Innovation Adoption: Exploring the Turkish Context. *Business and Management Studies an International Journal*. <https://doi.org/10.15295/bmij.v6i4.277>
- Mao, H., Liu, S., & Zhang, J. (2014). How the Effects of IT and Knowledge Capability on Organizational Agility Are Contingent on Environmental Uncertainty and Information Intensity. *Information Development*. <https://doi.org/10.1177/0266666913518059>
- Matthijs, A. A. v. d. M., Johnson, A. M., Schmitzer-Torbert, N., & Redish, A. D. (2010). Triple Dissociation of Information Processing in Dorsal Striatum, Ventral Striatum, and Hippocampus on a Learned Spatial Decision Task. *Neuron*. <https://doi.org/10.1016/j.neuron.2010.06.023>
- Miller, D. (1991). Stale in the Saddle: CEO Tenure and the Match Between Organization and Environment. *Management Science*. <https://doi.org/10.1287/mnsc.37.1.34>
- Moorkamp, M., Kramer, E.-H., Gulijk, C. v., & Ale, B. J. M. (2014). Safety Management Theory and the Expeditionary Organization: A Critical Theoretical Reflection. *Safety Science*. <https://doi.org/10.1016/j.ssci.2014.05.014>
- Olson, E. M., Slater, S. F., & Hult, G. T. M. (2005). The Performance Implications of Fit Among Business Strategy, Marketing Organization Structure, and Strategic Behavior. *Journal of Marketing*. <https://doi.org/10.1509/jmkg.69.3.49.66362>
- Ostos, J., Hinderer, H., & Bravo, E. R. (2016). Relación Entre El Ambiente De Negocio Y Los Tipos De Estrategia De Negocio: Evidencia en Compañías Peruanas. *Revista Universidad Y Empresa*. <https://doi.org/10.12804/http://revistas.urosario.edu.co/index.php/empresa/article/view/4716>
- Salehi, S. M. R., Mirsepasi, N., & Farhangi, A. A. (2015). Investigating Organizational Culture Adaptability of Broadcasting Firm in Response to Environmental Changes. *Management Science Letters*. <https://doi.org/10.5267/j.msl.2015.10.002>
- Sulistyorini, A. (2023). Talent Management System : Challenges for Organizational Sustainability. *Syntax Literate Jurnal Ilmiah Indonesia*. <https://doi.org/10.36418/syntax-literate.v7i12.11349>
- Xue, Y., & Deng, Y. (2021). Decision Making Under Measure-Based Granular Uncertainty With Intuitionistic Fuzzy Sets. *Applied Intelligence*. <https://doi.org/10.1007/s10489-021-02216-6>