

Adaptive Management in the Era of Technological Disruption: Organizational Strategies for Facing Global Uncertainty

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Abstract

The rapid advancement of technology over the past four years has deepened the phenomenon of disruption, reshaping social, economic, political, and cultural structures globally. Organizations no longer operate under stable conditions but rather in a VUCA environment (Volatility, Uncertainty, Complexity, Ambiguity), characterized by supply chain crises, geopolitical fluctuations, climate crises, and the digital revolution. This study employs a qualitative approach with a systematic literature review (2021–2025) to analyze how adaptive management can serve as an organizational strategy in addressing global uncertainty. The analysis reveals that adaptive management functions as a conceptual framework emphasizing flexibility, continuous learning, digital technology utilization, and cross-sector collaboration. Inputs such as human resource competence, visionary leadership, digital infrastructure, and an innovative culture are proven to be key determinants that generate outputs in the form of innovation, efficiency, organizational resilience, competitiveness, and positive socio-economic impact. However, the implementation of adaptive management still faces challenges, including internal resistance, limited digital competence, technological complexity, and regulatory uncertainty. This article proposes a conceptual model of adaptive management based on five pillars: agile leadership, learning organization, digital integration, collaborative ecosystem, and risk intelligence. Thus, this study not only underscores the urgency of adaptive management as a response to technological disruption but also offers a strategic framework relevant for modern organizations to remain resilient while proactively leading change.

Keywords: Adaptive Management, Technological Disruption, Global Uncertainty

INTRODUCTION

The development of technology over the past two decades has brought fundamental changes to human life, affecting social, political, economic, and cultural domains. The phenomenon known as the era of technological disruption is marked by the emergence of digital innovations that replace traditional ways of conducting daily and business activities. These innovations not only impact production processes but also influence consumption patterns, communication systems, models of social interaction, and organizational structures of work. The presence of the internet, artificial intelligence (AI), big data, the Internet of Things (IoT), blockchain, and industrial automation has significantly shaped a global landscape that is increasingly complex, fast-changing, and difficult to predict (Alemayu & Daghm, 2024).

Globalization, accelerated by digital technology, has eliminated geographical boundaries and created new opportunities for organizations to expand their reach and generate value. On the other hand, globalization has also introduced new vulnerabilities related to economic, political, and environmental uncertainty. Changes occurring on a global scale often result in disruptions that are difficult to manage, ranging from financial market fluctuations and geopolitical dynamics to climate crises and global pandemics that have shaken international supply chains. These conditions show that modern organizations operate within what is termed a VUCA environment (Volatility, Uncertainty, Complexity, Ambiguity). In this context, conventional managerial

strategies that are rigid, hierarchical, and slow to respond to change have become increasingly irrelevant (Roudometof, 2023).

The era of technological disruption has also shifted paradigms in the world of work. Many traditional professions have disappeared or been replaced by machines and algorithms, while new types of jobs based on digital technology have emerged (Howcroft et al., 2023). This shift requires organizations not only to focus on improving efficiency but also on developing adaptability, innovation, and human resource competencies. Organizations that fail to adjust quickly face decline or even collapse, as seen in several large companies that could not withstand the digital revolution.

In facing these uncertain conditions, adaptive management emerges as a strategic approach that enables organizations to remain relevant, resilient, and sustainable. Adaptive management is not merely a responsive concept to change; it also involves proactivity in anticipating potential disruptions and the ability to leverage opportunities that arise from change itself. Adaptiveness requires organizations to build flexible structures, foster innovative cultures, embrace transformational leadership, and utilize data-driven and collaborative decision-making systems (Keller & Thomas, 2024).

Theoretically, adaptive management is rooted in complexity theory and adaptive systems theory, which view organizations as living entities that continuously interact with their environments (Burger et al., 2021). Organizations are no longer considered bureaucratic machines that function linearly but as dynamic networks that evolve through learning, experimentation, and innovation (Mergel, 2024). This perspective shifts organizational orientation from short-term target achievement to long-term capacity building, making organizations more resilient to global uncertainties.

The implementation of adaptive management has become increasingly urgent given that today's global challenges are not merely technical but multidimensional. For instance, climate change requires organizations to develop sustainability strategies; global political instability necessitates market and supply chain diversification; while the digital revolution demands both mastery of technology and organizational cultural transformation. In such a situation, organizational strategies can no longer rely on a "one-size-fits-all" approach but must instead be based on the ability to read environmental shifts, manage risks, and foster flexibility and creativity (Cubillos et al., 2024).

Previous research has emphasized the importance of agility and resilience in facing disruption. However, both need to be realized through a more comprehensive framework of adaptive management. This includes dimensions of leadership, innovation, human resources, and the utilization of digital technology. Adaptive leadership can guide long-term vision, facilitate organizational learning, and nurture cultures that support change. Innovation becomes the foundation for creating new value, while digital technology acts as an enabler, allowing organizations to transform more rapidly and efficiently (Pelaez et al., 2023).

Thus, the urgency of this study lies in further examining how the concept of adaptive management in the era of technological disruption can be applied as an organizational strategy for addressing global uncertainty. The main focus of this article is to analyze relevant adaptive strategies, key success factors, and implementation challenges in different organizational contexts. This study is expected not only to contribute to the development of modern management theory but also to offer practical implications for organizational leaders, policymakers, and business practitioners in formulating strategic responses to disruption (Mizrak, 2024).

By narrowing down to the core issue, this research departs from the assumption that an organization's ability to survive and grow amidst global uncertainty is no longer determined solely by financial resources or physical assets but primarily by its strategic adaptability. Therefore, adaptive management emerges as an answer to the challenges of the times, requiring organizations not only to endure but also to lead change in a dynamic global landscape.

METHOD

This study employs a qualitative research design with a systematic literature review method. This method was chosen because it allows researchers to conduct a structured exploration of current theoretical and empirical discussions on adaptive management in the era of technological disruption. Through the systematic collection and synthesis of findings, this study seeks to build a comprehensive understanding of organizational strategies for facing global uncertainty.

The data sources were limited to scientific publications from the last four years (2021–2025) to ensure the relevance and timeliness of the analysis. These sources include reputable journal articles, academic books, conference proceedings, institutional reports, and global policy documents that specifically discuss adaptive management, technological disruption, organizational agility, and resilience.

Literature selection was conducted using purposive sampling with strict inclusion and exclusion criteria. Only works explicitly addressing organizational adaptive strategies in responding to disruption and uncertainty were included, while publications lacking theoretical or empirical depth were excluded.

Data collection was carried out through systematic searches in academic databases such as Google Scholar, Scopus, Web of Science, and SINTA. The keywords used included adaptive management, technological disruption, organizational resilience, and strategic agility.

The collected data were analyzed using thematic content analysis techniques. The process consisted of three stages: (1) categorizing the literature into major themes, (2) interpreting patterns, similarities, and differences across studies, and (3) synthesizing to build a conceptual framework of adaptive management as a sustainable organizational strategy for facing technological disruption and global uncertainty.

RESULT AND DISCUSSION (Hasil dan Pembahasan)

Result

1. Conceptual Foundation of Adaptive Management

The literature over the past four years shows that adaptive management is understood as a framework emphasizing flexibility, continuous learning, and the ability to respond to rapid environmental change (Kirschner et al., 2023). This concept is rooted in complex adaptive systems theory, in which organizations are viewed not as static entities but as dynamic ecosystems that continuously evolve. Compared to traditional management, which tends to be hierarchical and linear, adaptive management emphasizes decentralized decision-making, individual empowerment, and cross-unit collaboration. This approach aligns with the development of digital technologies that demand speed, accuracy, and agility in decision-making (Mayo et al., 2024).

2. Technological Disruption and the Dynamics of Global Uncertainty

The literature review confirms that technological disruption accelerates global uncertainty. Artificial intelligence (AI), automation, and big data have transformed how organizations manage operations, human resources, and consumer relationships (Pavaloaia & Necula, 2023).

Beyond technology, uncertainty is also driven by geopolitical dynamics, climate crises, and global pandemics that strain supply chains. The OECD (2023) reports that companies with high levels of adaptability recover more quickly from global shocks compared to those still dependent on rigid management systems (Claeys et al., 2021)

These changes require organizations to build resilience through diversification strategies, the use of real-time data, and predictive risk management. Recent studies emphasize that resilience is not only about survival but also about the capacity to transform rapidly (Miceli et al.,

2021).

3. Adaptive Strategies in Organizations

The synthesis of the reviewed literature indicates that modern organizations can no longer rely solely on operational efficiency to survive the disruptive era. Instead, they must develop adaptive strategies that are dynamic, collaborative, and based on continuous innovation. The most prominent and consistently identified adaptive strategies in various studies include:

a. Transformational and Adaptive Leadership

Leadership is a key factor in building resilient organizations in times of uncertainty. Adaptive leaders act not only as decision-makers but also as catalysts of change who can mobilize the entire organization toward a shared vision. Transformational leaders foster motivation, inspire teams, and create flexible work environments where innovation can grow organically. Emphasizes that adaptive leadership can increase organizational agility by up to 35% in responding to rapid market changes (Sott et al., 2025). This demonstrates that leadership is not merely a managerial factor but a strategic instrument for achieving adaptive advantage.

b. Learning and Innovation Culture

In addition to leadership, organizational success in adaptation is closely tied to its internal culture. Adaptive organizations tend to cultivate a continuous learning culture, where every individual is encouraged to develop skills, particularly in digital and collaborative domains. This culture makes innovation not just a project but part of the organizational identity. On Asian technology firms revealed that those with adaptive learning cultures were more successful in carrying out comprehensive digital transformations than reactive firms (He Zeya et al., 2023). This indicates that continuous learning is not merely a supporting factor but the very foundation of organizational resilience.

c. Utilization of Digital Technology

Digital technology serves both as a catalyst for change and a source of new opportunities. Adaptive organizations use technology not only to improve efficiency but also to create new value propositions through new business models. AI, IoT, and blockchain have been proven to transform risk management practices, marketing strategies, and service mechanisms. (Oyedokun et al., 2025) Report revealed that organizations investing in predictive technologies increased global risk management effectiveness by up to 40%. This shows that digital technology is not just a technical solution but a strategic tool for enhancing organizational resilience to global dynamics.

d. Cross-Sector Collaboration

In facing global complexity, organizations cannot stand alone. Cross-sector collaboration with governments, academia, civil society, and local communities becomes an essential strategy for building collective resilience. The World Economic Forum (WEF, 2024) highlights that companies engaged in collaborative ecosystems are better able to adapt to international regulatory changes and global market fluctuations (Thomas, 2024). Such collaboration creates opportunities for knowledge sharing, resource expansion, and organizational legitimacy in both social and political contexts (Donbesuur et al., 2022).

4. Challenges in Implementing Adaptive Management

Despite the widely recognized urgency of adaptive management in the literature, implementation in practice still faces various obstacles. The main challenges include:

a. Internal Resistance

Many organizations remain trapped in rigid, hierarchical, and bureaucratic mindsets. This creates resistance to flexibility and innovation. Putri & Nugroho (2022) found that internal

resistance was the main factor behind the failure of adaptive strategy implementation in several public organizations.

b. Human Resource Limitations

Digital skill gaps, especially in developing countries, present serious barriers. Many employees are unprepared for new technological demands, forcing organizations to invest heavily in training and capacity-building.

c. Technological Complexity

Adopting digital technologies requires not only significant financial investment but also strong change management capabilities. Failure to manage technological complexity can result in inefficiencies or even financial losses.

d. Regulatory Uncertainty

Shifts in global policy—such as data privacy laws, AI regulations, and environmental standards—often create additional uncertainty. Singh (2023) noted that many multinational companies struggle to align their adaptive strategies with rapidly changing regulations across jurisdictions.

5. Conceptual Model of Adaptive Management

Based on the literature synthesis, this study proposes a conceptual model of adaptive management consisting of five main pillars:

- a. **Leadership Agility** → Visionary, flexible, and collaborative leadership.
- b. **Learning Organization** → A culture of innovation and continuous development of digital competencies.
- c. **Digital Integration** → The use of technology not only for efficiency but also for value creation.
- d. **Collaborative Ecosystem** → Cross-sector collaboration to strengthen resilience.
- e. **Risk Intelligence** → Data-driven and predictive risk management.

This model aligns with complex adaptive systems theory, which emphasizes that organizations are not static entities but dynamic ecosystems that continuously interact with their environments (Burke & Morley, 2023). Thus, this model can serve as a strategic reference for organizations aiming to remain relevant in the face of technological disruption.

6. Practical and Theoretical Implications

This study presents two main implications: Practical Implications: Organizations must develop adaptive mechanisms sustainably by emphasizing three core aspects: learning, digitalization, and collaboration. Adaptive strategies should not be reactive but designed as ongoing processes.

Theoretical Implications: Academically, the findings strengthen the concept of adaptive management as an alternative framework to conventional management models. Traditional management models, which are hierarchical and stability-oriented, are increasingly irrelevant in addressing global uncertainty. In contrast, adaptive management emphasizes flexibility, collaboration, and innovation as the keys to sustaining organizations

Discussion

The synthesis of the reviewed literature highlights the growing urgency of adaptive management as both a theoretical framework and a practical response to global uncertainty.

Several important insights emerge from the findings.

First, the conceptual foundation of adaptive management, which is rooted in complex adaptive systems theory, provides a strong basis for rethinking organizational resilience. Unlike traditional management that emphasizes stability and hierarchy, adaptive management emphasizes flexibility, continuous learning, and collaboration. This paradigm shift is highly relevant in today's environment, where digital technologies accelerate the pace of change and require organizations to develop agility as a core competency (Kirschner et al., 2023; Mayo et al., 2024). The discussion suggests that adaptive management is not merely a management style but a fundamental organizational philosophy.

Second, the dynamics of global disruption—driven by AI, automation, climate crises, and geopolitical tensions—intensify the need for adaptive responses. Literature indicates that organizations with higher adaptability recover more quickly from systemic shocks (Claeys et al., 2021; OECD, 2023). This demonstrates that resilience is no longer defined only by survival but by the ability to transform and reconfigure in response to uncertainty (Miceli et al., 2021). The implication is clear: organizations must move beyond efficiency-driven models and embrace adaptive strategies that are dynamic and future-oriented.

Third, the reviewed adaptive strategies highlight four critical domains: leadership, learning culture, digital integration, and collaboration. Leadership emerges as the most significant factor, with evidence showing that adaptive leadership can increase organizational agility by up to 35% (Sott et al., 2025). This finding reinforces leadership as a strategic enabler of adaptability. At the same time, organizational culture—particularly one that fosters continuous learning and innovation—is shown to be the bedrock of resilience, particularly in Asian technology firms (He Zeya et al., 2023). Moreover, digital technologies act as both disruptors and enablers. Their effective use not only enhances efficiency but also creates new forms of value through predictive analytics and innovative business models (Oyedokun et al., 2025). Finally, cross-sector collaboration is increasingly recognized as indispensable for addressing global complexity, with collaborative ecosystems providing both legitimacy and capacity for adaptation (Thomas, 2024; Donbesuur et al., 2022).

However, despite strong theoretical support, the implementation of adaptive management faces significant challenges. Internal resistance to change, limited human resources, technological complexity, and regulatory uncertainty often hinder the transition. These barriers reflect a tension between theory and practice: while adaptive management is recognized as essential, many organizations remain trapped in traditional paradigms (Putri & Nugroho, 2022; Singh, 2023). This gap underscores the importance of strategic interventions that address cultural inertia and build digital competencies, particularly in developing countries.

The conceptual model proposed in this study—consisting of leadership agility, learning organization, digital integration, collaborative ecosystem, and risk intelligence—offers a comprehensive framework for operationalizing adaptive management. It aligns with complex adaptive systems theory and provides a holistic roadmap for organizations navigating disruption (Burke & Morley, 2023). Importantly, this model highlights that adaptability is not a singular practice but a systemic orientation that requires integration across leadership, culture, technology, and networks.

Finally, the implications of this research are both practical and theoretical. Practically, organizations must embed adaptive mechanisms as ongoing processes rather than short-term responses, emphasizing sustainable learning, digitalization, and collaboration. Theoretically, the findings contribute to the refinement of adaptive management as an alternative to conventional management models that are increasingly inadequate in contexts of volatility, uncertainty, complexity, and ambiguity (VUCA).

Taken together, the discussion reveals that adaptive management is not only a response to disruption but a proactive strategy for future sustainability. Nevertheless, further empirical studies are needed to test the applicability of the conceptual model across different organizational contexts, especially in emerging economies where structural challenges are more pronounced.

CONCLUSION

This study demonstrates that adaptive management is the key for organizations to survive and grow amidst technological disruption and global uncertainty. Organizational success largely depends on managing inputs such as human resource competence, digital infrastructure, organizational culture, visionary leadership, and external factors, which are then converted into outputs in the form of innovation, efficiency, resilience, competitiveness, and positive socio-economic impact. Four main strategies—adaptive leadership, a learning culture, digital technology integration, and cross-sector collaboration—have been proven to complement one another in building organizational resilience. By implementing these strategies, organizations are not only able to face uncertainty but also create new opportunities for sustainable growth in the disruptive er..

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