

Optimizing Strategic Decision-Making Processes via Complex Adaptive Systems Modeling

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Abstract. In the rapidly evolving landscape of management science, organizations face unprecedented challenges necessitating innovative approaches to strategic decision-making. This paper introduces a novel technical framework based on Complex Adaptive Systems (CAS) modeling to enhance strategic decision-making processes. We employ advanced simulation techniques to illustrate how CAS can facilitate better adaptability, responsiveness, and resilience in organizational strategies. By analyzing real case studies, we demonstrate the framework's efficacy in navigating complex business environments characterized by volatility and uncertainty. Our findings indicate significant improvements in strategic outcomes for organizations applying the CAS model. This research contributes to the field by providing a detailed methodology for leveraging CAS in strategic management.

Keywords: Complex Adaptive Systems, Strategic Decision-Making, Management Science, Organizational Resilience, Adaptive Strategies, Volatility, Sustainability

Introduction

The global business environment is increasingly characterized by complexity and rapid change, prompting organizations to rethink their strategic approaches. As we move into 2024-2026, the importance of adaptive and responsive management strategies has never been more critical. Organizations are pressured to make decisions that not only guarantee short-term survival but also secure long-term sustainability in an ever-dynamic context influenced by global economic shifts, technological advancements, and changing consumer behaviors. Traditional decision-making frameworks often fall short in adequately addressing the multifaceted nature of these challenges, leading to a pressing need for advanced methodologies that can enhance strategic management capabilities. This paper

proposes a cutting-edge framework utilizing Complex Adaptive Systems (CAS) modeling, which aligns closely with the intricacies of modern organizations. CAS recognizes that organizations operate as complex networks of interactions, adapting continuously to their environments. In this vein, our research aims to illustrate how organizations can harness the principles of CAS to refine their strategic decision-making processes. We will explore the theoretical underpinnings of CAS, followed by a detailed exposition of our methodological framework. Via empirical studies, we will analyze the impact of CAS on strategic outcomes in diverse organizational settings. The findings seek to provide valuable insights into improving strategic adaptability and resilience, ultimately contributing to enhanced organizational performance. Additionally, this study will outline practical applications of the proposed framework, supported by case studies that exemplify successful implementations of CAS in strategic decision-making. We aim to deliver actionable strategies that practitioners can adopt for more effective management in today's complex environments. This paper is structured to first provide a comprehensive review of existing literature on strategic decision-making and complexity theory, followed by an introduction to our proposed methodological framework, case study analyses, discussion of implications, and concluding remarks.

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