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Research on the Mechanism of the Influence of Leadership Cognitive Complexity on Strategic Decision-Making Quality

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ABSTRACT

This paper investigates the mechanism through which leadership cognitive complexity influences the quality of strategic decision-making. In today's rapidly changing and highly uncertain business environment, cognitive complexity, as a crucial component of leaders' cognitive capabilities, plays a vital role in strategic decision-making quality. Cognitive complexity encompasses the ability to identify relationships among multiple factors, evaluate diverse perspectives, and seek innovative solutions in complex situations. Leaders with high cognitive complexity are able to effectively identify key environmental factors, foresee risks, and recognize opportunities, thereby enhancing decision-making flexibility and innovativeness. This study explores how to measure and enhance leaders' cognitive complexity and examines its specific manifestations in various decision-making contexts. Further, it analyzes how strategies such as enhancing organizational structural flexibility, cross-departmental collaboration and information flow, as well as investment in technological infrastructure and information resources, influence decision-making quality. The study aims to offer guidance for enterprises to develop leadership cognitive complexity in order to improve the effectiveness and adaptability of strategic decisions, ultimately strengthening overall organizational competitiveness and long-term development capability.

KEYWORDS

Leadership cognitive complexity; Strategic decision-making quality; Organizational environment; Mechanism of influence

1. INTRODUCTION

1.1. Research Background

In today's rapidly changing and highly uncertain business environment, leaders face unprecedented challenges when making strategic decisions. Cognitive complexity, as a key element of leaders' thinking capabilities, has become a significant factor influencing the quality of strategic decision-making. Cognitive complexity refers to an individual's ability to understand and process information, including recognizing relationships among multiple variables, accommodating and evaluating diverse viewpoints, and seeking innovative solutions in complex situations. With the accelerating pace of market evolution, technological development, and globalization, traditional linear decision-making models can no longer effectively address the multiplicity and uncertainty inherent in complex environments.

Against this backdrop, leaders' cognitive complexity plays a critical role in the success of strategic decisions. Leaders with high cognitive complexity can more effectively identify key drivers in the environment, foresee potential risks, and recognize opportunities, enabling greater flexibility and innovativeness in the decision-making process [1]. Additionally, such leaders tend to be more open

and inclusive of diverse information sources and perspectives, thereby forming more comprehensive and information-rich decision-making viewpoints.

Existing research has preliminarily revealed the correlation between cognitive complexity and decision-making quality, but its specific mechanism of influence remains to be further explored. This includes how to measure cognitive complexity, how to effectively enhance leaders' cognitive capacity, and how it dynamically interacts with specific decision-making contexts. Further analysis of this mechanism will provide theoretical support for organizations aiming to cultivate leaders with high cognitive complexity and ultimately improve their strategic responsiveness.

1.2. Research Objectives

This study aims to delve into the specific mechanism through which leaders' cognitive complexity affects the quality of strategic decision-making. In a fast-changing, highly competitive, and uncertain business environment, traditional decision-making models are insufficient for ensuring enterprise success. Understanding how leadership cognitive complexity influences decision-making quality is particularly crucial. The objective of the research is to clarify the connotation and constituent elements of cognitive complexity and to reveal, through empirical analysis, the relationship and impact path between cognitive complexity and strategic decision-making quality. The study will also examine how cognitive complexity influences decision-making quality under different organizational contexts, identifying key factors and conditions. The research seeks to provide actionable recommendations to enterprises to help cultivate leadership cognitive complexity, thereby improving the effectiveness and adaptability of strategic decision-making. This will not only optimize organizational leadership but also enrich strategic management theory, providing better decision-making support for enterprises confronting complex environments.

1.3. Research Significance

This research holds significant theoretical and practical implications. On the theoretical level, it will enrich and deepen the understanding of the relationship between cognitive complexity and strategic decision-making quality, offering new perspectives and empirical support to leadership and strategic management theory. By revealing the mechanism of cognitive complexity's influence on decision-making processes, this study helps to fill existing research gaps and promotes the application and development of the cognitive complexity concept within strategic management. It provides a framework for researchers to further explore how leadership cognitive complexity impacts organizational performance under uncertainty and complexity.

On the practical level, the study's findings can directly guide enterprises in enhancing leaders' cognitive capabilities, assisting them in processing information more effectively and making wiser decisions, which is critical in responding to an ever-changing market. By identifying key cognitive skills and influencing factors, enterprises can cultivate highly adaptive leadership, achieve higher-quality strategic decisions, and enhance overall organizational competitiveness and sustainable development capability. This research not only offers theoretical insights but can also be translated into concrete strategies and methods for improving enterprise practices.

2. THEORETICAL FOUNDATIONS

2.1. Cognitive Complexity Theory

Cognitive complexity theory, as a foundation for understanding leadership decision-making behavior, emphasizes the multidimensional cognitive ability of leaders in information processing, analytical judgment, and adaptability to change [2]. This theory posits that leaders with high cognitive complexity can integrate vast amounts of information, analyze problems from multiple perspectives,

and make accurate and innovative decisions in complex and dynamic environments. Such complex cognitive structures enable them to identify key trends and causal relationships during the strategic decision-making process and flexibly adjust strategies in response to environmental changes, thereby significantly enhancing decision-making quality.

2.2. Strategic Decision-Making Theory

Strategic decision-making theory provides a framework for understanding how enterprises make decisions in the face of dynamic internal and external environments. It emphasizes the importance of systematic thinking, dynamic adaptation, and long-term planning. This theory holds that the strategic decision-making process requires not only high-level information analysis but also the identification and evaluation of uncertainty and risk. Leaders' cognitive complexity is critical in this process, as it enables them to comprehensively understand market dynamics and competitive pressures and formulate innovative and effective strategic decisions accordingly. Through flexible strategic adjustments and forward-looking decision-making, leaders with high cognitive complexity can ensure the sustainability and competitive advantage of enterprise strategies.

2.3. Organizational Behavior Theory

Organizational behavior theory provides essential context for studying the mechanism by which leadership cognitive complexity influences strategic decision-making quality. It focuses on the behavioral performance of individuals and teams within organizational settings and how these behaviors are affected by organizational culture, structure, and environmental factors [3]. This theory emphasizes that a leader's decision-making capability depends not only on their personal cognitive complexity but also on organizational support, team collaboration, and cultural atmosphere. An environment that supports innovation and diversity can enhance leaders' ability to apply cognitive complexity in strategic decisions, thereby improving decision-making quality and organizational effectiveness. At the same time, organizational behavior theory helps in understanding how optimizing the organizational environment can foster the development of leaders' cognitive abilities, enabling excellent strategic decision-making and sustained competitive advantage.

3. CURRENT SITUATION ANALYSIS OF LEADERSHIP COGNITIVE COMPLEXITY AND STRATEGIC DECISION-MAKING QUALITY

3.1. Current Situation of Leadership Cognitive Complexity in Enterprises

In the contemporary business environment, enterprise leaders' cognitive complexity shows significant variation, closely related to industry characteristics, organizational culture, and market positioning requirements. Leaders with high cognitive complexity are more commonly found in highly dynamic industries such as technology, finance, and consulting [4]. These industries require leaders to process complex information flows, identify critical relationships, and propose innovative solutions. Leaders' ability to process large volumes of information and rapidly identify market changes is particularly notable—they tend to rely on data sourced from diverse information agencies to support strategic decisions.

By contrast, leaders in traditional manufacturing or regional service industries often exhibit lower levels of cognitive complexity. This is mainly because these industries operate in relatively stable markets, where decision-making typically depends on years of accumulated experience and industry conventions. While this decision-making approach may be effective in stable environments, it proves clumsy when facing rapid changes and unpredictable market conditions. Leaders with insufficient cognitive complexity are ill-equipped to support efficient strategic adjustments and innovative decisions under complex circumstances.

Leaders' cognitive complexity is influenced by multiple factors, including professional background, educational level, personal qualities, and continuous learning ability. High cognitive complexity requires not only academic support but also the accumulation of practical experience and an open attitude toward new knowledge and ideas. Some enterprises enhance leaders' cognitive complexity by implementing targeted training programs and collaborative exchanges, preparing them to meet complex market challenges [5].

Table 1. Analysis of Reasons for Differences

Dimension	High Cognitive Complexity Industries	Low Cognitive Complexity Industries
Market Environment	High dynamism with a need to respond to unpredictable changes	High stability with infrequent changes
Decision-Making Basis	Integration of diverse information and innovative logic	Reliance on historical experience and industry conventions
Competency Requirements	Information processing, relational recognition, and capability for innovative problem-solving	Application of experience and procedural execution

3.2. Current Situation of Strategic Decision-Making Quality

Strategic decision-making quality is a key factor for enterprises to maintain competitiveness in the market and achieve long-term development. In different market environments, the quality of strategic decision-making exhibits a certain degree of complexity. At present, many enterprises are facing challenges such as declining market share and weakened competitiveness due to insufficient quality in their strategic decisions. Strategic decision-making failures typically stem from several aspects: the leadership team may interpret information one-sidedly, neglect openness to diverse perspectives, or react too slowly in the face of uncertainty.

Some enterprises, although led by leaders with high cognitive complexity, suffer from poor execution due to weak information foundations and overly complex decision-making processes. Outdated information analysis equipment and a lack of data processing technologies prevent full utilization of leaders' cognitive capabilities in strategic decision-making [6]. In some cases, a closed organizational culture also hinders the emergence of innovative strategic decisions, making it difficult to introduce new ideas and transformational perspectives into the decision-making process, thereby lacking necessary flexibility and adaptability.

At the same time, there are enterprises that have significantly improved decision-making quality by investing in data analysis tools, enhancing information processing, and optimizing decision-making mechanisms. These enterprises often gain a marked competitive advantage in the market by improving information analysis capabilities and simplifying decision execution processes through effective resource allocation and technological upgrades. It is thus evident that improving strategic decision-making quality relies not only on the individual cognitive complexity of leaders but also on comprehensive optimization in areas such as information analysis, decision execution, and organizational culture.

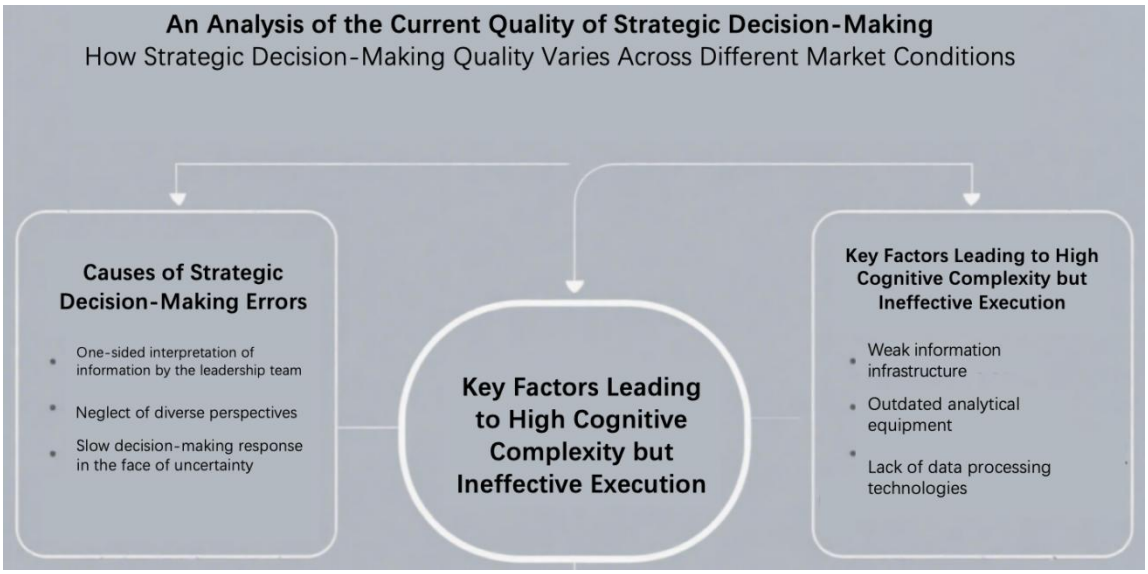

Figure 1. Current Status of Strategic Decision-Making Quality

3.3. Specific Impact of Leaders' Cognitive Complexity on Decision-Making

Leaders' cognitive complexity has a profound and multifaceted impact on the quality of decision-making. First, leaders with high cognitive complexity are able to gain deeper insights into market dynamics and identify underlying business trends, thereby formulating strategic decisions based on reliable information and multiple potential strategies [7]. For instance, when facing market uncertainty, leaders with high cognitive complexity tend to adopt flexible decision-making models. They are capable of comprehensively evaluating issues from multiple perspectives, taking into account both long-term and short-term goals, and ensuring that corporate strategies remain continuously adaptive.

Secondly, leaders with high cognitive complexity are adept at shifting flexibly between different viewpoints, thus avoiding strategic errors caused by a singular perspective. They can assess the advantages and disadvantages of various solutions and integrate input from internal teams and external experts to form comprehensive, multidimensional strategic plans. Furthermore, such leaders are typically skilled at managing collaboration and communication both within and outside the organization. During the strategic decision-making process, they bring together knowledge from multiple levels and fields, creating a dynamic and open decision-making platform for the enterprise. This mechanism is particularly important in industries that demand rapid innovation and transformation. By aggregating diverse intelligence and resources, enterprises are able to maintain competitiveness and market leadership in complex environments.

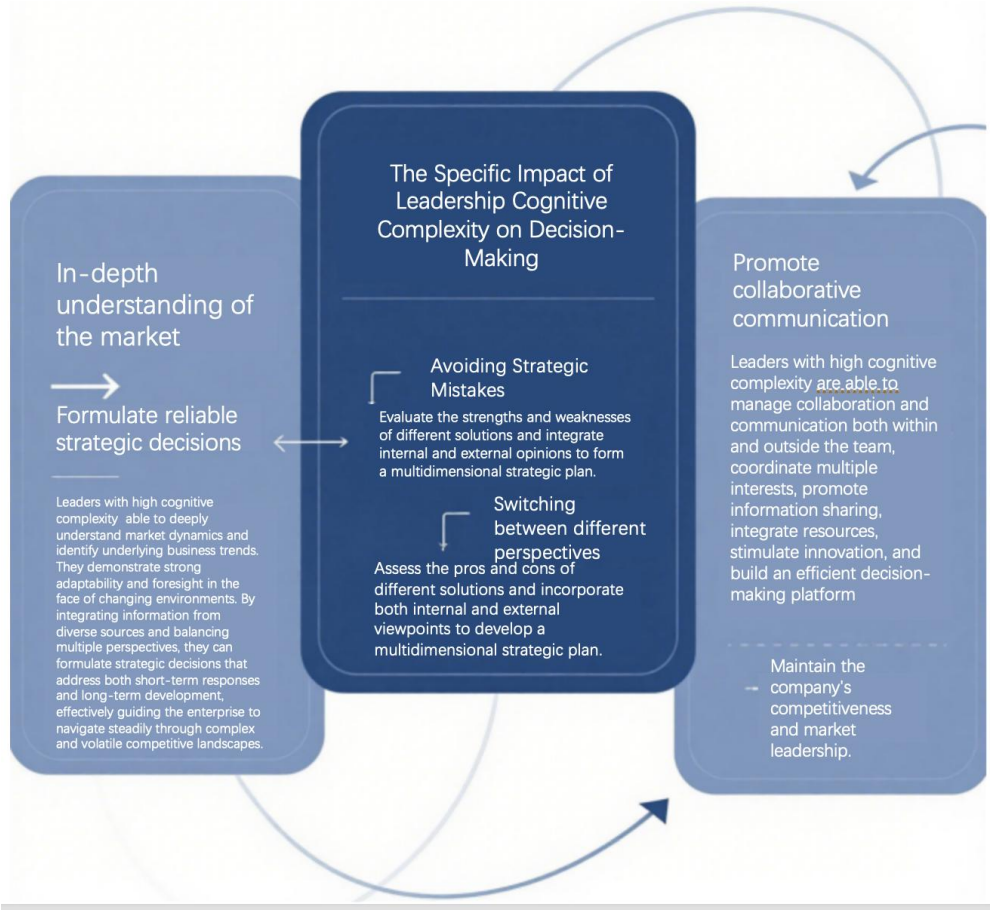

Figure 2. Diagram of the Specific Impact of Leadership Cognitive Complexity on Decision-Making

3.4. Organizational Environment and Decision Support

The organizational environment plays a critical role in enhancing strategic decision-making quality and supporting leaders' cognitive complexity. An organizational culture that promotes innovation and embraces diverse perspectives often provides leaders with the necessary support to fully leverage their cognitive complexity. Modern enterprises commonly adopt cross-departmental collaboration and open communication mechanisms, encouraging team members to share information and viewpoints in order to improve the accuracy and comprehensiveness of decisions [8]. Enterprise investment is reflected not only in technology and resource allocation but also in strategic planning aimed at enhancing information processing capabilities and decision-making efficiency.

Enterprises need to adjust their organizational structures to ensure smooth information flow and rapid decision implementation, which is essential for improving strategic decision quality and strengthening overall competitiveness. An innovation-supportive organizational atmosphere encourages leaders to engage in continuous learning and reflection, and to actively apply new technologies and methods to optimize decision-making processes. The complexity of market challenges requires enterprises to constantly adapt in the face of change. To achieve this goal, leaders' cognitive complexity and the organizational environment must mutually support each other, forming an effective strategic decision-making system.

Table 2. Key Elements of Organizational Environment and Decision Support

Organizational Environment Dimension	Specific Measures	Supportive Role in Decision-Making
Organizational Culture	Foster innovation and embrace diverse perspectives	Provides leaders with supportive conditions to fully leverage cognitive complexity and avoid biased or narrow decision-making
Work Mechanisms	Establish cross-departmental collaboration and open information-sharing systems	Integrates team and cross-disciplinary insights to enhance decision accuracy and comprehensiveness, optimizing multidimensional decision plans
Resource Investment	Strategic allocation of technology and resources to enhance information processing and decision efficiency	Strengthens data analysis capabilities, supports leaders in utilizing complex information, and shortens decision-making response times
Organizational Structure Adjustment	Optimize information flow to ensure rapid decision implementation	Reduces information silos, facilitates the effective execution of strategic decisions, and improves organizational responsiveness to market changes
Organizational Climate	Promote innovation and encourage continuous learning and adoption of new technologies among leaders	Fosters a dynamic learning environment, enabling leaders to continuously update their cognitive frameworks, refine decision pathways, and maintain competitive advantage

4. EXISTING PROBLEMS IN THE CURRENT STATE OF LEADERS' COGNITIVE COMPLEXITY AND STRATEGIC DECISION-MAKING QUALITY

4.1. Insufficient Cognitive Complexity Among Enterprise Leaders

In today's highly complex and constantly changing business environment, enterprise leaders are often faced with the critical challenge of enhancing their cognitive complexity [9]. Many leaders demonstrate significant shortcomings in this regard, which severely impacts the quality of their strategic decision-making. A major issue lies in the limitation of their information-processing capabilities. Confronted with information overload, leaders often struggle to effectively filter, integrate, and prioritize important market information and dynamics. This deficiency directly leads to the neglect of market trends and results in biased and incomplete strategic decisions. An excessive reliance on past experiences and industry conventions, along with a disregard for rapid changes in the external environment, reflects a conservative attitude among some leaders. This attitude significantly restricts the organization's adaptability and innovation potential, weakening its capacity for agile response and forward-looking planning in the market.

The lack of innovative thinking further prevents leaders from identifying opportunities and challenges from new perspectives, thereby hindering strategic adjustments. This absence of innovation is often rooted in the limitations of leaders' professional backgrounds and insufficient capacity for continuous learning [10]. These limitations prevent leaders from updating their knowledge in a timely manner and adapting to the rapid changes in technology and the market. A narrow professional background can result in limited vision, affecting cross-disciplinary understanding and decision-making. Meanwhile, inadequate continuous learning capabilities hinder insights into emerging technologies

and the inertia of market developments. Although some enterprises have begun implementing targeted training programs and cross-industry exchange initiatives to enhance leaders' cognitive complexity, the limitations of time and resources have made it difficult for these efforts to yield far-reaching results. As a consequence, leaders often feel incapable of effectively responding to emerging technologies and the constantly evolving market environment.

Table 3. Analysis of Challenges in Enhancing Leaders' Cognitive Complexity.

Type of Challenge	Specific Manifestations	Consequences
Limitations in Information Processing Capacity	Difficulty filtering, integrating, and prioritizing critical information amid information overload; neglect of market trends	Leads to biased or incomplete strategic decisions, causing delayed responses to market changes
Overreliance on Experience and Conventions	Rigid adherence to past experience and industry norms; conservative decision-making despite rapidly changing external environment	Limits organizational adaptability and innovation potential, weakening responsiveness and foresight
Lack of Innovative Thinking	Constrained by professional background and insufficient continuous learning, unable to identify opportunities and challenges from new perspectives	Hinders strategic adjustment, reducing the organization's ability to keep pace with technological and market shifts
Constraints in Training and Development Resources	Although training and cross-industry exchange programs exist, limited time and resources restrict their effectiveness	Leaders struggle to cope with emerging technologies and dynamic market conditions; cognitive development remains slow

4.2. Deficiencies in Strategic Decision-Making Quality

Deficiencies in the quality of strategic decision-making have become a significant challenge affecting enterprises' market performance and long-term development. These shortcomings are often manifested in the lack of systematization in the decision-making process. Some enterprises have failed to establish systematic analytical frameworks, resulting in excessive reliance on individual subjective judgment during the strategic decision-making process, and a lack of support from data-driven and rational analysis. This arbitrariness and lack of logic in the decision-making process can easily lead to improper resource allocation and misjudgments in risk management, ultimately causing strategic decision failures. Inefficient resource distribution and insufficient risk assessment often cause enterprises to miss critical opportunities and limit their ability to respond quickly to market shifts and adjust strategic direction accordingly.

The uncertainly sluggish response is another pressing issue. When interacting with rapidly changing market environments, enterprises often exhibit inadequate and imprecise assessments of risks and uncertainties. This is typically caused by outdated information analysis tools and techniques, as well as underdeveloped decision-making mechanisms. Internally, overly closed organizational cultures hinder the introduction of innovative thinking, leading to strategic decisions that lack flexibility and adaptability. Such cultural constraints make cross-departmental collaboration and information sharing difficult, ultimately affecting the effectiveness and efficiency of decision-making.

Although some enterprises have attempted to enhance their information analysis capabilities and decision execution efficiency through technological upgrades and resource reallocation, these actions have not yet reached an optimal level. As a result, enterprises still appear slow to respond to market changes. Improving the quality of strategic decision-making does not rely solely on the cognitive abilities of leaders; a deeper challenge lies in the systematization of the decision-making process and the openness of the organizational culture.

Table 4. Analysis of Deficiencies in Strategic Decision-Making Quality

Type of Deficiency	Specific Manifestations	Consequences
Non-systematic Decision-Making Process	Lack of structured analytical frameworks; overreliance on subjective judgment; insufficient data and rational analysis support	Misallocation of resources and poor risk management leading to strategic failure, missed market opportunities, and reduced responsiveness
Slow Response to Uncertainty	Outdated information analysis tools and techniques; incomplete decision-making mechanisms; imprecise risk assessments	Strategic decisions lack flexibility and adaptability, making it difficult to respond to rapid market changes and reducing overall decision effectiveness and efficiency
Closed Organizational Culture	Barriers to introducing innovative thinking; difficulties in cross-departmental collaboration and information sharing	Results in a closed decision-making process, inability to integrate diverse perspectives, delayed strategic adjustments, and weakened market competitiveness
Incomplete Optimization Measures	Technological upgrades and resource reallocation fall short of optimal levels; limited improvements in information analysis and decision execution efficiency	The organization remains slow in responding to market dynamics, with limited enhancement in strategic decision quality, and persistent systemic bottlenecks

4.3. Limitations of the Influence of Cognitive Complexity on Decision-Making

Although cognitive complexity is crucial for enhancing the quality of strategic decision-making, its influence also has notable limitations. One prominent issue is over-complexification. Some leaders attempt to factor in too many variables during the decision-making process, resulting in overly cumbersome and lengthy procedures, which significantly reduce decision-making efficiency. In rapidly changing and highly competitive market environments, this complexity severely hampers an organization's response speed, making it difficult for leaders to seize opportunities brought about by dynamic market shifts and thus diminishing the enterprise's agility and competitiveness.

Even when leaders with high cognitive complexity are able to formulate detailed and sophisticated strategic plans, effective implementation remains challenged by team coordination and resource allocation. Complex strategies require high levels of interdepartmental collaboration and rational deployment of resources. However, in practice, leaders often face difficulties in team communication and misallocation of resources, making it hard for strategies to be effectively executed. This lack of coordinated execution often prevents strategic plans from achieving their intended impact and hinders their transformation into actionable outcomes.

Confusion regarding causality is another critical limitation. In complex environments, leaders may misjudge the causal relationships between factors, overemphasizing secondary issues while overlooking key variables. Such misjudgments not only reduce decision accuracy but may also lead to deviations and failures in the implementation of strategies. Incomplete information and misleading communications can further exacerbate this confusion, causing leaders to make flawed judgments in complex contexts and undermining the overall effectiveness of strategic decision-making.

Table 5. Analysis of the Limitations of the Impact of Leadership Cognitive Complexity on Decision-Making

Type of Limitation	Specific Manifestations	Consequences
Over-Complexification of Decision-Making Process	Excessive consideration of variables; overly lengthy and intricate procedures; reliance on complex analytical frameworks	Reduces decision-making efficiency, slows organizational responsiveness to market changes, leads to missed opportunities, and weakens agility and competitiveness
Strategic Implementation Collaboration Dilemma	Complex strategies require high-level cross-departmental coordination and resource alignment, yet face communication breakdowns and poor resource allocation	Strategies fail to be effectively implemented; plans remain theoretical and cannot be translated into concrete actions, leading to unmet strategic goals
Causal Reasoning Bias	Misjudgment of causal relationships; overemphasis on secondary factors or neglect of critical variables; reliance on incomplete or misleading information	Decreased decision accuracy, deviation or failure in strategy execution, and increased risk of systemic misjudgments in complex environments

4.4. Deficiencies in Organizational Environment and Decision Support

In the pursuit of enhancing organizational cognitive complexity and improving strategic decision-making quality, inadequacies in the organizational environment and decision support have emerged as significant barriers. Many companies fail to effectively cultivate a culture that encourages innovation and inclusiveness, making it particularly challenging to propose and implement innovative strategies. Rigid cultural environments constrain multi-perspective decision discussions, suppressing the emergence of creative thinking and alternative solutions, which ultimately results in stagnation during the strategy formulation process. Inefficient cross-departmental collaboration and information-sharing mechanisms further hinder the effective internal flow of information, negatively affecting the comprehensiveness and depth of decision-making. Although many organizations promote open work mechanisms in theory, in practice, teams often struggle to align on strategic direction due to information silos and communication barriers, resulting in low decision execution efficiency.

Another major factor contributing to weak decision support is the insufficient investment in technological infrastructure and information resources. This lack of investment leaves enterprises under-equipped in data processing and analytical capabilities, limiting leaders' ability to identify and leverage critical information and market trends during strategic analysis. Specifically, the absence of advanced data analytics tools and inadequate information resource allocation restricts timely access to and interpretation of relevant data, which hampers the accuracy and speed of decision-making. Furthermore, inflexible organizational structures exacerbate difficulties in information transmission, making it hard to implement decisions with real-time responsiveness. As a result, companies often react slowly to market changes, significantly weakening their ability to rapidly adapt strategic directions in dynamic environments. These issues severely undermine the effectiveness of efforts to enhance both cognitive complexity and the quality of strategic decisions.

Table 6. Analysis of Deficiencies in Organizational Environment and Decision Support

Type of Deficiency	Specific Manifestations	Consequences
Rigid Organizational Culture	Lack of a culture that supports innovation and embraces diverse perspectives; constrained decision-making discussions; suppression of creative thinking	Stagnation in strategic formulation, limited innovation in proposals, closed decision-making processes, and reduced flexibility and adaptability
Ineffective Cross-Departmental Collaboration Mechanisms	Breakdown in information-sharing systems; presence of information silos and communication barriers; disconnect between theoretical frameworks and practical execution	Decisions lack comprehensiveness and depth, difficulty in forming unified strategic direction, low execution efficiency, and poor decision implementation outcomes
Insufficient Investment in Technology and Resources	Lack of advanced data analytics tools; underinvestment in information infrastructure; weak data processing and analysis capabilities	Leaders struggle to identify key market signals and trends, resulting in reduced decision accuracy and speed, and hindering strategic precision
Low Flexibility in Organizational Structure Adjustment	Inefficient information flow; sluggish decision implementation; inability to respond to rapid market changes	Delayed organizational response to market dynamics, inability to promptly adjust strategic direction, and weakened competitiveness in volatile environments

5. STRATEGIES FOR ENHANCING COGNITIVE COMPLEXITY AND IMPROVING DECISION-MAKING QUALITY

5.1. Strategies for Enhancing the Cognitive Complexity of Corporate Leaders

Table 7. Summary of Strategies to Enhance the Cognitive Complexity of Corporate Leaders

Strategic Focus	Key Measures	Objectives
Information Processing Capability Training	Learn systematic filtering methods, conduct scenario simulations, utilize technological tools, and establish screening criteria	Improve information filtering efficiency and optimize decision-making processes
Diversified Experience Accumulation	Promote cross-industry collaboration, implement job rotation systems, and study multi-disciplinary case studies	Broaden cognitive perspective and strengthen problem-solving capabilities
Continuous Learning and Innovation Incentives	Foster a learning-oriented culture, provide training resources, and initiate innovation projects	Maintain sensitivity to trends and enhance innovative decision-making capabilities
Personalized Career Development Plans	Assess individual strengths and weaknesses, customize training programs, and adjust development paths dynamically	Enhance capabilities with precision and align individual growth with organizational strategic needs

5.1.1. Enhance Training on Information Filtering and Processing Abilities

In the information age, leaders face an unprecedented volume of data, requiring them to possess efficient information filtering and processing capabilities to make precise strategic decisions.

Through specialized training programs, leaders can learn systematic methods for identifying and screening relevant information. These courses cover not only theoretical knowledge but also practical skills such as information classification standards, filtering mechanisms, and key data recognition techniques. Simulation exercises provide valuable hands-on experience by mimicking real-world scenarios, helping leaders improve their agility in handling complex information. This training enables leaders to quickly assess the importance of information, eliminate distractions, and focus on data that truly impacts decision-making. The use of information technology tools, including automated filtering and classification systems, significantly enhances efficiency. Setting clear standards for information filtering ensures that only the most valuable data reaches the decision-making level, ultimately optimizing decision processes and outcomes.

5.1.2. Increase Accumulation of Diverse Experiences

In today's fiercely competitive and rapidly changing market environment, accumulating diverse experiences is a crucial strategy for enhancing leaders' cognitive complexity. By offering cross-industry exchange opportunities, companies can broaden leaders' perspectives and expose them to numerous innovative ideas and technologies, which are vital for enriching their cognitive frameworks. Participation in industry conferences, international seminars, or innovation projects helps leaders absorb valuable knowledge from different fields and apply it to address their own challenges [11]. This approach not only improves leaders' adaptability to fast-changing environments but also boosts their creativity and agility in solving complex problems. Cross-industry experience accumulation enables leaders to abstract universal lessons from cases of success and failure, forming comprehensive judgment abilities. With this capability, leaders perform better individually and bring diverse viewpoints to teams, promoting strategic planning diversity and innovation. Companies implementing cross-industry rotation systems, allowing leaders to deepen their expertise across various market and technological settings, further foster professional development. This system enhances leaders' overall quality and helps companies maintain a competitive edge.

5.1.3. Encourage Continuous Learning and Innovative Thinking

Continuous learning and innovative thinking are key strategies for enhancing cognitive complexity in corporate leaders. These elements are core competencies ensuring that leaders can make accurate decisions in rapidly changing market environments [12]. To promote this strategy, organizations must highly value learning and innovation within their culture, creating an atmosphere that encourages exploration and experimentation so employees are motivated to discover new methods and solutions. Leaders can continuously update their knowledge base by participating in external training, online learning platforms, and workshops, especially focusing on the latest technologies and market trends. This not only keeps them up-to-date with evolving times but also provides a reliable information foundation for innovative decision-making. Companies should provide sufficient resource support, such as flexible learning schedules and ample training budgets, enabling leaders' self-improvement. Establishing innovation projects or hosting innovation competitions effectively stimulates creative thinking, allowing leaders to experiment with novel ideas in a safe and supportive environment. Such practices ensure that innovative ideas are tested and developed for better application in practical decisions. These strategies help leaders maintain agile thinking amid complex markets and empower them with innovative capabilities to handle changing situations. Through persistent learning and innovation, leaders develop deeper insights, keeping the enterprise at a leading edge when facing future challenges.

5.1.4. Develop Personalized Career Development Plans

Developing personalized career development plans is an important strategy for improving corporate leaders' cognitive complexity, as each leader's background, skills, and cognitive abilities differ significantly. Companies need to use personalized assessment tools to identify leaders' strengths, weaknesses, and unique development goals. Through these assessments, organizations can accurately understand leaders' personal needs, career interests, and alignment with corporate strategic objectives,

enabling the design of tailor-made development plans. These plans not only focus on career growth but also help leaders maximize their potential during learning and development to support long-term business goals. Such plans may include various forms, such as professional training courses to enhance technical skills, mentoring for experiential support, and cross-department rotations to accumulate diverse work experience. Integrating these forms effectively raises leaders' cognitive complexity and strategic decision-making capabilities, as they gain rich perspectives and practical experience through continuous role changes and new environmental challenges. This systematic career development plan must be dynamic, allowing ongoing refinement and adjustment according to leaders' growth and evolving business needs.

5.2. Suggestions for Improving the Quality of Strategic Decisions

Table 8. Summary of suggestions for Improving the Quality of Strategic Decisions

Recommendation Area	Key Measures	Objectives
Establish a Systematic Decision-Making Framework	Introduce tools such as SWOT analysis and decision trees; provide training on tool usage; conduct regular decision reviews	Reduce reliance on subjective judgment and enhance the scientific rigor of decision-making
Promote a Data-Driven Decision-Making Culture	Strengthen data collection and analysis capabilities; invest in advanced technological tools; train staff in data analytics; foster collaboration between leadership and data teams	Support decisions with data to improve accuracy and reliability
Enhance Capacity to Respond to Uncertainty	Introduce advanced analytical techniques and risk assessment models; apply scenario planning methods; offer risk awareness training for leaders	Improve strategic flexibility and strengthen responsiveness in uncertain environments
Strengthen Internal Communication and Collaboration	Hold regular cross-departmental meetings and brainstorming sessions; establish efficient communication mechanisms; utilize modern communication technologies; cultivate a culture of open dialogue	Integrate diverse perspectives and enhance the effectiveness of decision-making processes

5.2.1. Establish a Systematic Decision Analysis Framework

In the process of formulating strategic decisions, establishing a systematic decision analysis framework is a key step to improving decision quality. This framework aims to reduce subjective judgment and ensure the logicality and scientific rigor of decisions through standardized processes and analytical tools. At its core, it involves introducing effective tools such as SWOT analysis and decision trees. SWOT analysis enables leaders to comprehensively identify the strengths, weaknesses, opportunities, and threats of the enterprise, assisting in developing robust strategic plans. Decision trees provide a structured path of reasoning, allowing leaders to systematically weigh different options and their potential outcomes, ensuring a thorough analysis of complex issues. Enterprises need to actively conduct relevant training to improve decision-makers' proficiency in using these tools so they can effectively apply them in complex situations. Regular decision reviews are also an important part of enhancing decision quality. By inviting external experts for evaluation, enterprises can gain professional feedback and independent perspectives to reveal potential biases and blind spots. Such external review not only makes the decision-making process more transparent and rigorous but also minimizes bias and continuously improves decision quality. In summary, a systematic decision framework not only offers enterprises an efficient decision-making platform but also provides

scientific support for leaders' decision capabilities, ultimately helping companies make more accurate and successful strategic choices in complex market environments.

5.2.2. Promote a Data-Driven Decision Culture

In the modern business environment, having a data-driven decision culture is key to competitiveness. Facing ever-increasing volumes of data, this culture provides a solid foundation for making decision processes more scientific and accurate [13]. To promote such a culture, it is essential first to strengthen data collection and analysis capabilities, ensuring comprehensive data support throughout the decision-making process. Enterprises should actively invest in advanced data analysis tools and technical platforms that not only enhance data processing efficiency but also provide the infrastructure for complex data analytics. Emphasis should also be placed on cultivating employees' data analysis skills and mindset, making data analysis a core part of daily work. This can be achieved through training courses and practical activities, enabling employees to proficiently identify and apply key data [14]. With these skills, employees can make more data-supported judgments within their own fields and provide deeper insights for overall strategy. Promoting close collaboration between leaders and data science teams is also an important component of a data-driven culture. Through such cooperation, valuable insights derived from quantitative analysis can significantly improve decision accuracy and reliability, reducing biases caused by subjective judgment and impulsive experience. In such an environment, enterprises can better leverage their data resources to make fact-based rather than intuition-based strategic decisions, maintaining a leading position in market competition.

5.2.3. Enhance Capability to Manage Uncertainty

In today's fast-changing and dynamically uncertain business environment, enterprises face emerging challenges and opportunities continuously. To effectively cope with such uncertainty, enterprises must adopt strategic measures to enhance their leaders' response capabilities [15]. This starts with introducing advanced information analysis technologies and risk assessment models that help leaders identify uncertainty factors and conduct quantitative evaluations, providing strategically insightful and data-supported guidance. This not only allows enterprises to anticipate potential changes in advance but also enables flexible choices tailored to different scenarios. Scenario planning techniques are an effective approach to dealing with future uncertainty. By simulating multiple future scenarios, leaders can anticipate and plan different strategic pathways, enabling rapid strategy adjustments in real situations to optimize outcomes. This improves strategic flexibility and prepares various contingency plans. Enterprises should also focus on improving leaders' understanding of uncertainty and risk factors. Through dedicated training and learning programs, leaders can better identify key risks in complex contexts and assess their potential impacts. A culture of continuous learning and reflection—especially analyzing and summarizing past decision outcomes—will enhance leaders' adaptability.

5.2.4. Strengthen Internal Communication and Collaboration

Internal communication and collaboration have become indispensable elements in the strategic decision-making process. Effective communication and collaboration mechanisms not only facilitate the sharing and flow of information but also ensure that the decision-making process integrates diverse perspectives from various fields. To strengthen internal communication and collaboration, enterprises can adopt a series of measures, including regularly holding cross-department meetings and brainstorming sessions that encourage interaction among employees, stimulate innovative thinking, and promote rapid information transmission. Establishing an efficient communication mechanism is key. This means information must flow seamlessly between different departments and leaders to avoid creating information silos. Such mechanisms can be realized through clear processes and technological means, such as building internal communication platforms or using instant messaging software to enable timely updates and information sharing. Leveraging modern communication technologies can greatly enhance cross-team collaboration efficiency. Online collaboration tools and project management software, such as Slack, Microsoft Teams, or Asana,

provide real-time collaborative workspaces where team members can view project progress anytime, share the latest information, and give feedback. This not only improves work transparency but also enhances team responsiveness and flexibility. Encouraging an open communication culture is another important aspect of fostering communication and collaboration. Enterprises can cultivate employees' communication skills and team spirit through diverse training and workshops, creating an environment that encourages diverse viewpoints and proactive contributions. This atmosphere enriches the background information for decisions and improves the overall effectiveness of strategic decision-making.

5.3. Methods to Optimize the Application of Cognitive Complexity in Decision-Making

Table 9. Summary of Methods to Optimize the Application of Cognitive Complexity in Decision-Making

Methodological Focus	Key Measures	Objectives
Streamline the Decision-Making Process	Break down complex problems, establish prioritization systems, leverage automation tools, and simplify decision steps	Improve decision-making efficiency and avoid excessive complexity
Strengthen Team Collaboration	Establish clear communication channels and accountability mechanisms, conduct regular cross-functional collaboration activities, and build efficient feedback systems	Ensure strategic implementation and enhance execution effectiveness
Refine Causal Analysis	Utilize causal diagrams and scenario analysis tools, conduct targeted training, implement dynamic scenario simulations, and promote cross-team discussions	Accurately identify key relationships and reduce decision-making errors
Leverage Comprehensive Information Resources	Build internal knowledge repositories, apply advanced data analytics techniques, dynamically update information classification, and enhance employees' information literacy	Ensure information is comprehensive and accurate, strengthening the foundation for informed decisions

5.3.1. Simplify Decision-Making Processes to Improve Efficiency

When facing complex strategic decision-making tasks, enterprises need to adopt strategies to enhance decision efficiency, and simplifying decision processes is an important approach. Complex decisions often involve multiple factors and large amounts of information, so streamlining the process can effectively reduce the burden on decision-makers, allowing them to focus on the most impactful factors. By breaking down complex problems into manageable units, decision-makers can gradually concentrate on the key elements of each unit and avoid being overwhelmed by excessive information. This method is similar to dissecting a difficult problem and solving each part sequentially to ultimately find a comprehensive solution.

Establishing a prioritization system can also help decision-makers clarify which factors are most important in strategic decisions, thereby focusing resources and attention. This not only improves decision efficiency but also optimizes resource allocation, ensuring the enterprise makes wise choices within limited time. Enterprises can leverage automation tools and systems, such as big data analytics and artificial intelligence systems, to reduce manual processing time. Technological support provides real-time data analysis and recommendations, helping leaders quickly obtain information and take action. Streamlining decision steps reduces unnecessary complexity; by eliminating redundancies in the process, enterprises ensure direct and efficient information flow, lowering delays or misjudgments

caused by process complexity. Through simplifying decision processes, enterprises can not only avoid the confusion caused by complex decisions but also ensure that key decisions are executed quickly and effectively in market competition. This approach enhances decision quality while helping enterprises maintain flexibility and responsiveness in rapidly changing environments.

5.3.2. Strengthen Team Collaboration to Ensure Strategic Implementation

In the process of strategy implementation, team collaboration is a core element to ensure the successful execution of strategies. By establishing clear communication channels and responsibility allocation mechanisms, enterprises can promote efficient cooperation among departments during strategy execution [16]. This requires setting clear responsibility boundaries for team members and clarifying the relationship between their individual tasks and overall strategic goals, so each member clearly understands the critical impact of their contributions to enterprise objectives.

To foster close coordination among different departments, enterprises can hold regular team meetings and collaborative workshops. These interactive activities provide an open environment that encourages active communication and information sharing, thereby enhancing understanding and cohesion among team members. This not only helps break down inter-departmental barriers but also promotes innovative thinking and efficient cooperation, ensuring tasks progress in an orderly manner. Establishing an efficient cross-departmental feedback system is another important measure to strengthen team collaboration. Through such a system, enterprises can promptly provide feedback and resolve issues arising during strategy implementation. This improves problem-solving efficiency and enhances the practical feasibility of strategic planning. The feedback system offers team members a quick-response mechanism, ensuring adjustments can be made timely and maintaining the smooth progress of strategy implementation.

5.3.3. Refine Causal Relationship Analysis

Refining causal relationship analysis is a key step to accurately understanding the root causes of problems and forecasting potential consequences. By using tools such as causal diagrams and scenario analysis, leaders can identify and comprehend key relationships in complex decision-making processes. This precise analysis helps decision-makers avoid misjudgments caused by underestimating important factors or over-focusing on secondary ones. In enterprises, providing specialized training on these techniques ensures decision-makers are proficient in applying causal analysis methods, thereby enhancing judgment capabilities.

Causal relationship analysis is not limited to static processes; it can also be deepened through dynamic scenario simulations that explore outcomes possibly triggered by hypothetical changes. Data support plays a vital role in this process; by simulating different scenarios, enterprises can better predict and respond to various potential changes and challenges. Such in-depth analysis helps uncover the internal driving mechanisms of complex issues, laying a foundation for formulating more targeted strategic measures. Cross-team diverse discussions are an effective way to supplement causal analysis perspectives. By collaborating across departments and pooling varied viewpoints and experiences, enterprises can analyze causal relationships more comprehensively. This diversity not only aids in uncovering the essence of problems but also fosters the generation of innovative solutions.

5.3.4. Leverage Comprehensive Information Resources

Utilizing comprehensive and accurate information resources is fundamental to improving decision quality. To achieve this, enterprises need to establish a sound information collection and analysis mechanism to ensure leaders have access to broad and rich resource support. An effective starting point is to build an internal knowledge base that centrally stores and organizes relevant data, market reports, research literature, and other critical information. Such a knowledge base not only facilitates centralized information management but also allows the enterprise to store and share knowledge, enhancing overall cognitive capacity. Employing advanced data analysis technologies can greatly improve information utilization efficiency. This includes introducing big data platforms and

analytical software that provide technical support for interpreting information. Through these tools, enterprises can quickly process large volumes of data and extract valuable insights and trend analyses. Data analysis technology not only strengthens the informational foundation for decision-making but also makes the decision process more transparent and precise. Ensuring timely updates and classified management of information is another key aspect of information resource utilization. Enterprises need to set up processes and protocols to guarantee that information is updated quickly and accurately, thus consistently providing decision-makers with the latest market trends and industry intelligence. This dynamic information management enables enterprises to maintain agility in rapidly changing markets. Enhancing employees' information recognition capabilities is also an important part of an enterprise's information utilization strategy. Through regular training and skill development courses, enterprises can ensure employees are capable of identifying critical information and filtering out irrelevant data, thereby reducing errors and misjudgments during analysis.

5.4. Improving the Organizational Environment and Enhancing Decision Support

Table 10. Summary of Measures to Improve Organizational Environment and Enhance Decision Support

Strategic Focus	Key Measures	Objectives
Foster an Innovation-Supportive Organizational Culture	Create an open and inclusive environment; establish innovation labs; encourage daily idea proposals; embrace failure as a learning opportunity	Stimulate innovation potential, attract creative talent, and drive strategic renewal
Enhance Cross-Department Collaboration and Information Flow	Leverage information technologies (e.g., collaboration platforms, real-time communication tools); form cross-functional teams; eliminate information silos	Improve communication efficiency, integrate diverse perspectives, and increase decision-making flexibility
Improve Technological Infrastructure and Investment in Information Resources	Invest in data analytics tools and platforms; build an internal knowledge base; provide employee training in data literacy	Strengthen information processing capabilities and ensure data-driven decision-making
Increase Organizational Structural Flexibility	Establish cross-functional teams; shorten decision-making chains; support self-organizing teams; dynamically adjust organizational structures	Enhance organizational responsiveness and enable rapid adaptation to market changes

5.4.1. Build an Innovation-Supportive Corporate Culture

Building a corporate culture that supports innovation is an important way to enhance strategic decision-making capabilities [17]. By fostering an open and inclusive environment, enterprises can encourage employees to freely express ideas and conduct bold experiments, which are core elements of an innovative culture. An effective approach is to establish innovation labs or creative thinking workshops that provide employees with a safe space to test new concepts and methods. Such an environment allows for trial and acceptance of failure as part of the learning process, not only reducing the risks associated with trying new things but also promoting the cultivation of an innovative spirit.

Integrating innovative thinking into the daily operations of the enterprise is another key factor. Employees should be encouraged to actively propose improvement suggestions and innovative project ideas in their respective roles. This practice not only stimulates employee initiative but also makes innovation a natural component of business operations. By continually challenging the status

quo and seeking improvements, enterprises can break the constraints of traditional thinking and create a dynamic, ever-changing work environment for their employees.

A culture that supports innovation not only unlocks the innovative potential of existing employees but also attracts talent with an innovative mindset, which is crucial for enterprises to maintain competitiveness in fiercely contested markets. Talent drives enterprise success, and individuals with an innovative consciousness often bring new perspectives and approaches, thus driving enterprise development and transformation.

5.4.2. Enhance Cross-Department Collaboration and Information Flow

Enhancing cross-department collaboration and information flow plays a vital role in improving the quality of strategic decision-making. In modern enterprises, information silos and communication barriers often lead to reduced decision efficiency. Utilizing information technology tools to improve communication channels is an important way to break down these barriers [18]. Through collaborative platforms and real-time communication tools, different departments can seamlessly connect on the same projects. These technological means not only improve communication efficiency but also enable the enterprise to respond quickly to market changes and internal resource allocation issues. Cross-department collaboration is not merely a technical matter but also part of organizational strategy. Establishing cross-functional teams in key areas can significantly enhance the enterprise's overall strategic flexibility and innovation capability. These teams aggregate members from diverse professional backgrounds, promoting the application of varied perspectives in the decision-making process. This not only broadens the scope and depth of decisions but also enables teams to identify potential market opportunities and hidden threats. By analyzing problems from diverse viewpoints, cross-department teams can understand and solve complex problems from multiple angles, which is especially important for optimizing decision-making processes. With access to richer information sources and more comprehensive analytical capabilities, these teams can propose more innovative and feasible solutions, ensuring the enterprise maintains high adaptability and responsiveness in strategic decisions.

5.4.3. Improve Technological Infrastructure and Investment in Information Resources

Strategic choices regarding the enhancement of technological infrastructure and investment in information resources have a significant impact on an enterprise's overall decision support capability. As the market environment continuously evolves, enterprises urgently need to increase investment in the latest data analysis tools and technology platforms to significantly improve information processing capabilities. By building high-performance data storage and processing systems, enterprises can ensure real-time data acquisition and rapid application of analysis results. Such infrastructure supports the handling and precise analysis of massive data volumes, providing leaders with the critical insights needed for immediate decision-making.

Constructing a comprehensive information resource library is another core area enterprises must focus on. A well-organized information repository enables leaders to easily retrieve and manage relevant data, reducing time wastage while increasing data utilization efficiency. This not only optimizes information flow but also enhances decision accuracy, ensuring that every strategic decision is based on complete and up-to-date information.

Employee data skills are also an important factor in decision success. Enterprises should improve employees' data-related skills through continuous training and development programs [19]. Such training covers not only technical operations but also how to extract strategic insights from data. Employees proficient in data analysis can leverage technology more deeply, promoting the successful implementation of strategic planning.

5.4.4. Enhance Organizational Structure Flexibility

In a rapidly changing market environment, the flexibility of organizational structure is crucial to the success of enterprise strategic decision-making [20]. To respond to ever-changing market dynamics,

enterprises need to continuously review and adjust their organizational structure so it can quickly adapt to new challenges. Creating cross-functional teams is an effective strategy to improve organizational responsiveness. These teams integrate expertise and skills from different fields, enabling rapid identification and response to changes, turning information into actions that drive strategy execution.

Shortening the decision-making chain is another key measure to enhance flexibility. By reducing hierarchical obstacles, information can be rapidly transmitted and fed back within the organization. This streamlined communication path ensures immediate responses during decision processes, reduces time waste and information distortion, and enables the organization to swiftly adjust strategic direction to cope with market uncertainties.

Supporting self-organized team operations is another way to increase flexibility. By empowering employees with autonomous decision-making and rapid action capabilities, enterprises not only enhance overall responsiveness but also boost creative efficiency in problem-solving. This team operation model fosters innovative thinking and allows employees to work in a more dynamic environment, thus finding effective solutions more quickly.

6. CONCLUSION

This study explores the mechanism by which leaders' cognitive complexity affects strategic decision quality, revealing how the multidimensional attributes of cognitive complexity enhance decision quality in an increasingly complex and dynamic business environment. By analyzing the roles of cognitive complexity in information processing, innovative thinking, and organizational coordination, the research emphasizes the importance of cultivating leaders' cognitive abilities for enterprises to maintain competitiveness in uncertain markets. To help optimize decision quality, the effective utilization of technological infrastructure and information resources, simplification of decision processes, refinement of causal relationship analysis, and strengthening of team collaboration have all been confirmed as effective measures. Creating an innovation-supportive corporate culture and enhancing organizational structural flexibility are also necessary conditions for improving decision agility and adaptability. To maximize the effectiveness of cognitive complexity, enterprises must foster an open and collaborative atmosphere internally, promoting cross-departmental information exchange and integration. These strategies not only strengthen leaders' decision-making capabilities but also improve organizational responsiveness overall, driving sustained success for enterprises in highly competitive environments. Through the integration of theory and practice, this research offers actionable and guiding insights, providing more precise theoretical support and practical pathways for cultivating adaptive leadership in the context of digital transformation.

REFERENCES

[1] Curseu P L. The role of cognitive complexity in entrepreneurial strategic decision-making [J]. Entrepreneurial Strategic Decision Making A Cognitive Approach, 2008.

[2] Wronikowska M W. Coping with the Complexity of Cognitive Decision-Making: The TOGA Meta-Theory Approach [J]. Springer International Publishing, 2013. DOI:10.1007/978-3-319-00395-5_53.

[3] Buenger V. Organizational Behavior 1: Essential Theories of Motivation and Leadership [J]. personnel psychology, 2010, 59(3):757-759. DOI:10.1111/j.1744-6570.2006.00052_6.x.

[4] Lev-On, A. Communication, community, crisis: Mapping uses and gratifications in the contemporary media environment [J]. New Media & Society, 2012, 14(1):98-116. DOI:10.1177/1461444811410401.

[5] Schaubman A, Stetson E, Plog A. Reducing Teacher Stress by Implementing Collaborative Problem Solving in a School Setting [J]. School Social Work Journal, 2011, 35:72-93.

[6] Tsapekos D, Seccomandi B, Mantingh T, et al. Cognitive enhancement interventions for people with bipolar disorder: A systematic review of methodological quality, treatment approaches, and outcomes [J]. Bipolar disorders, 2020, 22(3):216-230. DOI:10.1111/bdi.12848.

[7] Benbasat T I. An Experimental Investigation of the Impact of Computer Based Decision Aids on Decision Making Strategies [J]. Information Systems Research, 1991, 2(2):87-115. DOI:10.1287/isre.2.2.87.

[8] Milliken, F. J. Strategic Decision-Making Tasks and Group Effectiveness: Insights from Theory and Research on Small Group Performance [J]. Human Relations, 1991, 44(12):1229-1253. DOI:10.1177/001872679104401201.

[9] Boada H, Forns M. The Cognitive Complexity of the Referent and Self-Regulation in Children's Messages [J]. Journal of Psycholinguistic Research, 2004, 33(3):237-261. DOI:10.1023/B:JOPR.0000027964.51244.d8.

[10] Rusdiyanto J. Innovative Thinking - Enhancing Opportunities and Triggering Idea Rising for Success in Business: an empirical study of a small business level in Surabaya [J]. Badan Penerbit Universitas Muria Kudus, 2012.

[11] Ujwary-Gil A. KNOWLEDGE, PARTICIPATION AND WASTE MANAGEMENT – SELECTED PROBLEMS. Journal of Entrepreneurship, Management and Innovation, Vol. 9, Iss.4, 2013 [M]. 2013.

[12] Phan H P. A cognitive multimedia environment and its importance: A conceptual model for effective learning and development [J]. International Journal on E-Learning, 2011, 10:199-221.

[13] Catalano M M, Vaughn P, Been J. Using Maps to Promote Data-Driven Decision-Making: One Library's Experience in Data Visualization Instruction [J]. Medical Reference Services Quarterly, 2017, 36(4):415-422. DOI:10.1080/02763869.2017.1369292.

[14] Okoro E. International Organizations and Operations: An Analysis of Cross-Cultural Communication Effectiveness and Management Orientation [J]. Journal of Business & Management (COES&RJ-JBM), 2013, 1(1):1-13.

[15] Iyer K N S. Demand chain collaboration and operational performance: role of IT analytic capability and environmental uncertainty [J]. Journal of Business & Industrial Marketing, 2011, 26(1-2):81-91. DOI:10.1108/08858621111112267.

[16] Stetler C B, Mcqueen L, Demakis J, et al. An organizational framework and strategic implementation for system-level change to enhance research-based practice: QUERI Series [J]. Implementation Science, 2008, 3(1):1-11. DOI:10.1186/1748-5908-3-30.

[17] Walls M R. Measuring and Utilizing Corporate Risk Tolerance to Improve Investment Decision Making [J]. The Engineering Economist, 2005, 50(4):361-376. DOI:10.1080/00137910500348434.

[18] Guan J, Chen Z. Patent collaboration and international knowledge flow [J]. Information Processing & Management, 2012, 48(1):170-181. DOI:10.1016/j.ipm.2011.03.001.

[19] Herrell W R. Method for evaluating employees and aggregating their respective skills and experience in a searchable database for sharing knowledge resources: US09933666 [P]. US20020024531A1 [2025-06-17]. DOI:US20020024531 A1.

[20] Jingshan L I, Huang N. Modeling and Analysis of a Multiple Product Manufacturing System with Split and Merge [J]. International Journal of Production Research, 2005, 43(19):4049-4066. DOI:10.1080/00207540500031899.