



Decision Intelligence for Sustainable Business: A Strategic Framework Integrating Artificial Intelligence, Human Judgment, and Strategic Management

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ABSTRACT

Artificial intelligence (AI) is transforming organizational decision-making by improving analytical capabilities and supporting data-driven strategic decisions. However, existing research remains fragmented across artificial intelligence, strategic management, business analytics, and sustainability, providing limited theoretical integration of these perspectives. This conceptual study addresses this gap by proposing Decision Intelligence for Sustainable Business (DISB) as a dynamic organizational capability that integrates artificial intelligence, human judgment, knowledge integration, strategic management, and sustainability governance within a unified decision framework. Using a systematic conceptual methodology and interdisciplinary theory synthesis, the study develops an integrated framework supported by the Resource-Based View, Dynamic Capabilities, the Knowledge-Based View, Organizational Information Processing Theory, Socio-Technical Systems Theory, and Stakeholder Theory. The framework identifies five interrelated capabilities and explains how their interaction enhances strategic decision quality, organizational adaptability, and sustainable value creation. In addition, the study develops an operational decision cycle and eight theoretical propositions to guide future empirical research. The proposed framework contributes to the literature by clarifying the conceptual boundaries of Decision Intelligence, integrating sustainability into strategic decision-making, and extending current technology-centered perspectives. It also provides managers with a structured approach for combining intelligent technologies, organizational capabilities, and responsible governance to improve long-term organizational performance and resilience. Finally, the study outlines a future research agenda for validating and extending the proposed framework across different organizational contexts.

1. Introduction

Organizations are operating in an increasingly volatile environment shaped by digital transformation, geopolitical uncertainty, sustainability pressures, and rapid technological innovation. Strategic decisions are expected to address not only economic performance but also organizational

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resilience, stakeholder expectations, and long-term value creation. At the same time, advances in artificial intelligence (AI) have transformed the availability and analytical power of organizational data, creating unprecedented opportunities to improve decision quality. Nevertheless, technological sophistication alone does not ensure better strategic decisions. Organizations continue to face the challenge of integrating AI-generated insights with human expertise, organizational knowledge, and strategic priorities. This section introduces the context of the study, identifies the principal research gap, and explains the theoretical and practical contributions of the proposed framework.

1.1 Strategic Decision-Making in the Age of Artificial Intelligence

Strategic decision-making has long been recognized as one of the most important determinants of organizational success because it influences resource allocation, competitive positioning, innovation, and long-term organizational performance. Traditionally, executives relied primarily on managerial experience, intuition, and historical information when evaluating strategic alternatives. Although these sources of knowledge remain valuable, they are increasingly insufficient in business environments characterized by rapid technological change, information overload, and growing uncertainty. Organizations must now interpret vast amounts of heterogeneous data while responding to continuously evolving market conditions, regulatory requirements, and stakeholder expectations [1,2].

The accelerating pace of digital transformation has fundamentally changed the nature of organizational decision-making. Technologies such as big data analytics, cloud computing, machine learning, and generative AI enable organizations to process complex information, identify hidden patterns, predict future scenarios, and evaluate strategic alternatives with greater speed and precision than traditional analytical approaches. Consequently, AI is no longer viewed solely as an operational automation tool but increasingly as an important source of strategic intelligence capable of supporting executive decision-making across diverse organizational functions [3,4]. Despite these advances, strategic decisions remain fundamentally human activities. Executive decisions frequently involve ambiguity, incomplete information, ethical considerations, institutional constraints, and conflicting stakeholder interests that cannot be resolved through algorithmic optimization alone. AI systems generate valuable analytical insights, but managers remain responsible for interpreting these outputs within organizational and environmental contexts. Contemporary research therefore increasingly characterizes AI and human expertise as complementary rather than competing sources of intelligence. Superior strategic decisions emerge when computational capabilities are effectively combined with managerial judgment, organizational learning, and contextual understanding rather than when either capability operates independently [5,6].

Simultaneously, sustainability has become a strategic priority rather than a peripheral corporate initiative. Organizations are expected to generate economic value while addressing environmental, social, and governance (ESG) responsibilities that influence competitiveness, legitimacy, and long-term resilience. Strategic decisions must therefore consider broader organizational consequences extending beyond short-term financial performance. This expanded decision context increases both the complexity and the importance of managerial decision processes because organizations are required to balance efficiency, innovation, risk management, stakeholder expectations, and sustainable development objectives within a single strategic framework [7].

These developments indicate that organizations require more than advanced analytical technologies. They require decision capabilities capable of integrating artificial intelligence,

managerial expertise, organizational knowledge, and sustainability considerations into coherent strategic processes. While AI significantly enhances analytical capacity, sustainable competitive advantage depends on how organizations transform analytical outputs into high-quality strategic decisions. Recent research has consequently emphasized AI-enabled strategic governance and explainable decision analytics as important mechanisms for improving organizational decision quality under conditions of uncertainty [8,9].

1.2 Research Gap and Problem Statement

Research examining AI-enabled decision-making has expanded rapidly during the past decade. Significant contributions have emerged from strategic management, information systems, business analytics, operations management, and sustainability research. Although these studies have advanced understanding of AI applications and organizational decision support, they have largely evolved in parallel rather than through theoretical integration. As a result, the existing literature provides valuable insights into individual components of intelligent decision-making but offers relatively limited explanation of how these components collectively contribute to sustainable strategic decisions.

Within the information systems discipline, considerable attention has been devoted to decision support systems, business intelligence, predictive analytics, and machine learning applications. These studies primarily examine technological capabilities, analytical performance, and data-driven optimization. In contrast, strategic management research continues to emphasize organizational capabilities, leadership, competitive advantage, and dynamic adaptation. Sustainability research, meanwhile, focuses largely on ESG performance, stakeholder governance, responsible innovation, and long-term organizational resilience. Each stream contributes important knowledge, yet relatively few studies explain how these perspectives can be integrated within a unified framework for strategic decision-making [10–12]. The emerging concept of Decision Intelligence has the potential to bridge these fragmented research streams. However, its theoretical development remains limited within management scholarship. Existing studies frequently use the term interchangeably with business intelligence, decision analytics, or AI-assisted decision-making without establishing clear conceptual boundaries. Consequently, there remains limited consensus regarding its defining characteristics, organizational dimensions, or relationship with established theories of strategic management. This conceptual ambiguity restricts cumulative theory development and complicates future empirical validation.

Another important limitation concerns the relationship between AI and human judgment. Many studies acknowledge that managers remain central to strategic decision-making despite increasing technological capabilities. However, relatively few conceptual models explain how AI-generated insights should interact with managerial cognition, organizational learning, strategic leadership, and sustainability objectives throughout the decision process. Consequently, the literature provides only partial guidance regarding how organizations can systematically develop decision capabilities that improve both decision quality and long-term organizational performance.

These limitations reveal an important theoretical opportunity. Rather than considering AI, strategic management, and sustainability as separate research domains, this study argues that they should be understood as complementary components of a broader organizational capability. Developing such an integrative perspective requires moving beyond technology-centered

explanations toward a framework that simultaneously recognizes analytical intelligence, human judgment, strategic reasoning, and sustainability-oriented value creation.

Accordingly, this study addresses the following research question:

How can artificial intelligence, human judgment, and strategic management be integrated into a unified Decision Intelligence framework that enhances sustainable organizational decision-making?

1.3 Research Objectives and Contributions

To address the identified research gap, this paper develops Decision Intelligence for Sustainable Business (DISB) as a new conceptual framework that explains how organizations can integrate artificial intelligence, human judgment, and strategic management to improve decision quality while supporting sustainable organizational performance. Rather than treating AI as an isolated technological resource, the proposed framework conceptualizes decision intelligence as a dynamic organizational capability that combines analytical technologies with managerial competencies, organizational knowledge, and sustainability principles.

The study pursues three primary objectives. First, it critically synthesizes the fragmented literature on artificial intelligence, strategic management, sustainability, and decision intelligence to establish a coherent theoretical foundation for the proposed construct. Second, it conceptualizes Decision Intelligence for Sustainable Business by defining its characteristics, dimensions, and conceptual boundaries in relation to existing concepts such as business intelligence, decision support systems, and AI-enabled analytics. Third, it develops an integrated strategic framework that explains the interactions among AI capabilities, human judgment, and strategic management in generating sustainable organizational value.

The proposed framework contributes to the literature in several important ways. From a theoretical perspective, it introduces Decision Intelligence for Sustainable Business as a distinct organizational capability rather than another technological application. By integrating multiple theoretical perspectives within a single conceptual model, the study extends current understanding of intelligent strategic decision-making and provides a stronger foundation for future theory development. From a conceptual perspective, the framework clarifies the relationships among artificial intelligence, managerial judgment, organizational learning, and sustainability. It establishes clearer conceptual boundaries for Decision Intelligence and differentiates it from closely related constructs that have frequently been used interchangeably in previous research.

The study also offers practical contributions. Managers increasingly face strategic decisions involving uncertainty, technological disruption, and sustainability pressures. The proposed framework provides a structured perspective for integrating AI capabilities into organizational decision processes without diminishing the essential role of executive judgment and strategic leadership. Consequently, it offers guidance for organizations seeking to strengthen strategic adaptability, improve governance, and create sustainable long-term value.

Finally, the paper establishes a foundation for future empirical research by identifying theoretical relationships that can subsequently be examined across industries, organizational contexts, and institutional environments.

1.4 Organization of the Paper

The remainder of this paper is organized as follows. Section 2 outlines the conceptual methodology adopted to develop the proposed framework. Section 3 critically reviews the relevant literature and identifies the key theoretical gaps that motivate the study. Section 4 presents the theoretical foundations underpinning Decision Intelligence for Sustainable Business (DISB). Section 5 conceptualizes the proposed construct by defining its characteristics, dimensions, and conceptual boundaries. Section 6 introduces the integrated strategic framework and explains the interaction among its core capabilities. Section 7 develops a set of theoretical propositions to guide future empirical research. Section 8 discusses the theoretical, managerial, and policy implications of the proposed framework. Section 9 presents a future research agenda, and Section 10 concludes the paper by summarizing its principal contributions, acknowledging its limitations, and highlighting directions for future development of Decision Intelligence research.

2. Methodology

This study adopts a systematic conceptual research methodology to develop the proposed Decision Intelligence for Sustainable Business (DISB) framework. Because the objective is theory development rather than empirical hypothesis testing, the methodological emphasis is placed on transparency in literature selection, theoretical integration, and framework construction. The section explains how the existing body of knowledge was critically synthesized to identify conceptual gaps and develop an integrated model that combines artificial intelligence, human judgment, and strategic management.

2.1 Research Philosophy and Design

The study follows a theory-building approach grounded in conceptual research. Rather than generating primary data, conceptual research seeks to advance knowledge by integrating existing theories, identifying inconsistencies within the literature, and proposing new conceptual relationships. This approach is particularly appropriate for emerging research domains where theoretical development has not yet kept pace with technological and managerial change [13].

Accordingly, the present study views Decision Intelligence as a multidisciplinary phenomenon that cannot be adequately explained from a single theoretical perspective. Developing the proposed framework therefore required integrating insights from strategic management, information systems, organizational learning, decision science, and sustainability research. This interdisciplinary perspective provides a stronger theoretical foundation than examining artificial intelligence or strategic decision-making independently.

2.2 Literature Identification Strategy

The conceptual framework was informed by a structured review of the academic literature. Google Scholar served as the primary search platform because of its broad multidisciplinary coverage, while bibliographic information was cross-checked using established academic databases where necessary. The search concentrated on peer-reviewed journal articles, scholarly books, review papers, and influential conceptual studies relevant to organizational decision-making.

Search terms included combinations of:

- Decision Intelligence
- Artificial Intelligence
- Strategic Decision-Making
- Strategic Management
- Human Judgment
- Decision Support Systems
- Business Intelligence
- Organizational Intelligence
- Sustainable Business
- Sustainability
- Dynamic Capabilities
- Explainable Artificial Intelligence (XAI)

The review primarily emphasized publications from the last decade to capture recent developments in AI-enabled decision-making while retaining a limited number of seminal studies that remain fundamental to contemporary strategic management theory.

2.3 Literature Selection and Synthesis

The literature was selected according to three principal criteria. First, publications had to make a direct theoretical or empirical contribution to artificial intelligence, strategic management, decision-making, sustainability, or closely related fields. Second, only peer-reviewed and academically recognized sources were considered to ensure the reliability of the conceptual foundation. Third, each selected study was evaluated according to its relevance to the development of an integrated decision intelligence framework rather than its disciplinary origin.

Instead of organizing previous studies chronologically, the literature was synthesized thematically. This approach facilitated the identification of recurring concepts, complementary theoretical perspectives, unresolved debates, and areas of conceptual overlap. It also enabled the study to move beyond descriptive literature review toward analytical integration, which is widely recommended for conceptual research [14,15].

2.4 Framework Development Process

The proposed framework was developed through an iterative process consisting of four stages. First, the literature was analyzed to identify the principal constructs associated with effective strategic decision-making in contemporary organizations. Second, relationships among these constructs were examined using established theories from strategic management, organizational information processing, knowledge management, and sustainability research. Third, overlapping concepts were consolidated to establish clear conceptual boundaries for Decision Intelligence. Finally, the resulting framework was refined to ensure internal consistency, logical coherence, and managerial relevance.

Rather than introducing an entirely independent theory, the framework integrates complementary theoretical perspectives into a unified organizational capability. This approach extends existing knowledge by explaining how artificial intelligence, human judgment, organizational learning, and strategic management interact to support sustainable decision-making.

2.5 Ensuring Conceptual Rigor

Several measures were adopted to strengthen the quality of the proposed framework. First, conceptual development relied predominantly on well-established peer-reviewed literature and recognized theoretical contributions. Second, evidence was drawn from multiple disciplines to reduce theoretical bias and provide a balanced understanding of intelligent strategic decision-making. Third, the proposed construct was systematically compared with related concepts including business intelligence, decision support systems, and AI-enabled analytics to establish clear conceptual boundaries and reduce construct ambiguity.

Finally, the framework was evaluated according to three widely accepted criteria for conceptual research: logical consistency, theoretical coherence, and practical applicability. These principles guided the refinement of the framework and enhanced its suitability for future empirical validation across different organizational settings [13,16].

2.6 Methodological Contribution

The methodological contribution of this study extends beyond a conventional narrative review. By combining a structured literature identification process with thematic synthesis and interdisciplinary theory integration, the study develops a coherent conceptual foundation for Decision Intelligence for Sustainable Business. The resulting framework provides a transparent basis for future empirical research while offering researchers and practitioners a theoretically grounded perspective on integrating artificial intelligence, human judgment, and strategic management within sustainable organizational decision-making.

3. Literature Review

The rapid convergence of artificial intelligence, advanced analytics, and strategic management has generated an extensive yet fragmented body of research on organizational decision-making. Although these research streams share a common objective of improving decision quality, they have evolved largely independently, resulting in different conceptual foundations, theoretical assumptions, and analytical perspectives. Rather than reviewing these streams separately, this section critically synthesizes their evolution to demonstrate how strategic decision-making has progressed from information processing toward intelligent decision capabilities. This synthesis provides the theoretical context for positioning Decision Intelligence for Sustainable Business (DISB) as an integrative organizational capability that addresses limitations within existing research.

3.1 Evolution of Strategic Decision-Making: From Decision Support Systems to Decision Intelligence

The evolution of organizational decision-making reflects broader changes in information technology, managerial practice, and organizational complexity. Early research primarily viewed decision-making as a structured process in which managers collected information, evaluated alternatives, and selected the most appropriate course of action. Under relatively stable market conditions, organizations relied heavily on management information systems and quantitative decision models designed to improve analytical efficiency and reduce uncertainty [17,18]. These

systems enhanced information availability but remained largely dependent on human interpretation and predefined decision rules.

During the 1970s and 1980s, the emergence of Decision Support Systems (DSS) represented a significant milestone in organizational decision-making. DSS extended traditional information systems by combining databases, analytical models, and interactive interfaces to assist managers in solving semi-structured and unstructured problems. Unlike conventional reporting systems, DSS emphasized managerial support rather than decision automation, allowing decision-makers to evaluate multiple scenarios while retaining responsibility for final judgments [10]. Despite these advances, DSS primarily focused on improving information accessibility and analytical efficiency rather than generating strategic intelligence.

As organizations accumulated increasing volumes of digital information during the 1990s and early 2000s, the emphasis gradually shifted toward Business Intelligence (BI). BI integrated data warehouses, reporting tools, dashboards, and performance monitoring systems to transform organizational data into actionable information. Compared with DSS, BI provided broader organizational visibility by consolidating information from multiple business functions and supporting evidence-based performance management [19]. Nevertheless, most BI applications remained descriptive in nature, explaining what had occurred rather than predicting future developments or recommending strategic responses. The rapid expansion of computational capacity, cloud computing, and big data technologies subsequently transformed organizational analytics. Predictive analytics and machine learning enabled organizations to move beyond descriptive reporting by identifying hidden relationships within complex datasets and forecasting future outcomes. Decision-making increasingly became proactive rather than reactive, allowing organizations to anticipate customer behavior, operational risks, market changes, and competitive dynamics with greater accuracy [3,20]. This transition fundamentally altered the role of data within organizations, shifting its function from historical documentation toward strategic prediction.

Recent advances in artificial intelligence have accelerated this transformation even further. Contemporary AI systems are capable of processing unstructured information, recognizing complex patterns, generating strategic alternatives, and continuously improving analytical performance through adaptive learning mechanisms. Unlike earlier analytical technologies that relied primarily on predefined models, AI introduces greater flexibility in addressing uncertainty and complexity. Consequently, organizations increasingly employ AI not only to automate operational activities but also to support strategic planning, innovation management, risk assessment, and resource allocation [6,21]. Despite these technological advances, evidence increasingly suggests that superior strategic decisions cannot be explained by analytical capability alone. Organizational decision-making remains inherently socio-technical because strategic choices involve contextual interpretation, organizational experience, ethical reasoning, stakeholder expectations, and long-term vision. AI systems may generate highly accurate predictions, yet they cannot independently determine organizational priorities, evaluate competing social objectives, or interpret institutional constraints. These dimensions continue to depend on managerial judgment and organizational knowledge, highlighting the limitations of technology-centered perspectives [5,22].

This recognition has stimulated growing interest in Decision Intelligence, an emerging concept that extends beyond traditional decision support by integrating artificial intelligence, human expertise, organizational learning, and structured decision processes. Rather than replacing managerial judgment, Decision Intelligence seeks to improve the quality, transparency, and consistency of strategic decisions by combining computational intelligence with human reasoning.

The concept therefore represents an important shift from technology-oriented decision support toward organizational decision capability [23].

Although Decision Intelligence has attracted increasing academic and professional attention, its conceptual foundations remain relatively fragmented. Existing studies frequently associate the concept with business analytics, AI-enabled decision support, or digital transformation without establishing clear theoretical boundaries or explaining how intelligent decision capabilities contribute to long-term organizational sustainability. Consequently, the literature still lacks an integrated framework that connects artificial intelligence, human judgment, strategic management, and sustainable value creation within a single conceptual model. Addressing this limitation provides the foundation for the framework proposed in this study.

Before examining these emerging perspectives in greater detail, it is useful to summarize how successive generations of decision technologies have progressively expanded organizational decision capabilities while simultaneously revealing new theoretical challenges.

Table 1 synthesizes the historical evolution of organizational decision-making and highlights the progression from information-oriented systems toward intelligent organizational capabilities. The comparison illustrates that each stage addressed important limitations of its predecessor while introducing new opportunities and challenges for strategic management.

Table 1

Evolution of Organizational Decision-Making: From Information Systems to Decision Intelligence

Evolution Stage	Primary Focus	Organizational Contribution	Principal Limitation
Management Information Systems (MIS)	Information reporting	Operational efficiency and standardized reporting	Limited analytical capability
Decision Support Systems (DSS)	Analytical decision support	Improved evaluation of semi-structured decisions	Dependent on predefined models
Business Intelligence (BI)	Organizational analytics	Enterprise-wide performance monitoring	Primarily descriptive analysis
Predictive Analytics	Forecasting and prediction	Anticipation of future events and risks	Limited contextual interpretation
Artificial Intelligence	Intelligent analysis and learning	Pattern recognition, optimization, adaptive analytics	Limited human reasoning and ethical judgment
Decision Intelligence	Integrated organizational decision capability	Combines AI, human judgment, organizational knowledge, and strategic reasoning	Conceptual foundations remain underdeveloped

The evolution presented in Table 1 demonstrates that advances in organizational decision-making have not followed a process of technological substitution but one of cumulative capability development. Each generation has expanded analytical capacity while simultaneously revealing the continuing importance of managerial interpretation and organizational context. This progression provides the conceptual basis for examining how artificial intelligence and human judgment should be viewed as complementary rather than competing components of intelligent strategic decision-making.

3.2 From Automation to Augmentation: Integrating Artificial Intelligence and Human Judgment

The growing adoption of artificial intelligence has fundamentally reshaped academic discussions surrounding organizational decision-making. Early research largely viewed AI as a technological solution capable of automating routine activities and improving analytical efficiency. More recent scholarship, however, argues that the principal challenge is no longer whether AI can generate accurate predictions, but how organizations can combine algorithmic intelligence with human expertise to produce decisions that are strategically sound, ethically responsible, and adaptable to uncertain environments. This shift reflects a broader transition from automation toward augmentation, where AI is expected to strengthen rather than replace managerial decision-making [3,6].

The first debate concerns the role of AI in organizational decision processes. Technology-centered perspectives often assume that increasingly sophisticated algorithms will gradually replace human decision-makers by producing faster and more objective decisions. Improvements in machine learning, deep learning, and generative AI have reinforced this expectation by demonstrating remarkable capabilities in prediction, classification, optimization, and scenario analysis [21]. Nevertheless, organizational evidence suggests that strategic decisions differ fundamentally from routine operational decisions. Strategic choices frequently involve ambiguous objectives, incomplete information, conflicting stakeholder interests, and institutional constraints that extend beyond the analytical capabilities of even the most advanced AI systems [5].

Consequently, an alternative perspective has gained increasing support within the management literature. Rather than viewing AI and managers as substitutes, scholars increasingly describe them as complementary sources of intelligence whose strengths address different aspects of the decision process. AI excels at processing large-scale data, identifying complex patterns, and evaluating numerous alternatives within a short period. Human decision-makers, by contrast, contribute contextual understanding, experiential knowledge, ethical reasoning, political awareness, and the ability to interpret organizational realities that are rarely captured in historical datasets [4,6]. Decision quality therefore depends less on maximizing algorithmic sophistication than on designing effective interactions between computational intelligence and managerial expertise.

A second debate concerns the scope of AI-supported decisions. Most successful organizational applications continue to concentrate on operational and tactical activities, including demand forecasting, inventory optimization, fraud detection, predictive maintenance, customer segmentation, and resource scheduling. These decisions generally involve structured problems supported by historical data and clearly defined performance criteria. Strategic decisions present a different challenge. They are typically long-term, multidimensional, and influenced by uncertainty, organizational culture, competitive dynamics, regulatory change, and sustainability objectives. Because these factors evolve continuously and often lack complete data representation, strategic decision-making remains difficult to automate entirely [1,10]. This distinction highlights an important limitation within current research. Much of the AI literature evaluates algorithmic performance through measures such as predictive accuracy, computational efficiency, or optimization capability. Comparatively fewer studies examine whether improved analytical performance necessarily leads to better strategic outcomes. Accurate predictions do not automatically produce effective organizational decisions if managers misunderstand their implications, ignore contextual factors, or fail to integrate analytical insights with broader organizational objectives. The value of AI therefore depends not only on technological capability but also on organizational processes that transform analytical outputs into informed strategic action [17].

A third debate focuses on trust, explainability, and governance. As AI systems become increasingly complex, managers frequently encounter "black-box" models whose internal reasoning is difficult to interpret. Limited transparency may reduce managerial confidence, complicate organizational accountability, and hinder adoption in high-stakes strategic contexts. These concerns have stimulated growing interest in explainable artificial intelligence (XAI), which seeks to improve the interpretability of algorithmic recommendations without substantially reducing predictive performance. Explainability is particularly important for strategic decisions because executives remain accountable for organizational outcomes regardless of whether analytical recommendations originate from humans or intelligent systems [9].

The importance of human judgment extends beyond interpreting AI outputs. Strategic managers continuously reconcile competing organizational objectives, negotiate stakeholder interests, respond to institutional pressures, and anticipate environmental changes that cannot be represented fully through historical data. Such capabilities depend on tacit knowledge, organizational experience, and strategic reasoning developed through continuous interaction with internal and external environments. AI can strengthen these capabilities by expanding analytical insight, but it cannot independently define organizational purpose or determine acceptable strategic trade-offs [22].

These observations suggest that the central challenge facing contemporary organizations is not increasing analytical automation but developing the organizational capability to integrate diverse sources of intelligence into coherent strategic decisions. Artificial intelligence, managerial judgment, organizational learning, and governance mechanisms should therefore be viewed as mutually reinforcing rather than independent capabilities. This perspective moves the discussion beyond the traditional automation paradigm and establishes the conceptual foundation for Decision Intelligence as an integrative organizational capability.

Table 2 summarizes the conceptual transition identified in the literature from technology-centered automation toward intelligence augmentation. The figure illustrates that the progression is not a replacement of human decision-makers by AI, but an increasing integration of computational intelligence, managerial judgment, and organizational learning.

Table 2

Evolution from Automation to Augmentation

Traditional Perspective	Emerging Perspective
AI automates decisions	AI augments managerial decision-making
Technology-centered capability	Human–AI collaborative capability
Analytical accuracy as the primary objective	Decision quality as the primary objective
Algorithm-driven optimization	Strategic integration of AI, human judgment, and organizational knowledge
Operational efficiency	Sustainable strategic value creation

The evolution presented in **Table 2** indicates that organizational performance depends increasingly on the quality of collaboration between intelligent technologies and human expertise rather than on either capability independently. This conclusion provides an important bridge to the next subsection, which critically examines Decision Intelligence as an emerging concept and evaluates whether current definitions adequately capture this integrative organizational capability.

3.3 Decision Intelligence: Current State of Knowledge and Conceptual Boundaries

Although the concept of Decision Intelligence (DI) has attracted growing attention in both academia and industry, its theoretical development remains at an early stage. Existing research generally agrees that DI seeks to improve organizational decisions by combining data, analytical models, and decision processes. However, considerable disagreement remains regarding its conceptual scope, theoretical foundations, and relationship with established constructs such as Decision Support Systems (DSS), Business Intelligence (BI), Artificial Intelligence (AI), and Business Analytics. Consequently, Decision Intelligence is often used as an umbrella term rather than a clearly defined organizational capability [27,28]. Current definitions generally follow two perspectives. The first adopts a technology-oriented view, describing Decision Intelligence as the application of AI, machine learning, and advanced analytics to optimize organizational decisions. This perspective emphasizes computational performance, predictive accuracy, and automation, positioning DI as an extension of existing analytical technologies [3,21]. While valuable, this interpretation narrows the concept to technological capability and overlooks the broader organizational processes through which strategic decisions are developed and implemented.

The second perspective adopts a managerial orientation by emphasizing the interaction between analytical insights and human expertise. From this viewpoint, Decision Intelligence represents a structured approach that integrates data, organizational knowledge, managerial judgment, and decision processes to improve decision quality under conditions of uncertainty [10,24]. Rather than replacing managerial discretion, DI enhances managers' ability to interpret complex information, evaluate strategic alternatives, and coordinate organizational responses. This interpretation aligns more closely with contemporary views of AI augmentation discussed in the previous subsection.

Despite these advances, the literature continues to exhibit three important conceptual limitations.

First, conceptual boundaries remain unclear. Decision Intelligence is frequently used interchangeably with business intelligence, predictive analytics, intelligent decision support, and AI-driven decision-making, despite important differences in purpose and scope. As a result, empirical findings are difficult to compare because studies often investigate different phenomena under the same label [27].

Second, organizational capabilities receive limited attention. Most existing studies focus on analytical tools and algorithms while giving comparatively little consideration to leadership, organizational learning, governance, knowledge integration, and strategic capabilities that influence how analytical outputs become effective decisions [6,11]. This technology-centered emphasis provides only a partial explanation of organizational decision quality.

Third, sustainability is largely absent from current conceptualizations. Existing Decision Intelligence research primarily focuses on efficiency, prediction, and operational optimization. Comparatively little attention has been devoted to how intelligent decision capabilities contribute to long-term organizational resilience, responsible governance, ESG objectives, and sustainable value creation. As organizations increasingly operate within environments characterized by regulatory complexity, stakeholder expectations, and environmental uncertainty, this omission represents an important gap in the literature [7].

These limitations suggest that Decision Intelligence should be conceptualized more broadly than an analytical technology. Instead, it should be viewed as an organizational capability that integrates technological intelligence with human judgment, strategic management, and sustainability-oriented decision processes. Such an interpretation not only distinguishes Decision Intelligence from related concepts but also provides a stronger theoretical basis for explaining how organizations create sustainable competitive advantage through intelligent strategic decision-making.

To clarify these distinctions, Table 3 compares Decision Intelligence with closely related concepts that have frequently been treated as equivalent in previous research.

Table 3

Comparison of Decision Intelligence with Related Organizational Concepts

Concept	Primary Objective	Main Focus	Principal Limitation
Decision Support Systems (DSS)	Support managerial decisions	Models and interactive analysis	Limited learning capability
Business Intelligence (BI)	Transform data into information	Reporting and organizational performance	Predominantly descriptive
Business Analytics	Generate predictive and prescriptive insights	Statistical and computational analysis	Limited strategic integration
Artificial Intelligence (AI)	Intelligent prediction and automation	Algorithms and machine learning	Limited contextual and ethical reasoning
Decision Intelligence (Current Literature)	Improve decision quality	Integration of analytics and decision processes	Inconsistent conceptual boundaries
Decision Intelligence for Sustainable Business (Proposed)	Sustainable strategic decision-making	Integration of AI, human judgment, strategic management, organizational learning, and sustainability	Framework proposed in this study

Table 3 demonstrates that the proposed Decision Intelligence for Sustainable Business (DISB) framework extends existing interpretations by positioning Decision Intelligence as a dynamic organizational capability rather than solely a technological or analytical solution. This broader perspective provides the conceptual bridge between the existing literature and the theoretical foundations developed in the following section.

3.4 Synthesis of the Literature and Research Gaps

The preceding review demonstrates that research on strategic decision-making has progressed considerably through advances in artificial intelligence, analytics, and decision support technologies. Nevertheless, theoretical development has not advanced at the same pace as technological innovation. Existing studies provide valuable insights into individual components of intelligent decision-making, yet they rarely explain how these components interact within a unified organizational capability. Consequently, the literature remains fragmented across multiple disciplines, with each emphasizing different dimensions of the decision process.

The first gap concerns disciplinary fragmentation. Research in information systems primarily focuses on technological capabilities such as AI, machine learning, decision support systems, and business analytics. In contrast, strategic management emphasizes organizational capabilities, competitive advantage, leadership, and adaptation, while sustainability research concentrates on long-term value creation, stakeholder governance, and ESG performance. Although these streams address related challenges, they generally evolve independently and provide limited theoretical integration [3,6,7,11]. This separation restricts a comprehensive understanding of intelligent strategic decision-making.

A second gap relates to the dominance of technology-centered perspectives. Much of the AI literature evaluates success through predictive accuracy, computational efficiency, or automation performance. While these indicators are important, they do not necessarily explain whether

organizations make better strategic decisions. Decision quality is also influenced by managerial experience, organizational knowledge, governance structures, and environmental context. These factors remain underrepresented in many existing conceptual models, creating an imbalance between technological capability and organizational capability [5,10].

The third gap concerns the limited conceptual clarity surrounding Decision Intelligence. Although the concept is receiving increasing scholarly attention, there is no widely accepted definition or theoretical foundation. Decision Intelligence is frequently presented as an extension of business analytics or artificial intelligence without clearly distinguishing its characteristics, dimensions, or organizational purpose. This conceptual ambiguity makes it difficult to compare empirical findings and slows cumulative theory development [27,28].

A fourth limitation is the insufficient integration of sustainability into intelligent decision-making. Existing frameworks largely prioritize efficiency, optimization, and prediction, whereas sustainability is often treated as an external organizational objective rather than an integral component of strategic decision processes. As organizations increasingly balance financial performance with environmental and social responsibilities, decision frameworks must account for long-term resilience, responsible governance, and stakeholder value alongside analytical performance [7,8].

Collectively, these limitations indicate that current research explains individual decision technologies more effectively than the organizational capability required to transform analytical intelligence into sustainable strategic action. Addressing this challenge requires moving beyond isolated technological or managerial perspectives toward a more integrated conceptual framework. Accordingly, this study proposes Decision Intelligence for Sustainable Business (DISB) as a dynamic organizational capability that combines artificial intelligence, human judgment, strategic management, organizational learning, and sustainability principles within a unified decision architecture. Unlike previous conceptualizations that emphasize analytical technologies alone, the proposed framework positions decision intelligence as an organizational capability that supports adaptive, transparent, and sustainability-oriented strategic decision-making.

The review also highlights several opportunities for future research. First, empirical studies are needed to operationalize and validate the proposed dimensions of Decision Intelligence for Sustainable Business. Second, comparative research across industries and institutional settings could examine how contextual factors influence intelligent strategic decision-making. Third, longitudinal investigations may provide deeper insight into how organizations develop decision intelligence capabilities over time and how these capabilities contribute to sustained competitive advantage. These directions reinforce the need for a stronger theoretical foundation, which is developed in the following section through the integration of complementary management and organizational theories.

4. Theoretical Foundations of Decision Intelligence for Sustainable Business

The literature review demonstrated that existing research provides valuable insights into artificial intelligence, strategic management, organizational decision-making, and sustainability. However, these perspectives remain conceptually fragmented and do not fully explain how organizations transform analytical intelligence into sustainable strategic decisions. Developing Decision Intelligence for Sustainable Business (DISB) therefore requires a broader theoretical foundation that integrates complementary perspectives rather than relying on a single organizational theory. This section

establishes that foundation by explaining how strategic resources, organizational capabilities, information processing, and stakeholder value collectively support intelligent decision-making.

4.1 Why Existing Theories Alone Are Insufficient

Organizations operate in increasingly dynamic environments where strategic decisions depend simultaneously on technological capability, organizational learning, managerial judgment, and sustainability considerations. Existing organizational theories successfully explain individual dimensions of this process but provide only partial explanations of intelligent strategic decision-making. For example, resource-based theories explain how organizations create competitive advantage through valuable resources, while information-processing theories explain how organizations respond to uncertainty by acquiring and interpreting information. Likewise, stakeholder-oriented perspectives emphasize long-term value creation and responsible governance. Although each perspective contributes important insights, none independently explains how artificial intelligence, human judgment, and strategic management interact as an integrated organizational capability.

This limitation becomes particularly evident when examining recent developments in AI-enabled decision-making. Artificial intelligence substantially improves analytical performance by processing large volumes of structured and unstructured information. Nevertheless, organizations frequently experience difficulties translating analytical outputs into effective strategic decisions because successful implementation depends on leadership, organizational knowledge, governance structures, learning capabilities, and contextual interpretation. Consequently, technological capability alone cannot adequately explain differences in strategic decision quality among organizations with access to similar analytical technologies [3,6]. Similarly, traditional strategic management theories were developed before the widespread adoption of intelligent decision technologies. Although these theories remain highly relevant for explaining competitive advantage and organizational adaptation, they provide limited guidance regarding the role of AI as a strategic resource or how computational intelligence should interact with managerial expertise during decision-making. Addressing this limitation requires integrating complementary theories capable of explaining both technological and organizational dimensions of intelligent strategic decisions.

Accordingly, this study adopts a multi-theoretical perspective in which each theory explains a specific component of Decision Intelligence for Sustainable Business. Rather than competing with one another, these theories provide complementary explanations that collectively support the proposed conceptual framework.

4.2 Resource Integration and Strategic Capability

The strategic management literature provides the first theoretical pillar supporting Decision Intelligence for Sustainable Business through the integration of the Resource-Based View (RBV), Dynamic Capabilities, and the Knowledge-Based View (KBV). Together, these perspectives explain how organizations create value by acquiring strategic resources, transforming those resources into organizational capabilities, and continuously adapting them to changing environments.

The Resource-Based View argues that sustainable competitive advantage originates from resources that are valuable, rare, difficult to imitate, and effectively organized [2]. Within the context of Decision Intelligence, artificial intelligence should not be viewed simply as an advanced technology but as a strategic organizational resource whose value depends on complementary assets such as

managerial expertise, data quality, organizational culture, and governance mechanisms. Organizations possessing similar AI technologies often achieve markedly different outcomes because they differ in their ability to integrate technological resources with strategic decision processes.

While RBV explains the importance of strategic resources, it offers only a static perspective on competitive advantage. Dynamic Capabilities extend this explanation by emphasizing an organization's ability to sense environmental changes, seize emerging opportunities, and continuously reconfigure resources in response to uncertainty [1]. This perspective is particularly relevant for Decision Intelligence because strategic decisions increasingly occur in environments characterized by technological disruption, market volatility, and rapidly evolving stakeholder expectations. AI enhances organizational sensing capabilities by identifying patterns and predicting future developments, whereas managerial judgment remains essential for interpreting these insights and translating them into strategic action.

The Knowledge-Based View further strengthens this theoretical foundation by recognizing organizational knowledge as the most important strategic asset [11]. Knowledge extends beyond data or information; it includes managerial experience, organizational memory, tacit expertise, and collective learning accumulated through organizational practice. Artificial intelligence contributes by generating analytical insights from extensive datasets, yet these insights acquire strategic value only when integrated with organizational knowledge and contextual understanding. Consequently, effective Decision Intelligence depends on continuous interaction between computational intelligence and organizational learning rather than on algorithmic capability alone.

Viewed collectively, these three theories explain complementary aspects of intelligent strategic decision-making. RBV explains what strategic resources organizations possess, Dynamic Capabilities explain how these resources are continuously adapted, and KBV explains how organizational knowledge transforms analytical information into strategic action. Their integration therefore provides a stronger theoretical foundation for Decision Intelligence than any individual theory could provide independently.

To summarize these complementary perspectives, Table 4 presents the contribution of each theory to the proposed Decision Intelligence for Sustainable Business framework.

Table 4

Strategic Management Theories Supporting Decision Intelligence for Sustainable Business

Theory	Primary Focus	Contribution to DISB
Resource-Based View (RBV)	Strategic resources and competitive advantage	Explains AI, data, and human expertise as complementary strategic resources.
Dynamic Capabilities	Organizational adaptation and resource reconfiguration	Explains how organizations continuously adapt intelligent decision capabilities under uncertainty.
Knowledge-Based View (KBV)	Knowledge creation and organizational learning	Explains how analytical outputs become strategic knowledge supporting managerial decisions.

Table 4 demonstrates that no single strategic management theory fully explains Decision Intelligence for Sustainable Business. Instead, integrating these perspectives provides a comprehensive explanation of how organizations develop intelligent decision capabilities that support sustainable competitive advantage. The following subsection extends this theoretical foundation by examining how organizations process information and coordinate interactions between artificial intelligence and human judgment during strategic decision-making.

4.3 Decision Processing and Human–Technology Interaction

Possessing valuable resources and organizational capabilities does not automatically result in superior strategic decisions. Organizations must also be capable of acquiring, interpreting, and utilizing information effectively under conditions of uncertainty. This perspective shifts attention from what organizations possess to how organizations process information and coordinate interactions between artificial intelligence and human decision-makers. To explain this process, the proposed framework integrates Organizational Information Processing Theory (OIPT) and Socio-Technical Systems Theory (STS), both of which provide complementary explanations for intelligent organizational decision-making.

Organizational Information Processing Theory argues that organizations exist to reduce uncertainty by increasing their capacity to acquire, interpret, and disseminate information [29]. As environmental complexity increases, organizations require more sophisticated information-processing mechanisms to support effective decisions. Contemporary AI technologies substantially enhance this capability by rapidly analyzing large volumes of structured and unstructured data, identifying emerging patterns, and generating predictive insights that exceed traditional analytical methods. Nevertheless, information-processing capacity alone does not guarantee effective strategic decisions because information must still be interpreted within organizational, competitive, and institutional contexts.

This limitation explains why technological intelligence should complement rather than replace managerial judgment. Strategic decisions frequently involve incomplete information, conflicting objectives, regulatory constraints, and ethical considerations that cannot be fully represented through computational models. Managers therefore remain responsible for evaluating AI-generated recommendations, reconciling competing priorities, and selecting courses of action that align with organizational strategy and stakeholder expectations. Decision quality consequently depends on the interaction between analytical intelligence and human reasoning rather than on either capability independently [5,6].

Socio-Technical Systems Theory further strengthens this perspective by arguing that organizational performance emerges from the joint optimization of technological and social systems rather than from technological advancement alone [30]. Within intelligent organizations, AI represents the technical subsystem responsible for data processing, prediction, and analytical support, whereas managers, organizational culture, governance structures, and collaborative processes constitute the social subsystem. Sustainable improvements in decision quality therefore require continuous alignment between these two components. Organizations that invest heavily in AI while neglecting leadership, employee capabilities, or governance frequently fail to realize the expected strategic benefits despite possessing advanced analytical technologies.

The interaction between AI and human expertise should therefore be understood as a process of collaborative intelligence. AI contributes computational speed, consistency, and analytical depth, while managers contribute contextual understanding, tacit knowledge, ethical reasoning, and strategic vision. Organizational learning further strengthens this interaction by enabling continuous refinement of both analytical models and managerial decision practices. Consequently, intelligent decision-making becomes an iterative process in which human and technological capabilities evolve together rather than functioning independently. From this perspective, Decision Intelligence for Sustainable Business extends beyond technological implementation. It represents an organizational capability that combines information-processing capacity with human interpretation, collaborative learning, and governance mechanisms to improve strategic decision quality. This integrated

perspective provides the operational foundation of the proposed framework by explaining how AI-generated knowledge becomes actionable strategic intelligence capable of supporting sustainable organizational performance.

To summarize these complementary theoretical perspectives, Table 5 outlines the distinct but interconnected roles of Organizational Information Processing Theory and Socio-Technical Systems Theory in supporting Decision Intelligence for Sustainable Business.

Table 5

Information Processing and Human–Technology Integration in DISB

Theory	Core Assumption	Contribution to DISB
Organizational Information Processing Theory (OIPT)	Organizations improve decisions by increasing their information-processing capacity.	Explains how AI enhances organizational sensing, analysis, and decision support under uncertainty.
Socio-Technical Systems Theory (STS)	Organizational performance depends on balancing technological and social systems.	Explains why AI, human judgment, governance, and organizational learning must function as an integrated decision system.

Table 5 illustrates that intelligent strategic decision-making requires more than analytical capability. Organizations must simultaneously develop robust information-processing mechanisms and effective collaboration between technological and human systems. These complementary perspectives provide the conceptual bridge to the sustainability dimension of the framework, where intelligent decisions are evaluated not only by their analytical quality but also by their contribution to long-term organizational and stakeholder value.

4.4 Sustainability and Stakeholder Value

While strategic management theories explain organizational capabilities and information-processing theories explain decision mechanisms, they do not fully address why organizations make strategic decisions or for whom value is created. Decision quality cannot be evaluated solely through efficiency, profitability, or predictive accuracy. Contemporary organizations operate within complex stakeholder ecosystems in which shareholders, customers, employees, regulators, communities, and society increasingly influence strategic priorities. Consequently, intelligent decision-making must also incorporate sustainability and responsible governance as fundamental decision criteria rather than treating them as secondary organizational objectives.

Stakeholder Theory provides this broader perspective by arguing that sustainable organizational success depends on balancing the interests of multiple stakeholder groups rather than focusing exclusively on shareholder returns [31]. Within the context of Decision Intelligence for Sustainable Business, this perspective expands the purpose of intelligent decision-making beyond operational optimization. AI-generated insights should therefore support decisions that create long-term organizational value while simultaneously considering environmental responsibility, social impact, ethical governance, and organizational resilience.

This perspective is particularly relevant because AI systems are increasingly involved in strategic decisions with significant societal implications, including resource allocation, workforce planning, investment evaluation, environmental management, and risk governance. Although AI improves analytical consistency, it cannot independently determine acceptable trade-offs between competing stakeholder interests or evaluate broader social consequences. These responsibilities remain

inherently managerial and require ethical judgment, organizational values, and governance mechanisms that extend beyond algorithmic optimization [7,9].

Integrating Stakeholder Theory into the proposed framework therefore broadens the definition of decision quality. Rather than measuring success exclusively through prediction accuracy or financial performance, Decision Intelligence for Sustainable Business evaluates strategic decisions according to their ability to generate sustainable value for organizations and their stakeholders over time. This perspective differentiates the proposed framework from existing Decision Intelligence models, which generally emphasize analytical effectiveness while giving comparatively limited attention to sustainability and governance.

Accordingly, Stakeholder Theory represents the normative foundation of the proposed framework. It ensures that AI-enabled strategic decisions remain aligned with organizational purpose, responsible governance, and long-term value creation. Together with the strategic management and information-processing perspectives discussed earlier, it completes the theoretical architecture supporting Decision Intelligence for Sustainable Business and prepares the integration of these complementary theories in the following subsection.

4.5 Integrated Theoretical Foundation

The preceding discussion demonstrates that no single organizational theory adequately explains how artificial intelligence, human judgment, strategic management, and sustainability collectively shape intelligent strategic decision-making. Each theoretical perspective contributes a distinct explanation, yet each also leaves important aspects unexplained when considered independently. Consequently, Decision Intelligence for Sustainable Business (DISB) requires an integrated theoretical foundation that combines complementary rather than competing perspectives.

The Resource-Based View explains why AI, organizational knowledge, data assets, and managerial expertise constitute strategic resources capable of creating competitive advantage. However, resource possession alone does not explain how organizations continuously adapt these resources in dynamic environments. This limitation is addressed by Dynamic Capabilities, which emphasize sensing environmental change, seizing opportunities, and reconfiguring organizational resources in response to uncertainty. Together, these theories explain the strategic value of intelligent decision capabilities but provide only limited insight into the processes through which information becomes actionable knowledge.

The Knowledge-Based View complements these perspectives by positioning organizational knowledge as the primary source of value creation. Within the proposed framework, AI transforms data into analytical insights, while managers interpret these insights through organizational experience, contextual understanding, and accumulated knowledge. This interaction explains how analytical outputs become meaningful strategic decisions rather than isolated technological recommendations.

The decision process itself is further explained through Organizational Information Processing Theory and Socio-Technical Systems Theory. Organizational Information Processing Theory clarifies how AI expands an organization's capacity to acquire, process, and interpret increasingly complex information. Socio-Technical Systems Theory explains why technological capability must remain aligned with human expertise, organizational structures, and governance mechanisms. Collectively, these theories demonstrate that decision quality depends on the integration of technological and social capabilities rather than technological sophistication alone.

Finally, Stakeholder Theory broadens the purpose of intelligent decision-making by emphasizing long-term value creation for multiple stakeholder groups. Strategic decisions are therefore evaluated not only by their analytical accuracy but also by their contribution to organizational resilience, responsible governance, and sustainable performance. This perspective ensures that decision intelligence extends beyond operational optimization toward sustainable strategic value creation.

The integration of these theoretical perspectives provides a comprehensive explanation of Decision Intelligence for Sustainable Business. Rather than treating AI as an independent technological capability, the proposed framework conceptualizes intelligent decision-making as a dynamic organizational capability that emerges through the interaction of strategic resources, organizational capabilities, information-processing mechanisms, human judgment, and sustainability-oriented governance.

To summarize this integration, Table 6 presents the contribution of each theoretical perspective to the proposed framework.

Table 6

Integrated Theoretical Foundation of Decision Intelligence for Sustainable Business

Theoretical Perspective	Principal Contribution	Role within the DISB Framework
Resource-Based View (RBV)	Explains strategic resources and competitive advantage	Positions AI, data, and managerial expertise as complementary strategic resources.
Dynamic Capabilities	Explains organizational adaptation under uncertainty	Supports continuous development and reconfiguration of intelligent decision capabilities.
Knowledge-Based View (KBV)	Explains knowledge creation and organizational learning	Integrates analytical insights with organizational knowledge and managerial experience.
Organizational Information Processing Theory (OIPT)	Explains organizational information processing	Describes how AI enhances sensing, analysis, and decision support.
Socio-Technical Systems Theory (STS)	Explains interaction between technology and people	Supports effective collaboration between AI, managers, and organizational processes.
Stakeholder Theory	Explains sustainable value creation	Ensures that strategic decisions balance economic, social, environmental, and governance objectives.

Table 6 demonstrates that the proposed framework is not derived from a single theoretical tradition but from the complementary integration of multiple organizational theories. This integrated perspective provides the conceptual foundation for the next section, which formally defines Decision Intelligence for Sustainable Business, establishes its conceptual boundaries, and identifies its core dimensions as a distinct organizational capability.

5. Conceptualizing Decision Intelligence for Sustainable Business

The preceding sections established that existing theories collectively explain important dimensions of intelligent strategic decision-making but do not provide a unified explanation of how artificial intelligence, human judgment, strategic management, and sustainability interact within organizations. This section addresses that limitation by conceptualizing Decision Intelligence for Sustainable Business (DISB) as a distinct organizational capability. The objective is to define the construct, clarify its conceptual boundaries, identify its essential characteristics, and distinguish it from related concepts frequently used in the literature.

5.1 Defining Decision Intelligence for Sustainable Business

The rapid evolution of AI has encouraged organizations to invest heavily in data infrastructure, analytical platforms, and intelligent technologies. However, these investments do not automatically improve strategic decisions. Organizations often possess similar technological capabilities yet achieve substantially different outcomes because they differ in how they integrate analytical insights into strategic decision processes. This observation suggests that decision quality depends less on technological sophistication than on the organizational capability to transform information into informed, adaptive, and sustainable strategic action.

Building on the theoretical foundations presented in the previous section, this study defines Decision Intelligence for Sustainable Business (DISB) as:

A dynamic organizational capability that integrates artificial intelligence, human judgment, organizational knowledge, strategic management, and sustainability principles to support adaptive, evidence-based, and responsible strategic decision-making that creates long-term organizational and stakeholder value.

This definition extends existing interpretations of Decision Intelligence in three important ways.

First, it shifts the focus from technology to organizational capability. While many studies associate Decision Intelligence primarily with AI, analytics, or decision automation, the proposed definition recognizes that technology represents only one component of intelligent decision-making. AI generates analytical insights, but those insights acquire strategic value only when interpreted through managerial expertise, organizational learning, and governance processes.

Second, the definition explicitly recognizes the complementary relationship between artificial intelligence and human judgment. Rather than viewing AI as a substitute for managerial decision-makers, DISB assumes that high-quality strategic decisions emerge through collaboration between computational intelligence and human reasoning. AI contributes speed, scalability, and analytical precision, whereas managers provide contextual interpretation, ethical reasoning, and strategic vision. The interaction between these capabilities strengthens organizational adaptability and improves decision quality under conditions of uncertainty.

Third, sustainability is positioned as an integral characteristic of intelligent decision-making rather than a separate organizational objective. Strategic decisions are evaluated not only according to efficiency or financial performance but also according to their contribution to organizational resilience, responsible governance, stakeholder value, and long-term competitiveness. Consequently, DISB expands the purpose of Decision Intelligence beyond optimization toward sustainable value creation.

Conceptualizing DISB as a dynamic organizational capability also distinguishes it from technology adoption models. Organizations do not develop Decision Intelligence simply by implementing AI systems or analytical software. Instead, they develop Decision Intelligence by continuously integrating technological resources, organizational knowledge, managerial capabilities, governance mechanisms, and sustainability objectives into coherent strategic decision processes. This capability evolves through organizational learning and continuous adaptation rather than through one-time technological investments. Accordingly, Decision Intelligence for Sustainable Business should be understood as an organizational capability that connects strategic resources, decision processes, and sustainable organizational outcomes. This broader interpretation provides a theoretical basis for explaining why organizations with comparable technological resources often achieve different strategic outcomes and why sustainable competitive advantage depends on effective capability integration rather than technology alone.

5.2 Conceptual Characteristics of DISB

Based on the preceding definition, Decision Intelligence for Sustainable Business exhibits several characteristics that distinguish it from existing decision-related concepts.

Dynamic. DISB continuously evolves as organizations acquire new knowledge, respond to environmental change, and refine decision processes. It is therefore better understood as an adaptive capability than as a fixed organizational resource.

Integrative. The framework combines multiple sources of intelligence—including AI, managerial expertise, organizational knowledge, and sustainability principles—within a unified decision architecture.

Strategic. Unlike operational decision-support technologies, DISB primarily addresses complex decisions that influence organizational direction, competitive positioning, innovation, resilience, and long-term performance.

Collaborative. Decision quality emerges through collaboration between intelligent technologies and human expertise rather than through technological automation alone.

Sustainability-oriented. Strategic decisions are assessed according to their long-term contribution to economic performance, organizational resilience, stakeholder value, and responsible governance.

These characteristics collectively distinguish DISB from existing concepts by positioning intelligent decision-making as an organizational capability that simultaneously addresses technological, managerial, and sustainability challenges.

To summarize these defining characteristics, Table 7 presents the core attributes of the proposed construct.

Table 7

Core Characteristics of Decision Intelligence for Sustainable Business

Characteristic	Description	Strategic Implication
Dynamic	Continuously adapts through organizational learning	Supports long-term adaptability
Integrative	Combines AI, human judgment, knowledge, and sustainability	Improves decision quality through capability integration
Strategic	Focuses on high-impact organizational decisions	Strengthens competitive positioning
Collaborative	Promotes human–AI complementarity	Balances analytical precision with managerial judgment
Sustainability-oriented	Aligns decisions with long-term stakeholder value	Supports resilient and responsible organizational performance

Table 7 demonstrates that DISB extends beyond existing interpretations of Decision Intelligence by integrating technological capability with strategic management and sustainability. These characteristics establish the conceptual identity of the proposed construct and provide the foundation for defining its dimensions and conceptual boundaries in the following subsection.

5.3 Dimensions of Decision Intelligence for Sustainable Business

The conceptualization of Decision Intelligence for Sustainable Business extends beyond defining a new construct; it also requires identifying the organizational capabilities through which the construct operates. Drawing upon the integrated theoretical foundation developed in the previous

section, this study proposes five interrelated dimensions that collectively explain how organizations develop and apply intelligent strategic decision-making. These dimensions should not be viewed as independent capabilities but as mutually reinforcing components of a unified organizational system.

The first dimension, Artificial Intelligence Capability, represents the organization's ability to collect, process, and analyze large volumes of data using intelligent technologies. This capability includes machine learning, predictive analytics, intelligent automation, and explainable AI. Its primary contribution is to enhance the speed, accuracy, and depth of strategic analysis by transforming data into actionable insights. However, AI capability alone does not create decision intelligence unless its outputs are effectively integrated into organizational decision processes.

The second dimension, Human Decision Capability, reflects the role of managerial expertise in interpreting analytical insights and making strategic judgments. Strategic decisions frequently involve uncertainty, conflicting objectives, and ethical considerations that cannot be fully addressed through computational models. Consequently, managers remain responsible for contextualizing AI-generated recommendations, balancing competing stakeholder interests, and exercising informed judgment when selecting strategic alternatives. Human capability therefore complements analytical intelligence by contributing experience, intuition, leadership, and strategic vision.

The third dimension, Knowledge Integration Capability, explains how organizations convert information into organizational knowledge. This capability encompasses knowledge sharing, organizational learning, cross-functional collaboration, and institutional memory. AI systems may generate valuable analytical outputs, but these outputs create organizational value only when they are interpreted, disseminated, and incorporated into strategic decision processes. Knowledge integration therefore acts as the mechanism through which analytical insights become organizational learning.

The fourth dimension, Strategic Management Capability, represents the organization's capacity to align intelligent decision-making with long-term strategic objectives. This capability involves environmental scanning, opportunity recognition, resource allocation, risk assessment, and organizational adaptation. Rather than treating AI as an isolated technological investment, strategic management capability ensures that intelligent decision processes remain aligned with organizational priorities and competitive positioning.

The fifth dimension, Sustainability Governance Capability, positions sustainability as an integral component of strategic decision-making. This capability incorporates environmental responsibility, social impact, ethical governance, regulatory compliance, and stakeholder engagement into organizational decisions. It broadens the evaluation of decision quality beyond financial performance by emphasizing resilience, responsible governance, and sustainable value creation.

Although each dimension performs a distinct function, their effectiveness depends on continuous interaction. AI capability provides analytical intelligence, human capability supplies strategic interpretation, knowledge integration transforms information into organizational learning, strategic management aligns decisions with organizational objectives, and sustainability governance ensures that strategic actions contribute to long-term stakeholder value. Decision Intelligence for Sustainable Business therefore emerges from the integration of these capabilities rather than from excellence in any single dimension.

To summarize the proposed construct, Table 8 presents the five dimensions and their respective roles within the DISB framework.

Table 8
Dimensions of Decision Intelligence for Sustainable Business

Dimension	Primary Function	Strategic Contribution
Artificial Intelligence Capability	Generate analytical insights from organizational data	Improves analytical quality and predictive capability
Human Decision Capability	Interpret information and exercise strategic judgment	Enhances contextual reasoning and leadership
Knowledge Integration Capability	Transform analytical outputs into organizational knowledge	Supports learning and informed decision-making
Strategic Management Capability	Align intelligent decisions with organizational strategy	Strengthens adaptability and competitive advantage
Sustainability Governance Capability	Incorporate ESG and stakeholder considerations into decisions	Promotes responsible and long-term value creation

Table 8 demonstrates that Decision Intelligence for Sustainable Business is a multidimensional organizational capability rather than a single technological resource. The proposed dimensions collectively explain how organizations integrate analytical intelligence with strategic management and sustainability to improve the quality of strategic decisions.

5.4 Conceptual Boundaries of DISB

Establishing clear conceptual boundaries is essential because Decision Intelligence is frequently confused with related concepts such as Artificial Intelligence, Business Intelligence, Business Analytics, and Decision Support Systems. Although these concepts are closely related, they differ in their objectives, scope, and organizational role.

Artificial Intelligence primarily refers to computational methods that enable machines to perform tasks requiring aspects of human intelligence, including learning, prediction, and pattern recognition. Business Intelligence focuses on transforming organizational data into information that supports managerial reporting and performance monitoring. Business Analytics extends this capability by applying statistical and predictive models to generate insights and support forecasting. Decision Support Systems provide analytical tools designed to assist managers in evaluating alternatives without replacing human judgment.

Decision Intelligence for Sustainable Business incorporates elements of each of these concepts but extends beyond them by emphasizing capability integration rather than technological functionality. It does not represent another analytical technology or software platform. Instead, it explains how organizations combine AI, human judgment, organizational knowledge, strategic management, and sustainability principles into a coherent decision capability capable of generating sustainable competitive advantage.

These conceptual boundaries distinguish DISB from existing constructs and reinforce its contribution as a new theoretical perspective. They also provide a clear foundation for the integrated strategic framework presented in the following section, where the relationships among the proposed dimensions are translated into an organizational model of intelligent strategic decision-making.

6. A Strategic Framework for Decision Intelligence for Sustainable Business

The preceding sections established the conceptual foundations of Decision Intelligence for Sustainable Business (DISB) and identified its five interrelated dimensions. This section advances the paper's primary contribution by integrating these dimensions into a unified strategic framework.

Rather than depicting Decision Intelligence as a sequence of isolated technological activities, the proposed framework conceptualizes it as a continuous organizational capability in which artificial intelligence, human judgment, knowledge integration, strategic management, and sustainability governance interact dynamically to improve strategic decision quality and organizational resilience.

6.1 Framework Architecture

The proposed framework is built upon the premise that sustainable strategic decisions emerge through the continuous interaction of technological, managerial, and organizational capabilities. Artificial intelligence provides analytical intelligence, but its organizational value depends on how managers interpret analytical outputs, integrate them with organizational knowledge, align them with strategic priorities, and evaluate their implications for long-term stakeholder value. Decision Intelligence therefore functions as a capability integration mechanism rather than a technological platform.

The framework begins with Artificial Intelligence Capability, which continuously acquires and analyzes internal and external organizational data. Through machine learning, predictive analytics, and explainable AI, this capability identifies opportunities, detects emerging risks, and generates evidence-based recommendations that support managerial decision-making. However, analytical outputs remain potential rather than realized value until they are evaluated by organizational decision-makers [3,9].

The second stage involves Human Decision Capability, where executives and managers interpret AI-generated insights using experience, strategic judgment, and contextual understanding. Rather than accepting algorithmic recommendations uncritically, managers assess their strategic relevance, organizational feasibility, ethical implications, and potential stakeholder consequences. This interaction transforms computational outputs into informed strategic alternatives, reinforcing the complementary relationship between artificial intelligence and managerial expertise [5,6].

These strategic alternatives are subsequently strengthened through Knowledge Integration Capability. Organizations consolidate analytical findings with accumulated organizational knowledge, previous strategic experience, and cross-functional expertise. This capability enables continuous organizational learning while preventing strategic decisions from relying exclusively on historical data or algorithmic prediction. Knowledge integration therefore acts as the mechanism through which information becomes organizational intelligence capable of supporting long-term strategic adaptation [11].

The framework then progresses to Strategic Management Capability, where intelligent insights are translated into organizational action. At this stage, managers evaluate alternative courses of action, allocate strategic resources, prioritize organizational initiatives, and align decisions with long-term objectives. Dynamic adaptation becomes particularly important because competitive environments continue to evolve after strategic decisions are implemented. Accordingly, organizations continuously monitor outcomes, reassess assumptions, and refine strategic responses as new information becomes available. This adaptive perspective aligns closely with recent discussions on strategic agility, which emphasize the ability to reconfigure organizational capabilities in response to environmental disruption [32].

The final stage consists of Sustainability Governance Capability, which evaluates strategic decisions according to broader organizational outcomes. Beyond financial performance, decisions are assessed through their contribution to environmental responsibility, ethical governance,

stakeholder relationships, organizational resilience, and long-term value creation. Consequently, sustainability functions not as a separate organizational objective but as a decision criterion embedded throughout the strategic decision process. Recent studies similarly argue that sustainable competitiveness increasingly depends on integrating ESG principles into strategic management rather than treating sustainability as an independent corporate initiative [33].

Importantly, the proposed framework is cyclical rather than linear. Organizational outcomes continuously generate new information that feeds subsequent decision cycles, allowing AI models, managerial expertise, and organizational knowledge to evolve together. Decision Intelligence for Sustainable Business therefore represents a learning capability that strengthens over time through continuous interaction between technology, people, and organizational experience.

To illustrate these relationships, Figure 1 presents the proposed Decision Intelligence for Sustainable Business framework.

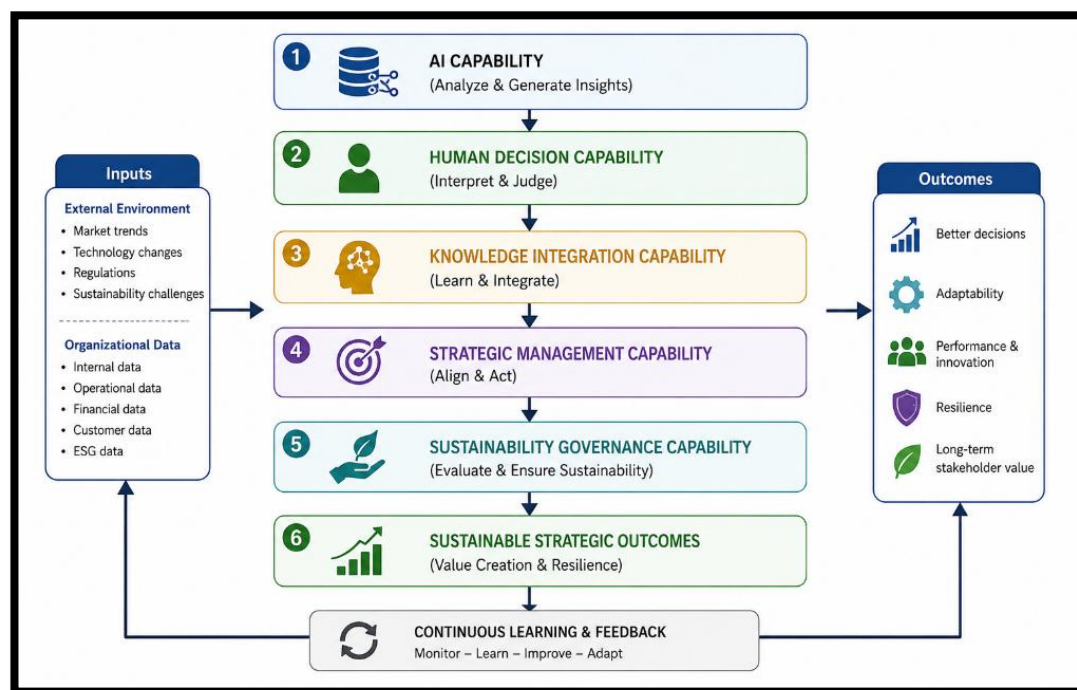


Fig. 1. Strategic Framework for Decision Intelligence for Sustainable Business

The framework illustrates that Decision Intelligence is not generated by any individual capability. Instead, it emerges through continuous interaction among analytical technologies, managerial expertise, organizational learning, strategic adaptation, and sustainability governance. This dynamic interaction differentiates the proposed framework from existing technology-centered models by positioning intelligent decision-making as an evolving organizational capability that supports sustainable business performance.

6.2 Interaction Among the Five Capabilities

The proposed Decision Intelligence for Sustainable Business (DISB) framework assumes that intelligent strategic decision-making emerges through the interaction of five complementary organizational capabilities rather than the independent contribution of any single capability. While each capability performs a distinct function, sustainable organizational value is created through their continuous integration. This interaction transforms analytical outputs into strategic actions that support organizational adaptability, resilience, and long-term competitiveness.

The process begins with Artificial Intelligence Capability, which continuously captures and analyzes internal and external organizational information. Through advanced analytics, machine learning, and explainable AI, this capability identifies opportunities, predicts emerging risks, and generates evidence-based recommendations. However, analytical outputs alone do not constitute organizational intelligence because they lack contextual interpretation and strategic prioritization [3,9].

These analytical insights are subsequently interpreted through Human Decision Capability. Managers evaluate AI-generated recommendations using experience, organizational knowledge, ethical reasoning, and strategic judgment. Rather than validating algorithmic outputs mechanically, decision-makers assess their feasibility, relevance, and alignment with organizational objectives. This interaction transforms analytical information into strategic alternatives suitable for executive decision-making [5,6].

The resulting strategic alternatives are strengthened through Knowledge Integration Capability, which combines AI-generated insights with organizational learning, institutional memory, and cross-functional expertise. Continuous knowledge sharing enables organizations to refine decision quality, reduce repetitive errors, and improve organizational adaptability. Consequently, decision intelligence evolves through cumulative organizational learning rather than isolated analytical performance [11].

Strategic alternatives are then translated into organizational action through Strategic Management Capability. At this stage, managers evaluate strategic priorities, allocate resources, coordinate implementation, and adapt organizational responses according to environmental changes. Strategic agility becomes particularly important because intelligent decisions require continuous reassessment as market conditions, stakeholder expectations, and technological developments evolve. Organizations capable of rapidly reconfiguring their resources are therefore more likely to convert analytical intelligence into sustainable competitive advantage [1,32].

The final capability, Sustainability Governance Capability, evaluates strategic decisions according to their long-term organizational and societal consequences. Beyond financial performance, decision outcomes are assessed through environmental responsibility, ethical governance, stakeholder engagement, regulatory compliance, and organizational resilience. Embedding sustainability throughout the decision process ensures that intelligent decisions create enduring value rather than short-term optimization [7,33]. An important characteristic of the proposed framework is the presence of a continuous feedback mechanism. Organizational outcomes generated by one decision cycle become new knowledge inputs for subsequent decisions. Performance indicators, stakeholder feedback, operational experience, and environmental changes continuously update AI models, managerial understanding, and organizational knowledge. This recursive learning process enables Decision Intelligence to evolve over time, strengthening organizational adaptability and improving future strategic decisions.

Accordingly, the relationship among the five capabilities should be viewed as dynamic and mutually reinforcing rather than sequential. Improvements in one capability strengthen the effectiveness of the others, while weaknesses in any single capability reduce the overall effectiveness of the Decision Intelligence system. Sustainable strategic performance therefore depends on maintaining balance across all five organizational capabilities rather than maximizing technological capability alone.

To summarize these relationships, Table 9 presents the interaction mechanism underlying the proposed framework.

Table 9

Interaction Among the Five Capabilities of Decision Intelligence for Sustainable Business

Capability	Primary Role	Interaction with Other Capabilities
Artificial Intelligence Capability	Generates analytical insights	Provides evidence for managerial interpretation and organizational learning
Human Decision Capability	Interprets and evaluates strategic alternatives	Transforms analytical outputs into strategic judgments
Knowledge Integration Capability	Converts information into organizational knowledge	Connects AI insights with organizational learning and collaboration
Strategic Management Capability	Aligns decisions with organizational objectives	Translates intelligent insights into adaptive strategic actions
Sustainability Governance Capability	Evaluates long-term organizational and stakeholder value	Ensures responsible, resilient, and sustainable strategic outcomes

Table 9 highlights that Decision Intelligence for Sustainable Business functions as an integrated capability system rather than a collection of independent organizational resources. The interaction among these five capabilities enables organizations to continuously transform data into knowledge, knowledge into strategic decisions, and strategic decisions into sustainable organizational value.

6.3 The Decision Process within the DISB Framework

The Decision Intelligence for Sustainable Business (DISB) framework conceptualizes strategic decision-making as a continuous organizational learning cycle rather than a sequence of isolated activities. The framework assumes that intelligent decisions emerge through iterative interactions among analytical technologies, managerial expertise, organizational knowledge, strategic adaptation, and sustainability governance. Each decision cycle generates new knowledge that improves future decisions, enabling organizations to strengthen their decision capabilities over time.

The process begins with environmental sensing, where Artificial Intelligence Capability continuously monitors internal operations and the external environment. AI technologies collect and analyze structured and unstructured data, identify emerging trends, detect potential risks, and generate predictive insights. These outputs provide an evidence base for strategic decision-making but do not independently determine organizational actions [3,9].

The second stage involves managerial interpretation. Human Decision Capability evaluates AI-generated insights using strategic experience, contextual understanding, organizational priorities, and ethical reasoning. Managers assess whether analytical recommendations are feasible, consistent with organizational objectives, and appropriate within the prevailing business environment. This stage ensures that analytical intelligence is translated into informed strategic judgment rather than automatic decision execution [5,6].

The third stage focuses on knowledge integration. Analytical insights and managerial assessments are consolidated through organizational learning, cross-functional collaboration, and knowledge sharing. This integration enables organizations to refine strategic alternatives, reduce uncertainty, and improve decision consistency. It also prevents critical knowledge from remaining isolated within individuals or technological systems, thereby strengthening institutional learning and long-term capability development [11].

Following knowledge integration, organizations enter the strategic execution stage. Managers allocate resources, implement strategic initiatives, coordinate organizational activities, and

continuously monitor implementation progress. Strategic Management Capability ensures that intelligent decisions remain aligned with organizational objectives while maintaining sufficient flexibility to respond to changing environmental conditions. This adaptive process reflects the importance of strategic agility in sustaining competitive advantage within dynamic business environments [1,32].

The final stage involves sustainability evaluation and organizational learning. Strategic outcomes are assessed using both organizational performance indicators and broader sustainability measures, including stakeholder value, governance quality, environmental responsibility, and organizational resilience. Lessons derived from implementation are incorporated into organizational knowledge and used to refine AI models, managerial practices, and strategic processes. This feedback mechanism transforms individual decisions into organizational learning, enabling continuous improvement of the Decision Intelligence system [7,33].

Accordingly, the DISB framework should be viewed as a recursive learning system rather than a linear decision model. Each completed decision cycle strengthens the organization's ability to acquire knowledge, adapt to environmental change, and improve future strategic decisions. Through continuous interaction among its five capabilities, the framework supports sustainable competitive advantage while enhancing organizational resilience and long-term value creation.

To illustrate this operational logic, Figure 2 presents the Decision Intelligence cycle proposed in this study.

Figure 2 demonstrates that Decision Intelligence is an adaptive organizational capability characterized by continuous learning rather than one-time decision optimization. The recursive nature of the framework enables organizations to refine analytical models, strengthen managerial capabilities, and improve strategic performance as environmental conditions evolve.

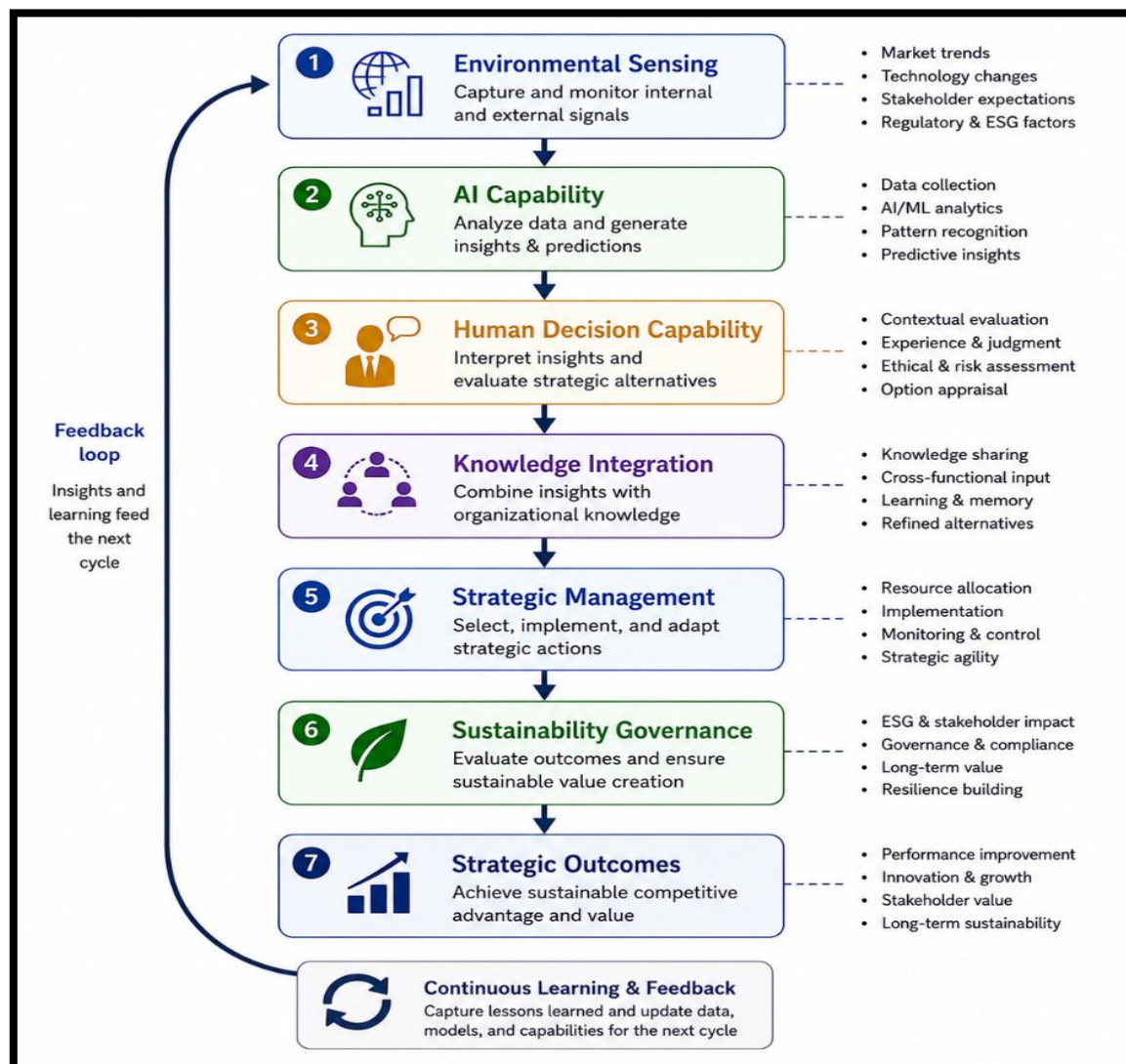


Fig. 2. Operational Decision Cycle of the DISB Framework

7. Theoretical Propositions

The proposed Decision Intelligence for Sustainable Business (DISB) framework explains how artificial intelligence, human judgment, organizational knowledge, strategic management, and sustainability governance interact to improve strategic decision-making. Although the framework is conceptual, it establishes theoretically grounded relationships that can be examined empirically in future research. This section develops a set of propositions derived directly from the integrated theoretical foundation and the interactions among the five capabilities proposed in the framework.

7.1 Artificial Intelligence and Human Decision Capability

Artificial Intelligence Capability enhances an organization's ability to identify patterns, generate predictions, and evaluate strategic alternatives. However, the literature consistently suggests that analytical outputs alone are insufficient for high-quality strategic decisions. Managers remain responsible for interpreting recommendations, assessing contextual factors, and balancing

organizational objectives with ethical and stakeholder considerations. Consequently, the contribution of AI depends largely on its interaction with Human Decision Capability rather than on algorithmic performance alone.

Proposition 1 (P1). *Artificial Intelligence Capability positively influences strategic decision quality through its complementary interaction with Human Decision Capability.*

7.2 Human Decision Capability and Knowledge Integration

Managerial interpretation creates value only when knowledge is shared and embedded within organizational processes. Knowledge Integration Capability enables organizations to combine AI-generated insights with organizational experience, institutional memory, and cross-functional expertise. This process strengthens organizational learning while improving the consistency and quality of future strategic decisions.

Proposition 2 (P2). *Human Decision Capability positively enhances Knowledge Integration Capability by transforming analytical insights into organizational knowledge.*

7.3 Knowledge Integration and Strategic Management

Knowledge integration provides the informational foundation for strategic planning and organizational adaptation. Organizations that effectively integrate analytical knowledge into decision processes are better positioned to allocate resources, recognize emerging opportunities, and respond to environmental change. Strategic Management Capability therefore depends on the organization's ability to transform knowledge into coordinated strategic action.

Proposition 3 (P3). *Knowledge Integration Capability positively influences Strategic Management Capability by improving organizational learning and adaptive decision-making.*

7.4 Strategic Management and Sustainability Governance

Strategic decisions increasingly require organizations to balance competitive objectives with environmental, social, and governance responsibilities. Sustainability Governance Capability ensures that strategic initiatives remain aligned with stakeholder expectations, ethical standards, and long-term organizational resilience. Strategic management therefore provides the mechanism through which sustainability principles become embedded within organizational decision processes.

Proposition 4 (P4). *Strategic Management Capability positively strengthens Sustainability Governance Capability by aligning strategic decisions with long-term stakeholder value.*

7.5 Sustainability Governance and Organizational Outcomes

Organizations that systematically incorporate sustainability into strategic decision-making are more likely to develop resilient business models, strengthen stakeholder trust, and sustain competitive advantage. Sustainability Governance Capability therefore represents the final mechanism through which intelligent decisions generate enduring organizational value.

Proposition 5 (P5). *Sustainability Governance Capability positively influences sustainable organizational performance through responsible and adaptive strategic decision-making.*

7.6 Continuous Organizational Learning

The DISB framework assumes that intelligent decision-making is recursive rather than linear. Organizational outcomes generated from one decision cycle become new inputs for subsequent decisions, enabling AI models, managerial expertise, and organizational knowledge to evolve continuously. Continuous learning therefore strengthens each organizational capability and enhances future decision quality.

Proposition 6 (P6). *Continuous organizational learning positively reinforces the interaction among the five Decision Intelligence capabilities, improving long-term strategic adaptability.*

7.7 Integrated Decision Intelligence Capability

Although each capability contributes independently to organizational decision-making, the proposed framework argues that sustainable value emerges through their combined interaction. Organizations demonstrating balanced development across all five capabilities should achieve higher-quality strategic decisions than organizations emphasizing technological capability alone.

Proposition 7 (P7). *The integrated interaction among Artificial Intelligence Capability, Human Decision Capability, Knowledge Integration Capability, Strategic Management Capability, and Sustainability Governance Capability positively enhances Decision Intelligence for Sustainable Business.*

7.8 Decision Intelligence and Sustainable Competitive Advantage

The ultimate contribution of the proposed framework is the development of a dynamic organizational capability capable of sustaining long-term competitive performance. Organizations that effectively develop Decision Intelligence are expected to improve strategic adaptability, organizational resilience, innovation capacity, governance quality, and stakeholder value simultaneously.

Proposition 8 (P8). *Decision Intelligence for Sustainable Business positively contributes to sustainable competitive advantage through continuous capability integration, organizational learning, and responsible strategic decision-making.*

The eight propositions collectively explain the causal logic underpinning the proposed framework. Rather than examining isolated technological effects, they conceptualize Decision Intelligence as an integrated organizational capability that evolves through continuous interaction among technology, people, knowledge, strategy, and sustainability. These propositions also provide a structured agenda for future empirical research aimed at validating and extending the proposed framework across different organizational and institutional contexts.

8. Discussion and Implications

The proposed Decision Intelligence for Sustainable Business (DISB) framework extends current understanding of intelligent organizational decision-making by integrating artificial intelligence, human judgment, strategic management, organizational learning, and sustainability within a unified conceptual model. Unlike existing approaches that primarily emphasize technological capability, the proposed framework conceptualizes Decision Intelligence as a dynamic organizational capability that evolves through continuous interaction among complementary resources and capabilities. This section discusses the principal theoretical, managerial, and policy implications of the proposed framework.

8.1 Theoretical Implications

This study makes several contributions to the emerging literature on Decision Intelligence and strategic management.

First, it contributes to the conceptual development of Decision Intelligence by providing a clearer theoretical definition and establishing explicit conceptual boundaries. Previous studies have frequently associated Decision Intelligence with business analytics, artificial intelligence, or decision support technologies, resulting in overlapping definitions and inconsistent applications. The proposed framework addresses this ambiguity by positioning Decision Intelligence for Sustainable Business (DISB) as a higher-order organizational capability rather than another analytical technology. This perspective broadens the concept beyond algorithmic performance and emphasizes the organizational processes through which analytical insights become strategic decisions.

Second, the study advances theory by integrating multiple organizational perspectives into a coherent explanatory framework. Rather than relying on a single theoretical lens, DISB combines strategic resource theory, organizational capability theory, information-processing theory, socio-technical systems thinking, and stakeholder-oriented governance. This integration demonstrates that intelligent strategic decision-making cannot be adequately explained through technological capability alone. Instead, it emerges from the interaction of organizational resources, managerial judgment, knowledge integration, and governance mechanisms. The resulting framework therefore provides a more comprehensive explanation of intelligent organizational behavior under conditions of uncertainty.

Third, the framework extends the relationship between artificial intelligence and strategic management. Existing AI research often evaluates intelligent systems according to prediction accuracy, automation efficiency, or computational performance. While these dimensions remain important, they explain only part of organizational decision quality. The proposed framework argues that AI creates strategic value only when embedded within organizational decision processes supported by managerial expertise and institutional learning. This interpretation is consistent with recent work emphasizing AI as an enabler of sustainable strategic governance rather than an autonomous decision-maker [8].

Another theoretical contribution concerns the integration of explainability into strategic decision-making. As AI systems become increasingly sophisticated, organizations face growing challenges related to transparency, accountability, and managerial trust. The proposed framework recognizes explainability as a critical mechanism that connects analytical outputs with managerial interpretation, thereby strengthening the interaction between computational intelligence and

human judgment. This perspective complements recent research on explainable AI by extending its application from algorithmic transparency to organizational decision capability [9].

The study also contributes to the sustainability literature by positioning sustainability as a core decision criterion rather than a downstream organizational outcome. Most existing studies discuss sustainability after strategic decisions have been made, focusing on performance evaluation or ESG reporting. In contrast, DISB embeds sustainability within the decision process itself, ensuring that environmental responsibility, social impact, governance quality, and long-term stakeholder value influence strategic choices from the outset. This perspective strengthens the theoretical connection between intelligent decision-making and sustainable value creation.

Finally, the framework contributes methodologically by offering a structured foundation for future empirical research. The five proposed dimensions and the eight theoretical propositions provide a coherent basis for developing measurement scales, testing causal relationships, and validating Decision Intelligence across different industries and organizational contexts. Consequently, the study not only introduces a new conceptual framework but also establishes a research agenda capable of supporting cumulative theory development within the emerging field of Decision Intelligence.

8.2 Managerial Implications

The proposed Decision Intelligence for Sustainable Business (DISB) framework offers practical guidance for organizations seeking to improve strategic decision-making in increasingly complex and data-intensive environments. Rather than recommending greater dependence on artificial intelligence alone, the framework emphasizes developing complementary organizational capabilities that enable technology and human expertise to function as an integrated decision system.

A primary implication concerns organizational capability development. Many organizations invest significantly in AI technologies but obtain inconsistent strategic outcomes because technological adoption is not accompanied by corresponding investments in leadership, governance, knowledge management, and organizational learning. The proposed framework suggests that AI initiatives should be implemented alongside capability-building programs that strengthen managerial judgment, cross-functional collaboration, and decision governance. This integrated approach increases the likelihood that analytical insights will be translated into effective strategic actions rather than remaining isolated technical outputs. Such an approach is consistent with recent work highlighting digital transformation as an organizational capability rather than a purely technological process [34].

The framework also highlights the importance of leadership and strategic agility. Managers are increasingly required to make decisions under conditions characterized by rapid technological change, market volatility, and evolving stakeholder expectations. Decision Intelligence enables executives to combine predictive analytics with strategic judgment while continuously adapting organizational priorities as new information becomes available. Organizations capable of integrating intelligent technologies with agile strategic processes are therefore better positioned to respond to disruption, recognize emerging opportunities, and sustain competitive advantage in dynamic environments [32].

Another managerial implication relates to knowledge management. Decision Intelligence should be supported by organizational mechanisms that facilitate knowledge sharing, organizational learning, and collaboration across functional boundaries. AI-generated insights become strategically

valuable only when they are interpreted collectively and incorporated into organizational routines. Managers should therefore establish governance structures that encourage interdisciplinary collaboration and continuous learning while ensuring that organizational knowledge remains accessible beyond individual decision-makers.

The proposed framework further emphasizes the strategic importance of embedding sustainability into decision processes. Rather than treating sustainability as a compliance requirement or a separate corporate initiative, organizations should incorporate environmental, social, and governance (ESG) considerations into strategic evaluation, resource allocation, and performance assessment. Integrating sustainability throughout the decision cycle strengthens organizational resilience, enhances stakeholder trust, and supports long-term competitiveness. This perspective reinforces previous research arguing that sustainability should be understood as a core management strategy rather than a peripheral organizational objective [35,33].

Implementation also requires systematic strategic assessment. Organizations should periodically evaluate whether their decision capabilities remain aligned with changing competitive conditions, technological developments, and stakeholder expectations. Strategic assessment tools, including SWOT-based capability analysis, can help managers identify organizational strengths, capability gaps, emerging risks, and improvement priorities before major strategic decisions are implemented. Such evaluations contribute to continuous capability development and strengthen organizational preparedness for future disruption [36].

Finally, successful implementation of DISB depends on organizational governance. Managers should establish transparent decision processes, define clear accountability for AI-supported decisions, and ensure that analytical recommendations remain subject to appropriate managerial oversight. Continuous performance monitoring and organizational feedback should also be integrated into decision systems so that both AI models and managerial practices evolve through experience. Consequently, Decision Intelligence becomes a continuously improving organizational capability rather than a one-time technology implementation project.

Collectively, these implications demonstrate that successful Decision Intelligence requires organizational transformation rather than technological modernization alone. Organizations that simultaneously strengthen AI capability, leadership, organizational learning, strategic agility, and sustainability governance are more likely to improve decision quality while achieving resilient and sustainable long-term performance.

8.3 Policy Implications

The increasing integration of artificial intelligence into organizational decision-making extends beyond individual firms and creates new challenges for governments, regulators, and public institutions. As AI becomes embedded within strategic decisions affecting investment, employment, sustainability, and resource allocation, policy frameworks must evolve to ensure that intelligent decision systems remain transparent, accountable, and aligned with broader societal objectives. The proposed Decision Intelligence for Sustainable Business (DISB) framework provides a conceptual foundation that can support the development of governance policies balancing technological innovation with responsible decision-making.

A primary implication concerns AI governance. Policymakers should encourage organizations to adopt governance mechanisms that promote transparency, explainability, accountability, and human oversight in AI-supported strategic decisions. Regulatory frameworks should emphasize that

organizations remain responsible for decisions informed by AI, particularly in situations involving significant economic, environmental, or social consequences. This approach strengthens public trust while supporting the responsible adoption of intelligent technologies.

The framework also has implications for national digital transformation strategies. Governments increasingly promote AI adoption as a driver of productivity, competitiveness, and innovation. However, technological investment alone is unlikely to deliver sustainable development outcomes unless accompanied by investments in organizational capabilities, managerial skills, institutional learning, and governance capacity. Public policies that encourage capability development alongside digital infrastructure are therefore more likely to generate long-term economic and social benefits.

Another implication relates to sustainability governance and ESG implementation. Regulators are progressively introducing reporting requirements related to environmental, social, and governance performance. The proposed framework suggests that these requirements should extend beyond disclosure by encouraging organizations to integrate sustainability directly into strategic decision processes. Embedding ESG considerations within decision-making strengthens organizational resilience and improves the alignment between corporate strategy and sustainable development objectives. This perspective is consistent with research emphasizing the importance of identifying critical success factors that support the effective implementation of sustainable development policies rather than relying solely on performance measurement [37]. The framework also highlights the importance of cross-sector collaboration. Governments, businesses, universities, and civil society organizations should cooperate in developing standards, educational initiatives, and research programs that strengthen organizational decision capabilities. Such collaboration can accelerate responsible AI adoption while improving the quality of strategic decisions across both public and private sectors.

Finally, the proposed framework has implications for public-sector decision-making. Government agencies increasingly face complex policy challenges involving climate change, infrastructure, healthcare, and economic development. Applying Decision Intelligence principles can support evidence-based policymaking while ensuring that analytical insights remain balanced with public values, institutional knowledge, and long-term societal priorities. Recent research on climate governance similarly demonstrates that effective policy implementation depends on integrating technological capability with multilevel governance, stakeholder participation, and institutional coordination [38].

Overall, the policy implications of DISB extend beyond organizational performance. The framework provides a basis for designing governance systems that promote responsible AI adoption, strengthen institutional decision-making, and support sustainable development through integrated strategic intelligence. Consequently, Decision Intelligence should be viewed not only as an organizational capability but also as a governance capability capable of supporting resilient and sustainable economic development.

9. Future Research Agenda

The proposed Decision Intelligence for Sustainable Business (DISB) framework provides a conceptual foundation for understanding how artificial intelligence, human judgment, strategic management, and sustainability can be integrated into a unified organizational capability. As a theory-building study, its primary objective is conceptual development rather than empirical

validation. Consequently, several opportunities exist to extend and refine the proposed framework through future research.

First, future studies should develop and validate measurement scales for the five capabilities proposed in the DISB framework. Reliable measurement instruments would enable researchers to operationalize Artificial Intelligence Capability, Human Decision Capability, Knowledge Integration Capability, Strategic Management Capability, and Sustainability Governance Capability across different organizational settings. Such work would facilitate quantitative testing of the relationships proposed in this study.

Second, researchers should empirically examine the theoretical propositions developed in Section 7. Structural equation modeling, partial least squares structural equation modeling (PLS-SEM), covariance-based SEM, and multi-level analytical approaches could be employed to evaluate the relationships among the proposed capabilities. Comparative analyses across industries would also help determine whether the framework performs differently in manufacturing, services, healthcare, finance, and public-sector organizations.

Third, future research should investigate contextual factors that may influence the effectiveness of Decision Intelligence. Organizational size, digital maturity, leadership style, data quality, institutional environments, and national regulatory frameworks may strengthen or weaken the interaction among the proposed capabilities. Examining these contextual conditions would improve understanding of when and how Decision Intelligence generates sustainable organizational value.

Fourth, longitudinal studies are needed to examine capability development over time. Decision Intelligence is conceptualized as a dynamic organizational capability that evolves through continuous learning and strategic adaptation. Longitudinal research could explain how organizations progressively strengthen their decision capabilities, refine AI-supported decision processes, and improve organizational resilience through repeated learning cycles.

Fifth, future studies should investigate the role of emerging AI technologies within the DISB framework. Recent advances in generative AI, autonomous agents, explainable AI, digital twins, and intelligent decision platforms present new opportunities for supporting strategic decision-making. Evaluating how these technologies influence organizational learning, managerial judgment, and sustainability governance would further extend the proposed framework. Another promising direction concerns cross-country and cross-cultural comparisons. Institutional environments, governance structures, cultural values, and regulatory systems influence organizational decision-making in different ways. Comparative studies could determine whether the proposed framework requires contextual adaptation across developed and emerging economies or whether its core capabilities remain universally applicable.

Finally, future research should explore public-sector and non-profit applications of Decision Intelligence. Although this study primarily focuses on business organizations, the proposed framework may also support strategic decision-making in government agencies, healthcare systems, educational institutions, and international organizations. Examining these settings would broaden the theoretical scope of Decision Intelligence while demonstrating its applicability beyond the private sector. Collectively, these research directions establish a comprehensive agenda for advancing Decision Intelligence scholarship. They also provide a pathway for transforming the proposed conceptual framework into an empirically validated theory capable of informing both academic research and organizational practice.

10. Conclusion

This study introduced Decision Intelligence for Sustainable Business (DISB) as a new conceptual framework for understanding how organizations can integrate artificial intelligence, human judgment, strategic management, and sustainability into a unified decision capability. The framework responds to the growing need for decision approaches that move beyond technological efficiency and support long-term organizational resilience, adaptability, and value creation in increasingly complex business environments.

The paper argued that existing research has made important contributions to artificial intelligence, decision support, business analytics, strategic management, and sustainability. However, these research streams have largely evolved independently, resulting in fragmented explanations of organizational decision-making. By integrating complementary theoretical perspectives into a single framework, the study provides a broader understanding of how intelligent strategic decisions are developed and how they contribute to sustainable organizational performance.

A central contribution of the study is the conceptualization of Decision Intelligence as a dynamic organizational capability rather than a technological application. The proposed framework demonstrates that effective strategic decisions emerge through the interaction of five complementary capabilities: Artificial Intelligence Capability, Human Decision Capability, Knowledge Integration Capability, Strategic Management Capability, and Sustainability Governance Capability. These capabilities operate as an interconnected system in which analytical intelligence, managerial expertise, organizational learning, and responsible governance continuously reinforce one another.

The study also contributes by establishing clear conceptual boundaries for Decision Intelligence for Sustainable Business and distinguishing it from related concepts such as Artificial Intelligence, Business Intelligence, Business Analytics, and Decision Support Systems. This clarification strengthens conceptual consistency and provides a more robust foundation for future theoretical and empirical research.

From a practical perspective, the framework offers organizations a structured approach for improving strategic decision-making. Rather than encouraging greater reliance on artificial intelligence alone, it highlights the importance of balancing technological capability with leadership, organizational learning, governance, and sustainability. This perspective enables organizations to transform data into strategic knowledge, improve organizational adaptability, and create long-term value for both the organization and its stakeholders.

The proposed theoretical propositions and integrated framework also establish a foundation for future empirical investigation. Researchers can operationalize the proposed capabilities, examine their interrelationships across different organizational contexts, and evaluate their influence on strategic performance, innovation, organizational resilience, and sustainable competitive advantage. Such studies will contribute to the continued development of Decision Intelligence as an emerging field of research. Like all conceptual studies, this paper has limitations. The proposed framework has not yet been empirically validated and should therefore be viewed as a theoretical foundation rather than a finalized explanatory model. Future empirical studies are expected to refine the proposed dimensions, examine contextual influences, and evaluate the framework across industries, organizational sizes, and institutional settings.

In conclusion, Decision Intelligence for Sustainable Business provides a comprehensive perspective on intelligent strategic decision-making by integrating technology, human expertise, organizational capabilities, and sustainability within a single conceptual architecture. As

organizations continue to operate in environments characterized by rapid technological change, increasing uncertainty, and growing sustainability expectations, the ability to develop integrated decision capabilities is likely to become a critical determinant of long-term success. The framework proposed in this study offers a foundation for advancing both academic research and managerial practice while supporting the evolution of more adaptive, responsible, and sustainable organizations.

Author Contributions

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Conflicts of Interest

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Artificial intelligence tools were used solely to assist with language refinement, editorial improvement, manuscript organization, and the generation of conceptual illustrations (Figures 1 and 2). All AI-generated figures were critically reviewed, revised where necessary, and approved by the author to ensure that they accurately represent the proposed conceptual framework. The conceptual development, theoretical integration, literature synthesis, interpretation, analysis, and all scientific conclusions are entirely the responsibility of the author, who has verified the accuracy, originality, and integrity of the final manuscript.

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