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# REDEFINING ARTIFICIAL INTELLIGENCE FOR STRATEGIC VALUE CREATION: FROM DIGITAL LITERACY TO BOARDROOM DOMINANCE THROUGH COGNITIVE AUGMENTATION AND IMPOSSIBILITY THINKING

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**A R T I C L E I N F O.**

**Keywords:** Cognitive Augmentation, Digital Literacy for Executives, AI driven Strategic Imagination, Boardroom Digital Literacy, AI in Strategic Decision making

**Abstract.**

This paper advances a deliberate re examination of artificial intelligence, not as an instrument of efficiency, but as a force that reshapes human cognition and strategic possibility. The central claim is straightforward: organisations that treat AI as automation will plateau, while those that integrate it into thinking itself will redefine performance boundaries.

Drawing on emerging literature in AI augmented decision making, cognitive enhancement, and digital capability development, the study develops an integrated framework linking digital literacy, cognitive augmentation, impossibility thinking, and boardroom decision superiority. Evidence suggests that AI increasingly functions as a cognitive partner, influencing reasoning, creativity, and judgement rather than merely executing predefined tasks (Alshammari and Alshammari, 2026). At the same time, gaps in executive understanding persist, particularly at governance levels, where many leaders remain underprepared to engage meaningfully with AI driven insight (Cossin and Saito, 2025).

The paper contributes in three ways. First, it repositions AI within a cognitive and strategic paradigm. Second, it elevates digital literacy from a technical skill to a strategic competence shaping organisational judgement. Third, it introduces impossibility thinking as a mechanism through which AI expands strategic imagination and enables outcomes previously considered unattainable.

The argument is not speculative. It is grounded in observable shifts across organisations where AI informs scenario modelling, risk anticipation, and executive decision processes. What emerges is a new reality: strategic advantage now depends on how well organisations integrate artificial intelligence into the architecture of thinking itself.

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## Introduction

The conversation around artificial intelligence has been framed too narrowly. Efficiency dominates the narrative. Automation is celebrated. Yet something more fundamental is happening beneath the surface. AI is altering how decisions are constructed, how uncertainty is interpreted, and how possibilities are defined.

Research confirms that AI integration is already reshaping leadership competencies and decision frameworks within organisations [1]. At the same time, adoption remains uneven, with many firms constrained by cultural resistance and limited technical understanding [2]. This reveals a gap between technological potential and organisational reality.

Technology does not fail organisations. Misunderstanding does. A board that approaches AI as a reporting tool will use it for retrospective insight. A board that understands AI as a cognitive system will use it to construct futures. The difference is not marginal. It is structural.

This paper takes that distinction seriously. It does not ask how AI improves operations. It asks how AI changes the way leaders think, and how that shift translates into strategic dominance.

The approach is integrative. Rather than isolating technology, the discussion connects AI with digital literacy, cognitive augmentation, and strategic imagination. Each element on its own is valuable. Together, they redefine what organisations are capable of achieving.

## Theoretical Development and Hypotheses

### 1. Redefining Artificial Intelligence: From Automation to Cognitive Partner

The dominant understanding of artificial intelligence has been shaped by a narrow premise: machines exist to automate human tasks. That premise has guided both managerial practice and academic conversation for decades. Yet it is no longer sufficient. Automation assumes a clear boundary between human thinking and machine execution. Humans define goals, machines perform actions. The model is linear, predictable, and ultimately limited. What we now observe, however, is a shift away from execution and towards participation in cognition itself. AI systems do not merely act, they influence how decisions are conceptualised, evaluated, and refined.

Emerging research supports this reinterpretation. Artificial intelligence increasingly functions as a cognitive partner, one that enhances reasoning, supports creativity, and contributes to knowledge formation [3]. This is not a cosmetic change in terminology. It represents a deeper transformation in the structure of organisational intelligence. Consider the difference in practical terms. In a traditional financial planning environment, analysts compile data, generate projections, and present findings. The process is sequential, and human cognitive limits constrain the range of scenarios considered. In contrast, an AI-augmented system can simulate multiple economic pathways simultaneously, revealing interactions that would otherwise remain invisible. The executive is no longer simply reviewing results. They are engaging in a dialogue with a system that actively shapes the decision landscape.

This is where the concept of cognitive infrastructur**e** becomes essential. AI is not an external tool, it becomes embedded within the organisation's thinking processes. It influences how problems are framed and how solutions are imagined. As research on AI-driven leadership indicates, this transformation alters not only decision outcomes but also the competencies required of leaders themselves [4]

However, this shift introduces tension. When AI participates in reasoning, questions of authority become less straightforward. Who is accountable for decisions shaped by algorithmic insight? Where does human judgement end and machine influence begin? These are not abstract concerns. If organisations adopt AI without rethinking governance structures, they risk creating systems where decisions are followed without being fully understood. The danger is not only technical failure but cognitive disengagement. Yet the opportunity is equally significant. When organisations treat AI as a cognitive partner rather than an execution tool, they unlock a qualitatively different form of strategic capability.



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**Hypothesis 1 (H1):**
Organisations that conceptualise AI as a cognitive partner will demonstrate higher strategic decision quality than those that treat AI primarily as an automation tool.

## 2. Digital Literacy as Strategic Capability

Digital literacy has often been discussed in operational terms, associated with technical proficiency or basic engagement with digital tools. That framing is no longer adequate at the level of senior leadership. The area of concern here is executive digital literacy, a form of understanding that goes beyond usage and extends into interpretation, critique, and integration. It is the capacity to engage with AI as an intellectual system rather than as a black box.

Frameworks on AI literacy identify three core capacities: understanding how AI systems operate, evaluating their outputs critically, and applying insights in meaningful contexts [5]. At the boardroom level, these capacities take on a strategic dimension.

Let us consider a concrete example.

A board reviewing an AI-driven risk model may receive outputs indicating potential vulnerabilities in a supply chain. Without sufficient literacy, these outputs may be accepted at face value or dismissed due to lack of trust. Neither response is adequate. A digitally literate board interrogates the model. It examines underlying assumptions, questions data sources, and explores alternative interpretations.

This capacity becomes even more critical when we consider current evidence. Many boards remain underprepared to engage with AI meaningfully, with a significant proportion lacking even basic understanding of its capabilities [6].

This creates a structural asymmetry. Organisations invest heavily in AI systems, yet fail to invest proportionally in the cognitive capability required to use them effectively.

The strategic implication is clear. Digital literacy is not a supporting skill. It is a determinant of value extraction from AI.

Without it, AI remains underutilised. With it, AI becomes a source of insight, foresight, and competitive differentiation.

**Hypothesis 2 (H2):**
Executive digital literacy is positively associated with the effective utilisation of AI in strategic decision-making.

## 3. Cognitive Augmentation and Decision Superiority

The concept of cognitive augmentation sits at the centre of this study. It represents the mechanism through which AI creates value, not by replacing human thought, but by extending it.

Cognitive augmentation operates across several dimensions. First, it enhances analytical capacity, allowing decision-makers to process complex datasets with greater depth. Second, it expands creative thinking by generating novel combinations of ideas. Third, it supports strategic reasoning by enabling the exploration of multiple scenarios simultaneously.

Empirical work supports this perspective. AI-driven augmentation has been shown to improve both productivity and innovation quality, particularly in environments characterised by complexity and uncertainty [7].

Let us ground this in practice:

In global logistics, disruptions are rarely isolated. A delay in one region can cascade across multiple supply chains. Traditional decision-making struggles to account for this level of interdependence. AI systems, however, can model these interactions dynamically, allowing executives to evaluate competing response strategies in real time.

This produces a distinct form of advantage: Decision superiority. Decisions are not only faster but more informed, more comprehensive, and more resilient.

Yet this advantage is not automatic. It depends on how augmentation is integrated into decision processes.



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There is a risk of over-reliance. When executives defer excessively to AI outputs, they may fail to exercise independent judgement. Conversely, scepticism can lead to underutilisation, where valuable insights are ignored.

The most effective organisations navigate this balance carefully. They cultivate a mode of engagement that combines trust with scrutiny.

**Hypothesis 3 (H3):**

Cognitive augmentation mediates the relationship between digital literacy and decision superiority.

## 4. Impossibility Thinking: Expanding Strategic Boundaries

This is where the argument broadens beyond efficiency and into ambition.

Impossibility thinking refers to the deliberate pursuit of outcomes that lie beyond conventional constraints. It is not about optimism for its own sake. It is about challenging the limits that define what organisations believe they can achieve.

Historically, these limits have been shaped by human cognition. Leaders rely on experience, intuition, and available data. These sources, while valuable, impose boundaries. AI disrupts those boundaries by expanding the range of information and possibilities that can be considered.

Research on cognitive augmentation highlights how AI enables novel forms of reasoning and problem-solving, extending human conceptual capacity [8].

Let us consider a concrete case: In pharmaceutical research, AI systems analyse molecular structures at a scale that far exceeds human capability. This has accelerated the discovery of new drugs and opened pathways that were previously considered unreachable. What once appeared impossible becomes feasible through expanded cognitive reach.

A similar dynamic is visible in climate modelling, where AI integrates environmental, economic, and policy variables to generate complex sustainability strategies.

However, impossibility thinking must be treated carefully. Not every expanded possibility is viable. Without disciplined evaluation, organisations risk pursuing unrealistic strategies.

This brings us back to the importance of cognition. AI generates possibilities; human judgement filters them.

Impossibility thinking, therefore, is not blind exploration. It is structured expansion of strategic imagination, guided by augmented cognition and grounded in critical evaluation.

**Hypothesis 4 (H4):**

Cognitive augmentation positively influences the development of impossibility thinking.

**Hypothesis 5 (H5):**

Impossibility thinking is positively associated with long-term strategic innovation and competitive advantage.

## 5. Boardroom Dominance: The Strategic Integration of AI

At the boardroom level, the implications of these developments become fully visible.

Boardroom dominance refers to sustained superiority in strategic judgement, foresight, and governance. It is not simply about making good decisions, but about consistently making better decisions than competitors.

AI contributes to this dominance in several ways.

First, it enhances foresight. By analysing large volumes of data and modelling future scenarios, AI allows boards to anticipate risks and opportunities with greater precision [9].

Second, it improves decision quality. AI-supported processes increase the speed, accuracy, and depth of strategic decisions [11].

Third, it reshapes governance itself. Decision-making becomes more evidence-based, while accountability structures must adapt to incorporate algorithmic influence [12]

2. Consider a board evaluating an acquisition.



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Traditionally, the decision would rely on financial analysis, market positioning, and managerial judgement. With AI, the board can simulate integration outcomes, identify cultural risks, and assess long-term performance trajectories under different conditions. This does not eliminate uncertainty. It changes how uncertainty is approached.

Boards that integrate AI effectively develop a form of strategic clarity that is difficult for competitors to replicate. Those that do not risk misinterpretation, delayed responses, or incomplete analysis.

**Hypothesis 6 (H6):**

Impossibility thinking mediates the relationship between cognitive augmentation and boardroom decision superiority.

**Hypothesis 7 (H7):**

Boardroom digital literacy positively moderates the relationship between AI utilisation and strategic performance.

## Methodology

The study thus used a quantitative cross-sectional research design that investigates the role of artificial intelligence in strategic value creation using digital literacy, cognitive augmentation, impossibility thinking and boardroom decision superiority as mediating variables. So it used a deductive research approach where empirical testing of the conceptual framework and hypothesized relationships among the study constructs was conducted. The participants were comprised of senior-level executives, board directors, chief strategy officers and digital transformation managers, as well as other positions that involved significant decision-making responsibilities in organizations that use AI technologies in operational and strategic processes. A structured questionnaire based on validated measurement scales from the literature and tailored towards AI-enabled strategic decision-making context was employed to collect data. Executive digital literacy, AI utilization, cognitive augmentation, impossibility thinking and superiority of boardroom decisions strategic organizational performance were assessed using five-point Likert scales ranging from strongly disagree (1) to strongly agree (5). The instrument was reviewed by experts for content validity, and a pilot study to evaluate its reliability (using Cronbach's alpha coefficients) was conducted before the main survey. The data were analyzed through descriptive and inferential statistical techniques. Descriptive statistics were used to encapsulate the distribution of demographic characteristics and constructs in respondents, while Structural Equation Modeling (SEM) was performed to analyze measurement and structural models and direct, mediating, and moderating effects along with overall goodness fit for the proposed theoretical framework. Furthermore, thematic analysis of additional executive interviews was performed to generate qualitative insights into AI-enabled strategic decision-making and enhance the interpretation through methodological triangulation. This methodological approach offers a solid foundation for exploring the extent to which cognitive supplement and executive digital literacy in combination augment strategic performance and sustainable competitive advantage of AI-enabled firms.

## Result and Discussion

1. **Data Collection**
   - Sample: Senior executives, board directors, and strategy leaders in AI-enabled firms
   - Instruments: Structured questionnaires measuring digital literacy, AI utilisation, cognitive augmentation, and decision outcomes
   - Supplementary interviews to capture behavioural and strategic nuances
2. **Measurement Variables**
   - Digital Literacy: Ability to interpret and evaluate AI outputs
   - Cognitive Augmentation: Perceived enhancement of reasoning and decision capacity
   - Impossibility Thinking: Willingness to pursue unconventional strategies
   - Decision Superiority: Quality, speed, and impact of decisions
   - Strategic Performance: Long-term organisational outcomes



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**3. Data Analysis**
- Structural Equation Modelling to test relationships between variables
- Thematic analysis for qualitative insights
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**4. Measurement Variables**
- **Digital Literacy**: Ability to interpret and evaluate AI outputs
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- Robustness checks to ensure validity

**Conceptual Framework: The AI Strategic Value Cycle**

The framework developed in this paper must be understood as dynamic. It is not a sequence of steps to be followed once. It is a cycle that reinforces itself over time. It begins with digital literacy. Leaders must first possess the capacity to engage with AI meaningfully. Without this foundation, subsequent stages weaken. From literacy emerges cognitive augmentation. AI extends reasoning capacity, allowing leaders to engage with complexity in new ways. This expanded cognition enables impossibility thinking. Leaders begin to question existing constraints and explore broader strategic options. These expanded perspectives lead to decision superiority. Decisions become more informed, more comprehensive, and more effective [13][14].

Finally, this produces boardroom dominance. Organisations achieve sustained advantage through consistently superior judgement. What makes the framework powerful is the feedback loop. As organisations become more successful, they invest further in literacy and AI integration, strengthening the entire cycle. Over time, this creates cumulative advantage that is difficult for others to replicate [15].

**Implications for Theory and Practice Expanded**

**Theoretical Implications**

This study challenges several deeply embedded assumptions.

First, it rejects the view of AI as a peripheral tool. Instead, it positions AI as part of the organisation's cognitive infrastructure. This shifts attention from technology to thought itself.

Second, it redefines digital literacy as a strategic capability rather than an operational skill. This connects literacy directly with performance outcomes.

Third, it reconceptualises strategy as dynamic. Rather than operating within fixed constraints, organisations continuously redefine what is possible through technological integration. Taken together, these shifts move the conversation from technology adoption to cognitive transformation.

For practitioners, the implications are direct. Boards must invest in digital literacy at the highest level. Without it, AI adoption will remain superficial. Organisations must design AI systems that support reasoning rather than replace it. The goal is not efficiency alone, but enhanced judgement. Leaders must cultivate disciplined engagement with AI. This means trusting systems where appropriate, while maintaining critical oversight. Failure to do so will not simply limit performance. It will distort decision-making.

**Conclusion**

The argument developed in this paper is not complicated, but it is consequential. Artificial intelligence is not merely a tool for doing things faster. It is a system that reshapes how organisations think. Those who approach it as automation will achieve incremental gains.



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Those who understand it as cognitive augmentation will improve decision-making. But those who integrate it with digital literacy and impossibility thinking will redefine what their organisations can achieve. That is where the real shift lies. Not in technology itself, but in how human judgement evolves alongside it. The transition of artificial intelligence from a technical utility to a core instrument of corporate governance marks a definitive shift in executive responsibility. This research demonstrates that navigating this landscape requires far more than rudimentary digital literacy. Genuine strategic value is not realised by merely automating existing workflows, but by fundamentally altering how leadership conceptualises what is achievable.

By systematically integrating cognitive augmentation with impossibility thinking, executive boards can transcend traditional analytical constraints. In this paradigm, artificial intelligence ceases to be a mere tool for operational efficiency. Instead, it functions as an intellectual partner, expanding the human capacity to model complex, non-linear futures and challenge long-held market assumptions.

Traditional governance views technology as an execution tool; strategic dominance requires viewing it as an expansion of intellect. Boardroom dominance in this new era belongs exclusively to organisations that view artificial intelligence not as an IT investment, but as a profound cognitive shift in corporate strategy. Leaders who successfully embed these principles will move beyond defensive adaptation, establishing a proactive posture that actively dictates market realities rather than merely reacting to them. The future of enterprise leadership does not depend on replacing human judgment, but on elevating it to entirely new dimensions of strategic foresight.

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