

RESEARCH NOTE

From the Mintzberg-Simon debate to prompting advantage: A new core skill in the AI era

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As artificial intelligence makes it easy to generate fast, polished answers, real advantage increasingly lies in knowing which questions to ask in the first place. Revisiting the classic Mintzberg–Simon debate, University of Bologna professor Riccardo Silvi introduces the concept of *prompting advantage* as a practical skill for using AI wisely, not just efficiently, in management and decision making.

1. Introduction

In 1967, Herbert Simon introduced a pioneering perspective on management education, emphasising a scientific approach that profoundly influenced subsequent generations. A decade later, Henry Mintzberg challenged the dominant analytical paradigm, asserting that business schools were producing managers capable of providing technically accurate answers but often lacking the ability to ask fundamental, strategic questions. This ongoing debate, rooted in the history of management education, has gained renewed significance in the context of artificial intelligence. A paradox emerges as AI systems become increasingly prevalent, despite our capacity to generate information. This article examines how the enduring tension between analytical thinking and managerial intuition continues to influence the human-AI relationship. It introduces the concept of prompting advantage, highlighting it as a frontier for gaining an edge in an era where the skill of asking the right questions is paramount for effective decision making and innovation.

2. Literature Review

Herbert Simon (1967) presented a scientific vision of management education that significantly influenced future generations. Later, Henry Mintzberg (1973, 1976) critiqued the prevailing scientific analytical model, arguing that business schools produced managers who could provide technically correct answers but were unable to ask fundamental questions. This historical debate, confined to the past of management education, gains surprising relevance in the age of artificial intelligence. As increasing AI systems emerge, we face a paradox reminiscent of the Simon-Mintzberg debates. While our ability to obtain accurate and immediate answers reaches unprecedented levels, the skill to formulate the right questions becomes more critical and rarer. This article explores how the historical debate between scientific analysis and managerial intuition continues to shape the relationship between humans and artificial intelligence, introducing the concept of prompting advantage as a new frontier.

2.1 The Simon Paradigm: Scientific Management Education

Herbert Simon, a Nobel Prize winner in economics, embodied the post-war confidence in making management more scientific and rigorous. His proposal for business schools was based on integrating disparate bodies of knowledge and skills into a synergistic relationship for improving managerial practice, combining the world of practice with several sciences through multidisciplinary approaches (Simon, 1967). For Simon, even managerial intuition could be reduced to analytical processes: "Intuition and judgment – at least good judgment – are simply analyses frozen into habit and into the capacity for rapid response through recognition." (Simon, 1987, p. 63) in the

context of his work on intuition and decision making. It encapsulates his perspective that intuition and analysis are not separate cognitive processes. Instead, intuition is analytic thinking internalised through experience, enabling quick recognition and response. This reductionist vision viewed management as a discipline that could be perfected through scientific methods, quantitative data and predictive models.

2.2 Mintzberg's Critique: The Primacy of Intuition

Through his empirical observation of managerial work, Mintzberg developed a radical critique of this approach. In his "Managers Not MBAs" (2004), he denounced how prestigious business schools were obsessed with numbers and how their overzealous attempts to make management a science were damaging the discipline of management education. He argues that elite business schools – including Harvard Business School and the Wharton School – place excessive emphasis on quantitative analysis and abstract models, and that attempts to treat management as a science, detached from practice and experience, ultimately weaken management education and managerial effectiveness. Mintzberg's central thesis was that managers educated according to the analytical model became experts at providing technical answers to defined problems but lost the more fundamental capacity to identify problems, navigate ambiguity and ask meaningful questions. As he provocatively observed, many of these managers knew everything about strategy formulation but nothing about how to make things happen in organisations.

Henry Mintzberg (1977) responded with his critique of the dominant analytical model, arguing that business schools were producing managers capable of providing technically correct

answers but incapable of asking fundamental questions. This debate, relegated to the history of management education, assumes surprising relevance in the era of artificial intelligence. The emergence of AI systems presents a paradox that strangely echoes the Simon-Mintzberg debate. While our ability to obtain immediate answers reaches unprecedented levels, the competence to formulate the right questions paradoxically becomes more critical and rarer.

Seventy years after the original debate, artificial intelligence based on large language models represents the ultimate embodiment of Simon's vision. Modern AI systems excel precisely in those competencies that Simon valued, such as the rapid processing of enormous amounts of information, the consistent application of frameworks and models, and providing structured and logically consistent answers with speed and precision. Modern AI operates similarly to the business school's education, as criticised by Mintzberg. AI is extraordinarily competent at responding to well-formulated questions using word patterns recognised in training data. However, it is fundamentally limited in its ability to question assumptions, identify non-obvious problems or navigate genuinely ambiguous situations.

2.3 The Paradox of Artificial Competence and System 1 / System 2 Thinking

Just as Mintzberg argued that business school graduates could apply models without questioning them, the strengths and limitations of modern AI together give rise to what Moravec (1988) and Brooks (1991) term the paradox of artificial competence. As AI improves at providing answers, the importance of our ability to ask the right questions becomes increasingly crucial. Like the famous parable of the drunk man searching for his keys under the streetlight

because there is light there, AI tends to provide brilliant solutions within its training parameters, but can completely miss problems that exist outside its cognitive range.

Critical thinking research distinguishes between two systems of human cognition that are particularly relevant to understanding the limitations of AI (Facione, 2023). System 1 thinking operates through quick, intuitive, pattern-recognition processes (Kahneman, 2011), areas where AI excels. System 2 thinking involves deliberate, reflective, analytical reasoning that questions assumptions and explores novel problem spaces – precisely the domain where human prompting advantage becomes crucial. AI systems demonstrate remarkable System 1 capabilities but lack the meta-cognitive awareness that characterises effective System 2 thinking, particularly the ability to question their own premises and identify what they do not know.

3. Conceptual Framework: Prompting Advantage

3.1 The Carta Matic Paradigm: When Numbers Tell the Wrong Story

The concept of prompting advantage can be best understood through the Carta Matic case, which demonstrates how sophisticated financial analysis – whether human or AI-driven – can reach fundamentally flawed conclusions when the right questions are not asked. Carta Matic SpA, an Italian producer of continuous-form computer paper in the early 1990s, appeared financially healthy based on standard metrics: 16.8% ROE, adequate liquidity ratios and 19% revenue growth. Any AI system analysing these numbers would likely conclude: "Creditworthy company with acceptable fundamentals and growth prospects."

However, the company nearly collapsed by 1992, with ROE plummeting to -55.3%. The numerical analysis overlooked critical factors that could only be revealed by specific questions. First, **Data Quality Questions**: Are all reported numbers accurately represented? For instance, what exactly constituted the “other credits” line item? The investigation revealed that these credits originated from withdrawals and lending to managers, effectively disguising management withdrawals. From a pragmatic point of view, this meant real equity available to the business was only 120k€, not the reported 375k€ – a fundamental misrepresentation of the company’s actual financial position. Second, **Strategic Context Questions**: If the company truly held a quality position, why didn’t this translate into higher margins compared to competitors? Why were quality-focused customers paying in 120 days rather than accepting standard terms for premium products? These questions would have exposed that customers were not actually valuing or paying for quality premiums, revealing a fundamental market strategy mismatch where the company’s positioning existed only in management’s perception, not in market reality. Third, **Industry Dynamics Questions**: How was technological change affecting competitive dynamics and business model viability? The emerging shift from dot-matrix to laser printing technology was creating industry-wide consequences: lower margins due to commoditisation, increased pressure on prices as quality differentiation became irrelevant and volumes at risk as the core product became obsolete. These dynamics rendered both the business model and financial model fundamentally unviable, yet remained invisible to traditional financial analysis.

This case exemplifies what Dumay (2015) refers to as the numerical sufficiency fallacy – the

assumption that comprehensive quantitative analysis inevitably leads to correct decisions. Like AI systems, traditional financial analysis provided brilliant solutions within its analytical parameters while completely missing problems that existed outside its cognitive illumination zone.

3.2 Prompting Advantage: Definition, Foundations and Development

The Carta Matic case reveals a fundamental pattern: sophisticated analytical tools – whether traditional financial analysis or AI systems – excel at processing information within established parameters but falter when critical assumptions remain unchallenged. This points to a missing capability we term *prompting advantage*.

Prompting advantage is not simply the technical ability to formulate effective prompts for AI systems but a deeper meta-cognitive competence: the ability to critically interrogate both one’s own assumptions and AI responses, to identify what is not being asked and to recognise when the most eloquent answer may be to the wrong question. Those who understand this prompting advantage do not just use AI as a faster processing tool but transform it into a thinking partner to explore previously time-consuming problem spaces. In this sense, prompting advantage becomes the contemporary equivalent of Mintzberg’s managerial intuition, in which effective decision making relies on rapid, experience-based pattern recognition (Mintzberg, 2004). Mintzberg argued that effective management depends on qualities such as tolerance for ambiguity, systems thinking and the capacity for creative synthesis – capabilities that emerge from practical engagement rather than purely analytical training (Mintzberg, 2004).

Developing prompting advantage requires transforming the intuitive ability to ask the right

questions into a learnable, scalable competency. Organisations can build this capability through complementary approaches:

- **Bisociation Workshops** – Drawing on Arthur Koestler's (1964) concept of bisociation, these workshops bring together distinct knowledge domains – technical, humanities, artistic – to generate questions that no single discipline would have posed autonomously. In the Carta Matic context, a bisociation workshop involving financial analysts, technology experts and industry practitioners might have uncovered questions that traditional financial analysis missed.
- **Canvas-Based Methodologies** – Tools such as the Business Model Canvas, Business Opportunity Canvas, Cost Management Canvas and Strategic Financial Analysis Canvas can transform intuitive insights into systematic approaches. These visual thinking tools stimulate creativity while teaching executives to ask the right questions in a structured manner. Applied to the Carta Matic case, a Strategic Financial Analysis Canvas would have prompted inquiry into industry dynamics and competitive positioning – issues overlooked by standard ratio analysis.
- **AI-Human Collaborative Sessions** – Adapted for AI interaction, these structured sessions develop practitioners' ability to frame complex problems in ways that harness both human intuition and artificial intelligence. They train teams to recognise when AI responses, though technically correct, address the wrong questions – precisely the skill that could have prevented the Carta Matic analytical failure.

Seen through the lens of the Simon–Mintzberg debate, prompting advantage directly addresses a tension central to the AI era: the distinction

between efficiency and effectiveness. AI enables us to generate information extraordinarily efficiently. However, without the ability to critically interrogate our own questions and the system's responses, we risk becoming less effective, solving problems that might not be the right ones to solve. As Mintzberg's critique of business school education warned, we may become highly skilled at applying models without questioning their premises.

This dynamic also reflects what Moravec (1988) and Brooks (1991) identified as the *paradox of artificial competence*: the better AI becomes at providing answers, the more crucial it is for humans to ask the right questions. Like the parable of the drunk man searching for his keys under the streetlight because that is where the light is, AI delivers brilliant solutions within the illuminated area of its training parameters, but may miss critical issues lying outside its cognitive cone of light.

4. Method

The research process behind this article was itself a demonstration of the *prompting advantage* and a practical exploration of the *paradox of artificial competence* (Moravec, 1988; Brooks, 1991). The initial connection between the Simon–Mintzberg debate and contemporary AI dynamics emerged from human intuition – the capacity to recognise hidden patterns between seemingly distant domains – built over years of experience, knowledge and research in performance management system effectiveness and business transformation.

However, moving from intuition to a structured argument required iterative human–AI collaboration. This was not a matter of simply instructing AI to draft an article, but of engaging it as a thinking partner: challenging its assumptions,

refining its responses and testing its outputs against the conceptual lens of prompting advantage. Each interaction generated new questions, surfaced alternative perspectives and revealed connections that neither the human author nor the AI would have identified alone.

In this sense, the method embodies the very thesis advanced in the preceding sections: in the AI era, value does not reside solely in human intuition nor in mechanical processing power, but in the capacity to orchestrate a generative interplay between the two. By deliberately applying bisociation, structured canvases and critical interrogation throughout the co-creation process, the research sought not only to describe prompting advantage but to practise it – transforming AI from a mere efficiency tool into an amplifier of human insight and a catalyst for conceptual innovation.

5. Discussion

5.1 Implications for Management Education

The Mintzberg-Simon debate, reevaluated through the lens of AI, suggests a need to rethink management education. If analytical processing and structured response generation become commodities provided by AI, what competencies should future managers develop to remain competitive? The answer appears to converge on the competencies that Mintzberg identified as crucial: the ability to ask the right questions, to critically read contexts, to navigate genuinely ambiguous situations and to integrate the technical and human dimensions of management. Paradoxically, the more powerful AI becomes, the more precious it becomes to that form of intelligence that Mintzberg called managerial intuition.

5.2 Practical Strategies for Developing Prompting Advantage

Organisations seeking to develop a concrete advantage in their teams can implement specific methodologies. Problem-finding sessions prove particularly effective; instead of starting from predefined problems, they stimulate teams to identify hidden or unarticulated problems through ethnographic observation techniques. Mintzberg used ethnographic-style observation in the 1970s, shadowing executives for days to understand what managers do, discovering that their work was fragmented, fast-paced and reliant on informal communication, rather than the structured planning or models taught in business schools.

Mintzberg's (1973; 2004) observational studies of executives revealed the fragmented, fast-paced nature of managerial work, challenging the formalised models taught in business schools. Creativity workshops that focus on question formulation rather than solution generation represent a significant shift in thinking. Techniques such as question storming (brainstorming questions rather than answers) (Adams, 2015), the extended Five Whys method (Ohno, 1988) and problem laddering (Morgan and Adams, 2009) foster a form of structured curiosity. This capability is foundational to prompting advantage, enabling practitioners to elicit deeper, more contextually relevant outputs from large language models. Business challenges specifically designed to evaluate problem-reframing capabilities offer experiential learning opportunities. These challenges should deliberately present ambiguous situations where the first problem formulation is always inadequate, forcing participants to iterate between questions, hypotheses and reformulations.

6. The Evolutionary Cycle: Intuition and Codification

A crucial consideration emerging from analysing the relationship between human and artificial intelligence is the fundamentally cyclical and synergistic relationship between intuition and codification. Far from being opposing approaches, they represent complementary phases of a continuous evolutionary process. Human intuition generates unprecedented insights, non-obvious connections and emergent understandings that escape consolidated patterns. These flashes of understanding immediately create tension toward the search for codification, a human desire to systematise, formalise and make replicable and scalable what initially existed only as individual intuition. Once developed, codification, which in the contemporary era often manifests through algorithms, AI systems and digital frameworks, does not represent the final point of the process but instead becomes a generative tool for new intuitions.

AI enables the exploration of spaces previously unthinkable for unassisted human cognition, thereby opening unexplored territories for intuition. The exploration creates an evolutionary spiral where each codification cycle elevates the complexity at which human intuition can operate. In management, this translates into the possibility of dedicating intuitive intelligence to increasingly sophisticated and multidimensional problems while AI handles growing levels of analytical complexity. From this perspective, the prompting advantage is not a static competence but part of a dynamic ecosystem of co-evolution between humans and artificial intelligence.

Those who develop a prompting advantage competence know how to effectively interrogate AI and understand how to use AI responses as a springboard for higher-level intuitions, which in turn fuel subsequent cycles of innovation and codification. It is not about rejecting Simon's analytical approach in favour of Mintzberg's intuition but about developing a dynamic synthesis that recognises the evolutionary and complementary nature of both. AI can manage the analytical dimension with superhuman efficiency, freeing managers to focus on activities that require genuine human intelligence, such as identifying emerging problems, understanding complex social contexts, navigating ethical dilemmas and constructing shared meaning.

7. Conclusions

The debate between Mintzberg and Simons, far from being a historical matter, proves prophetic for our era. The advent of AI does not resolve the tension between analysis and intuition. Still, it radicalises it while analysis is progressively delegated to machines, whilst intuition, understood as the ability to ask the right questions and navigate ambiguity, becomes the most precious distinctive competence.

The *prompting advantage* represents more than technical competence and is the contemporary manifestation of managerial wisdom that Mintzberg considers essential. In a world where obtaining answers becomes increasingly easy, knowing how to pose the right questions becomes increasingly precious. The challenge for organisations and educational systems is to develop this new form of literacy, not just knowing how to use AI but how to think with and beyond AI. As Mintzberg

had intuited fifty years ago, management does not consist of providing technically correct answers but of asking questions that open new possibilities for understanding and action. The AI era does not replace the debate between analysis and intuition but transforms it. At the same time, machines manage analysis, humans remain with the most profoundly human task of all, that of interrogating the world with wisdom, imagination and knowledge.

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