

CAPCO

a wipro company

THE CAPCO INSTITUTE  
**JOURNAL**  
OF FINANCIAL TRANSFORMATION

ORGANIZATION

Unlocking AI's potential through  
metacognition in decision making

SEAN MCMINN | JOON NAK CHOI



**GenAI**

**2024/2025 EDITION**

# THE CAPCO INSTITUTE

## JOURNAL OF FINANCIAL TRANSFORMATION

RECIPIENT OF THE APEX AWARD FOR PUBLICATION EXCELLENCE

### Editor

**Shahin Shojai**, Global Head, Capco Institute

### Advisory Board

**Lance Levy**, Strategic Advisor

**Owen Jelf**, Partner, Capco

**Suzanne Muir**, Partner, Capco

**David Oxenstierna**, Partner, Capco

### Editorial Board

**Franklin Allen**, Professor of Finance and Economics and Executive Director of the Brevan Howard Centre, Imperial College London and Professor Emeritus of Finance and Economics, the Wharton School, University of Pennsylvania

**Philippe d'Arvisenet**, Advisor and former Group Chief Economist, BNP Paribas

**Rudi Bogni**, former Chief Executive Officer, UBS Private Banking

**Bruno Bonati**, Former Chairman of the Non-Executive Board, Zuger Kantonalbank, and President, Landis & Gyr Foundation

**Dan Breznitz**, Munk Chair of Innovation Studies, University of Toronto

**Urs Birlcher**, Professor Emeritus of Banking, University of Zurich

**Elena Carletti**, Professor of Finance and Dean for Research, Bocconi University, Non-Executive Director, UniCredit S.p.A.

**Lara Cathcart**, Associate Professor of Finance, Imperial College Business School

**Géry Daeninck**, former CEO, Robeco

**Jean Dermine**, Professor of Banking and Finance, INSEAD

**Douglas W. Diamond**, Merton H. Miller Distinguished Service Professor of Finance, University of Chicago

**Elroy Dimson**, Emeritus Professor of Finance, London Business School

**Nicholas Economides**, Professor of Economics, New York University

**Michael Enthoven**, Chairman, NL Financial Investments

**José Luis Escrivá**, President, The Independent Authority for Fiscal Responsibility (AIReF), Spain

**George Feiger**, Pro-Vice-Chancellor and Executive Dean, Aston Business School

**Gregorio de Felice**, Head of Research and Chief Economist, Intesa Sanpaolo

**Maribel Fernandez**, Professor of Computer Science, King's College London

**Allen Ferrell**, Greenfield Professor of Securities Law, Harvard Law School

**Peter Gomber**, Full Professor, Chair of e-Finance, Goethe University Frankfurt

**Wilfried Hauck**, Managing Director, Statera Financial Management GmbH

**Pierre Hillion**, The de Picciotto Professor of Alternative Investments, INSEAD

**Andrei A. Kirilenko**, Reader in Finance, Cambridge Judge Business School, University of Cambridge

**Katja Langenbacher**, Professor of Banking and Corporate Law, House of Finance, Goethe University Frankfurt

**Mitchel Lenson**, Former Group Chief Information Officer, Deutsche Bank

**David T. Llewellyn**, Professor Emeritus of Money and Banking, Loughborough University

**Eva Lomnicka**, Professor of Law, Dickson Poon School of Law, King's College London

**Donald A. Marchand**, Professor Emeritus of Strategy and Information Management, IMD

**Colin Mayer**, Peter Moores Professor of Management Studies, Oxford University

**Francesca Medda**, Professor of Applied Economics and Finance, and Director of UCL Institute of Finance & Technology, University College London

**Pierpaolo Montana**, Group Chief Risk Officer, Mediobanca

**John Taysom**, Visiting Professor of Computer Science, UCL

**D. Sykes Wilford**, W. Frank Hipp Distinguished Chair in Business, The Citadel

# CONTENTS

## TECHNOLOGY

---

### 08 Mindful use of AI: A practical approach

**Magnus Westerlund**, Principal Lecturer in Information Technology and Director of the Laboratory for Trustworthy AI, Arcada University of Applied Sciences, Helsinki, Finland

**Elisabeth Hildt**, Affiliated Professor, Arcada University of Applied Sciences, Helsinki, Finland, and Professor of Philosophy and Director of the Center for the Study of Ethics in the Professions, Illinois Institute of Technology, Chicago, USA

**Apostolos C. Tsolakis**, Senior Project Manager, Q-PLAN International Advisors PC, Thessaloniki, Greece

**Roberto V. Zicari**, Affiliated Professor, Arcada University of Applied Sciences, Helsinki, Finland

### 14 Understanding the implications of advanced AI on financial markets

**Michael P. Wellman**, Lynn A. Conway Collegiate Professor of Computer Science and Engineering University of Michigan, Ann Arbor

### 20 Auditing GenAI systems: Ensuring responsible deployment

**David S. Krause**, Emeritus Associate Professor of Finance, Marquette University

**Eric P. Krause**, PhD Candidate – Accounting, Bentley University

### 28 Innovating with intelligence: Open-source Large Language Models for secure system transformation

**Gerhardt Scriven**, Executive Director, Capco

**Tony Moenicke**, Senior Consultant, Capco

**Sebastian Ehrig**, Senior Consultant, Capco

### 38 Multimodal artificial intelligence: Creating strategic value from data diversity

**Cristián Bravo**, Professor, Canada Research Chair in Banking and Insurance Analytics, Department of Statistical and Actuarial Sciences, Western University

### 46 GenAI and robotics: Reshaping the future of work and leadership

**Natalie A. Pierce**, Partner and Chair of the Employment and Labor Group, Gunderson Dettmer

## ORGANIZATION

---

### 56 How corporate boards must approach AI governance

**Arun Sundararajan**, Harold Price Professor of Entrepreneurship and Director of the Fubon Center for Technology, Business, and Innovation, Stern School of Business, New York University

### 66 Transforming organizations through AI: Emerging strategies for navigating the future of business

**Feng Li**, Associate Dean for Research and Innovation and Chair of Information Management, Bayes Business School (formerly Cass), City St George's, University of London

**Harvey Lewis**, Partner, Ernst & Young (EY), London

### 74 The challenges of AI and GenAI use in the public sector

**Albert Sanchez-Graells**, Professor of Economic Law, University of Bristol Law School

### 78 AI safety and the value preservation imperative

**Sean Lyons**, Author of Corporate Defense and the Value Preservation Imperative: Bulletproof Your Corporate Defense Program

### 92 Generative AI technology blueprint: Architecting the future of AI-infused solutions

**Charlotte Byrne**, Managing Principal, Capco

**Thomas Hill**, Principal Consultant, Capco

### 96 Unlocking AI's potential through metacognition in decision making

**Sean McMinn**, Director of Center for Educational Innovation, Hong Kong University of Science and Technology

**Joon Nak Choi**, Advisor to the MSc in Business Analytics and Adjunct Associate Professor, Hong Kong University of Science and Technology

## REGULATION

---

### 104 Mapping GenAI regulation in finance and bridging the gaps

**Nydia Remolina**, Assistant Professor of Law, and Fintech Track Lead, SMU Centre for AI and Data Governance, Singapore Management University

### 112 Board decision making in the age of AI: Ownership and trust

**Katja Langenbucher**, Professor of Civil Law, Commercial Law, and Banking Law, Goethe University Frankfurt

### 122 The transformative power of AI in the legal sector: Balancing innovation, strategy, and human skills

**Eugenia Navarro**, Lecturer and Director of the Legal Operations and Legal Tech Course, ESADE

### 129 Remuneration on the management board in financial institutions: Current developments in the framework of supervisory law, labor law, behavioral economics and practice

**Julia Redenius-Hövermann**, Professor of Civil Law and Corporate Law and Director of the Corporate Governance Institute (CGI) and the Frankfurt Competence Centre for German and Global Regulation (FCCR), Frankfurt School of Finance and Management

**Lars Hinrichs**, Partner at Deloitte Legal Rechtsanwaltsgesellschaft mbH (Deloitte Legal) and Lecturer, Frankfurt School of Finance and Management



# CAPCO CEO WELCOME

# DEAR READER,

Welcome to our very special 60th edition of the Capco Journal of Financial Transformation.

The release of this milestone edition, focused on GenAI, reinforces Capco's enduring role in leading conversations at the cutting edge of innovation, and driving the trends shaping the financial services sector.

There is no doubt that GenAI is revolutionizing industries and rapidly accelerating innovation, with the potential to fundamentally reshape how we identify and capitalize on opportunities for transformation.

At Capco, we are embracing an AI infused future today, leveraging the power of GenAI to increase efficiency, innovation and speed to market while ensuring that this technology is used in a pragmatic, secure, and responsible way.

In this edition of the Capco Journal, we are excited to share the expert insights of distinguished contributors across academia and the financial services industry, in addition to drawing on the practical experiences from Capco's industry, consulting, and technology SMEs.

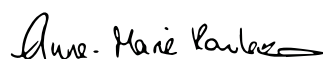
The authors in this edition offer fresh perspectives on the mindful use of GenAI and the implications of advanced GenAI on financial markets, in addition to providing practical and safe frameworks for boards and firms on how to approach GenAI governance.

The latest advancements in this rapidly evolving space demonstrate that the potential of GenAI goes beyond automating and augmenting tasks, to truly helping organizations redefine their business models, processes and workforce strategies. To unlock these benefits of GenAI, I believe that firms need a culture that encourages responsible experimentation and continuous learning across their organization, while assessing the impact of the potential benefits against a strategic approach and GenAI framework.

I am proud that Capco today remains committed to our culture of entrepreneurialism and innovation, harnessed in the foundation of our domain expertise across our global teams. I am proud that we remain committed to our mission to actively push boundaries, championing the ideas that are shaping the future of our industry, and making a genuine difference for our clients and customers – all while ensuring to lead with a strategy that puts sustained growth, integrity and security at the forefront of what we do.

I hope you'll find the articles in this edition both thought-provoking and valuable as you create your organization's GenAI strategy and future direction. As we navigate this journey together, now is the time to be bold, think big, and explore the possibilities.

My greatest thanks and appreciation to our contributors, readers, clients, and teams.



Annie Rowland, **Capco CEO**

# UNLOCKING AI'S POTENTIAL THROUGH METACOGNITION IN DECISION MAKING

**SEAN MCMINN** | Director of Center for Educational Innovation, Hong Kong University of Science and Technology

**JOON NAK CHOI** | Advisor to the MSc in Business Analytics and Adjunct Associate Professor, Hong Kong University of Science and Technology

## ABSTRACT

The rapid advancement of generative artificial intelligence (GenAI) tools has significant implications for creativity, decision making, and problem solving across various sectors. While AI offers opportunities to enhance productivity by offloading routine tasks to it, excessive or inappropriate dependence can diminish human cognitive engagement and critical thinking skills. This paper highlights the importance of metacognition, which is the ability to reflect on one's thinking and decision making strategies, in effectively integrating AI into both educational and professional settings. By developing metacognitive awareness and employing strategic approaches, individuals and organizations can assess when and how to use AI effectively. Addressing the AI literacy gap is also crucial as it empowers users to navigate AI-driven environments appropriately and confidently. Ultimately, fostering metacognitive skills ensures that AI serves to enhance, rather than replace, human judgment, creativity, and ethical responsibility in decision making processes. This article introduces key metacognitive strategies for effective AI integration and underscores the necessity of continuous learning and human oversight.

## 1. INTRODUCTION

The rapid development of generative artificial intelligence (GenAI) tools over the past two years has triggered considerable speculation of its impact on creativity, decision making, and problem solving [Chen et al. (2023), Essel et al. (2024), Hao et al. (2024), Kabashkin et al. (2023)]. The World Economic Forum highlights that AI will be both a major job creator and a disruptor [Di Battista et al. (2023)]. Its Future of Jobs Report [Di Battista et al. (2023)] suggests that GenAI tools have already surpassed humans in crucial technical skills like programming, cybersecurity, and design. While observers initially speculated that GenAI tools would displace workers [Hatzius et al. (2023)], more recent speculation has focused on the possibility that AI will empower workers who know how to leverage it to outcompete peers that do not [Lakhani (2023)].

For this reason, training and recruiting AI-ready talent has become crucial for businesses. Within the next five years, technology training programs focusing on AI and big data are

projected to comprise over 40% of the total in companies surveyed across the U.S., China, Brazil, and Indonesia [Di Battista et al. (2023)]. Correspondingly, employers now expect MBA graduates, for instance, to be proficient in leveraging GenAI tools [Jones and Olson (2024)]. While MBAs and other business graduates will not need to be technical experts in AI, they will nevertheless be expected to understand how to leverage GenAI in conjunction with traditional skills such as managing interpersonal relationships, working collaboratively, and leading teams [Jones and Olson (2024)].

Yet, universities have yet to adequately prepare graduates to properly leverage GenAI. The Digital Education Council (henceforth, DEC) Global AI Student Survey (2024) suggests that post-secondary school students may not have the appropriate AI literacy skills required for the future of work; additionally, universities are perceived to be slow in preparing graduates with the necessary skills for future work in an AI-era [DEC (2024)]. According to the survey, 58% of students feel they lack sufficient AI knowledge and skills, reflecting similar

concerns among business executives. The survey also reveals how students are starting to inappropriately rely on GenAI for routine tasks like information retrieval and analysis, paralleling how they might offload data processing and decision making to AI once they enter the workforce. These trends highlight a broader need for continuous AI literacy training, equipping both students and business leaders with the knowledge and skills necessary to navigate and leverage AI-driven environments.

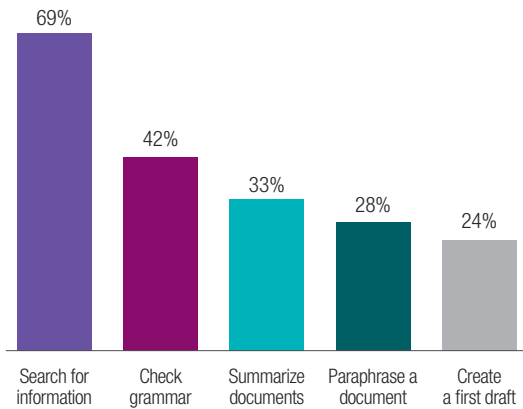
It is critical to emphasize that human oversight must guide AI in contexts requiring nuanced understanding, such as creative brainstorming, complex and contextual problem solving, and ethical decision making. In such scenarios, AI functions best as a supplement to human judgment, not a replacement [Chen

et al. (2023), Ng et al. (2024)]. Studies highlight that AI can mitigate human biases and reduce cognitive load by offering data-driven insights, but must be paired with human oversight to ensure context-aware, creative, and ethical decision making [Ng et al. (2024), Dahri et al. (2024), Chen et al. (2023), Essel et al. (2024), Hao et al. (2024)]. In this article, we will explain how to achieve a desirable outcome by avoiding the dangers posed by inappropriate cognitive offloading by appropriately leveraging metacognition.

## 2. THE DANGER: INAPPROPRIATE COGNITIVE OFFLOADING

Cognitive offloading refers to the process by which individuals delegate tasks that require memory, computation, or decision making to external tools, thereby reducing their cognitive load. The DEC Global AI Student Survey reveals that students are increasingly using GenAI tools for routine tasks such as information retrieval, summarizing, and drafting (Figure 1). By offloading these cognitive tasks to AI, students can theoretically focus more on higher-order thinking and creativity. The survey further highlights that students are utilizing AI not just for academic tasks but also for career-related activities, including drafting resumes and cover letters, practicing for mock interviews, and receiving career recommendations (Figure 2). This demonstrates the broader role of AI in reducing cognitive load across both academic and professional contexts, allowing users to allocate cognitive resources to more complex decision making and strategic planning.

**Figure 1:** How students usually use AI tools



Source: DEC (2024)  
 Note: Students were asked to select all that applied

**Figure 2:** AI use cases in higher education (ranked by student perception)



Source: DEC (2024)  
 Notes: Figures indicate the percentage of students who viewed a use case for AI positively.



Ideally, such cognitive offloading should enable students to focus on higher-order thinking, delegating routine tasks to AI. Similarly, in the business world, executives could adopt AI for routine tasks like simple data processing, market analysis, and operational decision making. By offloading such tasks to AI, the humans involved could dedicate more cognitive resources to more creative problem solving and strategic thinking.

The danger here, however, is that excessive dependence on AI could reduce human cognitive engagement, leading to poor decision making and diminished problem-solving abilities [Ng et al. (2024), Chen et al. (2023)]. While cognitive offloading to AI can free up mental resources for more complex tasks, overreliance on AI tools could lead to a decline in critical thinking and problem-solving skills. Students who frequently use AI for tasks like summarizing or drafting may bypass the deeper cognitive engagement necessary to fully understand the material, ultimately hindering their learning. Dell'Acqua et al. (2023) find that AI can improve human productivity and quality when performing complex tasks, enabling workers to perform at a higher level by offloading routine and repetitive activities to AI. However, it is difficult for humans to understand what tasks AI can and cannot do effectively [see the “jagged technological frontier” in Dell'Acqua et al. (2023)]. For instance, using AI for career-related tasks like resume creation may diminish opportunities for self-reflection and personal growth, potentially stunting the development of key professional skills and insights. Similarly, business leaders may begin to overlook important contextual factors if they depend solely on AI outputs without engaging in critical reflection on the nuances of their industry. Such an overreliance on AI can impair long-term cognitive skills and result in suboptimal decisions.

The key will be to think of AI as an assistant (or “co-pilot”) rather than a decision maker, with humans retaining control of final judgments [Ng et al. (2024)]. Randazzo et al.'s (2024) study conceptualizes three types of human-AI knowledge co-creation: “fused co-creation” (cyborgs), where professionals fully integrate AI into their workflows; “directed co-creation” (centaurs), where tasks are divided between humans and AI based on their strengths; and “abdicated co-creation” (self-automators), where professionals rely entirely on AI without developing new skills. When and where each form of co-creation is appropriate should drive how AI is used; in other words, form should follow function. Yet, students and executives alike are increasingly mis-using AI. Part of the problem is that they lack a basic understanding of AI (i.e., they lack AI literacy). An even bigger part of the problem, however, may be that humans are trying to apply AI without thinking

carefully about what they are doing and how they are doing it, which are prerequisites for properly introducing AI into decision making.

### 3. THE SOLUTION: METACOGNITION

This possibility highlights the need for metacognitive awareness, or the ability to reflect on one's thinking and decision making strategies. Metacognition refers to the ability to execute a sequence of strategies, employ heuristics that lead to success on a task, and explicitly self-regulate one's behavior during complex tasks [Flavell (1979), Hennessey (1999)]. It involves conscious awareness and control over one's cognitive processes, enabling individuals to plan, monitor, and adjust their approach to problem solving. For instance, an executive might be aware of their tendency to send emailed responses to complex situations without adequately thinking about it first, and make sure to sleep on it before responding. This concept excludes basic learning strategies like making inferences or summarizing text, foundational problem analysis such as defining entities and testing solutions, and general self-regulative behaviors like seeking clarification or offering alternative explanations. Instead, metacognitive awareness focuses on higher-order thinking skills that allow individuals to navigate complex tasks effectively and optimize their performance.

Metacognitive awareness enables individuals to assess when and how to use AI effectively, preventing overreliance on technology while ensuring AI outputs are properly evaluated. According to DEC (2024), 55% of students express concerns about becoming too dependent on AI. Specifically, students worry that overreliance on AI in teaching and learning could attenuate their learning experiences and 52% worry that it would negatively impact their academic performance. The survey's authors state that, “students do not want to become overreliant on AI, and they do not want their professors to do so either.” While students recognize the benefits of incorporating AI into education, they also perceive the risks of overdependence. Additionally, concerns arise that excessive use of AI in teaching could lead students to question the quality of their education and the fairness of AI-driven evaluations, especially if educators are not actively involved in the process. Although there is limited research on how these perceptions might translate into the workplace, executives should be mindful that similar concerns about overreliance on AI may exist in professional settings as well. AI's rapid processing capabilities could yield creative solutions in the workplace, but human leaders must actively regulate its use by exercising metacognition [Chen et al. (2023)].

This highlights the need for metacognitive strategies that encourage users to remain engaged in decision making, balancing AI assistance with human judgment. Metacognitive control is crucial in this context, allowing students and business leaders to reflect on the limitations of AI, particularly in interpreting context-specific variables. For example, executives using AI to draft reports must consciously evaluate how AI-generated outputs align with their specific needs [Ng et al. (2024)], actively reflecting on the appropriateness of AI's role in each decision. Metacognitive skills are essential for such management.

The DEC survey also reveals student concerns about the ethical use of AI and the potential biases embedded in AI systems, which further emphasizes the need for a critical thinking approach to AI-enhanced decision making (Figure 3). AI, while capable of processing vast amounts of data, can still produce biased or incomplete insights. Metacognitive awareness enables executives to question AI outputs, examine their assumptions, and ensure that decisions are made ethically and contextually. This balance between human oversight and AI integration ensures that cognitive offloading does not lead to passive decision making but instead enhances overall cognitive performance [Chen et al. (2023), Essel et al. (2024)].

Developing metacognitive skills allows leaders to assess AI-generated insights not just for their accuracy but also for their alignment with organizational values and goals, continuously evaluating its impact on strategy, ethics, and business performance. Without such a reflective approach, AI risks becoming a tool for automation rather than augmentation. Consequently, fostering metacognitive awareness in AI-enhanced environments is essential for ensuring that decisions remain human-centered, ethically sound, and strategically effective.

## 4. METACOGNITIVE STRATEGIES FOR EFFECTIVE AI INTEGRATION

To harness the full potential of AI while avoiding inappropriate cognitive offloading, individuals and organizations should develop and apply metacognitive strategies. In the context of AI, metacognitive strategies enable users to critically assess when and how to utilize AI tools effectively. This involves a series of steps that include:

### 4.1 Environmental awareness

- **Contextual understanding:** recognizing the environment, tools, and constraints that may impact task completion, including resource availability and organizational readiness. Being aware of the resources available and any limitations helps in planning effectively.
- **Sensory information processing:** actively gather and interpret information from your surroundings to inform your decisions and encourage open communication within teams to share insights.

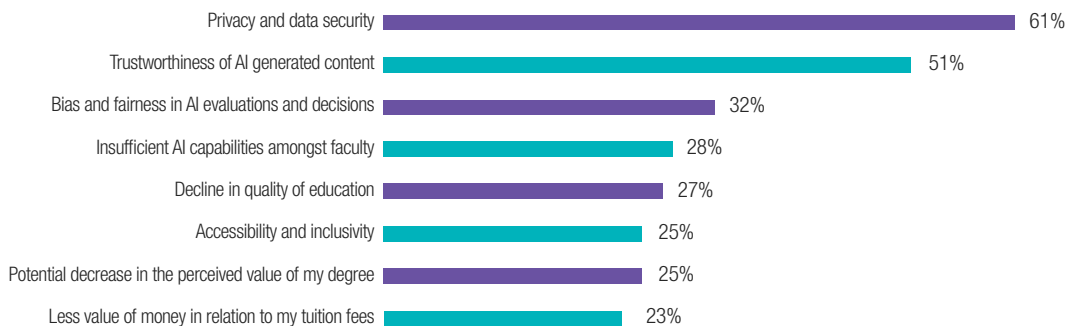
### 4.2 Planning and goal setting

- **Define objectives:** clearly outline what you aim to achieve before engaging with AI, considering the context and available resources. Set measurable goals and identify key performance indicators (KPIs) to track progress.
- **Determine task appropriateness:** assess which tasks are suitable for AI assistance and which require human insight.

### 4.3 Active monitoring

- **Self-questioning:** continuously ask yourself if AI outputs make sense. For example, "Is this recommendation logical given the data?"

**Figure 3:** Student concerns about their universities' use of AI



Source: DEC (2024)

Note: Figures indicate the percentage of students who expressed concern regarding AI usage within a specified topic.

- **Awareness of biases:** be vigilant about potential AI biases and your own cognitive biases that might affect interpretation.
- **Guard against latent persuasion:** be aware that AI tools can subtly shape the opinions you express and ultimately believe – a phenomenon known as latent persuasion [Sparks et al. (2024)]. Actively question whether AI is unintentionally steering your beliefs and ensure your conclusions are grounded in independent analysis and critical thinking.
- **Team feedback mechanisms:** implement regular team discussions to review AI outputs collectively, fostering a collaborative approach to monitoring and evaluation.

#### 4.4 Critical evaluation

- **Continuous evaluation:** while interacting with AI, continuously assess whether the outputs make sense and align with your objectives and the level of quality you expect.
- **Cross-verification:** validate AI outputs with additional sources or data when possible.
- **Outcome reflection:** after decisions are made, reflect on the role AI played and whether it enhanced the decision making process.

#### 4.5 Adaptive learning

- **Feedback integration:** use past experiences to inform future interactions with AI. This should be an iterative exercise with constant reflection. Document lessons learned and share them across the organization to promote collective learning.
- **Continuous education:** stay updated on AI developments to understand new capabilities and limitations, while reflecting its impact on decision making and problem solving.

### 5. ADDRESSING THE AI LITERACY GAP

Exercising metacognitive awareness is necessary but not sufficient by itself. Students and executives alike need to better understand what AI is, what it can do, and what it cannot. Gaps in AI literacy remain widespread. For instance, DEC (2024) reveals a significant gap in AI literacy, with 58% of students feeling underprepared for the future of work. These findings closely parallel the challenges faced in the corporate world, where many executives also acknowledge the need to bridge gaps in AI literacy within their organizations. Executives should focus on developing AI literacy along with metacognition, not only using AI but also reflecting on its limitations and capabilities [Ng et al. (2024)].

#### Box 1: Applying metacognitive strategies in practice

For instance, when using AI to generate a market analysis report, you should:

- **Plan:** define what insights you need and decide which sections AI can assist with.
- **Monitor:** as the AI generates content, regularly check for accuracy and relevance.
- **Evaluate:** critically assess the final output for any inconsistencies or gaps.
- **Adapt:** note any issues encountered and adjust your approach for next time.

There is a clear expectation from students that universities should play a central role in developing the skills necessary to manage AI effectively, something that business executives also need. Cultivating metacognitive strategies to maximize AI's potential in decision making will be crucial for success both before and after entering the workplace [Chen et al. (2023)]. Just as universities are being urged to enhance AI education, companies should also invest in ongoing AI literacy programs for their workforce. By offering professional development opportunities focused on AI, businesses can ensure that their employees remain competitive and proficient in using AI tools, thereby enabling its workforce to adapt to advances in AI.

### 6. CONCLUSION

As AI continues to reshape decision making across industries, the development of models like ChatGPTo1 highlights the rapid advancements in AI capabilities [OpenAI (2024)]. This new model, designed to reason through complex tasks and solve multi-step problems in areas as diverse as math, coding, and science, exemplifies how AI might become more sophisticated in mimicking human-like thought processes. The new model can evaluate multiple options before responding, making it significantly better at handling complex problems compared to previous models. While this progress shows AI's immense potential to transform problem solving and innovation, it also underscores the critical need for metacognitive awareness and human oversight in AI-driven environments given the ongoing need to adapt to technological advances.

This example emphasizes why human-in-the-loop decision making is more important than ever. Despite ChatGPTo1's ability to perform better than previous models, particularly in technical tasks, its outputs must still be carefully evaluated

by humans, especially in ambiguous or high-risk scenarios. AI tools like ChatGPT are more capable but still cannot fully understand the ethical or contextual complexities that may arise in business decisions. While AI can enhance problem solving and improve efficiency, it should nevertheless serve as a thought partner rather than a replacement for human judgment.

The risk of inappropriate cognitive offloading may also be exacerbated by these rapid advancements. As AI becomes more proficient, there is a growing temptation to offload more critical tasks to these systems. However, overreliance on AI could lead to diminished cognitive engagement and poorer decision making over time. Just like current students, business leaders must remain actively involved, applying metacognitive strategies to reflect on AI outputs, question assumptions, and ensure that decisions are made with a thorough understanding of the broader context.

The same advances also support the need for AI literacy among both students and executives. As AI systems become more complex, the ability to critically evaluate their outputs and understand their limitations becomes even more essential. Organizations must prioritize ongoing AI training and education, ensuring that their workforce is not only proficient in using AI but also equipped to oversee and guide AI in a way that aligns with ethical standards and business goals.

Throughout these processes, students and employees alike should remain involved in decisions regarding AI integration. DEC (2024) found that students wanted to help shape AI's role in education and the workplace. This mirrors how businesses should involve leadership teams in developing AI training strategies to avoid the risks of AI overreliance [Ng et al. (2024), Essel et al. (2024)]. By engaging executives and managers in AI training and decision making, organizations can ensure a more holistic approach to AI integration. Beyond enhancing the effectiveness of AI initiatives, this approach also builds a sense of ownership and accountability in how AI is used to shape business strategies and operations.

The rapid development of AI clearly demonstrates its growing capability to assist in decision making and problem solving. However, with these advancements comes the pressing need for careful human oversight. Business leaders must ensure that AI tools are used thoughtfully, balancing the convenience of offloading tasks with the necessity of staying engaged in critical decision making. By developing metacognitive skills and maintaining an active role in overseeing AI outputs, leaders can ensure that AI serves to enhance, rather than replace, human judgment, creativity, and ethical responsibility.

## REFERENCES

- Chen, B., X. Zhu, and H. F. Díaz del Castillo, 2023, "Integrating generative AI in knowledge building," *Computers and Education: Artificial Intelligence*, 5
- Dahri, N. A., N. Yahaya, W. M. Al-Rahmi, A. Aldraiveesh, U. Alturki, S. Almutairy, ... and R. B. Soomro, 2024, "Extended TAM based acceptance of AI-Powered ChatGPT for supporting metacognitive self-regulated learning in education: A mixed-methods study," *Heliyon*, e29317
- DEC, 2024, "The Digital Education Council Global AI student survey (2024)," <https://tinyurl.com/4fk7xuhf>
- Dell'Acqua, F., E. McFowland III, E. R. Mollick, H. Lifshitz-Assaf, K. Kellogg, S. Rajendran, ... and K. R. Lakhani, 2023, "Navigating the jagged technological frontier: Field experimental evidence of the effects of AI on knowledge worker productivity and quality," *Harvard Business School Technology & Operations Management unit working paper no. 24-013*
- Di Battista, A., S. Grayling, E. Hasselaar, T. Leopold, R. Li, M. Rayner, and S. Zahidi, 2023, "Future of jobs report 2023," *World Economic Forum*, <https://tinyurl.com/25z6pf86>
- Essel, H. B., D. Vlachopoulos, A. B. Essuman, and J. O. Amankwa, 2024, "ChatGPT effects on cognitive skills of undergraduate students: receiving instant responses from AI-based conversational large language models (LLMs)," *Computers and Education: Artificial Intelligence*, 6, 100198
- Flavell, J. H., 1979, "Metacognition and cognitive monitoring: a new area of cognitive-developmental inquiry," *American psychologist* 34:10, 906
- Hatzius, J., J. Briggs, D. Kodnani, and G. Pierdomenico, 2023, "The potentially large effects of artificial intelligence on economic growth (Briggs/Kodnani)," *Goldman Sachs Economic Research*, March 26
- Hennessey, M. G., 1999, "Probing the dimensions of metacognition: implications for conceptual change Teaching-Learning," Paper presented at the Annual Meeting of the National Association for Research in Science Teaching, Boston
- Jones, S., and O. Olson, 2024, "Preparing MBA students for leadership in GenAI environment: what educators need to know," *Effective Executive* 27:2, 49-55
- Kabashkin, I., B. Misnevs, and O. Zervina, 2023, "Artificial intelligence in aviation: new professionals for new technologies," *Applied Sciences* 13:21, 11660
- Lakhani, K., and A. Ignatius, 2023, "AI won't replace humans - but humans with ai will replace humans without ai," *Harvard Business Review*, <https://tinyurl.com/38fbtrct>
- Ng, D. T. K., C. W. Tan, and J. K. L. Leung, 2024, "Empowering student self-regulated learning and science education through ChatGPT: A pioneering pilot study," *British Journal of Educational Technology*
- OpenAI, 2024, "Introducing OpenAI o1-preview," <https://tinyurl.com/5unaf5a2>
- Randazzo, S., and H. Lifshitz-Assaf, K. Kellogg, F. Dell'Acqua, E. R. Mollick, K. R. Lakhani, 2024, "Cyborgs, centaurs and self automators: human-genai fused, directed and abdicated knowledge co-creation processes and their implications for skilling," SSRN, <https://tinyurl.com/yc4zxr6>
- Sparks, J. R., T. M. Ober, C. Tenison, B. Arslan, I. Roll, P. Deane, D. Z. Rivera, R. M. Gooch, and T. O'Reilly, 2024, "Opportunities and challenges for assessing digital and AI literacies," *ETS research Institute*, <https://tinyurl.com/5fwah72v>
- Suleman, R. M., R. Mizoguchi, and M. Ikeda, 2016, "A new perspective of negotiation-based dialog to enhance metacognitive skills in the context of open learner models," *International Journal of Artificial Intelligence in Education* 26, 1069-1115

© 2024 The Capital Markets Company (UK) Limited. All rights reserved.

This document was produced for information purposes only and is for the exclusive use of the recipient.

This publication has been prepared for general guidance purposes, and is indicative and subject to change. It does not constitute professional advice. You should not act upon the information contained in this publication without obtaining specific professional advice. No representation or warranty (whether express or implied) is given as to the accuracy or completeness of the information contained in this publication and The Capital Markets Company BVBA and its affiliated companies globally (collectively "Capco") does not, to the extent permissible by law, assume any liability or duty of care for any consequences of the acts or omissions of those relying on information contained in this publication, or for any decision taken based upon it.

## ABOUT CAPCO

Capco, a Wipro company, is a global management and technology consultancy specializing in driving transformation in the energy and financial services industries. Capco operates at the intersection of business and technology by combining innovative thinking with unrivalled industry knowledge to fast-track digital initiatives for banking and payments, capital markets, wealth and asset management, insurance, and the energy sector. Capco's cutting-edge ingenuity is brought to life through its award-winning Be Yourself At Work culture and diverse talent.

To learn more, visit [www.capco.com](http://www.capco.com) or follow us on LinkedIn, Instagram, Facebook, and YouTube.

## WORLDWIDE OFFICES

### APAC

Bengaluru – Electronic City  
Bengaluru – Sarjapur Road  
Bangkok  
Chennai  
Gurugram  
Hong Kong  
Hyderabad  
Kuala Lumpur  
Mumbai  
Pune  
Singapore

### MIDDLE EAST

Dubai

### EUROPE

Berlin  
Bratislava  
Brussels  
Dusseldorf  
Edinburgh  
Frankfurt  
Geneva  
Glasgow  
London  
Milan  
Paris  
Vienna  
Warsaw  
Zurich

### NORTH AMERICA

Charlotte  
Chicago  
Dallas  
Houston  
New York  
Orlando  
Toronto

### SOUTH AMERICA

São Paulo

**THIS UNIQUE IMAGE WAS GENERATED USING MID-JOURNEY, STABLE DIFFUSION AND ADOBE FIREFLY**

[WWW.CAPCO.COM](http://WWW.CAPCO.COM)



**CAPCO**  
a wipro company