Guest editor

Noah P. Barsky

Contributing authors

Jeremy Blain
San Murugesan
Michael Papadopoulos
Greg Smith
Eystein Thanisch

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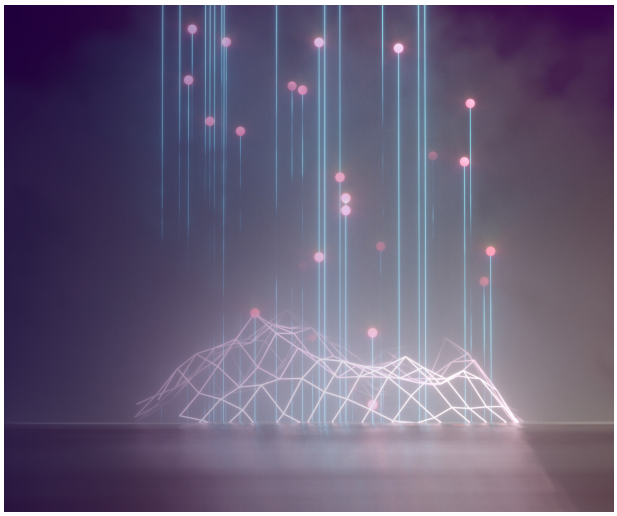
Anticipate, Innovate, Transform

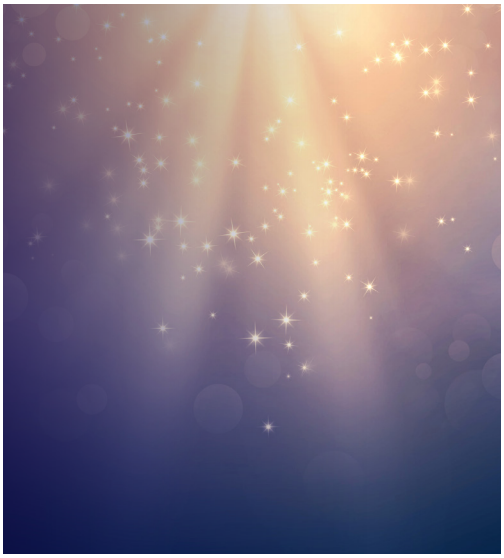
# Vision 2030: Toward Purposeful Leadership & Digital Era Stewardship

# CONTENT









# VISION 2030: TOWARD PURPOSEFUL LEADERSHIP & DIGITAL ERA STEWARDSHIP

BY NOAH P. BARSKY, GUEST EDITOR

**The next decade's dawn is now closer than the prior one's dusk. In many ways, five years ago seems ancient, as many technology frontiers are now commonplace, work arrangements have been redefined, and the pace of digital business is even more rapid.**

As companies work to craft, communicate, and execute Vision 2030 plans, executives and board members face emerging and evolving digital era opportunities and risks that will shape and define their organizations' future. The digital era ushers in transformative technologies offering immense potential to drive innovation, enhance operational efficiency, and create revenue streams. However, significant challenges accompany these prospects, including strategic relevance, hypercompetition, cybersecurity threats, talent retention, novel interdependencies, and regulatory changes.

The next half decade will be critical to long-term viability. Leaders need meaningful and substantive guidance to forge and run lasting, adaptive, and thriving business models to deliver sustainable performance.

For starters, AI empowers businesses to streamline operations, personalize customer experiences, and optimize decision-making processes through data-driven insights. By harnessing these technologies, companies can gain a competitive edge, enhance productivity, and drive business results.

However, cybersecurity threats loom large as organizations increasingly rely on interconnected systems and data-driven processes. The rise of sophisticated cyberattacks demands robust defenses to protect sensitive information, maintain customer trust, and comply with regulatory requirements. Executives and board members must prioritize investments in cybersecurity frameworks, employee training, and incident-response plans to mitigate strategic, reputational, operational, and financial risks.

Simultaneously, companies must capitalize on digital opportunities to drive sustainable growth. The digital era offers new ways to expand market reach, optimize supply chains, and diversify revenue streams. Through digital transformation, organizations can enhance agility, responsiveness, and resilience.

Next, the strategic evaluation of digital opportunities involves anticipating future trends and investing in emerging technologies that align with the organization's long-term vision. Whether exploring blockchain for secure supply chain management or leveraging data analytics for predictive insights, proactive decision-making can position businesses as industry leaders and innovators in their sectors.

Evaluating digital era risks and opportunities requires a holistic approach that integrates technological expertise with strategic foresight and ethical considerations. Executives and board members must foster a culture of continuous learning and leadership development. Such talent initiatives include industry partnerships, novel learning collaborations, and thought leadership applications.

Last, the ethical implications of technology adoption cannot be underestimated. Issues such as algorithmic bias, data privacy violations, and the societal impacts of automation require thoughtful consideration. Executives and board members bear the responsibility of ensuring that technological advancements contribute positively to society. These evolving demands call for clear governance frameworks, regular ethical audits, and support for responsible innovation and deployment.

This issue of *Amplify* looks at how leaders can best balance digital era stewardship and growth. That future hinges on strong management in the next five years. Each article addresses the universal question that challenges boards and C-suites: *will leaders shape the future, or allow it to define them?*

> **THE ETHICAL IMPLICATIONS OF TECHNOLOGY ADOPTION CANNOT BE UNDERESTIMATED**

## IN THIS ISSUE

To jumpstart leaders' preparation for the decade ahead, each of the four articles in this issue offers a different vantage point on critical digital era choices.

Opening the issue, Jeremy Blain offers a thought-provoking demarcation of digital detachment and determination. He identifies the pitfalls of widespread tepid and failed transformation projects in recent years and trumpets the imperative for credible leadership that forges meaningful digital era readiness. The article equips senior executives with the insights they need to ask meaningful questions and take substantive actions to ready their organizations for the decade ahead.

Next, Arthur D. Little's Eystein Thanisch, Greg Smith, and Michael Papadopoulos address talent management and career planning by asking, "Someone using AI will replace you, but who will replace them?" Their intriguing piece explores which everyday tasks can be augmented or automated by AI. They extend the discussion by examining skills needed across professions and encourage workplaces to reflect on and assess talent needs. Imagining future workflow, technology needs, and employee composition is an overdue dialogue — especially as AI capabilities accelerate.

In his article, Cutter Expert San Murugesan adds to the theme by spotlighting AI's worrisome "dark side." Specifically, he outlines a wide array of concerns related to AI's inherent complexity, scalability, reliability, and ethical issues. More importantly, Murugesan sets forth a trust framework that can underpin responsible and effective AI design, development, implementation, and application.

The issue closes with a piece I have long felt compelled to write (and this issue seemed like the perfect home). Timely and timeless financial acumen is as crucial as ever in the digital era, as it can quickly reveal which enterprises are, in reality, only technologies in search of a sustainable business model. Despite the fluid and fleeting lexicon of business buzzwords, leaders of well-run organizations honor fiscal stewardship, deliver competitive returns, and communicate with clarity and candor.

## SOMEWHERE IN TIME

This issue of *Amplify* was carefully compiled and organized. It opens with a broad perspective on substantive digital transformation. The second and third articles anchor the discussion on the irreplaceable human elements of effectively and ethically stewarding business enterprises. The closing piece sirens the criticality of financial insight and responsibility.

Reading these articles together helped refine my view about the most important conversations and debates awaiting in the next half decade. Each should prompt readers to pause, contemplate, and seek out wider conversations. Leaders still have time to make judicious choices that will serve as the foundation for their organizations' long-term viability.

Our dynamic times merit questions that will shape 2030 and beyond. Here are a few that seem particularly overarching and salient:

- In what ways can AI and machine learning be leveraged to improve business performance?
- What are the ethical considerations and potential societal impacts of AI use in core business processes?
- What are the challenges and opportunities in ensuring data security and privacy? What are the current and emerging cybersecurity threats facing critical infrastructure and organizations? What are effective resilience measures for organizations to recover from cyberattacks and disruptions to business operations?
- What are the digital transformation considerations that will drive M&A due diligence, integration, and valuation?
- How can biases in AI algorithms be identified, mitigated, and regulated to ensure fairness and equity in decision-making processes? What roles do governments, tech companies, and civil society play in addressing algorithmic bias?
- What models of digital governance promote innovation while protecting user rights and ensuring cybersecurity?
- How will AI-driven automation reshape job roles and career paths across various industries? What are the most effective strategies for re-skilling and upskilling the workforce to meet the demands of a digital-first economy?
- How will universities and emerging learning forums evolve in the digital age to meet the changing needs of students and industries? Will they survive?
- How can organizations foster interdisciplinary collaborations and industry partnerships to address global challenges and societal needs? How can these collaborations contribute to innovation, knowledge transfer, and economic development?
- How can organizations design effective professional learning and development programs that incorporate emerging technologies and accommodate diverse learning styles?

## ALL ABOARD

Collectively, this issue of *Amplify* serves as both a compass and a challenge for leaders navigating the complexities of Vision 2030. The articles underscore the immense responsibility that today's decision makers bear in crafting a future where innovation flourishes while addressing ethical, societal, and operational imperatives. These are not abstract considerations; they are the foundation on which enduring success will be built.

The themes explored in this issue (substantive transformation, workforce evolution, ethical AI, and fiscal stewardship) are intertwined. Together, they paint a vivid picture of the stakes, prospects, and perils ahead. Organizations must reject the lure of superficial digital adoption stagecraft draped in vacuous buzzwords, focusing instead on intentional strategies that prioritize long-term AI-era resilience and relevance.

Such substance will require bold leadership, a commitment to continuous learning, and an openness to reimagining existing paradigms, thus shattering workplace inertia and entrenched interest. Incentives, indifference, and incompetence have been the downfall of many prominent, mediocre, and fledgling organizations over the years.

At the same time, the ethical dimensions of technological progress demand unwavering attention. The implications of AI and automation stretch beyond corporate profitability; they shape the fabric of our communities and redefine human potential. Leaders who approach these challenges with integrity and foresight will drive innovation and earn the trust of their stakeholders, an invaluable currency in the digital era.

The next half decade represents a critical juncture. It is a time for making deliberate choices that will define industries, societies, and individual lives. Whether in recalibrating talent strategies, embracing responsible AI, or ensuring financial clarity, the decisions made today will echo well beyond 2030. By engaging with the perspectives offered in this issue, leaders are empowered to shape their organizations' futures with clarity and purpose. Success in the digital era will belong to those who not only anticipate change but who thoughtfully and courageously drive it.

## About the guest editor

**NOAH P. BARSKY**

Noah P. Barsky is a Cutter Fellow, a member of Arthur D. Little's AMP open consulting network, and Associate Professor at Villanova University School of Business in the executive and graduate business programs. His research and teaching focus on performance measurement, business planning, risk assessment, and contemporary financial reporting issues. Dr. Barsky develops and delivers executive education programs for various *Fortune* 100 companies, global professional services firms, and industry associations. He has authored five books and published over 100 articles in various academic and professional journals, including *Amplify, Strategic Finance*, and *Best Practices in Executive Decision Making*. Dr. Barsky earned a bachelor's and master's degree from Penn State University and a PhD from the University of Connecticut. He can be reached at experts@cutter.com.

# THE JOURNEY FROM DIGITALLY DETACHED TO DIGITALLY DETERMINED

Author

Jeremy Blain

**Digital transformation is the integration of digital technology into all areas of a business, fundamentally changing how it creates and delivers value to customers while realizing internal operational benefits. And yet, *only one in three* digital transformations succeed.[1,2]**

Where many organizations and leaders fail is in the implementation. The strategy could be rock-solid, but without a mindset shift that ensures the organization and its people are evolving at the same rate — bought in and committed to being part of the solution—execution often just fizzles out. Obviously, this is a serious problem for companies hoping to thrive in the fast-changing era leading up to 2030.

As "The Digital Leadership Specialists," Robin Speculand and I surveyed 2,138 leaders across four continents and 18 countries. Our research paper "The Digital Leadership Perspective 2024" identified a significant gap between the perceptions of the board/senior leaders and the rest of the organization regarding digital transformation progress.[3] We call this "digital detachment."

Despite the unfortunate prevalence of digital detachment, digital transformation has created successes and efficiencies for many organizations. Our research found that:

- **Many organizations are on the right track.** There is progress in digital transformation in organizations around the world.
- **More leaders are digitally confident.** Almost two out of three of the leaders we interviewed said they believe they can guide their organization through its digital transformation.
- **New measures are being adopted.** Leaders recognize the importance of creating measures to precisely track digital transformation value.

For others, digital detachment is an issue, alongside three other factors:

1. **Senior leaders tend to overestimate** the state of their organization's transformation.
2. **Many leaders are not starting and ending their digital transformation with the customer in mind.** In fact, our research shows that their focus remains predominantly on internal efficiency.
3. **Senior leaders do not clearly understand why the organization is transforming** — a critical stumbling block. Having a clear purpose for digital transformation (i.e., a digital ambition) helps companies start their shift with the end in mind.

**WHERE MANY ORGANIZATIONS & LEADERS FAIL IS IN THE IMPLEMENTATION**

## CASE STUDY: CUSTOMER FOCUS & DIGITAL AMBITION

Singapore's DBS Bank states its digital ambition as "Make Banking Joyful." The bank's leaders recognized that no one wakes up on a Monday morning wanting to do banking and that it is a painful experience.[4] This led to a strategy that leverages technology to make the bank "invisible" to its customers and, thus, makes banking joyful.

Implementing this strategy transformed DBS and resulted in it being named the best bank in the world for five consecutive years. Internally, it inspired employees to take consistent, purposeful actions that enhanced customer experiences. They became "customer-obsessed," identified the jobs to be done, participated in hackathons, and then leveraged technology to make banking invisible.

DBS CEO Piyush Gupta explained that the bank's philosophy is customer-employee performance. A passionate focus on putting the customer first gives employees purpose, which leads to them delivering the best possible products and services.

## OTHER SURVEY FINDINGS

Additional insights uncovered by our research include:

- **Digital is not being used for the good of the customer.** Despite the importance of placing the customer at the center of digital transformation, an alarming number (half) of respondents do not believe their digital transformation improves the customer experience. Leveraging digital for the good of the customer remains a huge opportunity representing immediate competitive advantage for leaders with the courage and tenacity to transform their organization around their customers (an outside-in approach rather than an inside-out one).
- **Leaders are not effectively leveraging data.** Our research found that 60% of leaders are struggling to become data-driven and use data to make more effective and impactful decisions. Our previous research in 2019 found that 70% of leaders were not leveraging data at any level to inform more rapid decisions. This includes a lack of progress around data visualization, data analytics skills building, and the need to ensure the used data is current, cleansed, and value-adding.
- **There's a lack of cultural alignment.** Organizational culture-building continues to be a missed opportunity when considering successful digital transformation. Only one in two leaders believe their culture underpins their transformation, and this alignment lack holds back many organizations. Our 2019 research found that one of the top three reasons that two out of three organizations fail in their transitions is that they have not changed their culture. Five years later, this has become an even more urgent need.
- **Acknowledgment needs to convert into leadership action.** Just over 70% of leaders recognize that digital transformation is a top concern. They understand there's a pressing need to become deeply data-driven, including putting in place measures to track progress daily. This reinforces the point that leadership must move from focusing on what needs to be done to how to implement and track while ensuring customers and employees are on board.

## MOVING FROM DIGITAL DETACHMENT TO DIGITAL DETERMINATION

Given all these moving parts, it is easy to see how leaders can become detached. Transformation can be overwhelming, especially for those in lagging industries, leading to denial, immobilization, and frustration (the classic change curve). Unfortunately, in this speed-as-a-competitive-advantage era, procrastination is a fast route to short-termism, knee-jerk reactivity, and failure.

Thus, the question boards and C-suite executives must answer is not "What can digital transformation do for our organization?" but "What is our strategy to meet and exceed customers' needs and expectations in a digital world, and how do we execute it successfully?"

Digital transformation involves much more than just technology, and this is where many companies and leaders are going wrong. Digital transformation is a cultural change, a way of working that requires organizations to continually challenge the status quo, experiment, and get comfortable with setbacks — learn, adapt, and go again.

Antony Edwards, COO of software testing and monitoring company Eggplant, gets to the heart of it:

> Too many people treat digital transformation as something around infrastructure and IT. It's not; it's about the company culture, it's about DNA, and it's about business models. And if you don't approach it from that kind of business and customer perspective, it's going to fail.[5]

Businesses that don't look holistically at the business model transformation at hand can end up investing in the wrong technology and/or doubling down in the wrong areas. This results in the rest of the organization being pressured to recoup costs. When employees are starved of the resources required to service customers effectively, they become frustrated and question the capability of their leadership. In a world where employee choice is more powerful than ever, this is a dangerous moment for boards and leaders still trying to figure things out.

Today's leaders face a broader set of transformational challenges than during previous industrial revolutions. Industry 4.0 has three core shifts: digital, workforce, and "leader*shift*" itself. Leadershift refers to new capabilities that boards and executives must cultivate, adopt, and practice in a digital world. In many ways, leaders have the steepest learning curve of all and can easily become overwhelmed and immobilized by the sheer breadth of the tasks at hand.

## ACCELERATING PROGRESS

We know something is not working. It's a combination of leadership mindset, implementation orientation, and culture building at the same rate as business model transformation. It's a people play as much as it is executing on technology and technology ecosystems that enable great customer and employee experiences.

In addition, organizations with poor data and data analytics, legacy technology architecture, and increasing tech debt are increasingly immobilized, as they simply don't know where to turn and what to tackle first. Building out a short- to medium-term roadmap to bring everything together is the first important step in helping to visualize the scope, scale, and journey required for leaders, boards, and the rest of the organization.

And then, with the question having shifted from "what we need to do" to "how to execute successfully," leaders and their teams need a way to start. We suggest a compelling digital ambition. For many lagging companies, especially those in lagging industries, a digital ambition is the key to a clear path forward and requires five crucial steps:

1. **Identify your digital ambition**. Understand what digital transformation means to your customers and articulate your transformation strategy in a way that helps customers buy into it. This will make it easier to bring employees on board.

2. **Work from the inside out**. Create the purpose that drives the transformation. Many organizations enter digital transformation with plans for productivity improvements, cost savings, and the like. This is an inside-out view that considers the impact on the customer second. An outside-in view is required if your digital transformation aims to provide the best customer journeys and experiences. Of course, when the voice of the customer is loud and clear, internal benefits will follow.
3. **Cultivate a transformation culture.** Ensure the culture is evolving at the same speed that your organization is transforming. This ensures alignment between the board/senior executives with leaders across the business, resulting in stronger engagement and mobilization of the entire organization in the implementation journey.
4. **Leverage a data operating model.** A solid data-operating model is critical for fast, considered decision-making across the organization. (Better data = better decisions = better performance.) For many organizations and leaders, this is a bigger job than expected: there is a need to review, qualify, and clean legacy data and understand which data will be of greatest value to customers and the business going forward (keeping the digital ambition in mind). Done well, it leads to better decision-making and speed of execution and links directly to performance and future growth (e.g., the ability to monetize data as a consulting-led revenue stream).
5. **Move from awareness to action.** Align the whole organization behind taking the right actions and clearly articulate the why, what, how, when, and what next. Use language that everyone (customers and employees) can get behind to engage and mobilize the entire company, not just the leadership team or a few project leads tasked with taking things forward.

These steps ensure everyone at the board and executive levels is on the same page, aligned behind a digital purpose and able to drive the right digital expenditures, investments, and implementation steps — with the rest of the organization engaged and mobilized for the journey.

Over the next five years, boards, leaders, and organizations struggling with transforming for a digital world must get fully in the game, moving from digital detachment to digital determination with a clear, forward-looking plan and commitment from all levels, to ensure their long-term viability and success.

## REFERENCES


[1] "BCG: Only 1 in 3 Digital Transformation Projects Are Successful." Consultancy.com.au, 21 April 2021.

[2] Blain, Jeremy, and Robin Speculand. "The Digital Leadership 2024 Perspective." Performance Works, 2024.

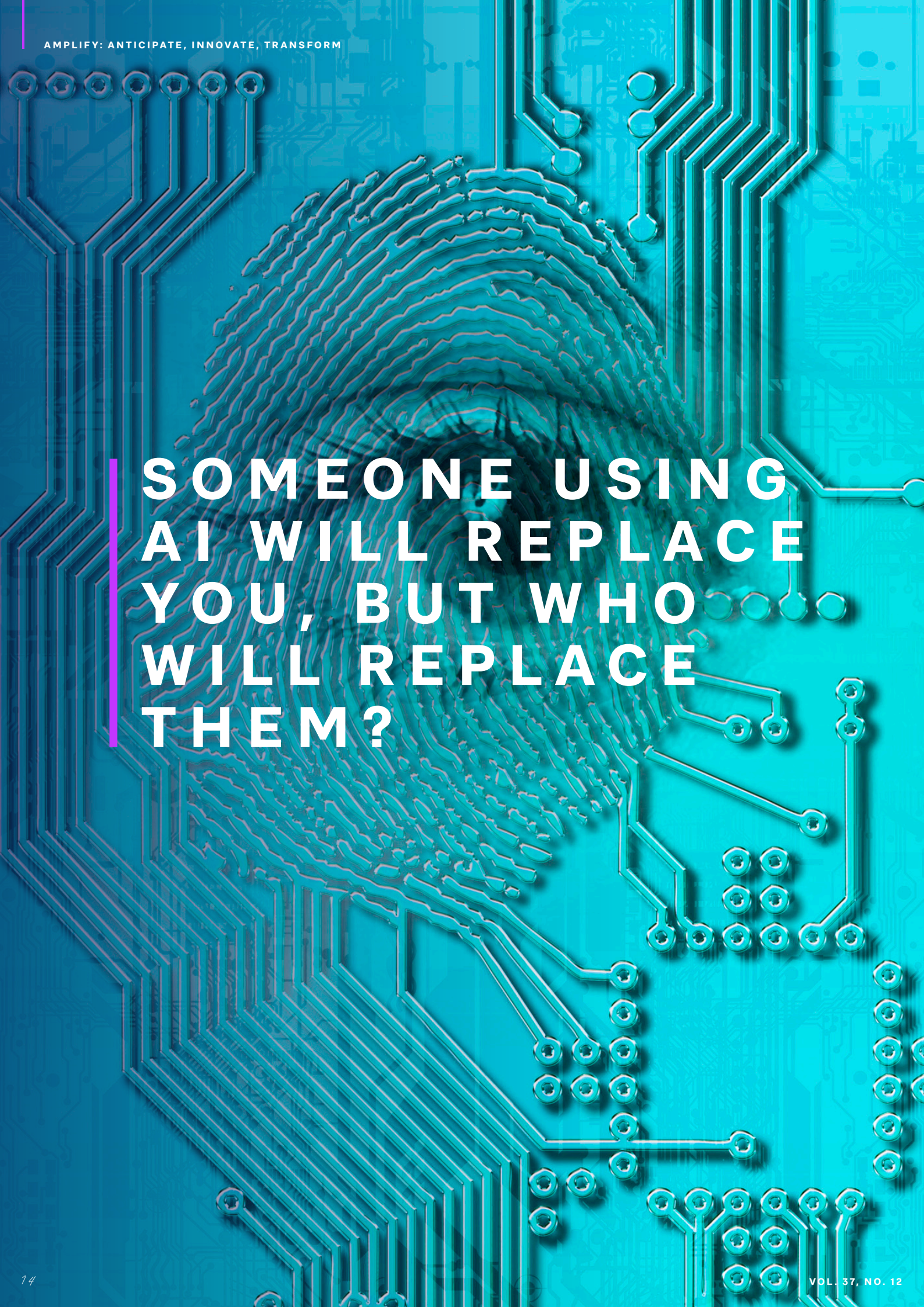
[3] Blain and Speculand (see 2).

[4] Speculand, Robin. *World's Best Bank: A Strategic Guide to Digital Transformation*. Bridges Business Consultancy International, 2021.

[5] Lawton, George, and Mekhala Roy. "11 Reasons Why Digital Transformations Fail, Explained by Pros." TechTarget, 20 October 2023.

# About the author

**Jeremy Blain** is Chief Executive of Performance Works International (PWI), a consultancy specializing in digital, workforce, and leadership transformation. He is also cofounder of DiversITy-talent, a social enterprise dedicated to inspiring underrepresented and untapped talent pools to explore career opportunities in modern business and technology. As an international change influencer, Mr. Blain works at both strategic and operational levels, helping boards, executive leaders, and organizations thrive in the digital age. He is a globally recognized authority on empowered working, a distinction reinforced by his #1 international bestseller *Unleash the Inner CEO: Make Distributed Leadership a Reality*, which won the prestigious "Leadership Book of the Year" award at the 2024 Global Book Awards. Mr. Blain's second book, *OpenHR: The Human Capital Manifesto for the Blended Workforce*, became an international #1 bestseller within its first week of publication. *The Digital Leadership Playbook: A Step-by-Step Guide to Digital Transformation for Leaders and Boards* is his most recent book. Mr. Blain is a prolific keynote speaker, researcher, and the author of over 30 industry white papers. As a media commentator, his expert insights on leadership, digital transformation, and workforce innovation have been featured in high-profile publications and platforms, including *Forbes, CEO Today, Inc.*, Medium, *The Times* (UK and India), *Dialogue, Business Matters, HRM*, HR Online, *Authority, BigThink*, and more. He can be reached at jeremy@performanceworks.global.



# SOMEONE USING AI WILL REPLACE YOU, BUT WHO WILL REPLACE THEM?

Authors

Eystein Thanisch, Greg Smith,
and Michael Papadopoulos

**Between now and 2030, we will undoubtedly see a transformation in AI adoption and application — but it is not clear which way this transformation will go. The huge advances made in the field in recent years are well-known, but they are not necessarily well-understood.**

Anxiety is building, not just over AI's legal, ethical, environmental, and social implications, but over whether it will yield the productivity gains so eagerly anticipated. Despite the rise to public prominence of generative AI (GenAI), especially since the 2021 release of ChatGPT, no significant rise in worker productivity has been observed.[1] In fact, a recent Upwork study found that 77% of employees believe AI has made them less productive.[2]

The Gartner Hype Cycle is well established: initial excitement at a new technology's potential leads to overinvestment, followed by a corrective crash that triggers consolidation and, in due course, more sustainable growth. AI may be entering the middle phase of this cycle. However, there are many examples of technologies that defied the cycle, either by sinking without a trace or continuing an unabated rise to success. The future of AI could go many ways.

Our struggles to convert AI into real-world gains suggest that the decisive challenge for the immediate future of AI is its successful integration into the tasks that skilled and professional people perform. According to the Upwork study, many executives feel their workers lack the skills to take advantage of the technology. Meanwhile, employees argue that time taken up checking unreliable AI output is a productivity killer.

Massachusetts Institute of Technology (MIT) economist David Autor graphically highlighted the vastly different value technologies can have in trained and untrained hands: "A pneumatic nail gun is an indispensable time-saver for a roofer and a looming impalement hazard for a home hobbyist."[3] AI cannot currently be expected to bridge all gaps in skill, experience, or data management within an organization.

**THE DECISIVE CHALLENGE FOR THE IMMEDIATE FUTURE OF AI IS ITS SUCCESSFUL INTEGRATION INTO THE TASKS THAT SKILLED & PROFESSIONAL PEOPLE PERFORM**

Multiple *Amplify* contributors have called for an inclusive, humanistic approach to AI adoption.[4,5] We believe that leaders looking to successfully integrate AI would benefit from undertaking a deep, widespread analysis of precisely what contribution AI can make to the most pivotal roles and skills in their organization. This is not only important for maximizing the positive value of AI; we argue that, in the face of wholesale automation of roles, a conscious effort is needed to maintain the skills and professional development ecosystem necessary to produce humans capable of adopting and exploiting AI in the future.

## THE DECOMPOSITION OF PROFESSIONS

Society's treatment of skill and expertise has been evolving in parallel to AI developments. In their seminal 2015 work, *The Future of the Professions*, Richard and Daniel Susskind proclaimed the wholesale decomposition of the professions as both socially desirable and already underway.

They argue that the expert craft of a traditional professional can increasingly be abstracted and encapsulated as logic and processes. These can be implemented, perhaps under expert direction, by paraprofessionals using standard operating procedures (SOPs) or a range of digital applications, with the result being faster and more affordable service delivery. Ultimately, they ask, why place expertise in people rather than in things or rules?[6]

The Susskinds call for work to be analyzed as tasks rather than jobs to better pinpoint where human expertise is truly required. They call for professional training to be structured less around the technical details of tasks and more on the fundamental problems and values of the relevant sector. Similar to a craft apprenticeship, this should also foster familiarity with the complex interactions of experienced human operators. It certainly should not consist of years of repetitive experiences working at a given profession's coalface.

Increasingly, in place of direct delivery, work will be about tool adoption, process analysis, results explanation, and dynamic integration with other areas of expertise. Education and training should adapt accordingly.

AI's acceleration renders the issues the Susskinds raise even more urgent. Breakthroughs in GenAI have put professional roles requiring a high level of education at the forefront of automation for the first time. Figure 1 offers a snapshot of occupations' exposure to AI (AIOE score) mapped to required education.[7]

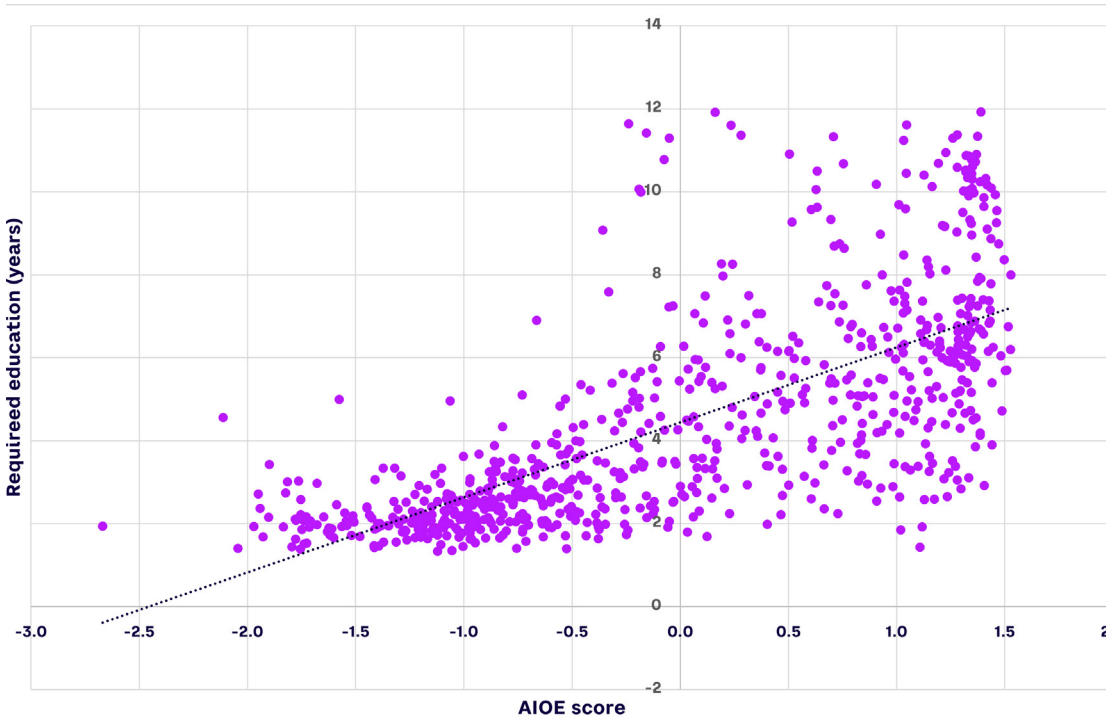



Figure 1. AIOE score mapped to required education (years) (source: Felten et al.)

In addition to offering a useful holistic model for considering the future of expertise, the Susskinds offer a lesson on the difficulties of looking ahead amid innovation and change. They were writing before the invention of the transformers architecture, which was pivotal to recent AI advances, allowing them to offer a prescient examination of issues and trends without foreseeing that one of the factors they analyzed would become a major driver in the medium term.

This illustrates the importance of taking a broad, circumspective view when considering technological innovation, which can often only be understood *a posteriori*, as we know from scientist/futurist Roy Amara:

> **Amara's Law:** We tend to overestimate the effect of a technology in the short run and underestimate the effect in the long run.

## THE MARRIAGE OF *TECHNE & EPISTEME*

When we consider possible future models of AI-human interaction, a complex picture emerges. It has become commonplace to suggest AI will mainly automate work that is possibly meticulous but ultimately routine and well-understood. Examples include writing code for a programmer, drafting a document for a lawyer, and suggesting plausible candidate molecules to a pharmacologist.[8-10]

There may be applications in which AI plays the role of co-expert. For example, the pharmacologist just mentioned may be required by their organization to be familiar with a formidable library of documentation and SOPs. These are important, but they are ancillary to the core science being delivered. With its powers of summarization and information retrieval, a large language model (LLM) could function as a responsive guide to this entire domain of knowledge, capable of applying it to specific situations as they arise. For example, at least one trial has shown that AI-driven knowledge bots trained on product manuals and troubleshooting history can successfully support software engineers.[11]

Some roles might radically shift in emphasis, but this will not necessarily result in less skill being required from a human overall. A report from design toolmaker Figma suggests that in response to the plethora of options AI will generate, the role of a UI/UX designer will pivot to selection, justification, and persuasion over actual design.[12]

**WHEN WE CONSIDER POSSIBLE FUTURE MODELS OF AI-HUMAN INTERACTION, A COMPLEX PICTURE EMERGES**

Design will also become far more data-driven, as user interactions with candidate designs can be simulated by AI at a scale rarely possible via human user acceptance testing.[13] Google was a noted early adopter of design by big data; in 2009, it was famously excoriated for taking this to excess by departing design lead Doug Bowman. This is a likely direction for many roles oriented around design in a broader sense, and, when kept in proportion, it could be enriching for the activities involved.

Indeed, AI solutions may end up taking on so many tasks relevant to a role that the human's main task becomes selecting the right model for each task and coordinating between them. In the clinical trial situation mentioned above, the SOPs might be accessible via an LLM while a model like AlphaFold identifies the molecules for the drug being trialed and another model scans the horizon for threats to the trial.[14]

Finally, AI itself will generate requirements for skills. These will not just include skills required to directly interact with AI, such as prompt engineering; they will also include extensions to existing services. For example, although cybersecurity has a lot of potential for AI-driven automation, AI applications themselves pose distinctive cybersecurity challenges with which cybersecurity professionals will have to come to grips.

This is a relatively optimistic vision of the future, in which skilled workers, augmented by AI, can focus on the fundamentals of their profession and adjacent synergies. In his 2004 book, *The Gifts of Athena*, economic historian Joel Mokyr argued that a key factor in the Industrial Revolution was the institutionalized and highly productive interplay of *episteme* and *techne*, which can be broadly defined as scientific knowledge of immutable truths and practical experience of messy realities. When they inform each other, the result is growth and progress.[15]

Respective AI and human capabilities cannot be easily mapped onto *episteme* and *techne*. AI is trained on massive banks of data (which can be thought of as experience); it then generalizes and pattern matches. The human's role is not purely intellectual: they might have a deep understanding of the context that the AI does not, but they must take practical steps to use AI's outputs in the real world.

Nonetheless, one can see the same interplay at work in emerging human-AI interactions, which can all be thought of as translating abstract knowledge into real outputs and vice versa.

## THE END OF SKILL SCARCITIES?

A key insight from Mokyr is that such an interplay is not organic. In the past, it required conscious organization. More ominously, Yuval Harari, in *Nexus*, his recent work on AI in the context of the history of information networks, counsels against comparisons of the nascent age of AI with the Industrial Revolution.[16] The impact of AI could be vastly more profound, precisely because AI poses an unprecedented challenge to the human monopoly on thought (albeit without actually thinking).

Furthermore, the grim human ramifications that can be traced back to the Industrial Revolution (colonialism, economic inequality, and environmental destruction) do not make the comparison a sound basis for complacency, even if valid. History should motivate and inform our actions, not provide glib reassurance as to what comes next.

Few deny that AI adoption will lead to major readjustments in the labor market. Some roles may be entirely automated. Even those that are augmented may require far less skill. On the one hand, they will become radically democratized; on the other, remuneration and job security will diminish.

In terms of which roles will be most impacted, studies tend to identify white-collar occupations requiring a high level of education with an emphasis on information processing (refer back to Figure 1). According to the World Economic Forum, the roles most likely to be automated entirely are those that consist of "routine and repetitive procedures and do not require a high level of interpersonal communication."[17] We believe nonroutine roles that focus heavily on a particular craft, resist decomposition, and lack active contextual involvement are also at high risk. For example, drafting documents is only one aspect of a lawyer's work, but translation is the defining activity of a translator.

This poses a challenge. Human experts will still be needed, but the incentives for individuals to amass that expertise will be reduced. Translators are already experiencing downward pressure on earnings due to GenAI.[18] Concern is expressed about those starting out in the profession, as automation reduces the opportunities to gain direct experience.[19] At the same time, experienced translators are in demand to check AI translations.

In an echo of the disconnect over AI's utility identified in the Upwork study cited above, translators say this kind of task is more painstaking and time-consuming than fresh translation, but purchasers perceive it not to be worth as much. The *techne* has been automated, the human *episteme* built up through it is still needed, and the relationship between the two is poorly understood by decision makers.

Similar issues played out in Hollywood during the 2023 Writers Guild of America strike. One of the main issues was the alleged plan by studios to generate initial screenplays using AI and bring in writers as editors.

With the *techne* automated, will we eventually reach a point where there are not sufficient humans with the necessary experience to provide the required *episteme* and oversight? The Susskinds describe this risk to the skills ecosystem as a "serious but not fatal" challenge to the decomposition of the professions that they urge.[20] They argue that prolonged exposure to automatable tasks early in one's career does not constitute high-quality training anyway and propose the alternative model summarized above.

Their model may not be commercially realistic, however. In many career paths, early career professionals undertake easily automatable tasks in parallel to gaining experience they will later use to undertake more complex tasks. In a typical professional services firm, a junior professional performs tasks like drafting, simple coding, or data analysis while gaining experience in project management, software architecture, or client relationship management, which will be their focus later in their career. If AI is handling the menial tasks, it will become more difficult to justify the expense of including juniors on projects to clients if the juniors are blatantly there just to build up the experience required for more senior, nuanced roles at some future point.

We are at a happy historical juncture, in which both powerful AI and independently experienced professionals are available, but if AI is not deployed thoughtfully and responsibly, this will not always be the case. Leaders should consider the longer-term sustainability of their skills ecosystem, including which skills are going to be needed.

It is difficult to tell what skills will cease being needed. Currently, the best results from many tasks are achieved through a collaboration between AI and humans. As noted, publishers and Hollywood studios appear far from ready to dispense with human input. Computer-assisted translation tools, which can have an AI component, are well-established in professional translation. AI has proved superior to medical professionals in some diagnosis tasks when compared head-to-head, but the best results are reported from the blending of human and AI observations.[21]

**WITH THE *TECHNE* AUTOMATED, WILL WE EVENTUALLY REACH A POINT WHERE THERE ARE NOT SUFFICIENT HUMANS WITH THE NECESSARY EXPERIENCE TO PROVIDE THE REQUIRED *EPISTEME* & OVERSIGHT?**

In software development, AI-powered copilots increase productivity but still introduce bugs, struggle to fully optimize code, and do not perform as well on more advanced problems.[22] One also needs to know exactly what to ask for from the AI and how to assemble and deploy the outputs. If we draw an analogy between the AI-augmented developer of the future and the software architect of the present, the consensus in the tech world is that the latter should still know how to code, to better inform their decision-making, even if they delegate the bulk of the actual coding.

One of the Susskinds' flagship examples of the automation of professional work is the rise of online dispute resolution (ODR) systems, which were pioneered by eBay in the late 1990s and are now being augmented with AI. ODR offers parties in high-volume, low-value transactions quick and cheap access to justice without direct lawyer involvement. Yet lawyers and professional mediators have typically been involved in the design and evolution of ODR systems. The technology meets a need that quite possibly would never have been met other than by automation, thanks to the pipeline of human experts continuing to flow.

One could argue that augmentation is an intermediate stage and that AI will become fully autonomous in the future. From a technical perspective, this is highly contentious. Even the latest, massive LLMs are highly dependent on their training data and not reasoning independently at all.[23] To improve, LLMs will need more training data of sufficient quality, and that data will be produced by human experts, broadly defined. LLMs rapidly degrade in quality (so-called model collapse) when trained on the output of other LLMs because they amplify subtle patterns within machine-generated data.[24]

Thus, the deskilling of humans can be seen as posing a threat not just to society and the benefits of AI, but to AI itself. The entire AI sector relies on humans continuing to produce content and interactions on which it would be worth training a model at the scale they have hitherto done, if not greater, despite the potential impacts of AI on skilled work. All in all, there is little to suggest that human expertise will not continue to be needed, especially if AI is to thrive rather than survive.

## THE FUTURE AI-HUMAN ECOSYSTEM

AI has enormous potential for good and for ill. Looking to 2030, if history is to bend toward the former, it will require careful, conscious management of the skills ecosystem within organizations and industries.

The notion of the decomposition of roles into tasks is useful, as this supports nuanced analysis of what can be automated, what can be augmented, and where human expertise is required. Furthermore, the wider sustainability of that human expertise must be carefully considered, and steps taken to actively maintain it, if it can be established that this expertise is critical to the continued improvement and realization of AI's potential.

We suggest leaders ask themselves the following:

- What tasks can be augmented by AI, and what tasks can be automated?
- Are workers currently gaining skills and experience from, *or in parallel to*, these tasks that may still be needed, meaning measures will be required to retain these skills by alternative means?

Interestingly, AI could offer solutions to the problem it has created. Explainable AI is a major topic of research: if AI can break out of the black box and be open about how it produces its insights, this will make for more effective AI-human collaboration and make the experience more educational for the humans involved.[25]

Furthermore, since AI is trained on data, and as this data is often the product of human interactions and processes, it is effectively a repository of experience. Driven by this experience, it could be directed not just to solve problems but to coach and mentor.

Neither uncritically adopting technology offering short-term gains nor ignoring the very real opportunities is a sensible approach. There are paths to a productive and sustainable future with a beneficial fusion of AI and human skills, but we are responsible for carving them out.

## ACKNOWLEDGMENT

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## REFERENCES

[1] US Bureau of Labor Statistics. "Business Sector: Labor Productivity (Output per Hour) for All Workers." Federal Reserve Bank of St. Louis, 11 December 2024.

[2] Monahan, Kelly, and Gabby Burlacu. "From Burnout to Balance: AI-Enhanced Work Models." Upwork, 23 July 2024.

[3] Autor, David. "Applying AI to Rebuild Middle Class Jobs." Working Paper 32140, National Bureau of Economic Research (NBER), February 2024.

[4] Ntsweng, Oteng, Wallace Chipidza, and Keith Carter. "Infusing Humanistic Values into Business as GenAI Shapes Data Landscape." *Amplify*, Vol. 37, No. 5, 2024.

[5] Schmarzo, Bill. "Unleashing Business Value & Economic Innovation Through AI." *Amplify*, Vol. 37, No. 6, 2024.

[6] Susskind, Richard, and Daniel Susskind. *The Future of the Professions: How Technology Will Transform the Work of Human Experts*. Oxford University Press, 2015.

[7] Felten, Edward, Manav Raj, and Robert Seamans. "Occupational, Industry, and Geographic Exposure to Artificial Intelligence: A Novel Dataset and Its Potential Uses." *Strategic Management Journal*, Vol. 42, No. 12, April 2021.

[8] Cui, Zheyuan (Kevin), et al. "The Effects of Generative AI on High Skilled Work: Evidence from Three Field Experiments with Software Developers." SSRN, 5 September 2024.

[9] Migliorini, Sara, and João Ilhão Moreira. "The Case for Nurturing AI Literacy in Law Schools." *Asian Journal of Legal Education*, 13 August 2024.

[10] Jayatunga, Madura KP, et al. "How Successful Are AI-Discovered Drugs in Clinical Trials? A First Analysis and Emerging Lessons." *Drug Discovery Today*, Vol. 29, No. 6, June 2024.

[11] Johnson, Nicholas, et al. "Taking Control of AI: Customizing Your Own Knowledge Bots." *Prism*, September 2023.

[12] "Anticipation, Experimentation and AI: Design Trend Report." Figma, accessed December 2024.

[13] Sreenivasan, Aswathy, and M. Suresh. "Design Thinking and Artificial Intelligence: A Systematic Literature Review Exploring Synergies." *International Journal of Innovation Studies*, Vol. 8, No. 3, September 2024.

[14] van der Schaaf, Ben, et al. "Managing Clinical Trials During COVID-19 and Beyond." Arthur D. Little, April 2020.

[15] Mokyr, Joel. *The Gifts of Athena: Historical Origins of the Knowledge Economy*. Princeton University Press, 2004.

[16] Harari, Yuval Noah. *Nexus: A Brief History of Information Networks from the Stone Age to AI*. Random House, 2024.

[17] "Jobs of Tomorrow: Large Language Models and Jobs." World Economic Forum/Accenture, September 2023.

[18] Giles, Ian. "Pirate AI." Eurozine, 12 August 2024.

[19] Anderson, Caroline. "What Do Writers Think About AI?" Authors' Licensing and Collecting Society, 26 June 2024.

[20] Susskind and Susskind (see 6).

[21] Cabitza, Federico, et al. "Rams, Hounds and White Boxes: Investigating Human-AI Collaboration Protocols in Medical Diagnosis." *Artificial Intelligence in Medicine*, Vol. 138, April 2023.

[22] Bucaioni, Alessio, et al. "Programming with ChatGPT: How Far Can We Go?" *Machine Learning with Applications*, Vol. 15, March 2024.

[23] de Gregorio, Ignacio. "Apple Speaks the Truth About AI. It's Not Good." Medium, 23 October 2024.

[24] Shumailov, Ilia, et al. "AI Models Collapse When Trained on Recursively Generated Data." *Nature*, Vol. 631, July 2024.

[25] Dwivedi, Rudresh, et al. "Explainable AI (XAI): Core Ideas, Techniques, and Solutions." *ACM Computing Surveys*, Vol. 55, No. 9, January 2023.

# About the authors

**Eystein Thanisch** is a Technology Analyst with ADL Catalyst. He enjoys ambitious projects that involve connecting heterogeneous data sets to yield insights into complex, real-world problems and believes in uniting depth of knowledge with technical excellence to build things of real value. Dr. Thanisch is also interested in techniques from natural language processing and beyond for extracting structured data from texts. Prior to joining ADL, he worked on *Faclair na Gàidhlig*, the historical dictionary of Scottish Gaelic, on a team tasked with building a tagged corpus of transcriptions from pre-modern manuscripts. He also was involved in IrishGen, a project on the use of knowledge graphs to represent medieval genealogical texts. Dr. Thanisch also worked as a freelance editor and analyst for a number of IGOs and academics. He earned a master of science degree in computer science from Birkbeck, University of London, and a PhD in Celtic studies from the University of Edinburgh, Scotland. He can be reached at experts@cutter.com.

**Greg Smith** is a Partner at Arthur D. Little (ADL), based in London. He founded and co-leads ADL Catalyst and was previously a member of ADL's Executive Committee, where he had responsibility for ADL's global innovation strategy. His work focuses on pragmatic business strategy in the context of digital transformation, as well as the application of disruptive information technologies in solving intractable business problems in major enterprises. Recently, Mr. Smith has been focusing on how the leading edge of innovation, and in particular advances in AI, can be practically applied within the real-world constraints of complex organizations. During his career, he alternated between strategic advisory and consultancy roles (ADL, Capgemini, and Atos Consulting) and hands-on technology leadership as CIO of a major private equity–owned logistics company going through a merger in record time. This latter role allowed Mr. Smith to discover the joys of applying Agile principles to wholesale business transformation and the need to be able to explain IT's explicit value contribution. He holds a bachelor of science degree in biological sciences from the University of Leicester, UK, and finds that after 30 years of dormancy within his professional life, the underlying concepts of biology are becoming increasingly valuable at unlocking business problems and articulating solutions — especially where reductive, engineering-based approaches need to be replaced with whole-system, evolutionary thinking. He can be reached at experts@cutter.com.

**Michael Papadopoulos** is a Cutter Expert, Partner in ADL Catalyst, and a member of ADL's AMP open consulting network. He is passionate about designing the right solutions using smart-stitching approaches, even when elegance and architectural purity are overshadowed by practicality. Mr. Papadopoulos leads the scaling of multidisciplinary organizations by focusing on continuous improvement, establishing quality standards, and following solid software engineering practices. He mentors team members, leaders, and managers along the way. Mr. Papadopoulos is a strong advocate of the DevOps culture and Agile principles and has demonstrated experience in solving problems in challenging global environments. Coming from a development background, he remains highly technical, with hands-on involvement in code review, design, architecture, and operations. Mr. Papadopoulos has 15 years' experience in technology and digital consulting and has worked in a variety of sectors, including telecom, gaming, energy, and media. He can be reached at experts@cutter.com.

# SHINING A LIGHT ON AI'S DARK SIDE

*Author*

San Murugesan

**AI is a game-changer poised to impact businesses and individuals significantly in the years ahead. Fueled by investor ambitions, business interests, and consumer enthusiasm, the pace of AI innovation and adoption is set to accelerate. Its importance and influence will grow as AI finds novel and unforeseen applications that transform industries, society, and government operations, delivering immense economic and societal value. AI will revolutionize healthcare, finance, manufacturing, transportation, education, and more. By 2030, AI-enabled autonomous systems, humanoid robots, and AI-driven decision-making will be prevalent across industries and applications.**

Amid this promise and excitement, we must not overlook AI's dark side — the limitations, risks, and societal harms it brings. As Cutter Fellow Steve Andriole aptly described in his 2018 article, AI is "good, disruptive, and scary."[1] Its unintended consequences can be alarming and genuinely harmful when implemented without caution or ethics.

This article offers a forward-looking, balanced perspective on AI's darker dimensions and potential impact. We explore the technical barriers, risks, and limitations associated with AI while proposing practical remedies. Emphasizing the urgent need for action, we call on all stakeholders (developers, users, governments, and regulatory bodies) to engage responsibly. By addressing these challenges now, we can steer AI toward a future that maximizes its benefits while minimizing its harms.

## THE DARK SIDE

Some of AI's key challenges and risks include:

- **Technological barriers.** Limitations in achieving true general intelligence, poor data quality, and issues with contextual understanding hinder AI performance.
- **Complexity, scalability, and sustainability.** Increasingly complex AI systems face challenges in scalability, often requiring massive computational and energy resources to maintain performance.
- **Ethical and operational limitations.** AI struggles with moral decision-making and often depends on human oversight for critical functions.
- **Generalization failures.** AI systems can't yet generalize learned knowledge across tasks or domains.
- **Societal harms.** These encompass the misuse of AI for malicious and illegal purposes, including creating deepfakes, generating and spreading misinformation, producing biased and discriminatory outcomes, violating data privacy, and enabling surveillance for ulterior motives.
- **Security threats.** AI systems are vulnerable to sophisticated cyberattacks, including those engineered by other AI systems. Furthermore, AI can aid security attacks on cyber-physical systems.

> **WE MUST NOT OVERLOOK AI'S DARK SIDE — THE LIMITATIONS, RISKS & SOCIETAL HARMS IT BRINGS**

- **Economic and social disruption.** AI applications can result in job displacement, increasing inequality due to automation, potential economic instability, and power concentration among tech giants.
- **Autonomous systems risks.** AI-driven vehicles, drones, and weapons can pose significant dangers when used without adequate human oversight.

We discuss many of these risks below. For more, please see Sumit Mattey's article, "Unveiling the Shadows: The Dark Side of AI in Modern Society."[2]

## BIAS

Generative AI (GenAI) models, also known as "foundation models," are trained on vast datasets comprising preexisting information, images, and data sourced from diverse platforms, including the Web. Unfortunately, biases inherent in this data often permeate the model's outputs. This can result in unfair, biased, inaccurate, or narrowly focused responses, leading to discriminatory outcomes such as racial or gender prejudice.

If a language model is exposed to biased information (intentionally or unintentionally), its responses will reflect those biases. To mitigate this issue and ensure fairness and trustworthiness, it is essential to use unbiased, diverse datasets representing varied perspectives.

AI systems may also exhibit algorithmic bias arising from systematic and repeatable errors embedded within the model's architecture.[3] This can stem from preexisting societal biases, machine learning biases, emergent biases, technical design flaws, or correlation biases. These issues can produce "unfair" outcomes across applications and industries.

An article in the *International Journal of Information Management Data Insights* thoroughly explores AI biases, providing examples from various sectors and emphasizing the need to address these challenges.[4]

## MISUSE & ABUSE

GenAI-based text, image, and video generators like ChatGPT, Midjourney, DALL-E 3, and Sora can be used to spread misinformation, promote offensive messages (e.g., sexist or racist rhetoric), and generate harmful material that incites violence or social unrest. These systems can also be used for impersonation in a way that causes reputational damage or financial harm.

Malicious actors can leverage AI chatbots to engage in antisocial or illegal activities, such as learning how to create explosives, commit theft, or cheat in various scenarios.

Robust safeguards, also known as "guardrails," are needed to address these risks. These measures aim to prevent misuse, ensure the ethical application of AI, and hold those who exploit the technology accountable.

## SECURITY

Cybercriminals can use AI to launch sophisticated cyberattacks that evade detection, and AI itself may become a target of advanced cyber threats.[5] For example, hackers could use AI-powered content generators to craft personalized, convincing spam messages or embed hidden malicious code in images, dramatically increasing the scale and effectiveness of cybersecurity attacks.

Additionally, users may inadvertently expose sensitive personal or business information by sharing it with chatbots like ChatGPT. Hackers could potentially store, analyze, or misuse this data, raising significant security, ethical, and privacy concerns.

Consider the following real-world scenarios:[6]

- An executive copied and pasted their company's 2023 strategy document into a chatbot, asking it to generate PowerPoint slides for a presentation.
- A doctor inputted a patient's name and medical condition into ChatGPT to draft a letter to the patient's insurance company.

These cases highlight the urgent need for stricter safeguards, operational guidelines, and higher levels of awareness.

## LEGAL ISSUES

Who owns the rights to an AI-generated essay, musical composition, or piece of art? Is it the people who provided the prompts and generated the content or those whose data was used to train the AI model?

It is worth noting that the US Copyright Office ruled that images generated by tools like Midjourney and other AI text-to-image platforms are not protected by US copyright law, as they lack the element of human authorship.[7] This decision sparked debate about the legal status of AI-generated creations. Artists filed a class-action lawsuit against companies offering AI-generated art, challenging the legality of training AI systems on datasets that include their work without explicit consent.[8] There is an urgent need to address AI's legal and ethical implications in creative domains.

## IMPACT ON EMPLOYMENT & SOCIETY

AI content generators have the potential to automate tasks traditionally performed by humans (e.g., writing, editing, and customer service), raising concerns about job displacement. Automated decision-making systems, autonomous systems, and agentic AI could significantly reduce the need for human operators, impacting labor dynamics and raising socioeconomic issues.

AI's broader societal impact includes the risk of exacerbating inequalities in access to its benefits, privacy erosion, and the degradation of human relationships. These concerns underscore the need for thoughtful policies and ethical considerations as AI advances.

## INFORMATION LAUNDERING

AI significantly influences how information is disseminated, but its potential biases and manipulations can distort information and/or spread misinformation. Key mechanisms through which AI contributes to information laundering include:[9]

- **Selective and biased presentation.** AI systems can omit relevant data to create skewed narratives, and language models trained on biased content can generate misleading information. Malicious actors can intentionally design algorithms to produce misleading or biased outcomes to serve specific agendas.
- **Deepfakes and content amplification.** AI enables highly realistic, fabricated content (images, videos, and audio) designed to spread false narratives. These technologies can also amplify the visibility of synthetic media, extending the audience while lending them a false sense of legitimacy.
- **Misinformation campaigns and echo chambers.** Automated bots can rapidly spread false information (echo chambers), creating a false perception of credibility or consensus. Personalization algorithms reinforce existing biases by presenting content aligned with users' beliefs, making distinguishing between true and false information harder.

There is an urgent need for vigilance, ethical practices, and robust safeguards to prevent the misuse and spreading of misinformation.

## OVERRELIANCE

AI for decision-making can undermine human qualities like empathy, creativity, and ethical discernment, which are essential for sound judgment.[10] This dependence can lead to dehumanization within organizations, erosion of human judgment, a decline in creative thinking, and a loss of human autonomy.

As organizations increasingly adopt AI-driven decision-making, they run the risk of using AI in contexts that require nuanced judgment and critical thinking, such as crisis management. Business leaders must learn to leverage AI capabilities while preserving leadership's unique human qualities and retaining the essential role of human judgment.

## ISOLATION, PSYCHOLOGICAL MANIPULATION & SOCIAL IMPLICATIONS

Despite fostering hyperconnectivity, AI-driven apps often contribute to social isolation. Virtual echo chambers and digital personas can replace human connections, leading to feelings of loneliness and alienation. A growing dependence on virtual interactions and the commercialization of online relationships will further weaken social cohesion, threatening collective well-being.

AI algorithms used by social media platforms and online services exploit human psychology, driving addictive behaviors and exacerbating mental health challenges. Inappropriate implementation and constant use of such applications affect mental health, human relationships, self-perception, and social dynamics.[11] There is an urgent need for ethical standards and regulatory oversight to safeguard mental and societal health.

## ENVIRONMENTAL IMPACTS

Large language model training is energy-intensive, contributing to climate change and depleting natural resources. Strategies to reduce AI's carbon footprint are urgently needed.

The swift obsolescence of AI hardware accelerates the generation of electronic waste (e-waste), posing challenges for sustainable waste management. Discarded devices and components often end up in landfills or are improperly disposed of, releasing harmful pollutants into ecosystems. Adopting sustainable design practices and responsible end-of-life management is crucial for minimizing e-waste.

## RISK MITIGATION

AI's rapid expansion presents both immense opportunities and potential risks, some of which could be irreversible if not addressed. A notable example is the AI-based trading bots in the 1980s and 1990s that led to a market crash due to automated selling triggered by other bots. This prompted financial markets to implement systems that halt trading when certain thresholds of selling activity are detected.

Predicting and analyzing AI-driven risks is crucial for business leaders and developers. As companies embrace digitalization and AI, a close interaction between business, AI, and organizational strategies is essential to navigate the digital imperatives of 2030 and beyond.[12]

Executives planning to integrate AI should analyze its contributions to roles within their organizations and maintain the skills and professional growth ecosystem necessary for their developers to leverage AI effectively in the future.

AI systems must incorporate human oversight to mitigate catastrophic AI-driven risks in automated environments, particularly in critical areas like healthcare, defense, law, and finance. Human-in-the-loop systems ensure that human operators retain control, balancing automation with human expertise and intuition.

## AI RISK MANAGEMENT

Many organizations are adopting AI, but not enough address its associated risks. A report by the IBM Institute for Business Value revealed that although 96% of leaders believe GenAI increases the risk of a security breach, only 24% of GenAI projects are adequately secured.[13]

AI risk management offers a structured approach to identifying, mitigating, and addressing these risks. It involves a combination of tools, practices, and principles focused on implementing formal AI risk management frameworks. The goal is to minimize AI's negative impacts while maximizing its benefits.

The National Institute of Standards and Technology (NIST) introduced the NIST AI Risk Management Framework (AI RMF) to manage the risks AI poses.[14] This voluntary framework integrates trustworthiness considerations throughout the AI lifecycle, from design and development to use and evaluation. AI RMF complements and aligns with other AI risk management initiatives.

## RESPONSIBLE DEVELOPMENT

Responsible AI development and use are essential for mitigating AI's ethical concerns and risks. Developers, users, and regulators collectively share this burden. Developers must ensure models are trained on diverse and representative data and implement safeguards to prevent misuse. An interdisciplinary approach is crucial to address the complex challenges of artificial general intelligence that matches or surpasses human cognitive capabilities across a wide range of cognitive tasks, a distant goal for researchers and developers.

Regulatory frameworks are needed to address privacy, bias, and accountability concerns. Accountability and responsibility must also be embedded within an appropriate legal framework to promote the ethical use of these technologies for societal benefit.

Users must be mindful of the data they provide to AI systems, including personal information. They should use AI content generators ethically, posing valid, responsible, and morally acceptable prompts; fact-checking responses; and correcting/editing the responses before use.

General moral principles and a comprehensive overview of AI ethics should be integrated into AI curricula and education for students, as well as training programs for AI developers, data scientists, and AI researchers.

**RESPONSIBLE AI DEVELOPMENT & USE ARE ESSENTIAL FOR MITIGATING AI'S ETHICAL CONCERNS & RISKS**

## TRUSTWORTHY AI

One of the biggest challenges developers and society face is trust in AI. Core principles of a responsible or trustworthy AI include fairness, accountability, robustness, safety, privacy, and societal and environmental well-being.[15] Preventative measures (guardrails) include requiring developers and deployers of high-risk AI to take specific steps across the AI lifecycle. Governments, technology companies, and individuals must join forces to establish a framework that ensures AI's ethical and responsible development and use. Key priorities include:

- **Comprehensive data protection.** Enforce stringent regulations to safeguard personal data and ensure accountability for data breaches.
- **Ethical AI practices.** Center AI development and deployment around core human values and fundamental rights.
- **Transparent algorithms.** Mandate transparency in AI and make AI systems explainable and open to auditing to minimize bias and prevent discrimination.
- **International collaboration.** Develop global standards for AI governance to tackle cross-border issues.
- **Public education.** Teach individuals to understand AI risks and how to safeguard themselves against potential harms.

Technologists should focus on improving the transparency and explainability of AI systems while actively tackling biases and establishing measures to prevent their misuse.

## AI REGULATION

Rapid AI advancement has spurred governments worldwide to establish evolving regulatory frameworks to balance its risks and benefits. A recent report offers a detailed overview of AI governance across the US, China, and the EU, covering key topics like system classification, cybersecurity, incident reporting, open source models, and risks tied to hazardous materials.[16] It highlights legislative insights and analyzes motivations and expectations for future regulations.

AI regulation enforcement is challenging. A recent research article argues, "If we believe that AI should be regulated, then AI systems must be *designed to be regulatable*."[17]

### AI AUDIT: ENSURING ACCOUNTABILITY & REDUCING RISKS

An AI audit, or algorithmic auditing, evaluates an AI system to ensure ethical, legal, and secure operations. It helps businesses identify risks, detect prohibited activities, address illegal bias, and implement safeguards to mitigate unacceptable risks.

The process includes documenting the AI system, assessing the development team, reviewing test datasets, analyzing inputs and outputs, and examining the model's internal workings for transparency.

AI audits also educate executives about AI's value and challenges. Global organizations provide AI auditing frameworks that guide businesses in responsibly adopting AI. The frameworks support risk mitigation and ensure AI technologies align with ethical standards, fostering trust and enhancing integration into digital transformation strategies, but they have yet to be widely adopted.

## WHY AI PROJECTS FAIL & HOW TO SUCCEED

More than 80% of AI projects fail, which is twice the already-high failure rate in corporate IT projects that do not involve AI.[18] Key reasons for failure include:[19]

- **Problem misunderstanding.** Lack of clarity about the problem AI is intended to solve and AI's capability to address it leads to misaligned objectives.
- **Insufficient data.** Inadequate or poor-quality data hampers the development of effective AI models and project outcomes.
- **Overemphasis on technology.** Focusing on the latest AI trends and tools rather than addressing real-world issues reduces project relevance.
- **Lack of infrastructure.** Weak or inadequate infrastructure for managing data and deploying models undermines project execution.
- **Overreach.** Applying AI to problems beyond its current capabilities leads to poor outcomes.

### STRATEGIES FOR SUCCESS

To overcome these challenges, industry leaders and developers should:

- **Bridge the gap between AI's potential and its successful implementation,** ensuring more impactful and sustainable outcomes.
- **Clearly define project goals** and focus on solving meaningful, real-world problems.
- **Invest in robust infrastructure** for data management and AI model deployment.

- **Recognize AI's limitations** and conduct feasibility assessments with input from technical experts to ensure realistic expectations.
- **Collaborate with government and private agencies** to address data collection challenges.
- **Support employees' continuing education and training** to build expertise in AI implementation.

In the evolving AI landscape, professionals must expand their expertise beyond technical skills to remain competent and relevant.[20] This includes staying updated on AI advancements, exploring the potential of AI in their work, addressing ethical and regulatory challenges, mitigating risks, and cultivating multidisciplinary knowledge. Having the knowledge, skills, and abilities to manage AI systems effectively is critical for the quality and success of AI applications.

By establishing clear success metrics, business leaders can identify underperforming AI experiments early and terminate them before costs escalate.[21] However, in some cases, pausing a project rather than abandoning it may be more effective, as emerging AI capabilities could address the underlying issues.

## CONCLUSION

If we don't embrace AI advances, we risk falling behind. But we must remain vigilant about AI's core issues, limitations, and risks. Failure to address these challenges can result in financial and reputation loss, security vulnerabilities, ethical dilemmas, economic and social disruption, and environmental harm. Addressing the dark side of AI demands awareness, technological innovation, collaboration, and decisive policy interventions. Put simply, we should be asking not just what AI *can* do, but what it should — and shouldn't — do. The future of AI lies in our hands. Let's unlock AI's potential and benefits by proactively addressing its risks and unintended consequences.

> Our future is a race between the growing power of technology and the wisdom with which we use it.
>
> — Stephen Hawking[22]

## REFERENCES


1 Andriole, Steve. "AI: The Good, the Disruptive, and the Scary." *Amplify*, Vol. 31, No. 2, 2018.

2 Mattey, Sumit. "Unveiling the Shadows: The Dark Side of AI in Modern Society." LinkedIn, 29 April 2024.

3 "Algorithmic bias." Wikipedia, accessed December 2024.

4 P.S., Varsha. "How Can We Manage Biases in Artificial Intelligence Systems — A Systematic Literature Review." *International Journal of Information Management Data Insights*, Vol. 3, No. 1, April 2023.

5 Murugesan, San. "The AI-Cybersecurity Nexus: The Good and the Evil." *IT Professional*, Vol. 25, No. 5, September-October 2022.

6 Lemos, Robert. "Employees Are Feeding Sensitive Biz Data to ChatGPT, Raising Security Fears." Dark Reading, 7 March 2023.

7 Quach, Katyanna. "America: AI Artwork Is Not Authored by Humans, So Can't Be Protected by Copyright." The Register, 24 February 2023.

8 Escalante-De Mattei, Shanti. "Artists File Class Action Lawsuit Against AI Image Generator Giants." ARTnews, 17 January 2023.

9 Fheili, Mohammad Ibrahim. "Information Laundering in the Age of AI: Risks and Countermeasures." LinkedIn, 1 July 2024.

10 Ribeiro, Brunno Boaventura. "The Dark Side of AI Dependency." LinkedIn, 22 August 2024.

11 Kak, Ajay. "The Dark Side of AI, Generative AI, and Machine Learning and Examining Its Psychological Consequences." LinkedIn, 3 September 2024.

12 Mithas, Sunil, San Murugesan, and Priya Seetharaman. "What Is Your Artificial Intelligence Strategy?" *IT Professional*, Vol. 22, March-April 2020.

[13] Badman, Annie. "What Is AI Risk Management?" IBM, accessed December 2024.

[14] "AI Risk Management Framework." National Institute of Standards and Technology (NIST), accessed December 2024.

[15] Varsha (see 4).

[16] Cheng, Deric, and Elliot McKernon. "New Report: 2024 State of the AI Regulatory Landscape." Convergence Analysis, 27 May 2024.

[17] Shen, Xudong, et al. "Directions of Technical Innovations for Regulatable AI Systems." *Communications of the ACM*, Vol. 67, No. 11, October 2024.

[18] Kahn, Jeremy. "Want Your Company's AI Project to Succeed? Don't Hand It to the Data Scientists, Says This CEO." *Fortune*, 26 July 2022.

[19] Ryseff, James, Brandon F. De Bruhl, and Sydne J. Newberry. "The Root Causes of Failure for Artificial Intelligence Projects and How They Can Succeed." RAND, 13 August 2024.

[20] Murugesan, San. "To Thrive in the Artificial Intelligence Age, Stay Professionally Fit — Forever." *IEEE Intelligent Systems*, Vol. 39, November-December 2024.

[21] Gross, Grant. "When Is the Right Time to Dump an AI Project?" *CIO*, 10 October 2024.

[22] Walker, Lauren. "Stephen Hawking Warns Artificial Intelligence Could End Humanity." *Newsweek*, 14 May 2015.

# About the author

**San Murugesan** (BE [Hons], MTech, PhD; FACS) is a Cutter Expert and a member of Arthur D. Little's AMP open consulting network. He is also Director of BRITE Professional Services and former Editor-in-Chief of the IEEE's *IT Professional* and *Intelligent Systems*. Dr. Murugesan has four decades of experience in both industry and academia, and his expertise and interests include artificial intelligence, quantum computing, the Internet of Everything, cloud computing, green computing, and IT applications. He offers certificate training programs on key emerging topics and keynotes. Dr. Murugesan is coeditor of a few books, including *Encyclopedia of Cloud Computing* and *Harnessing Green IT: Principles and Practices*. He is a fellow of the Australian Computer Society, Golden Core Member of IEEE Computer Society, and Life Senior Member of IEEE. Dr. Murugesan has held various senior positions at Southern Cross University, Australia; Western Sydney University, Australia; the Indian Space Research Organization, Bangalore, India; and also served as Senior Research Fellow of the US National Research Council at the NASA Ames Research Center. He can be reached at experts@cutter.com.

# DOLLARS & SENSE:

## 5 TIMELY & TIMELESS DIGITAL ERA FINANCIAL INSIGHTS

Author

Noah P. Barsky

**Financial acumen is as crucial as ever in the digital era, as it can quickly reveal which enterprises are, in reality, just technologies in search of a sustainable business model. Likewise, such knowledge can help leaders discern early warning signals (e.g., declining margins, productivity slides, customer churn, and inventory bloat) that a faltering business needs IT modernization. Yet the mere mention of financial statements usually generates scorn about arcane accounting terminology, puzzled looks at endless spreadsheet grids, and eagerness to move on to more "comfortable" topics.**

Nonetheless, just as routine medical checkups and fundamental health knowledge are important to wellness, all managers must periodically review and understand their organization's overall financial well-being. Just as metabolic blood test reports provide health indicators, financial statements reflect business vitality. Importantly, reported data, whether medical or financial, holds no answers, but it begs users to ask the right diagnostic questions — *especially if something has gone awry.*

The digital era does not change that. Despite the fluid lexicon of business buzzwords, leaders of well-run enterprises understand fiscal responsibility, deliver competitive returns, and communicate with clarity and candor. Detailed below are five timely and timeless insights about financial performance that ensure stewardship, especially in times of rapid technology-driven change (see the Appendix for terminology).

## INSIGHT 1: COMPANIES LIVE BY EARNINGS BUT PERISH BY THE BALANCE SHEET

The business press and financial markets repeat the mantra of "earnings, earnings, and earnings." What is often overlooked, to great peril, is management's first and fundamental fiduciary responsibility of *stewardship*. Established in the era of sea merchants, the first accounting methods reconciled resources entrusted to a crew upon departure against the treasure accumulated by journey's end. Today, reports of companies' demise often do not discuss lack of profitability; rather, they point to an inability to meet financial obligations. Successful leaders prioritize stewardship over empire building.

Consider four homes on a residential block, all of similar size and value. The assets appear the same, but a financial "X-ray" of each could reveal very different stories. House #1 was purchased 25 years ago at a much lower price than it would sell for today, and it has just a few years left on its mortgage. The owners of House #2 purchased the home this year, having scraped together a 20% down payment, and have decades of payments ahead. The family in House #3 paid cash and have no concerns about looming mortgage payments. House #4 is occupied by owners with hefty credit card debt who are in immediate jeopardy of foreclosure. By analogy, four corporate competitors may have similar assets and annual income, but very different pressures and flexibility due to obligations.

> **SUCCESSFUL LEADERS PRIORITIZE STEWARDSHIP OVER EMPIRE BUILDING**

Countless businesspeople, athletes, and actors have earned fortunes and then filed for bankruptcy. We may have seen their earnings, but never their balance sheets. When examining a balance sheet, in either absolute monetary units (i.e., dollars, euros, etc.) or relative terms (i.e., percentage of total assets), the three most important indicators to identify are (1) growth (2) mix, and (3) the largest item.

Company finances, like our retirement accounts, are usually either expanding or contracting; they rarely stay the same. A cursory examination of balance sheets over time will reveal, in money or percentages, changes in individual account or (sub) total lines. Knowing these changes provides an informed perspective on whether the workforce is being asked to do "more with less" or "more with more."

Growth can be desirable, but if unstable, it can be dangerous. Mix, the second critical balance indicator, provides appropriate context. Shoppers in grocery stores can often be observed closely studying product ingredients. What constitutes a food product or a company balance sheet reveals much about each's worthiness. For instance, a primary ingredient in many cereals is sugar while plain oatmeal contains just one ingredient: oats. A cake made for four or 400 has the same relative mix of eggs, butter, sugar, and chocolate, but the needed quantities will be vastly different.

On its "ingredients" list, the balance sheet shows assets, not by size, but in descending order of liquidity: how readily they can be turned into cash (hence, cash and cash equivalents are always first). Once capitalized (i.e., recorded on the balance sheet), an asset remains until it is sold, is exchanged, is depleted, is impaired, becomes obsolete, or is used to settle a liability.

For companies, the balance-sheet mix reveals the degree to which holdings consist of cash, accounts receivable (customer IOUs), inventory, property, intangibles (e.g., patents, or other investments) and how such resources have been financed (via short- or long-term debt or equity infusion from owners). A consistent mix, especially with growth, over time demonstrates stability and disciplined management (or lack thereof).

No examination of the mix on the balance sheet is complete without identification of the largest item(s) reported as assets or financing vehicles. For a retailer, it might be inventory or stores, depending whether they are owned or rented. For a movie studio or pharmaceutical firm, the largest asset can be intangible (film or patent rights, respectively).

The risks and pressures facing organizations and managers vary greatly depending on asset and debt mix. Assets require varied expertise, insurance, technologies, and other attention to manage. The largest financing item might be accounts payable (supplier bills due soon), bank loans, or retiree obligations; each has its own time horizon and implications. For instance, large aerospace companies, such as Boeing or Airbus, often receive customer payments in advance to fund the building of airplanes and spacecraft.

Such attention to the balance sheet is the foundation of a well-run enterprise and the essence of management obligation (as stewards) to first do no harm. Consistent profitability follows an understanding of the company's balance sheet and disciplined management of key resources.

## INSIGHT 2: KNOW THE COMPANY SPEED LIMIT

What is a company's *most* important metric? Such a question is as debatable and unanswerable as the singular most important health measure. Complex systems require multiple measures across vital components, and, as such, critical universal measures exist.

One key indicator is company sales growth rate percentage. Sales revenue is, over time, the best quantifiable and verifiable evidence of strategy execution. Revenues quantify customers' total purchases of a company's products and/or services and are the essence of basic economics, the prices and quantities not only desired, but transacted.

If company sales revenue increased from US $100 million to $110 million in one year, its annual growth rate was 10%. The sales growth rate is analogous to a roadway speed limit, a benchmarking context by which all other changes can be interpreted. Is a company growing too fast, too soon? It depends. Is it safe to drive a car at 50 miles per hour? Many people impulsively nod yes, but the answer is situational. Such speed would be dangerous in a driveway or parking lot, out of compliance in a school zone, and potentially traffic-clogging on an expressway.

Managers need to know their employer's sales growth rate in the past, present, and future to enhance decision and analysis credibility. For a company with an actual or anticipated sales growth rate of 10%, taming expense increases to a lesser rate results in profit growth, even while spending more.

The lesson is that *cost cutting is different than cost control.* Imagine two cars driving a great distance on an expressway, one car (sales) is proceeding at 70 miles per hour. Controlling the acceleration of the other vehicle (cost) to rate less than 70 mph increases the *distance between* the cars in each mile (in business terms, *profit*.) Both cars are still moving forward, but the rate of change is different, increasing the gap.

Retailers and restaurants can apparently increase total sales by opening locations. However, the growth of investment in storefronts, fixtures, and inventory may exceed the increase in sales, diluting the company's overall performance and asset utilization. Perhaps online sales and delivery would work better. Similarly, distributors may increase sales in the short term by loosening customer credit requirements. Such sales growth may be problematic and costly if less creditworthy customers result in more rapid accounts receivable growth and eventual collection issues. Clearly, there is great value in knowing and using sales growth rate as a marker for sound business judgment.

## INSIGHT 3: POWER OF THE PENNY

Despite the old adage "a penny saved is a penny earned," people often walk past pennies in parking lots, cafeterias, and just about every other place. We might think bending down to pick up a penny won't change our lives, but the consequences are severe to our employers. For every million dollars of sales, 10% of the top line equals $100,000, and 1% equals $10,000 dollars. For large companies, for every billion dollars of sales, 1% equals 10 million dollars. One tenth of 1%, a sliver of copper, equals 1 million dollars to such a firm.

If the CFO of a $1 billion company learned of a consulting idea that would improve the business by "just" one tenth of 1% ($1 million), that executive would certainly know the value and consider paying a tidy sum for such guidance. On a smaller scale, an entrepreneur running a $5 million company can improve profits (and owner pay) by $50,000 with "just" a 1% improvement.

Leaders make numbers meaningful with clarity and simplicity. Doing so guides the workforce to understand why their jobs are important and recognize the big differences that small changes can make. Surprisingly, an extra penny can pay for a lot at most companies.

The penny concept also reinforces how hard it is to succeed in business. Even healthy, well-known businesses are challenged to generate 10% profits on sales. Stated in terms of time, 10% of the year is just over 36 days. Divide a company's sales by 365. You will find that a tenth of a penny equates to about a third of a day, or approximately eight hours!

Relating time to money helps us look at things in a different way. Consider the value of each hour of work time. Think about what a meeting really costs, considering the approximate hourly rate of each attendee. Was the meeting time and money well spent? Would generative AI raise better questions and agentic AI more swiftly execute solutions?

The next time you see a penny on the ground, pick it up, and the next time you see a corporate penny hidden in plain view, guard that treasure — it is worth more than most of your colleagues ever considered.

## INSIGHT 4: RATIOS PROVIDE PERSPECTIVE

Countless technical volumes are filled with encyclopedic lists of financial-statement ratios calculated by dividing a number into another, but the meaning of most ratios often gets lost. An easy way to assess the value of any key performance indicator is to ask the simple question, "What's in the denominator?"

The denominator provides the context to scale the numerator. For example, sales revenue alone is meaningful, but divided by denominators, new insights emerge. Sales per employee, store, customer, transaction, hour, square footage, or assets yield different perspectives and actionable items that can improve the output (the numerator) by managing the denominator.

For example, "full service" movie theaters in recent years (pre-pandemic) moved from relying on occupancy (seats sold) to sales per seat, with dining as a new strategic offering. Innovators in technologies and medicine monitor the percentage of sales released in the last year, as new offerings often provide the highest price points and margins.

Focusing on the denominator creates perspective for comparing across time, companies, or industries. For example, managers can see liquidity reflected in the popular current ratio (current assets over current liabilities). Doing so illustrates how much of a company's most liquid asset is soon committed to short-term obligations.

Such a calculation is similar to determining the level of comfort by comparing the balance in one's checking and savings accounts to pending bills. There is no singular ratio that tells everything about a company, but using a workable set of meaningful indicators spotlights certain financial statement items for more attentive management.

Notably, the improvement or decline in ratio really depends on the difference in the growth rates of the selected numerator and denominators. Those differentials are even more meaningful when considering relative to the sales growth rate, discussed above.

## INSIGHT 5: CASH FLOW HOLDS NO SECRETS

Cash flow is the lifeblood of an organization. Households, nonprofits, and publicly held companies all share one thing: over time, more cash must be received than is spent. Without sufficient cash to pay bills and no way to gain access to such cash, a company will quickly find itself out of business.

Accrual accounting, the most widely accepted corporate approach, matches revenues and expenses to time of transactions rather than when cash is exchanged (i.e. payment is often made in the month following service). Regardless of accounting methods, terminology, and timing, over time, cash flow reveals all about a company, just as review of the past few months of one's debit or credit card statements will tell much about life.

Cash flow statements categorize the exchange of cash into three distinct activity sets: operating, investing, and financing. Operating cash flows are associated with a firm's primary business activity. Net income differs from cash flows from operating activities, because the income statement recognizes revenues and expenses when earned or incurred, not when collected or paid.

Investing cash flows are related to the purchase and sale of a company's non-current assets. When a company buys equipment to support its operations for one fiscal year, the cash spent is an investment in the future of the business. When the equipment is sold, the cash from the sale is considered investment cash inflows. Investments in financial securities (stocks and bonds) naturally fall into this category.

Financing cash flows are reported when companies raise or retire capital from creditors or shareholders. The receipt of cash from a bank loan or stock sales to owners are cash inflows. Conversely, dividend cash payments to shareholders or principal payments on loans are cash outflows.

Over time, successful businesses develop a pattern of generating sufficient cash from operations to purchase new assets, without continually requiring money from banks or owners. And what applies at the aggregate is certainly relevant at the project level, highlighting all managers' responsibility to recognize that truly great business opportunities demonstrate positive cash flow — consistently and as soon as possible. Factoring cash flow into decisions distinguishes successful leaders. After all, wages, bills, and debt must be paid.

## CONCLUSION

Well-prepared, readable financial statements provide a clear picture of an organization's financial health and are essential to informed decision making. Applying the five key insights detailed here will improve business acumen, make the "language" of finance more approachable and understandable, and help connect daily work with the organization's grander purpose. Without becoming a CPA or financial analyst, everyone can learn a bit more about financial statements and take a degree of responsibility for the short- and long-term fiscal well-being of their workplace. Perhaps such acumen has never been more important.

## APPENDIX: FINANCIAL STATEMENT OVERVIEW

| TERM | DESCRIPTION |
|---|---|
| **Balance sheet** | Known also as the Statement of Financial Position, the balance sheet lists an organization's assets (resources and rights), liabilities (obligations), and owners' equity (residual interest) on one specific date, usually the end of a month, quarter, or year. |
| **Income statement** | The profit and loss (P&L) statement presents the results for a particular period, showing revenues (sales), expenses (costs), and resulting net profit or loss. |
| **Statement of cash flows** | This statement details net change in cash for a period by detailing cash inflows and outflows in terms of operating, investing, and financing activities. |
| **Notes to the financial statements** | These supplemental narratives and schedules provide critical explanations of the summarized data presented in financial statements, including details about key accounting policies and details of specific financial statement account balances. |

# About the author

**Noah P. Barsky** is a Cutter Fellow, a member of Arthur D. Little's AMP open consulting network, and Associate Professor at Villanova University School of Business in the executive and graduate business programs. His research and teaching focus on performance measurement, business planning, risk assessment, and contemporary financial reporting issues. Dr. Barsky develops and delivers executive education programs for various *Fortune* 100 companies, global professional services firms, and industry associations. He has authored five books and published over 100 articles in various academic and professional journals, including *Amplify, Strategic Finance, and Best Practices in Executive Decision Making*. Dr. Barsky earned a bachelor's and master's degree from Penn State University and a PhD from the University of Connecticut. He can be reached at experts@cutter.com.

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