MIT MANAGEMENT SLOAN SCHOOL | IDEAS MADE TO MATTER

LEADING WITH AI: INSIGHTS FOR SUCCESS IN AI-DRIVEN ORGANIZATIONS

From MIT Sloan experts, innovative ideas for using artificial intelligence to solve critical business problems and deliver on strategy.

CREDIT: JENNIFER TAPIAS DERCH

CONTENTS

Letter From the Editor

If you are actively pursuing new AI use cases in your organization, you are part of a cohort of leaders across all industries.

In fact, 82% of C-suite leaders in a recent MIT Technology Review Insights survey said that "scaling AI or generative AI use cases to create business value is a top priority for our organization." And 80% of chief data officers believe that generative AI will transform their business environment, according to work from Thomas H. Davenport, a visiting scholar at the MIT Initiative on the Digital Economy.

At MIT Sloan, our faculty members and researchers are exploring AI from every angle that matters to leaders — data integration, workforce development, change management, organizational culture, entrepreneurial opportunity, and ethical and regulatory implications, among others. Their work is yielding crucial insights organizations will need as AI — and especially generative AI — reshapes our industries and our work.

The five articles in this report will help you craft a strategic approach to leading and managing with AI in your organization.

Inside you will find:

- Paul McDonagh-Smith's expert guidance on leading the AI-driven organization, drawn from his popular MIT Sloan Executive Education course.
- Research-driven advice for using generative AI to boost the productivity of your most highly skilled workers, including thoughts on onboarding and role reconfiguration.
- A look at how eight leading companies — including Pfizer and Comcast — are using generative AI to unlock speed.
- Details on a study from professor Kate Kellogg that cautions against having junior employees teach generative AI to senior colleagues.
- Strategies for retraining employees and using AI to find and close skills gaps, from researchers at the MIT Center for Information Systems Research.

With research ongoing, new insights are continually emerging. To keep up with what MIT experts are advising, follow MIT Sloan on LinkedIn. And sign up for our Thinking Forward newsletter, delivered every Tuesday morning.

Sincerely,
Zach Church
Director, Editorial and Digital Content

CREDIT: ALFONSO SOLER/KRULUA/ISTOCK

Leading the AI-driven organization

by Beth Stackpole

Why It Matters

Artificial intelligence strategies should encompass key business priorities, organizational data strategy, and employee skills.

Artificial intelligence technology is evolving quickly, and most organizations are struggling to keep up. Experimentation and pilot projects are well underway as companies try to create a framework for capitalizing on AI.

To achieve desired outcomes, leaders need to be equipped to lead AI initiatives, according to MIT Sloan senior lecturer Paul McDonagh-Smith, the faculty director of an MIT Sloan Executive Education course about leading AI-driven organizations. The course looks at how leaders can apply AI technologies to optimize value in business operations, guide organizations beyond exploration to implementation, and ensure the responsible application of AI, which is crucial as expanded use cases increase enterprise risk.

"There's currently a real delta between the numerous proofs of concept and full-blown AI strategies," McDonagh-Smith said. To close that gap, leaders need to create a plan for using AI that takes into account key business priorities, the organization's data strategy, and employee skills.

Throughout, leaders need to remember that the key to AI is "not humans plus machines, but humans multiplied by machines, augmenting and assisting our capabilities across the existing and emergent tasks performed in our organizations," McDonagh-Smith said.

He has the following advice for leaders who are guiding AI initiatives.

Create an AI playbook

There is no singular route to large-scale AI deployment. Rather, McDonagh-Smith advises leaders to use their answers to these three sets of questions to map out their organization's journey:

What are the organization's critical business problems and strategies, and can AI be used to deliver upon on those strategies?

AI use isn't about staying ahead of the curve or being part of a trend. Organizations need to clearly define the business problem they are trying to solve and fully understand the breadth of available AI technologies and techniques available to them so they can match a solution to the problem. One way to facilitate this exercise is to deconstruct a business challenge into a set of subproblems. "In the field of AI, you determine which technologies and techniques are going to be helpful for these subproblems," McDonagh-Smith said. "You also need to abstract and separate the signal from the noise."

Is the organization's data AI-ready (that is, are the datasets that are being trained suitably complete and managed with the proper governance)?

A key ingredient to successful AI is having the right datasets for exploring, analyzing, and recognizing patterns for each use case and business problem. Organizations need to elevate their data game by launching data cleansing and data management initiatives, establishing data governance, and aligning with the right third-party data partners where and when it makes sense.

What is the AI maturity level of organization employees, and where are there key skills gaps? What kind of programs should be in place to upskill employees on critical new competencies?

AI skills are not overly abundant, so organizations need programs to upskill and train employees on technical skills and technical decision-making to fully leverage AI's capabilities.

Culture is a big part of the equation: Organizations will need to create silo-busting cross-functional teams, make failure permissible to encourage creativity, and encourage innovative ways to combine human and machine capabilities in complementary systems.

Given the current frenzy around AI, level-setting expectations is a crucial element of enterprise-scale AI success. One way to achieve this is to recognize the key duality of AI: Organizations need to adopt a fast-and-slow, two-tier approach to their enterprise AI strategies, McDonagh-Smith said. "Fast experiments and proofs of concept are fed into the creation of slower, longer-term strategy," he said, pointing to the idea about two modes of thinking — one fast and intuitive and the other slow and analytical — that Nobel Prize-winning behavioral economist Daniel Kahneman examined in his work.

"By applying Kahneman's 'thinking fast and slow' [concept] to how we use AI today, we can enhance organizational capabilities and competitiveness tomorrow," McDonagh-Smith said. In addition, "we've got to be careful that the enthusiasm and optimism doesn't get waylaid and that we're able to have a practical, reasonable strategy for how we're going to integrate AI into our businesses."

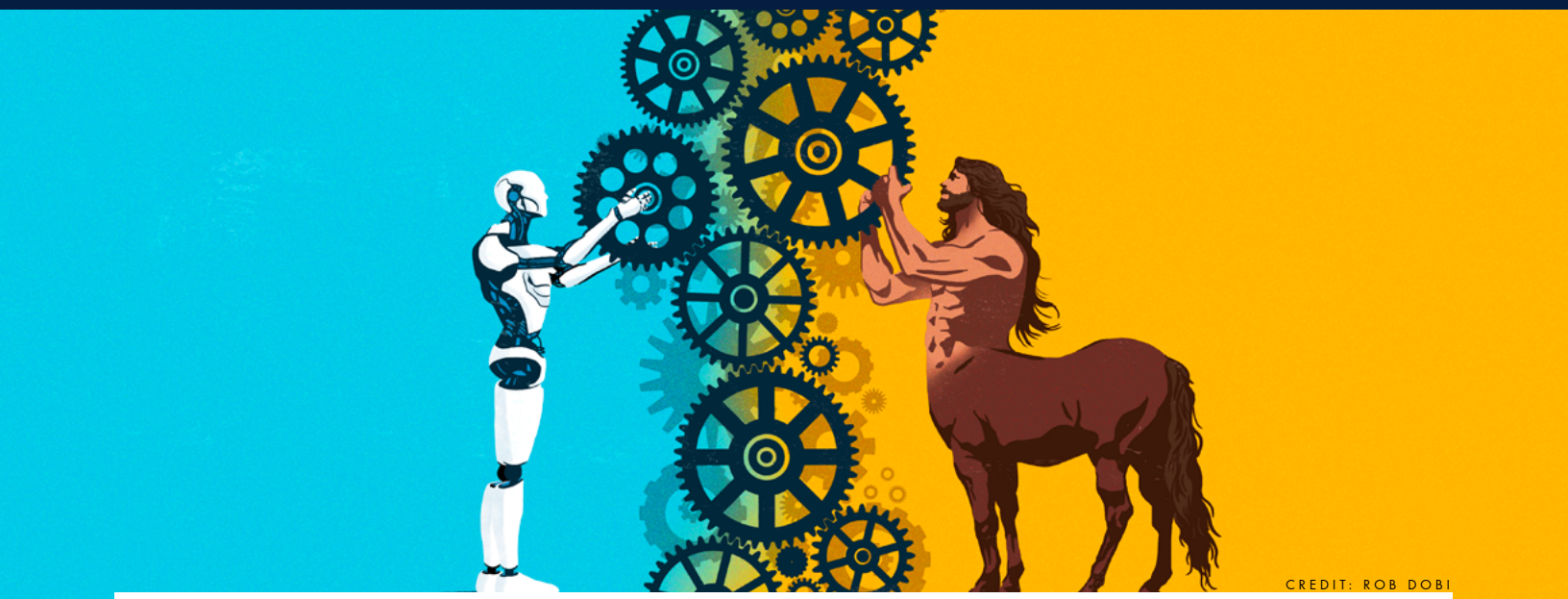
Embrace experimentation and responsible AI

With those questions answered, organizations have a strong foundation for moving forward with AI initiatives. When doing so, McDonagh-Smith said, leaders should remember the following:

Embrace experimentation while setting strategy. With AI, organizations need to continuously experiment, build proofs of concept, and promote sandbox activities. At the same time, they need to capture the lessons and data from these experiments — both successes and failures — and use them to inform medium-to-longer-term AI strategies. Most organizations lean too far in one direction or the other, McDonagh-Smith said.

"We might be experimenting but not envisioning what this means for a medium-to-longer-term strategy," he said. "But if all we're thinking about is medium-to-longer-term enterprise strategies, we're never going to be able to fine-tune enough of the proofs of concept to create value for our businesses."

Ensure responsible AI use. Without the proper safeguards, AI opens the door to significant enterprise risks, including potential brand damage, privacy infractions, and the spread of dangerous misinformation. Companies need to identify and communicate their ethical values, create accountability through organizational structures, and take continuous steps to detect and remediate bias.



CREDIT: ROB DOBI

How generative AI can boost highly skilled workers' productivity

by Meredith Somers

Why It Matters

Generative AI can boost worker productivity, but organizations must first establish a culture of accountability, reward peer training, and encourage role reconfiguration.

A new study on the impact of generative AI on highly skilled workers finds that when artificial intelligence is used within the boundary of its capabilities, it can improve a worker's performance by as much as 40% compared with workers who don't use it.

But when AI is used outside that boundary to complete a task, worker performance drops by an average of 19 percentage points.

The findings have implications not only for worker productivity but for organizations looking to successfully navigate what the researchers have termed the "jagged technological frontier" of AI — specifically, generative pretrained transformers, which produce human-like text, code, and other content in response to user prompts. Understanding the upper limits of AI's abilities is imperative, particularly as those abilities continue to expand, the researchers write.

It's important for managers to maintain awareness of this jagged frontier, said Harvard Business School's Fabrizio Dell'Acqua, the lead author of the paper, because the researchers found that it was not obvious to highly skilled knowledge workers which of their everyday tasks could easily be performed by AI and which tasks would require a different approach.

A multidisciplinary team of researchers authored the paper, including Karim R. Lakhani and Edward McFowland III from Harvard Business School; Ethan Mollick, SM '04, PhD '10, from The Wharton School; Hila Lifshitz-Assaf from Warwick Business School; and MIT Sloan's Kate Kellogg.

Here's a closer look at the study, along with some suggestions from Dell'Acqua, Kellogg, and Lifshitz-Assaf of steps organizations can take when introducing generative AI to a highly skilled workforce.

For best results, use cognitive effort and experts' judgment

The study was conducted in collaboration with Boston Consulting Group and involved more than 700 consultants who were assigned a skills assessment task and an experimental task.

The participants were sorted into two groups: One group was given a task designed to fall within GPT-4's capabilities of producing humanlike outputs, while the other group received a task "designed so that GPT-4 would make an error when conducting the analysis, ensuring the work fell just outside the frontier," according to the paper.

Within those two groups, study participants were sorted into three conditions: no access to AI, access to GPT-4 AI, and access to GPT-4 AI with an overview of prompt engineering.

The "inside the frontier" group was asked to imagine that they worked for a shoe company and that their manager had asked them to come up with a new product and present it at a meeting. Participants in this group were also

40%

Generative AI can improve a highly skilled worker's performance by as much as 40% compared with workers who don't use it.

instructed to complete several other actions, including coming up with a list of steps from pitch to launch, creating a marketing slogan, and writing a 2,500-word article describing the end-to-end process for developing the shoe and lessons learned.

AI had a positive effect on that group of participants: The GPT-only participants saw a 38% increase in performance compared with the control condition (no access to AI). The performance of those who were provided with both GPT and an overview was boosted even higher, with a 42.5% increase in performance compared with the control condition.

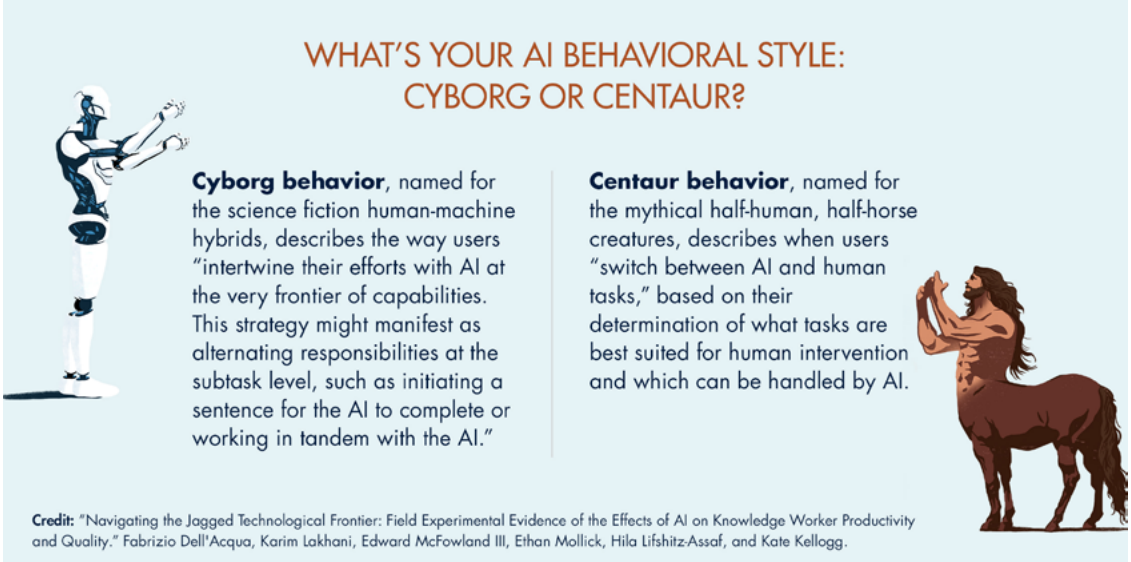
Interestingly, the researchers observed a bigger jump in performance scores for the participants in the lower half of assessed skills who used GPT-4 compared with those in the top half of assessed skills — at 43% and 17%, respectively — when they were compared with their baseline scores (i.e., no AI use).

The "outside the frontier" group was asked to imagine that they worked for a company with three brands. They were tasked with writing a 500-to-750-word memo to their CEO explaining which of the brands the CEO should invest in to drive revenue, and with suggesting innovative actions the CEO could take to improve the selected brand. The memo needed to include the rationale for their recommendation, and group participants were provided with interview comments and financial data from which they could draw. Additionally, participants were graded on the "correctness" of their recommendation — their reasoning or justification — by human evaluators.

AI had a negative effect on participants in this group. The GPT-only condition saw a decrease in performance of 13 percentage points compared with the control condition, while participants who had been provided with GPT and an overview showed a decrease of 24 percentage points compared with the control condition.

Dell'Acqua said that for the "outside the frontier" group, the researchers observed a performance decrease because people would "kind of switch off their brains and follow what AI recommends," which was more likely to be incorrect. However, even when an incorrect recommendation was made under one of the AI conditions, the quality of the participant's recommendation justification improved.

The quality improvement and decrease in performance indicates that, rather than blindly adopting AI outputs, highly skilled workers need to continue to validate AI and exert "cognitive effort and experts' judgement when working with AI," the researchers write.



Interface design, onboarding, role reconfiguration, and a culture of accountability

According to the researchers, there are several things organizations and managers should consider as they integrate AI into their employee workflows.

While it's tempting to use AI for knowledge work because it is fast, can boost rapid idea generation, and produces persuasive text, managers and professionals need to be cautious when using it for important tasks, Lifshitz-Assaf said.

Because some AI-generated answers look credible even when they're incorrect, "that suggests there's a role for internal or 'wrapper' developers to help design the interface in a way that makes it less likely that people fall into some of these traps," Kellogg said.

Developers can also help with figuring out where AI can be inserted into workflows and how to design technology for doing that.

Kellogg and Dell'Acqua also recommended that organizations have an onboarding phase so workers can get a sense of how and where the AI works well and where it doesn't and receive performance feedback. Relatedly, some people are very good at upskilling themselves, and those workers can be helpful as peer trainers. But they should be rewarded and recognized for their work.

Managers will also need to reconfigure people's roles.

"To use generative AI well, it's important to investigate the specific tasks along the work process," Lifshitz-Assaf said. "Some may be within the jagged frontier, and others outside."

Kellogg said that leaders can encourage role reconfiguration by having people from different positions experiment together to find the most productive structure.

Leaders should also encourage a culture of accountability. In talking with study participants, Kellogg said, one suggestion was that "we need to teach people to be able to explain what they did without using the term 'generative AI.'"

"Managers and workers need to collectively develop new expectations and work practices to ensure that any work done in collaboration with generative AI meets the values, goals, and standards of their key stakeholders," Kellogg said.

CREDIT: MIMI PHAN/KITAWIT JITATON/SHUTTERSTOCK

Generative AI is enabling companies to execute with speed

by Sara Brown

Why It Matters

Student teams from MIT Sloan advise Pfizer, Comcast, and others on using data and generative artificial intelligence to quickly bring products to market and communicate with customers.

For the past few years, companies have been experimenting with use cases for generative artificial intelligence. At least one common theme is emerging: Generative AI, paired with data analytics, helps companies execute projects and solutions with speed.

This is the most significant trend uncovered from the 2024 MIT Sloan Master of Business Analytics Capstone Project program, which partners students with companies that are looking to solve a business problem with data analytics. The program also provides a look at what problems were top of mind for organizations at the beginning of 2024. This year, one theme among the 41 projects was that companies are looking to take advantage of generative AI.

To contrast generative AI and traditional AI, students are starting to use the term "legacy machine learning," according to MIT Sloan lecturer Jordan Levine, who leads the Capstone program. "Legacy machine learning approaches enable precision — algorithms identify consumer preferences to the individual level, identify an individual's likelihood of voting, or prescribe treatment to individual patients. Generative AI unlocks speed."

All these projects reached the level of a functioning, in-use product and were tested with live data in some capacity, Levine said. About half are live and actively supported by the companies.

Here's a look at the problems businesses wanted to solve and how they are pairing generative AI and analytics for novel business solutions.

Speed to market

Two life science companies looked to use generative AI and large language models to increase speed to market for drugs.

Biopharmaceutical company Pfizer did so by speeding up the knowledge transfer process, which is when relevant research and development and other documents are transferred to the manufacturing department. Using manual methods, it could take nine months per molecule to classify thousands of documents for a drug, and observations can be lost, hidden, or siloed off from the broader enterprise. The MIT Sloan team used more than 33,000 documents to build a suite of products that makes scientists' work easily available by quickly recognizing and retrieving information. This is already accelerating the speed of discovery and the speed to market for therapies.

Leaders at biopharmaceutical company Takeda wanted to know whether the company's clinical trials included more or longer visits, more procedures, or more invasive procedures compared to clinical trials led by peer companies. The MIT Sloan team used data on more than 500,000

> *"Legacy machine learning approaches enable precision. … Generative AI unlocks speed."*
>
> **JORDAN LEVINE**
> MIT SLOAN LECTURER

clinical trials from a government website to establish benchmarks for clinical trial participants' visit frequency, visit length, and number of procedures. Combining this analysis with generative AI, the company can now design clinical trials more quickly, which will also speed up critical drug development timelines.

Quicker responses to customers

Three companies are demonstrating the ability to pair data with generative AI to more quickly deliver real-time insights and guidance to customers.

Insurance company CogniSure aimed to extract important information from thousands of PDFs and emails submitted by customers while retaining accuracy. This is especially difficult when information is presented in different forms, such as text fields and checkboxes. The MIT Sloan team used generative AI to develop a method for quickly reading any file, which will help the company deliver insurance quotes more quickly to people looking for a new policy.

Given that calls can cement a company's relationship with a customer — or result in lost business — telecommunications company Comcast wanted to improve its real-time response to nearly 6 million calls per month. The MIT Sloan team used a combination of customer data, data from an interactive voice response system, historic transcripts of calls, and seven-day churn results to build a framework that improves agent response to a customer during a call. This allows agents to quickly identify high-risk customers and identify targeted follow-up calls. It also provides insights about trends to management.

Global shipping and transportation company CMA CGM traditionally relied on its trade team's experience to make pricing decisions. The MIT Sloan team created a new generative AI system built on more than 70 million rows of transactional data that can provide more immediate predictions and guidance on dynamic pricing and the likely effects of price changes. These insights are available to agents through a dynamic pricing advice assistant, allowing them to give quicker, more accurate information to customers.

Speedier communication, both internally and externally

Two other companies are using generative AI to quickly publish customer communication and more easily share information within the company.

Retail store Dick's Sporting Goods sends one or two emails per day to customers on its subscription list. Previously, the emails were created manually and had a limited amount of personalization. To create more personalized campaigns more quickly, the MIT Sloan team used generative AI paired with demographic and loyalty data, email templates, email interactions, and transaction histories to create personalized email templates. The result is improved click-through rates per email and reduced time required for marketing campaign preparation.

At consulting firm McKinsey & Co., employees share knowledge and findings with their colleagues in a database, using tags to identify documents related to specific fields. In the past, this information was manually curated and tagged, which was time consuming and only about 50% accurate. A new generative AI tool created by the MIT Sloan students can label 26,000 documents annually, ensuring that the information is available at the right place and time.

Beyond speed: managing accuracy, generative AI, and the workforce

While there are many benefits to using generative AI to quickly respond to customers, develop drugs, or communicate with important stakeholders, accuracy is also important, Levine noted, and each team assessed the accuracy of their projects with various methods.

It's also important to understand how using generative AI will affect workers. Professional services company Accenture looked to help its clients redesign their workforces and adopt effective generative AI strategies. The MIT Sloan team analyzed task and skills data for 851 jobs, 332 tasks, and 7,748 skills; job transition data, which includes wages, education and experience; and employment statistics across enterprises. The result is a tool that predicts the effect of generative AI on large enterprise workforces, which will help companies deploy technology strategies and reskilling initiatives.

CREDIT: ALLIANCE IMAGES/SHUTTERSTOCK

The risk of letting junior professionals teach AI to senior colleagues

by Meredith Somers

Why It Matters

Generative AI's broad accessibility and applicability make it a vital tool for businesses — but those traits can also cause trouble when upskilling employees.

A new study on employee upskilling finds that relying on junior workers to educate senior colleagues about emerging technology is no longer a sufficient way to share knowledge, particularly when it comes to the use of generative artificial intelligence.

Generative AI's characteristics — specifically, its broad accessibility and applicability — are what give the technology its advantages, said MIT Sloan professor Kate Kellogg, co-author of the paper "Don't Expect Juniors to Teach Senior Professionals to Use Generative AI: Emerging Technology Risks and Novice AI Risk Mitigation Tactics."

But those same features can also create traps for junior workers, preventing them from being a reliable source of expertise for more senior workers, despite an

eagerness to help. The reason: Rather than offering advice like the kind generative AI experts would share with users, junior professionals tend to recommend what Kellogg and her co-researchers call "novice AI risk mitigation tactics."

These novice tactics "are grounded in a lack of deep understanding of the emerging technology's capabilities, focus on change to human routines rather than system design, and focus on interventions at the project level rather than system deployer or ecosystem level," the researchers write.

While it's important for leaders to encourage enthusiasm in junior employees, "you are still the leader; you're responsible, you're accountable," said Warwick Business School professor Hila Lifshitz-Assaf. It's up to senior leaders to better understand how generative AI works and how to use it.

Lifshitz-Assaf and Kellogg are part of the multidisciplinary team of scholars behind the research and related paper. Their co-authors include Steven Randazzo of Warwick Business School; Ethan Mollick, SM '04, PhD '10, of the Wharton School; Fabrizio Dell'Acqua and Edward McFowland III of Harvard Business School; François Candelon of Boston Consulting Group; and Karim R. Lakhani of Harvard Business School.

The three traps

Tapping junior employees to teach senior employees about a new technology has worked well in the past, Kellogg said. Junior employees tend to be newer hires and are expected to experiment with tools and learn about their capabilities. Newer workers also don't have behavior ingrained around the older technologies that an organization uses.

But the speed at which generative AI is developing, as well as its expanding availability, is impacting that flow of knowledge between junior and senior workers, according to the research.

In the summer of 2023, the researchers interviewed 78 junior consultants after they'd participated in a field experiment in which they were given access to generative AI — in this case, GPT-4 — to solve a business problem (identifying channels and brands that would help a fictional retail apparel company improve revenue and profitability). The junior consultants had one to two years of experience, while senior employees were managers with five or more years of experience.

After participating in the experiment, the junior workers were asked these questions:

- Can you envision your use of generative AI creating any challenges in your collaboration with managers?
- What are some ways to deal with these challenges?
- How do you think these challenges could be mitigated?

Their answers revealed that junior professionals can fall into three traps that experts avoid when teaching and deploying AI. Those traps are:

- Lacking a deep understanding of generative AI's accuracy, explainability, and contextualization (meaning, are answers relevant and understandable?).
- Focusing on changes to human routines rather than to system design.
- Focusing on changes at the project level rather than at the deployer or ecosystem level.

NOVICE AI RISK MITIGATION TACTICS

	Novice AI Risk Mitigation Tactics	Expert AI Risk Mitigation Tactics
GenAI capabilities	**Novices may lack deep understanding of GenAI**	**Experts are more likely to have deep understanding of GenAI**
Accuracy	• Use a standardized way of asking questions • Do the work first without GenAI	• Decide on appropriate use cases where error risks are acceptable • Test GenAI's reliability in executing each subtask
Explainability	• Explain model logic to managers • Agree on practices for explainable output	• Avoid GenAI use where high degree of explainability is required • GenAI provides illusion of transparency, but explanations may not match true actions
Contextualization	• Use for cases where contextualization is not necessary	• Provide contextual information, and specify the desired output • Use retrieval-augmented generation to add content

Credit: Kate Kellogg, et al., "Don't Expect Juniors to Teach Senior Professionals to Use Generative AI: Emerging Technology Risks and Novice AI Risk Mitigation Tactics" (2024).

MIT MANAGEMENT SLOAN SCHOOL

For example, according to some of the anonymized answers recorded in the paper, the junior consultants tried to address generative AI's output inaccuracy by recommending that workers use AI to augment human-created material rather

than using AI to create it from scratch. Generative AI experts, on the other hand, recommend that leaders decide appropriate use cases for the technology where "error risks are acceptable."

In another case, the surveyed juniors recommended changing human routines by training AI users to validate generated results. However, AI experts would be more inclined to use models that provide source links with the generated results.

The researchers offered a list of mitigation tactics to address these traps and recommended that corporate leaders ensure that junior and senior workers focus on addressing AI risks by understanding AI's capabilities and limitations, making changes to both system design and human routines, and "intervening in sociotechnical ecosystems, rather than only at the project level."

Lifshitz-Assaf said that while it's beneficial for companies to have junior workers who are excited about learning, "it's more a matter of waking up and shaking the leaders that right now are over-trusting the juniors and their ability to know what's right."

"You need to be focused on system design and firm-level and ecosystem-level things," Kellogg said of organization leaders. "Make sure that this isn't just about offering trainings but focusing on system design, pushing back with vendors, and putting things in place around data."

CREDIT: MARUCO/SHUTTERSTOCK

How companies can use AI to find and close skills gaps

by Brian Eastwood

Why It Matters

To train employees on digital skills, companies need precise insight into current workforce skills. Artificial intelligence can help.

As companies aim to take advantage of new technologies such as artificial intelligence, employees need to acquire new skills.

In a 2022 survey, executives estimated that 38% of their workers would need "fundamental retraining or replacement" within three years to address workforce skills gaps, according to research from the MIT Center for Information Systems Research.

People with AI and data skills are in high demand, and attracting and retaining talent is hard and time-consuming, according to Nick van der Meulen, a research scientist at MIT CISR. "Training is a really important way for us to achieve results. For performance, for retention, for customer experience, and for innovation, it's the way to go," van der Meulen said at the 2023 MIT Digital Technology and Strategy Conference.

And in many cases, workers want to be trained. In a Society for Human Resource Management survey, 55% of employees said they need more training to do their job better, and 76% said they would be more likely to stay with a company that offered continuous learning.

To retrain employees, companies need precise insight into workforce skills, including ones that are missing but would contribute to future success, van der Meulen said. To gain such insight, companies such as Johnson & Johnson are using "skills inference" — the process of using AI to analyze employee data to quantify skills proficiency and identify areas for improvement.

Here's a look at how companies can perform skills inference, and how it can guide workforce planning and employees' career development.

3 steps for skills inference

Johnson & Johnson began an effort to improve digital expertise among employees in early 2020, starting with the company's 4,000 technologists before expanding to other business units the following year. The skills inference process comprised three steps:

Skills taxonomy. This step involves defining the skills required "to reimagine business processes and develop future digital offerings," van der Meulen said. "It's not about the skills we need to be successful today, but to succeed five to 10 years from now." Johnson & Johnson identified 41 specific "future-ready" skills, such as master data management and robotic process automation, that were grouped into 11 capabilities.

Skills evidence. Here, an organization selects the right sources of employee data for skills inference. For Johnson & Johnson, these sources were the HR information system, the recruiting database, its learning management system, and one project management platform. Leadership made it clear that skills insights did not factor into employees' performance reviews and that the information was de-identified and used at an aggregate level to support strategic workforce planning. Employees were free to opt out.

Skills assessment. In the final step, Johnson & Johnson used a large language model to measure each technologist's proficiency in each of the 41 future-ready skills, using a 0–5 scale. The company also asked workers to rate themselves on the same skills using the same scale; if the two scores deviated by less than

one point, the company considered the scores usable. Communicating that the process would be used only for skill development as opposed to performance evaluation helped the company gain worker buy-in and mitigated bias in self-reporting skills, van der Meulen said.

The skills inference process proved powerful at both the personal and enterprise levels. Individual technologists could compare their existing skills with the skills required for a future role they envisioned for themselves and use that information as a catalyst to drive their training. Use of the company's professional development ecosystem increased 20% after the first round of skills inference; as of March 2024, 90% of technologists had accessed the learning platform.

Meanwhile, executives gained access to heat-map data about technology skills proficiency by geographic region and business line. "This is beneficial for strategic workforce planning," van der Meulen said. "You can see areas where you're strong and areas where you're a little weaker. You may say, 'Maybe we need to develop our decision science capability in Europe. This is where we should put development dollars.'"

A "career lattice" instead of a career ladder

There are obvious benefits to helping employees identify the skills they need to continue contributing to a company as it undergoes a digital transformation. But van der Meulen offered a word of caution to leaders who want to do this: Not everyone will want to move through the organization the same way.

Many employees seek traditional promotions with higher pay and additional responsibilities, but leaders should "look beyond those career ladders and look for a latticework" of interconnected roles, he said.

Some will want to make a lateral move to a similar role in another business unit. (This is common at companies the size of Johnson & Johnson, which has about 130,000 employees.) Others will want to take on an emerging title that requires specific new skills — such as AI prompt engineer, a role that was largely nonexistent a year ago. Others may be ready to take a step back, possibly for personal reasons.

For all of these workers, training has to go above and beyond online learning modules. Workers will need mentorship, hands-on training, and other programs "where people can really put what they want to learn into action right away," van der Meulen said. Leaders need to be ready to give workers the ability to determine what skills they will learn, when they will learn them, and how they would like to work once they've acquired those skills.

Leaders will also have to confront the class of workers who resist change and insist on continuing to complete the same tasks they've always done. Van der Meulen recommended showing these individuals what upskilling can mean for them, even if they're currently effective in their roles and performing well. Specific examples of people who have made exciting career moves can go a long way here.

"People need to understand that skills are dynamic," van der Meulen said. "What makes you successful today won't make you successful three years, five years, or 10 years from now."