MIS Quarterly Executive

Volume 23 | Issue 1 Article 8

March 2024

Responding to the Sharp Rise in AI in the 2023 SIM IT Trends Survey

Quintin McGrath

MIS Quarterly Executive

Responding to the Sharp Rise in AI in the 2023 SIM IT Trends Survey

"The 2023 SIM IT Issues and Trends Study," published in the March 2024 issue, reveals that one of the year's most significant shifts has been an increased focus on AI. Not only is it receiving more funding, but it is also worrisome to IT leaders, exacerbated by the hard-to-find skills. This article provides background on the opportunities related to AI, looks at some quantified benefits and raises awareness of potential risks. It concludes with two potential approaches for the responsible use of AI in business.[1]

Quintin McGrath
SIM Research Institute (U.S.)

Interest and Investment in AI Boomed in 2023

Anyone looking at "The 2023 SIM IT Issues and Trends Study" published in this issue of *MIS Quarterly Executive* will be struck by the rapidly growing interest in artificial intelligence (AI) and machine learning. Investment in AI jumped to 8th position in 2023 from 15th a year earlier. It is now the 6th most concerning topic for IT managers (up from 22nd a year earlier) and is No. 1 on their list of areas needing more funding and the second most personally worrisome, after cybersecurity. Also, AI skills were rated 3rd on the of list skills most hard to come by. All these indicators drive the need for action.

This article provides context for the current acceleration in the use of AI and insights into the opportunities and benefits provided by AI technology. However, the risks and unintended consequences must be considered and balanced alongside the potential opportunities. The article concludes by providing two approaches that business and technology leaders can follow as they seek to take advantage of AI in their organizations.

A Brief History of the Evolution of AI

AI has quickly become an integral part of modern society, influencing sectors from healthcare to finance and transportation to entertainment. It is a subject that inspires both excitement and trepidation among executives and society.[2] This dual sentiment illustrates that,

1 This article explores the implications of the findings of the "2023 SIM IT Issues and Trends Study" (published in this issue of MIS Quarterly Executive). For 43 years, the SIM survey has investigated the management issues, practices and leadership of information systems (IS). One of the most significant changes identified in the 2023 survey was the burgeoning interest and investment in AI and machine learning.

2 See, for instance, Tyson, A. and Kikuchi E. *Growing public concern about the role of artificial intelligence in daily life*, Pew Research Center, August 28, 2023, available at https://pewrsr.ch/3QZ6H6D; this article states that 52% of respondents are "more concerned than excited" about AI in daily life, up from 37% in 2021, and only 10% are "more excited than concerned," a drop of 8 percentage points.

to navigate AI's complex landscape with a balanced perspective, there is a need for greater understanding of AI.

The Beginnings and Early Milestones

The origins of AI can be traced back to the founders of computer science, like Alan Turing whose work laid the groundwork for the field.[3] The late 20th and early 21st centuries witnessed iconic moments in the development of AI, such as the chess match where IBM's Deep Blue defeated world champion Garry Kasparov, hinting at the potential of AI to surpass human abilities in specific tasks. It is also hard to forget IBM's Watson triumphing over Jeopardy champions in 2011. AI's journey includes significant advancements in various applications: personal assistants like Siri, facial recognition, and predictive technologies in platforms like Netflix and autonomous vehicles. One of the more recent breakthroughs is generative AI, which includes sophisticated language models like OpenAI's ChatGPT and models capable of creating art, such as Dall-E.[4]

The Growth of Machine Learning and Neural Networks

Machine learning, particularly deep learning, is pivotal in AI's evolution. Machine learning uses an algorithm, or neural networks, and represents a leap toward creating machines capable of learning and recognizing intricate patterns. Deep learning algorithms are designed to simulate the human learning process, constantly evolving through exposure to new data.

As AI evolved, the architectures of neural networks have grown in complexity, enabling them to undertake a growing range of types of learning. This evolution led to the birth of large language models like ChatGPT, which combine a computer's ability to parse, process and predict natural language with the ability to generate output from being trained on vast amounts of information.

Large Language Models, Generative AI and Modern AI

Large language models are algorithms trained on large datasets that represent the best and, unfortunately, sometimes the worst of human thought. However, such models require guardrails similar to establishing expected norms for individuals in society. Just as people might know how to harm others, AI, too, must be guided on what it should not articulate to prevent such harm. This process is analogous to "fine-tuning" AI's digital brain, ensuring responsible operation.

Based on the data used to train it, the algorithm establishes a link between terms—for example "coffee" and "hot"—based on the frequency of these terms appearing together in the training dataset. So, rather than understanding concepts, the algorithm has a map of the probability of terms, or tokens, appearing together. It does not understand the correctness of its output. It is a probability machine linking terms in a sentence based on what it has derived from the training data.

Once the large language model is built, "prompts," or specific instructions given to the AI model by the user, guide the generation and presentation of relevant output based on the context provided in that prompt.

The evolution of AI to date shows an ever-expanding canvas of possibilities and opportunities. As AI technologies become increasingly sophisticated, understanding their origins and designs is crucial to their practical use in a way that aligns with human values and societal norms.

Benefits of Generative AI

The emergence of generative AI, a form of AI that excels at creating new content and data, opens the door to efficiency and innovation. Based on recent studies, here are some of the advantages of generative AI.

Efficiency in Customer Service and Business Operations

The Nielsen Norman Group has highlighted three studies that delve into improvements related to the use of generative AI.[5] The first

3 See Turing, M. A. "Computing Machinery and Intelligence," *Mind*, LIX (236), 1950, pp. 433-460, available at https://doi.org/10.1093/mind/LIX.236.433.

4 Many authors have plotted the path of AI over the years. See, for example, *What is artificial intelligence (AI)*? IBM, available at https://www.ibm.com/topics/artificial-intelligence.

5 Nielsen, J. *AI Improves Employee Productivity by 66%*, Nielson Norman Group, July 16, 2023, available at https://www.nngroup.com/articles/ai-tools-productivity-gains/.

is a study by the National Bureau of Economic Research that found an uptick in organizational productivity—with a noteworthy 13.8% increase in handling customer inquiries per hour.[6] This surge is indicative of AI's ability to optimize customer service processes, thereby paving the way for a more responsive and satisfying customer experience. Second, a study by MIT's Economics Department found a 59% increase in documents created by business professionals using generative AI.[7] And third, a study by Cornell University researchers reported that programmers executed 126% more projects per week using Microsoft's Copilot.[8] These three studies underscore the efficiency benefits of generative AI in its current, likely still early, manifestations.

Another study by Microsoft's research initiative on AI found that using the Copilot generative AI tool to support team meetings can result in time savings of between 25% and 75%, allowing professionals to focus on high-value tasks by significantly reducing the time spent on everyday, routine undertakings.[9] This initial research by Microsoft indicates the significant potential efficiencies that AI can offer in task automation.

Enhancing Performance Across Diverse Domains

A Harvard University/Boston Consulting Group study of consultants using generative AI tools in their professional services work provides further evidence of AI's benefits.[10] It reported an impressive 40% improvement in the quality of deliverables, a performance hike for below-average performers of 43% and a 17% improvement in the performance of above-average professionals. This study shows that generative AI not only assists in elevating the baseline standard but also propels top performers to new heights of productivity.

All of these early studies of the efficiency benefits of generative AI solidify its status as an emerging cornerstone of innovation.

Preparing for Transformation

In a recent industry survey by Deloitte, 79% of respondents expect generative AI to transform their organizations and industries within the next three years.[11] And the World Economic Forum predicts that technology, especially generative AI, will impact 23% of today's jobs by 2027.[12] These expectations and predictions are a clarion call for CIOs and IT leaders to strategically embrace AI and leverage its potential for realizing a competitive advantage. They also reinforce the findings of "The SIM 2023 Technology Issues and Trends Study" relating to AI and machine learning. This is a clear call to action for business and technology leaders. But they will also need to consider the risks and unintended consequences of embracing AI.

6 Nielson, J. *AI Tools Raise the Productivity of Customer-Support Agents*, Nielson Norman Group, July 16, 2023, available at https://www.nngroup.com/articles/ai-productivity-customer-support; this article is based on Brynjolfsson, E., Li D. and Raymond, L. R. *Generative AI at Work*, National Bureau of Economic Research working paper 31161, April 2023, available at https://www.nber.org/papers/w31161.

7 Nielsen, J. ChatGPT Lifts Business Professionals' Productivity and Improves Work Quality, The Nielsen Norman Group, April 2, 2023, available at https://www.nngroup.com/articles/chatgpt-productivity/; this article is based on Noy, S. and Zhang, W. *Experimental Evidence on the Productivity Effects of Generative Artificial Intelligence*, MIT Economics Department working paper, 2023, available at https://economics.mit.edu/sites/default/files/inline-files/Noy_Zhang_1_0.pdf.

8 Nielsen, J. *AI Tools Make Programmers More Productive*, Nielson Norman Group, July 16, 2023, available at https://www.nngroup.com/articles/ai-programmers-productive/; this article is based on Peng, S., Kalliamvakou, E., Cihon, P. and Demirer, M. *The Impact of AI on Developer Productivity: Evidence from GitHub Copilot,* February 13, 2023 available at Kalamarakia https://arxiv.org/abs/2302.06590.

9 Alexia, C., Hecht, B., Edelman, B., Ngwe, D., Jaffe, S., Heger, A., Vorvoreanu, M. et al. *Early LLM-based Tools for Enterprise Information Workers Likely Provide Meaningful Boosts to Productivity*, Microsoft, available at https://www.microsoft.com/en-us/research/uploads/prod/2023/12/AI-and-Productivity-Report-First-Edition.pdf.

10 Dell'Acqua, F., McFowland, E., Mollick, E. R., Lifshitz-Assaf, H., Kellogg, K., Rajendran, S., Krayer, L., Candelon, F. and Lakhani, K. R. *Navigating the jagged technological frontier: Field experimental evidence of the effects of AI on knowledge worker productivity and quality*, Harvard Business School Technology & Operations Mgt. Unit Working Paper No. 24-013, September 2023, available at https://dx.doi.org/10.2139/ssrn.4573321.

11 *Now decides next: Insights from the leading edge of generative AI adoption*, Deloitte, January 2024, available at https://www2.deloitte.com/content/dam/Deloitte/us/Documents/consulting/us-state-of-gen-ai-report.pdf.

12 *Future of Jobs Report 2023*, World Economic Forum Insight Report, May 2023, available at https://www3.weforum.org/docs/WEF_Future_of_Jobs_2023.pdf.

Risks and Unintended Consequences

A primary concern is embedded within the creation and development of AI systems themselves. Unlike value-neutral tools such as hammers or cars, AI systems have trained-in biases and ethical leanings, which means they cannot be regarded as devoid of inherent values or ethical positions. An AI system embodies the norms and leanings introduced during its training, echoing the developers' ethical positions and the training data used.

Another issue is the nature of an AI tool; in essence, it is a probability engine. As a result, an unintended consequence is that an AI system might generate false information—a phenomenon called "hallucination." A real-life example was when an attorney inadvertently used AI-cited—but non-existent—documents for case preparation, highlighting the risks of relying on AI without proper vetting. Similarly, the spread of disinformation and deepfake technology has led to misrepresentation and harm; for instance, the circulation of deepfakes involving public figures or fake robocalls mimicking politicians advising people not to vote.[13]

Unfortunately, these are not isolated incidents. The potential misuse of AI includes creating malicious software, phishing attacks and spear phishing emails, all of which have become more sophisticated with AI technologies like ChatGPT. There are also economic implications, such as fraud committed by imitating voices, leading to financial losses, or the threat to job security as AI takes on roles traditionally filled by humans.

Another significant consequence is over-reliance on AI technology. This growing dependency is seen in various industries, including journalism, where reliance on AI-generated content has led to the dissemination of inaccurate or plagiarized content, necessitating some retractions. Such over-reliance reflects a shift toward uncritical trust in AI outputs, which can lead to detrimental outcomes.

13 For examples of AI-related incidents, see: 1) *AI Incident Database*, available at www.incidentdatabase.ai; and 2) *OECD AI Incidents Monitor (AIM)*, available at https://oecd.ai/en/incidents.

Two Approaches to Deploying AI for Business Benefit

To minimize the risks and unintended consequences of AI and to exploit the business opportunities provided by AI, we recommend using the following two approaches.

A Risk Management Approach

To mitigate the risks of AI, frameworks like the NIST AI Risk Management Framework[14] advocate a structured approach that considers the potential harm to individuals, organizations and ecosystems. Europe has proposed a similar risk-oriented approach to managing the impact of AI through the EU's AI Act,[15] which aims to regulate the use of AI based on the risk associated with each application. These frameworks and regulatory efforts aim at balancing AI opportunities with caution. Global leaders, including U.S. President Biden, U.K. Prime Minister Sunak and many others, are calling for due attention to be given to AI safety and governance.

Opportunity Assessment Matrix

To help technology and business leaders responsibly navigate the opportunities and challenges of AI, we propose a matrix with two dimensions: the degree of creativity and the degree of risk involved in using AI. The degree of creativity ranges from AI generating new and novel content or insights to reproducing or analyzing existing data. The degree of risk relates to the extent to which AI can affect the outcomes and the potential for harm or error. Based on these two dimensions, we can classify AI applications into four quadrants:

Low Creativity, Low Risk. These AI applications perform routine and predictable tasks, such as data entry, sorting and verification. They can be automated and require minimal human oversight or intervention.

Low Creativity, High Risk. These AI applications perform critical and sensitive tasks,

14 *Artificial Intelligence Risk Management Framework (AI RMF 1.0)*, National Institute for Standards and Technology, available at https://nvlpubs.nist.gov/nistpubs/ai/nist.ai.100-1.pdf.

15 *EU AI Act: first regulation on artificial intelligence*, European Parliament Press Release, June 8, 2023, available at https://www.europarl.europa.eu/news/en/headlines/society/20230601STO93804/eu-ai-act-first-regulation-on-artificial-intelligence.

such as supporting medical diagnosis, providing legal advice and processing financial transactions. These low-creativity AI applications require high human involvement to manage the risks.

High Creativity, Low Risk. These AI applications generate new and diverse content or insights, such as art, music and games. They can be used for entertainment, education and exploration, and generally have a low impact on the outcomes and stakeholders.

High Creativity, High Risk. These AI applications create new content or insights, such as opinions and predictions. They can persuade users but can also be used for manipulation and deception. These applications have a high impact on the outcomes and stakeholders and need extensive human involvement to ensure the appropriate use of the AI tool.

Technology and business leaders can use this two-dimensional matrix to assess AI applications' potential value and impact, and the necessary level of human-AI collaboration and governance. The matrix can also help identify the gaps and opportunities for AI innovation and adoption for an organization's below-the-line efficiency enhancements and new AI-enabled products or services.

Concluding Comments

The opportunities of the latest forms of AI, like generative AI, are immense, but so are the risks. Both the opportunities and risks are growing daily with each release of new capabilities. As "The 2023 SIM IT Issues and Trends Study" shows, AI is receiving increasing attention by IT leaders and their organizations. It is clear that IT and business leaders are keen to exploit AI for business benefit. As IT leaders and custodians of technological innovation, SIM members are responsible for steering this burgeoning technology toward the greater good, embracing its potential while carefully avoiding the negative repercussions. This article has provided two approaches to assist IT and business leaders in this task.

Though IT leaders are enthusiastic about the possibilities of AI, the two-sided coin of the technology requires them to be careful and strategic in deploying AI ethically and responsibly.

About the Author

Quintin McGrath

Quintin McGrath (qmcgrath@simnet.org) is SIM Research Institute's Executive Director. A retired Deloitte IT executive and founder of QplusAI LLC, he advises businesses on the impact of emerging technologies, most recently focusing on AI, ethics and risk management. Quintin serves on the CXO Advisory Network of the A.Team and Blumberg Capital's CIO Council. He is a board member of The Mentor Project and the SIM Tampa Bay chapter, and a Research Fellow for AI and Faith. Quintin is a popular speaker, panelist and Adjunct Professor at Muma College of Business, University of South Florida, teaching MBA and Executive MBA students.