AI in Indiana: 2023

Research Brief | March 2024

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Summary and Key Takeaways

- Adoption of AI and AI-related technologies could provide a welcome productivity boost, leading to increased prosperity for Hoosiers.
- Despite regular news about AI-related developments, it is unclear just how widely AI and AI-related technologies are actively used.
- McKinsey & Company's Global Survey on AI finds that, while some companies are AI leaders, it is still "early days" regarding broad-based AI adoption.
- To get a sense of the rate of AI adoption in Indiana, CICP—with leadership from TechPoint and Conexus Indiana—administered a survey on AI in Indiana: 2023 survey last fall.
- The survey generated 177 responses with 55% indicating the adoption of at least one AI capability—a share in-line with McKinsey's global survey.
- The AI in Indiana survey also found that the business functions most reported to be using AI are product manufacturing, marketing or sales, and product or service development.
- Survey responses indicate that the most adopted AI-related capabilities are computer vision, natural language generation, and robotic process automation.
- Creation of new AI-based products, contact center automation, and customer acquisition and lead generation are the uses most reported as adopted.
- There is still more to be learned on AI adoption and its impacts in Indiana, and CICP and its branded initiatives will continue to investigate these topics in the near future.
- CICP and its branded initiatives will also continue to encourage the use of technology to increase productivity and the development of leading-edge capabilities through efforts like AnalytiXIN.

Introduction

Developments in artificial intelligence have made frequent news over the past several months, prompting some, including a multidisciplinary team from Harvard, MIT, and BCG, to forecast a massive productivity increase. Productivity increases would almost certainly be welcomed as Indiana and the nation as a whole have seen languishing productivity growth in recent years. This slowdown in productivity growth is worrisome because such growth ultimately drives sustained economic prosperity. Because this is not an Indiana-specific challenge, it means that Hoosier industries and workers could lead the way in pursuing productivity growth through the adoption of AI and AI-related technologies.

Yet despite the frequent AI news, it is difficult to know just how it is being used and what its impacts might be. Gartner, the global technology consultancy, locates most software-related AI applications in the early phases of its well-known hype cycle. While this placement is almost certainly true for the generative AI developments that have been making the news, one still can't help but wonder just how, if at all, AI is currently being used.

To assess AI adoption in Indiana, CICP—with leadership from TechPoint and Conexus Indiana—recently administered a survey on AI adoption and readiness in Indiana. This research brief provides high-level results from that survey as well as additional insights into what we know about how AI is being used and why it matters for Hoosiers.

What is AI? – An AI Primer from TechPoint

Artificial Intelligence (AI) is the umbrella term for the practical use of machines, particularly computer programs, to carry out tasks that normally require human intelligence. This includes tasks like creating and interpreting images, recognizing and generating speech, understanding and producing language, using tools, and many other activities that involve perception and action. AI is gaining prominence, largely due to the enhanced sophistication of approaches and the growth of computational power. The recent leaps in technical abilities, such as increased computing power and advanced graphics processing units, have opened many applications across various sectors—spanning from generative AI to the use of AI in sensors and robotics technologies. TechPoint's "Artificial Intelligence: What Business Leaders Need to Know" provides an introduction to AI that enables non-technical readers to better understand pertinent concepts like machine learning, generative AI, and other aspects of the technology and its uses.

TECHPOINT

AI and Indiana's Economy

Last year, scholars at the Brookings Institution released new analysis finding that job postings data indicates that generative AI is concentrating in just six coastal cities (San Francisco, San Jose, New York, Los Angeles, Boston, and Seattle). This analysis—which prompted coverage in the New York Times, Politico, and elsewhere—encouraged states and cities to adopt efforts that "broaden the emerging AI map as the technology grows in significance." In doing so, Brookings highlighted CICP's very own AnalytiXIN as one of a few initiatives nationwide properly aimed at ensuring Indiana has the technological capabilities needed to thrive in the future economy.

AnalytiXIN – Accelerating Indiana's Advanced Analytics Ecosystem

Recognizing the concentrated nature of analytics activities on the coasts of the United States, particularly in AI, AnalytiXIN emphasizes the importance of cultivating and fortifying Indiana's workforce, faculty, and students in data analytics methods and technologies for the prosperity of Indiana.

Since its establishment in 2021, AnalytiXIN has transformed into a progressively influential platform, centered on four key pillars aimed at enhancing the state's vibrancy in the analytics ecosystem:

1. **Recruit Top Talent:** Develop the finest advanced analytics talent within Indiana.
2. **Build a "Common Place":** Establish a hub in Indianapolis for engagement, connecting university and industry expertise, capabilities, and talent in the realm of data analytics.
3. **Develop Data Assets:** Create impactful data assets to address real-world challenges and attract engagement and talent to Indiana.
4. **Facilitate Diverse Project Teams:** Collaborate between AnalytiXIN faculty and industry partners on analytics projects that leverage the strengths of both university and industry resources.

Finally, AnalytiXIN extends beyond the realm of advanced analytics and data. It is about leveraging Indiana's collective strengths to address real-world challenges, fostering positive transformations in patient care, businesses, and community engagement. By harnessing the power of analytics, AnalytiXIN aspires to make tangible and meaningful improvements that contribute to the well-being of Indiana.

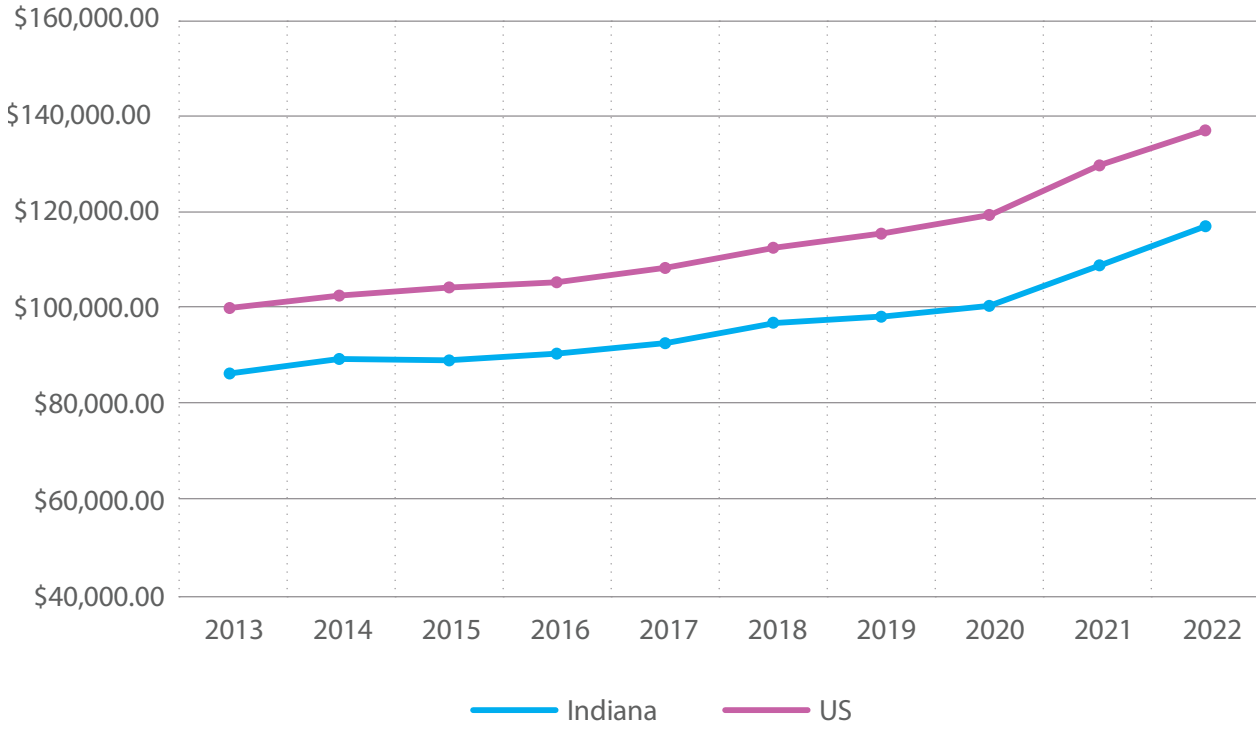
analytiXin

This is the second time Brookings has called-out AnalytiXIN as a smart investment in ensuring future AI capabilities. AnalytiXIN was also featured in a 2021 report that found AI activity concentrated in just a few places. In addition to six cities listed above and a handful of others, this report also identified 21 metro areas—including both Bloomington and Lafayette—that have a high degree of federally-funded AI activity thanks to the presence of a large research university.

Prior Brookings research on AI and automation have also focused heavily on Indiana. An early 2019 report identified Indiana as being the state most likely to feel the effects of automation due to the state's manufacturing intensity. This finding was repeated in a subsequent 2019 report focused on the impact of AI on jobs that also foreshadows the effect of generative AI on traditionally "white collar" jobs. A more recent analysis from the Pew Research Center reiterates that the latest AI developments are most likely to affect jobs that tend to be in higher-paying fields and require a college education.

The impact of AI and related technologies ultimately matters because their adoption should enable productivity growth. As mentioned previously, the US has seen slipping productivity growth in recent years. While this is not an Indiana-specific problem, it may present unique challenges in the Indiana context since past research has found that the state lags in technology adoption. Given that productivity growth enables long-term prosperity, Indiana must be at the forefront of adopting new technologies, like AI, that could enable productivity growth. This is particularly so because, as illustrated in Figure 1, Indiana has lagged the nation in productivity (GDP per worker) across all workers over the last 10 years.

Figure1. Productivity Growth in the US and Indiana, 2013-2022
(GDP per worker in nominal dollars)



Source: CICP analysis of Lightcast 2023.4 dataset.

Yet, for all of the news (and hype), the degree to which AI is actually being adopted remains unclear. Some insights can be gleaned from McKinsey's global survey on AI adoption, the most recent of which was released in August 2023. It finds that 54% of organizations have adopted AI in some form. To assess AI adoption in Indiana, CICP—with leadership from TechPoint and Conexus—recently administered a survey inspired by McKinsey's efforts.

McKinsey & Company's Global Survey on AI

CICP's survey questions are inspired by McKinsey's Global Survey on AI. McKinsey has carried out this survey annually since 2017 with responses coming from a diverse range of companies in terms of industry, size, region, and age. McKinsey's survey seeks to garner insights on AI adoption, changes in AI capabilities, AI use cases, levels of AI investment and returns, AI-related talent challenges, and more. McKinsey's most recent survey is "The State of AI in 2023: Generative AI's breakout year."

McKinsey & Company

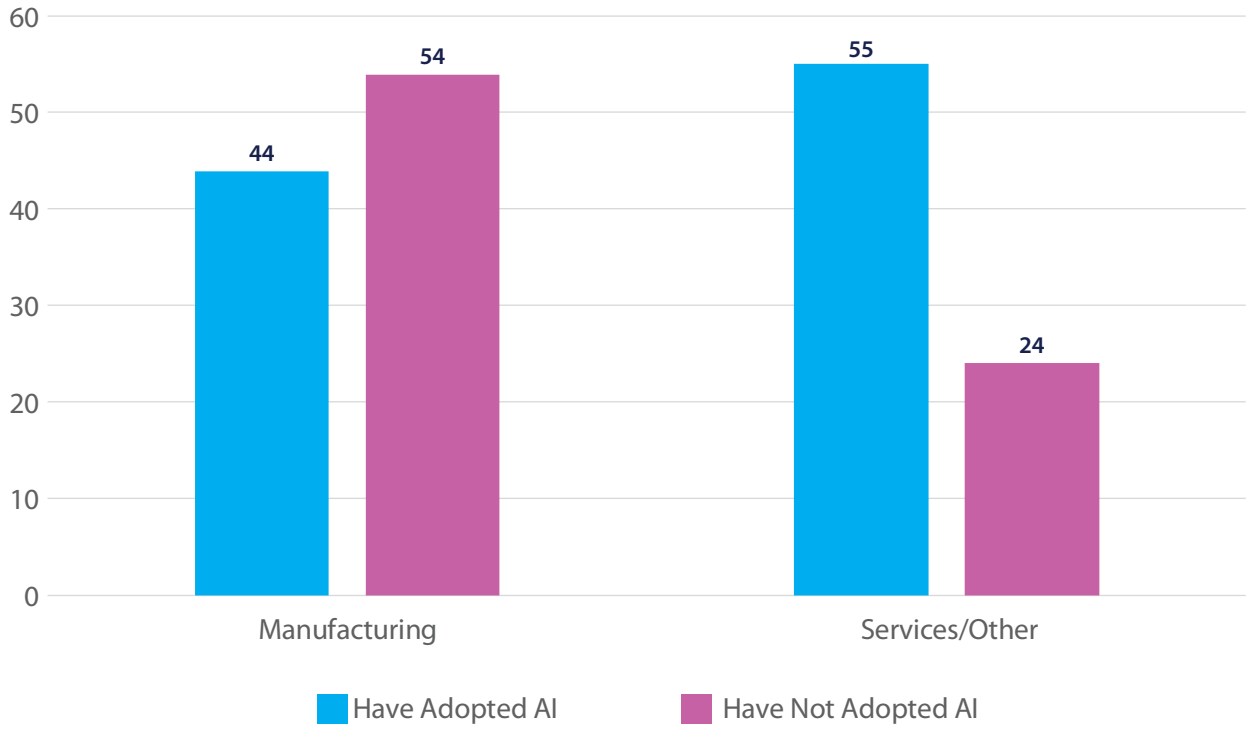
AI in Indiana Survey Results

The AI in Indiana Survey was launched in September 2023 and left open for about six weeks. More than 270 individuals logged into view the survey—a figure indicative of strong interest in the topic. Of those interacting with the survey, 177 completed it. Of these, 55% indicated they have adopted at least one AI capability, a share in-line with McKinsey's global survey.

Survey respondents were asked to identify the industry in which they work before being asked whether they have adopted any AI capabilities. Those working in a manufacturing industry responded to the survey at a higher rate than those working in non-manufacturing or service industries. However, as illustrated in Figure 2, non-manufacturers who responded to the survey are more likely to have adopted AI.

Respondents who indicated that their organization has adopted AI were asked several follow-up questions asking which business functions or units are using AI, which AI capabilities has your organization adopted, and how are AI capabilities used in your organization. Following each of these questions, respondents chose from a list of answers

Figure 2. AI Adopted in One or More Business Functions or Units by Industry



Source: CICP analysis of AI in Indiana: 2023 survey results.

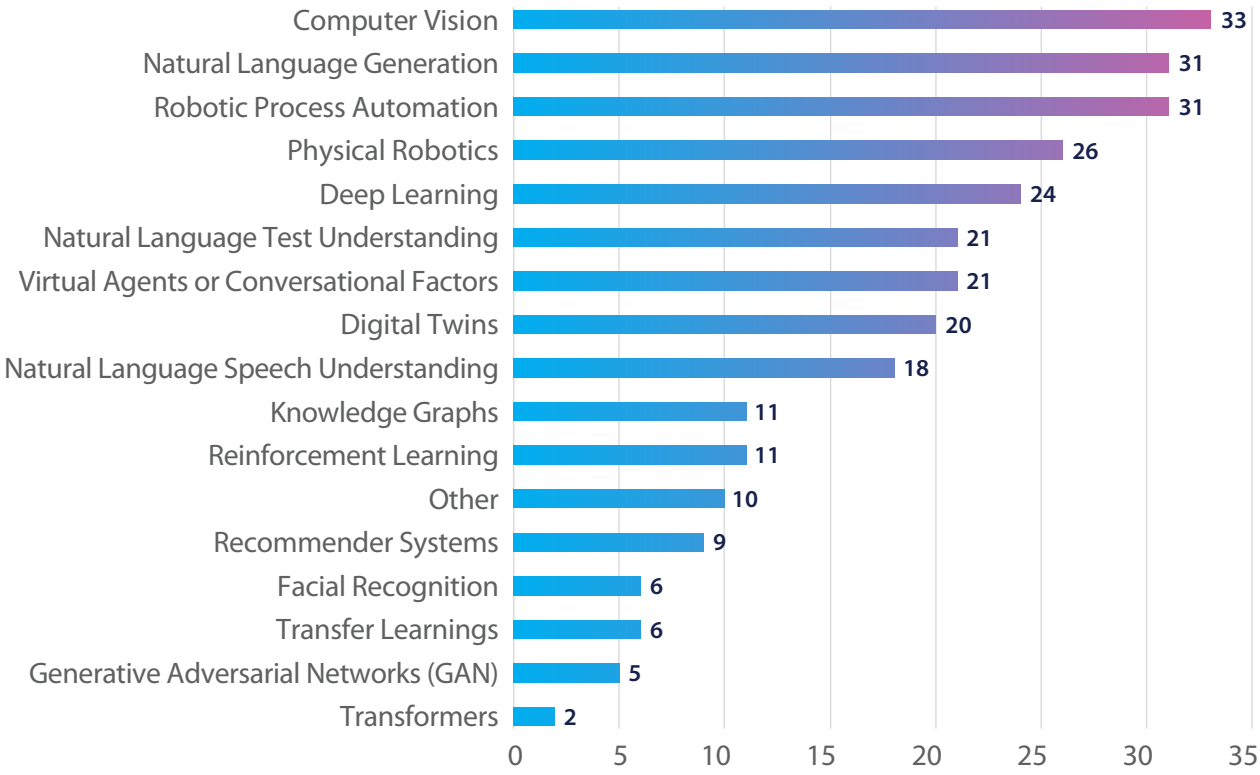
that was crafted to be similar to those included in McKinsey's Global Survey on AI. Hoosier respondents indicate that:

- **Product manufacturing**, **marketing or sales**, and **product or service development** are the three business functions most reported to be using AI.
- **Computer vision**, **natural language generation**, and **robotic process automation**—all of which are described in an AI primer TechPoint published last year—are the three capabilities most reported as adopted, as illustrated in Figure 3.
- **Creation of new AI-based products**, **contact center automation**, and **customer acquisition and lead generation** are frequently reported as adopted (setting aside "other").

Those indicating that their organization has adopted AI were also asked questions seeking to understand cost decreases and revenue increases due to AI usage as well as questions pertaining to AI talent. Few respondents answered these more technical questions, but answers were directionally consistent with what one would expect. AI adoption drives revenue increases and cost decreases. Roles related to AI (e.g., software engineers, data engineers, data architects) are in-demand, and filling these roles is a challenge.

Respondents whose organizations have not yet adopted AI were asked if any functions or business units were exploring AI adoption. Product manufacturing was the most cited function or unit considering adoption. This is, perhaps, unsurprising given that manufacturers responded to the survey at a higher rate than non-manufacturers. Regardless, it is a positive sign

Figure 3. AI Capabilities Adopted by Respondents



Source: CICP analysis of AI in Indiana: 2023 survey results.

of interest in technology investments. This should be unsurprising given that, as illustrated in the manufacturing case studies summarized below, AI-related technologies enable manufacturers increase productivity through improvements in manufacturing speed, reduced downtime, and enhanced quality.

All survey respondents—those whose organizations have and have not adopted AI—were also asked about AI-related risks their organizations see as relevant. Among all respondents cybersecurity was the most cited risk by far. The ability (or lack thereof) to explain how AI makes decisions was a distant second.

Real-World AI Implementation in Manufacturing – Case Studies from Conexus Indiana

While AI remains an emerging Industry 4.0 technology throughout Indiana's manufacturing sector, some companies are already reaping the gains of successful deployments. Through the State of Indiana's Manufacturing Readiness Grants (MRG) program, Indiana-based Mach Medical, POLARIS Laboratories and Photon Automation have implemented AI-enabled solutions to enhance production capabilities and provide new services to customers.

Mach Medical, a Whitely County medical device maker, used MRG to help it overcome a key challenge in the orthopedic implant market—the length of time it takes to translate new product designs into an efficient manufacturing process. Mach Medical's answer to this challenge is through developing a comprehensive "digital twin" of the manufacturing process tied to a standardized manufacturing platform, which significantly reduces the engineering time and resources it takes to translate the product design specifications to executable manufacturing.

Over the course of almost 25 years of operation, Indianapolis-based POLARIS Laboratories has built a massive database incorporating information from fluids, OEM machines, and other manufacturing equipment. With MRG support, POLARIS Laboratories has invested in proprietary AI/ML software to leverage this data to provide predictive maintenance and analytics for its global manufacturing customers. This enables its industrial customers to know how far they can extend the maintenance intervals to maximize use of the lubricants while keeping the components healthy.

Hancock County-based Photon Automation recently deployed an automated laser welding system that provides flexibility for both assembly of different battery sizes and materials as well as for low-volume contract manufacturing. MRG funding enabled Photon Automation to integrate robotics, software, machine vision, and proprietary AI/ML algorithms to precisely control a sophisticated laser welding system. Such a system is a must-have in the world of manufacturing batteries and electric vehicles, and Photon's capacity to assemble and test high-capacity batteries for these industries is critical for Indiana and the nation.

Case studies highlighting how Mach Medical, POLARIS Laboratories, and Photon Automation have used MRG to support AI adoption are available on the Conexus Indiana website.

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Moving Forward

Responses to CICP's AI in Indiana survey are indicative of an interest in AI. At the same time, the responses are representative of only a handful of Indiana companies. While the rate of AI adoption amongst respondents is consistent with that uncovered by McKinsey's Global Survey on AI, the relatively small sample provided herein should not be generalized to be indicative of Hoosier AI adoption more broadly. That said, there is clearly an interest in AI among Indiana business leaders—a point made plain by the nearly 100 survey respondents who asked for more information on AnalytiXIN.

It is also clear that there is more to learn, both in terms of current AI uses and future impacts. Recent developments in generative AI, like ChatGPT, have noticeably captured the attention of the general public. However, as noted in McKinsey's most recent Global Survey on AI, "it's early days." Generative AI is being widely explored both inside and out of the office, and expectations are that use of AI will increase going forward resulting in an array of disruptions. "Yet," McKinsey writes, "while the use of gen AI might spur the adoption of other AI tools, we see few meaningful increases in organizations' adoption of these technologies. The percent of organizations adopting any AI tools has held steady since 2022, and adoption remains concentrated within a small number of business functions."

Given the rate of change and uncertainty associated with AI, CICP and its branded initiatives are investigating how to best deploy future surveys of business leaders statewide and undertake additional research aimed at better understanding how to seize the current moment. At the same time, CICP and its branded initiatives will also continue efforts to encourage technology adoption and workforce readiness for new technologies. This includes continued development and implementation of AnalytiXIN as well as a range of other initiatives aimed at putting tech to work in key Indiana industries in order to boost productivity and ensure sustainable prosperity for all Hoosiers.

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