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REGION FOCUS: NORTH AMERICA

CIO Playbook 2024

Entering the Age of Al Everywhere





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Research, IDC



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About this study:

This eBook draws insights from custom research commissioned by Lenovo, surveying **900 IT and business decision-makers (ITBDMs) from organizations across North America.** The survey includes 600 respondents from the USA and 300 from Canada. Respondents come from a variety of industries, including but not limited to the following:



The research offers insights into prevailing attitudes and approaches toward Al adoption in North America, business and IT investment priorities, key challenges, and spending imperatives in accelerating their digital business agenda in 2024.

Entering the age of Al everywhere:

As businesses enter 2024, a notable wave of interest, planning, and investments is evident around the integration of artificial intelligence (AI) across organizations in North America. This shift reflects organizations' recognition of AI's potential to boost efficiency and competitiveness.

This report:

The following page summarizes the key insights and takeaways for chief information officers (CIOs) to consider for 2024, followed by a deeper dive into the findings.



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The following are key insights IDC observed from our research of 900 ITBDMs, as well as strategic imperatives for CIOs that IDC believes will help North America organizations gain a competitive edge in 2024:

Key insights

93% of IT and business decision-makers believe that AI will have an impact on business outcomes:

Organizations are eager to adopt AI for competitive advantage and must carefully consider the complexity and interdependencies of AI within the organization to be successful.

Considerations for CIOs in 2024

Be the AI orchestrator:

CIOs are uniquely positioned to see across every function of the business. They can enable AI for competitive differentiation by working with the C-Suite to create a strategic approach that addresses challenges across people, processes, and technology.





Al is a top priority and 43% believe it will be a "game changer," transforming how they run their business:

Half of the ITBDMs say they need to invest in generative AI (GenAI) capabilities to keep up with their competition.

Focus on both the short and long-term:

Use AI to improve productivity in the short term, and work to operationalize AI across the entire organization for enhanced customer satisfaction and increased revenues in the long term. Take a use case approach and experiment to learn and rapidly develop an enterprise-wide AI strategy and roadmap.





Infrastructure decisions must support the organizational AI strategy:

Hybrid cloud deployment models are expected to be the most prominent, but beyond cloud investments, the anticipated spending growth in edge computing will help support real-time analytics and insights.

Think of data as the differentiator:

Only one in four organizations has an enterprise-wide DataOps strategy in place today. Regardless of location, data is the key to success in the current business environment and needs a sharper focus.





People issues are holding everyone back:

Overcoming concerns that employees' jobs will be threatened is a key challenge to successful Al adoption. Employees need the relevant skills and a "data culture" for Al to succeed in the enterprise.

Invest in your people:

Find opportunities to align employee development plans with the future needs of the organization. Reskilling and upskilling workers will help close the data and AI skills gap and reduce fears of AI replacing workers.



CIO Strategic Imperatives

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Emerging technologies capture a strong

GenAl is the top tech investment priority for 2024

Spending on AI technologies is anticipated to increase significantly in 2024

The impact of AI helps address top business challenges and priorities

From core to edge, we are entering the age of AI everywhere

Executing successfully with AI means paying attention to people, process, and governance

It is critical for employees to embrace the Al transformation journey

CIOs must consider the impact of AI on their internal people and processes

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Emerging Technologies Capture a Strong Position on the Business Agenda

| Top business PRIORITIES for 2024 | | Top b | Top business CHALLENGES in 2024 | |
|----------------------------------|--|-------|----------------------------------|--|
| #1 | Higher customer experience & satisfaction | #1 | Cybersecurity & data privacy | |
| #2 | Emerging technologies (e.g., GenAl, etc.) | #2 | Data management and analytics | |
| #3 | Accelerating revenue & profit growth | #3 | Digital transformation | |
| #4 | Cost optimization and savings | #4 | Talent acquisition and retention | |
| #5 | Increased business agility & responsiveness | #5 | Customer experience | |

A customer-centric approach to business has been an enduring C-Suite priority. It's no secret that happy customers accelerate revenue growth and protect the business against loss during economic hardship. With the advent of GenAl, there is a massive opportunity for customer experience to be revolutionized for the better.

Prompted by the popularity of ChatGPT, GenAl quickly piqued the interest of business executives and has now made its way high up on the business agenda for 2024. Many executives prompted their CIOs to understand what this technology could do for the business in the short and long term. Whether or not executives are entirely sold on the value of GenAl compared to the cost, an overwhelming majority believe that, at the very least, some investment will be required to keep up with what their competitors are doing. Many are eager to find relevant use cases and are calling upon their technology teams to orchestrate deployment and provide ongoing support.

CIOs know if they do not help support the evaluation and implementation of emerging technologies, the business will go rogue—and they will be left trying to put the pieces together. By being an active member in conversations about the digital business strategy, the CIO can reduce the chances that the company will take a misstep.



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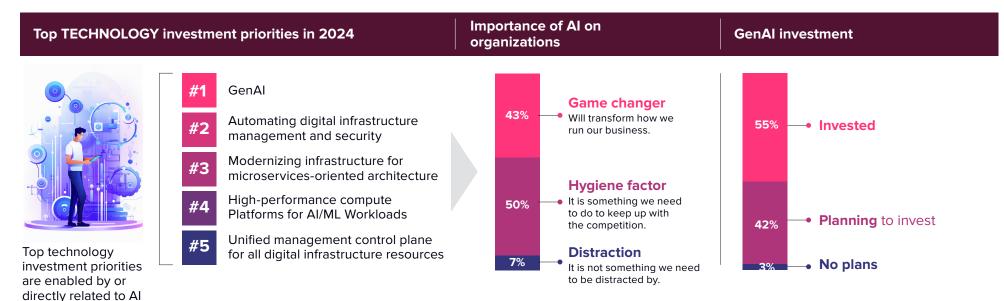
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GenAl Is the Top Tech Investment Priority for 2024



GenAl is the top technology investment priority according to ITBDMs in North America. This doubling down on GenAl, both on a business agenda and technology agenda, sends a clear message: Organizations are positioning themselves to invest in Al in 2024. Beyond GenAl, all the top five technology investment priorities are enabled by or directly related to Al.

When asked about its importance, 43% of respondents said that Al is a game changer that would transform how they run their business. An additional 50% said that investing in Al was a necessary hygiene factor to keep up with competitors. This sentiment follows through to investment for 2024, where over half of respondents say they have already invested in GenAl, and another 42% are planning to invest in GenAl technology.

Compared to Canadian respondents, a higher percentage of US respondents believe that AI will transform how they run their business, and a higher rate of respondents have already invested in GenAI. However, in both regions, more than half say they have already invested.

The power of GenAl is undeniable, and businesses must act now to stay ahead of the competition and ensure they are well-positioned to benefit from this game-changing technology. With this in mind, ITBDMs are looking at a variety of approaches to adopting GenAl, including building, buying, and embedding GenAl applications.



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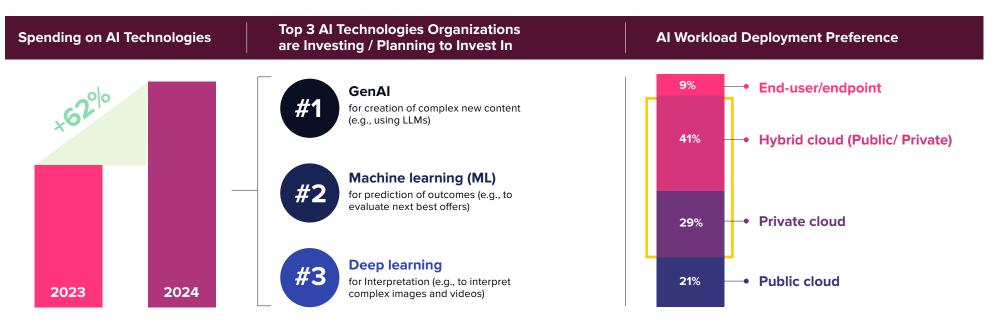
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Spending on Al Technologies Is Anticipated to Increase Significantly in 2024



ITBDMs anticipate a notable increase in spending on AI technologies as a proportion of their overall IT budget going into 2024, rising from 8.4% to 13.5%. Year over year, this represents a 62% increase in their spending on AI technologies as a proportion of their overall IT spending. Investments across GenAI, ML, and Deep Learning drive this.

Just over a quarter of spending is planned to go towards GenAl, with a close to even distribution across the remaining categories, including machine learning, deep learning, and robotics. A look across industries shows ITBDMs in the retail industry with the highest anticipated spending on GenAl in 2024. This makes sense with customer experience (CX) being so critical to the retail business model and the power of GenAl to help revolutionize CX.

Preference for deployment leans towards a hybrid approach, helping tap into what each deployment does best. While the public cloud offers immense scalability, the private cloud can be beneficial for security and low latency. It is worth noting that a significant percentage of respondents still prefer an approach geared to either private cloud or public cloud. End-user/endpoint, while the least common, is still the preference for close to one in 10 respondents.



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The Impact of Al Helps Address Top Business Challenges and Priorities

Top TECHNOLOGY areas most impacted by Al

Top BUSINESS areas most impacted by AI







With business priorities and spending priorities focused on AI, it makes sense that IT and business decision-makers assert that AI will impact technology areas like cybersecurity and threat detection, personalization, and customer experience. Cybersecurity and threat detection were identified as the top business challenges for 2024, while personalization and CX were identified as the top business priorities for the same year. Respondents see AI as an investment in technology that will minimize challenges and enhance priorities. This is reflected in the response choices for business areas most impacted by AI—better data-driven decision-making and improved client journey.

It is critical for CIOs to educate the C-Suite on how and where AI can be more rapidly deployed and where longer-term investments are required, as the underlying assets are enabled to ensure successful and ongoing projects. For the 7% of respondents that see AI as a distraction, this is an opportunity for CIOs to educate and communicate the benefits, outcomes, as well as costs to the business leaders. A do-nothing approach is riddled with risk, as competitors will work to enhance their employee productivity and customer experience and find new business models to drive revenue growth.



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From Core to Edge, We Are Entering the Age of Al Everywhere

(% of IT spend)

Edge use cases most impacted by AI

Real-time analytics and insights

Retail and CX

IoT device management

A significant increase in spending on edge computing is positioned to accelerate the proliferation of Al and the capabilities of underlying platforms, particularly in industries such as manufacturing and retail.

Edge devices will generate significantly more data, often in real-time, enabling AI models and supporting a host of new use cases. A flexible combination of cloud and edge computing will become necessary to handle the different model training and inference requirements.



Primary Client Edge/Endpoints Edge Infrastructure Communications **Datacenter Automotive Heavy Edge** Network Servers Infrastructure **Enterprise IoT Phones Industrial IoT** Wireless **Light Edge** Infrastructure **Tablets Consumer IoT**



Edge computing spending

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Executing Successfully with Al Means Paying Attention to People, Process, and Governance

Top challenges when deploying Al

- Employees are concerned that Al will threaten their jobs
- Lack of training for use of self-service Al tools (low/no code apps)
- Lack needed support from IT for successful automation deployment
- Fear, uncertainty, and doubt from employees are major roadblocks to the successful implementation of AI technologies. It is critical that employees understand their role within the paradigm of the AI everywhere phenomenon.
- Beyond understanding, employees need training and reskilling. The benefits of a specific tool remain unrealized if users of the technology are not instructed on when, how, and why they should use these new technologies.
- The need for technical expertise and ongoing support cannot be overstated. Many projects require massive organizational change management and transparent collaboration between tech and non-tech employees.

- Monitoring for potential misuse and AI hallucinations
- Model capability limitations (in terms of training data required, token limit)
- High dependence on third party
- There are still many unknowns when it comes to GenAl. A responsible Al policy is necessary to minimize the potential for misuse of this technology internally. Additionally, hallucinations, bias, and other inaccuracies in generated content will be challenging as models continue to be tuned and refined.
- GenAl demands massive datasets to ensure reliability. However, most organizations lack the required volume and data quality to train the Al models effectively.
- Selecting strategic technology partners for GenAl is not an easy task. C-Suite executives highlight the need to understand how the vendor uses their data to evaluate technology partners. With so much at stake with corporate goodwill, business leaders are hesitant about high reliance on third parties.



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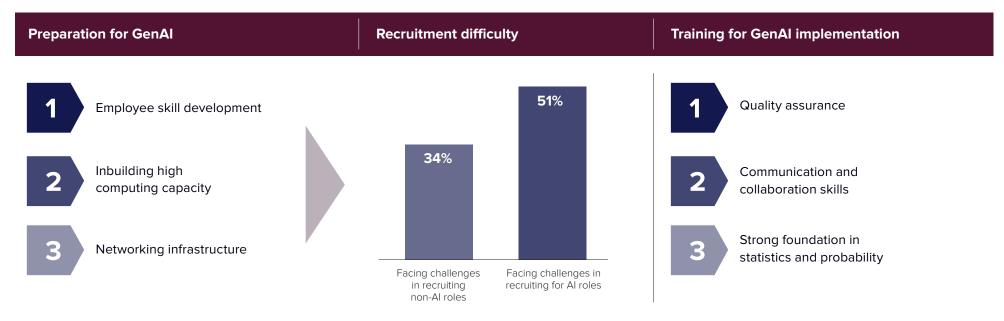
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It Is Critical for Employees to Embrace the Al Transformation Journey





In anticipation of the GenAl wave of transformation, companies are strategically investing in employee skills development, high computing capacity, and network infrastructure. This proactive approach aims to improve organizational readiness for the age of Al everywhere. However, a noteworthy challenge arises as companies express the difficulty of hiring for Al-related positions—over half of respondents stated that recruiting Al positions is difficult.

Companies are planning comprehensive training programs to bridge this talent and skills gap. The focus areas include quality assurance, communication and collaboration skills, and a strong foundation in statistics and probability. This approach addresses the immediate hiring challenges and positions companies to navigate the complexities of the GenAl landscape by cultivating an adaptable workforce. It reflects a forward-looking strategy where talent development becomes a cornerstone for sustained success in the evolving technological landscape.

While the job market in North America is less constrained than in 2021, the skills gap is an enduring issue that employers must plan for. Communication with existing employees must be frequent and transparent to dissipate fear around automation and Al replacing humans. GenAl should be a tool to enhance work, not remove or eliminate the human in the loop.

The advantage in the market will come to those who can execute effectively with AI, and this means the focus needs to be on training and education both at the executive level and the knowledge worker level. The more informed CIOs will be able to advise IT and the business on potential use cases, outcomes, and architectures AI will demand.



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CIOs Must Consider the Impact of AI on Their Internal People and Processes



Parts of DevOps transformed by Al

- Intelligent infrastructure resource utilization
- Troubleshooting errors and anomalies improving the DevOps credibility
- Greater collaboration

The use of GenAl will fundamentally transform the role of developers over time because this technology can:

- Generate code
- Explain code
- Develop code documentation
- · Assist in testing and quality control
- Enable code translation between languages

Many of these capabilities will require experimenting with, refining, and optimizing. The ultimate impact will be substantial, giving rise to new roles centered on prompt engineering, fine-tuning, and incorporating third-party data feeds to enhance model outputs.



Percentage of organizations using AI to enhance its security framework (SecOps)

Top deployment of security/ trust related AI tech

- Data discovery and identification
- Curated recovery
- Anomaly detection

Al embedded within security vendors' offerings will deliver the desired improvements and experiences. The design and development in this field is highly specialized and demand access to significant data volumes, a resource typically available only to the largest security vendors.

The shift from static to dynamic security is the driving force behind this adoption. The necessity for continuous situational awareness in the face of thousands of risks per second makes it an industry concern best addressed by vendors.



Percentage of organizations using Al to enhance its **DataOps**

Al usage in DataOps

- Data access & data quality through self-service
- Data governance framework and processes
- Metadata management

Successful Al deployments rely on a robust DataOps program. At the same time. Al can also enhance DataOps capabilities. Currently, only 25% of organizations have an enterprisewide DataOps strategy. This should be the target for organizations.

Once the enterprise-wide foundation is established, a continuous process of 'classify at ingest' must be implemented to ensure that Al models can adequately index and leverage all incremental data sources.



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Al vs GenAl - Cut through the confusion

Adopt productivity use cases first

Implementing AI use cases: Build, Buy or Fine-Tune?

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Al vs GenAl - Cut Through the Confusion

Survey results showed that GenAl is the #1 investment priority in 2024. IDC observed some confusion about Al in general and GenAl in particular—the differences across technologies, their business impacts, and their likely economic implications.

The figure below explains the critical distinctions:

Characteristics of PREDICTIVE & INTERPRETIVE AI

- Outputs predictions/classifications, learning from large data sets about past actions' consequences
 Models have hundreds thousands of
- Models have hundreds thousands of parameters
- Requires thousands millions of data points

Characteristics of **GENERATIVE AI**

- Outputs large complex content exhibiting characteristics similar to training data (e.g., text, audio, video, images, code)
- Models have billions trillions of parameters
- Requires billions trillions of data points



TECHNOLOGIES

BUSINESS IMPACTS

- Highly accurate outputs
- Low transparency (white/grey box)
- Examples: Credit scoring, fault assessment
- Challenges: Data quality, availability, timeliness, model explainability, downsides, bias, fairness
- Broad and sophisticated outputs
- Very low transparency (black box)
- Examples: Knowledge management, marketing, code generation, product design
- Challenges: Lack of data, explainability, impacts on process outcomes, lack of trust, IP, skills, employment



- Makes predictions easy and cost-effective
- Decreases value of human substitutes for prediction (e.g., sight, experience)
- Increases value of complements for prediction (e.g., judgement)

- Makes content generation easy and costeffective
- Decreases value of human substitutes for content generation (e.g., language, imagination)
- Increases value of complements for content generation (e.g., trust, explainability, and real creativity)



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Adopt Productivity Use Cases First

Survey results showed that organizations were most interested in use cases focused on customer, quality, and innovation. IDC observed that there are three distinct categories of use cases and suggests the following approach for organizations:

Business Impact

Increase task productivity

Drives operational efficiencies

Adoption Drivers

- Limited skills
- Limited budget
- Lower risk appetite
- Limited amount of data

Consequences

- Cost savings & increased productivity
- Quick time to value
- Low control of model governance, security, privacy, & data

Use Case Examples

Summarizing documents

- Generating code
- Marketing content

Over the medium term, organizations could develop functional use cases to augment essential but non-central functions such as HR, marketing, legal, engineering, and design. While these create more value, they require a greater upfront investment in IT platforms, data, and business process redesign.

In the near term, most organizations can adopt

productivity use cases to reduce costs and

enhance the focus of expensive knowledge

workers, particularly within IT and the front

intelligence, software development, and

marketing.

office. These often involve low-cost, low-risk,

off-the-shelf solutions for areas such as business



Productivity

use cases

Functional use cases

- Increase functional effectiveness
- Contextualized experiences
- Institutional data
- Skills and budgets are available
- Longer time to value
- Some risk appetite
- Drives operational efficiencies & greater business focus
- Moderate control over model governance, security, & privacy
- Engineering knowledge management
- Legal document management
- Generative product design and prototyping

Several larger enterprises and consortia are already investing in building industry-specific use cases using propriety data to gain a competitive edge, but this entails high risks, complexity, and substantial budgets.



Industryspecific use cases

- Enable new digital business models, products, and services
- Industry specific competitive moats
- Quality and quantity of institutional data
- Ample skills and budget
- Longer time to value
- Potential competitive differentiation
- Complete control over model governance
- Generative drug discovery in life
- Generative material design for manufacturing



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Implementing AI use cases: Build, Buy, or Fine-Tune?

There are **various approaches** organizations can take to implement **the previously mentioned Al use cases**. Organizations can start by **buying** prebuilt models or applications with embedded models. This is the simplest way to adopt and requires minimal customization. This approach will lead to productivity gains across tasks or functions.

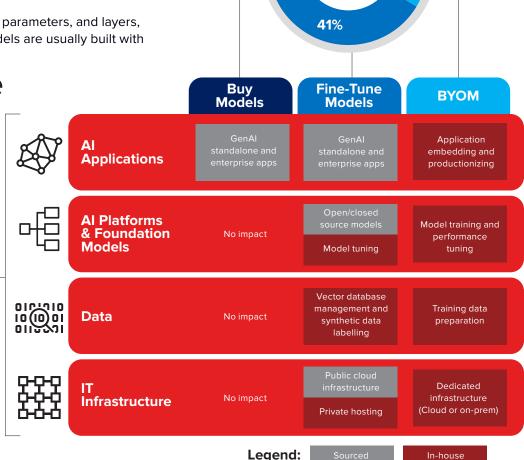
Fine-tuning a model can help deliver efficiencies with some competitive advantage but is costly and requires regular refreshing of models.

Build your own model (BYOM) offers complete control of model architecture, parameters, and layers, offering a serious competitive advantage at huge costs. Complex custom models are usually built with vendors or industry partners.

Al depends on the larger IT stack

Al implementations can be complex, requiring capabilities across multiple layers of the tech stack: IT infrastructure, data, Al platforms, and foundational models, and Al applications. Various Al implementation approaches discussed will impact different aspects of the below stack.

- The Build Approach lies on one end of the spectrum with implications on all layers of the tech stack, starting from infrastructure to data to model layers, requiring resources and talent to implement.
- The Buy Approach is a lighter lift and typically impacts the application layer of the tech stack.



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Models



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CIO Spotlight

Accelerating Innovation with Principle-Based Al

When asked about the advancement of AI in the company and its implications for the skills and capabilities of employees:



Matt Hoag CTO, Koch Industries



Brian Donnelly CIO, INVISTA

"GenAl has led to the democratization of Al. Typically, someone needed deep technical and mathematic skills to work in and with Al. Today, our best prompt engineers are not highly trained technical people."

Koch Industries is one of the largest private companies in America, with a diverse set of businesses and industries across the globe. From life's basics to tomorrow's technological breakthroughs, it's Koch's job to create and innovate a wide spectrum of products and services that improve life.

"GenAl has expanded our world It can help ease the burden of knowledge drain. It may be possible to create a virtual plant SME for less experienced operators to interact with, which is a completely new opportunity that was not possible with traditional Al."

INVISTA has been driven and transformed through constant innovation, becoming a leading producer of the nylon and polypropylene value chains. A subsidiary of Koch Industries, the company has been discovering solutions and developing products for the benefit of millions of people around the globe from its beginning.



Strategic approach to Al OCIONO Heading into the GenAl boom, Koch Industries

Heading into the GenAl boom, Koch Industries had been embracing machine learning and predictive AI for several years, which helped drive the AI discussion into the boardroom. The Koch approach is to think in terms of three key categories:

- 1. How to apply Al within our businesses.
- 2. How to apply Al to the products and services we deliver to the market.
- 3. How to think about AI from our investment footprint.



Moving fast and learning

The organization is keen on moving fast: learning fast and failing fast, knowing that GenAl will be a differentiator. INVISTA, a Koch Industries company, focuses on business outcomes, not just going after AI for the technology but seeking better outcomes faster. This is fundamental to the culture of the company.



Potential novel AI use cases

- Operational efficiency in manufacturing: natural language models that allow junior operators to ask procedural questions rather than thumb through a 500-page manual.
- Performance measurement "chat on my data": improve the process for identifying scattered information from multiple dashboards with the ability to have users ask questions about the data.
- Automate summarization of commodity chats: training large language model (LLM) to review and edit jargon-filled documents, allowing analysts to move up to higher-value tasks.



The human side of Al

Principle-based AI is Koch's strategy for responsible AI, which fundamentally links to the company's Principle Based Management™ framework—enabling individuals to succeed long term by creating superior value for others. Two key principles are Integrity and Stewardship & Compliance. This drives the company to make the best use of GenAl applications; protect data, IP, and trade secrets; ensure compliance; and recognize and mitigate risks of Al hallucinations. Koch continues to drive awareness and education programs to help employees navigate the risks and opportunities with the emergence of new AI technologies.



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Overal

Manufacturing

BFSI

Retai

Healthcare

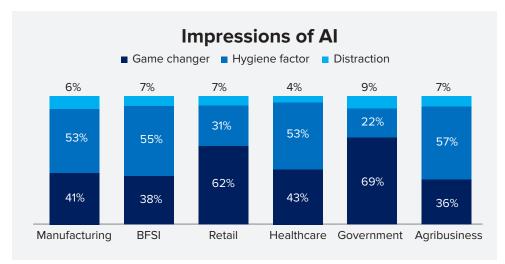
Government

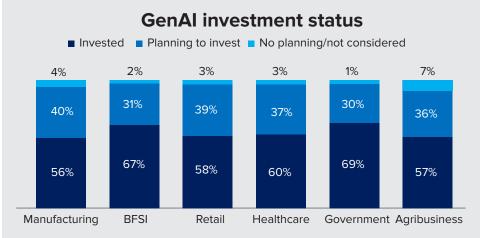
Agribusiness

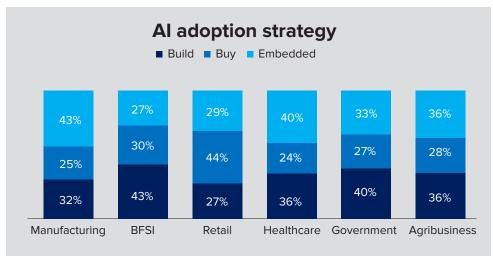
CIO Playbook 2024 Research Methodology Overall

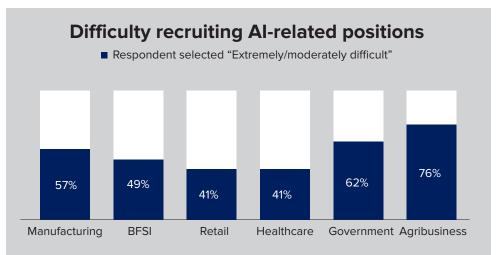
Vertical Insights Overview

The survey showed a significant degree of agreement on Al investment interest across industries, but separate from that, industry responses vary quite widely. BFSI organizations, for example, show a strong interest in building their in-house Al systems, whereas Manufacturer respondents were particularly likely to favor solutions with Al embedded.











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Overall

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Retai

Healthcare

Government

Agribusines

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Manufacturing Overview (1/2)

Manufacturers continue to face the balancing act of supply chain resiliency, operational efficiency, and the need to innovate while retaining and upgrading talent continuously. With that context, IT and business leaders are looking at the application of new technologies, including AI, to drive automation and transform their businesses. Manufacturers prioritize revenue and profit growth and are focused on protecting and future-proofing the organization by investing in cyber resiliency and modernizing legacy applications. Talent and workforce management continues to be a challenge, likely exacerbated by the pace of change with AI.

Top business priorities in 2024

- 1 Accelerating revenue & profit growth
- 2 Employee productivity improvement
- 3 Higher CX and satisfaction

Top tech investment priorities in 2024

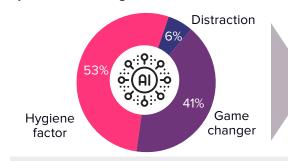
- Better cyber resiliency to address ransomware & malware attacks
- Modernizing legacy businesscritical applications
- Unified management control plane for all digital infrastructure resources

Anticipated challenges in 2024

- 1 Data management and analytics
- 2 Talent acquisition and retention
- 3 Cybersecurity and data privacy



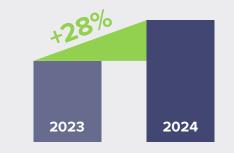
Impact of AI on organizations



Top tech/business areas most impacted by AI

- 1 Intelligent automation and robotics
- 2 Automation and efficiency
- 3 Talent and workforce management

Edge computing spending increase



Edge use cases most impacted by Al

- 1 Real-time analytics and insights
- 2 Industrial automation and manufacturing
- 3 Retail and CX



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Manufacturing Overview (2/2)

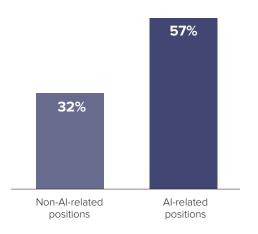
Manufacturing ITBDMs say employees' fear that Al will threaten their jobs makes them resist change. Deployment challenges also exist surrounding IT support and the rapid pace of change. With so much demand for Al technologies, it is no surprise that recruiting talent with the necessary skills is challenging for Al-related positions. Despite this, 96% of respondents said they have either invested or are planning to invest in GenAl. They are interested in using GenAl for knowledge management, enhancing productivity, and improving cost efficiency.

Top challenges when deploying Al

- Employees are concerned that Al will threaten their jobs
- Lack needed support from IT for successful automation deployment
- Difficulty keeping up with Al tech requirements

Recruitment difficulty

Respondents selected "Extremely/ moderately difficulty"



GenAl investment **GenAl types of interest**



- Productivity (personal, developer (code generation), and data analysts)
- Enhancing cost efficiency

Preparation for GenAl

4%

Employee skill development

Invested

Planning to invest

No plans/have not heard

- Inbuilding high computing capacity
- End-to-end network security

- Reshaping workforces
- High dependence on third party
- Biasness of algorithms



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BFSI Overview (1/2)

Banking, Financial Services, and Insurance (BFSI) ITBDMs are prioritizing emerging technologies as a top business priority in 2024. All is entering the BFSI sector fast and across a multitude of use cases. While BFSI tends to be subject to more compliance and regulations compared to other industries, GenAl is still seen as a top tech investment, automating digital infrastructure and modernizing legacy business-critical applications. The challenges foreseen in 2024 are cybersecurity and data privacy, as well as customer experience, which are both areas that respondents said were likely to be disrupted and impacted by Al.

Top business priorities in 2024

- Emerging technologies (e.g., GenAl, etc.)
- Higher customer experience and satisfaction
- 3 Driving digital business innovation

Top tech investment priorities in 2024

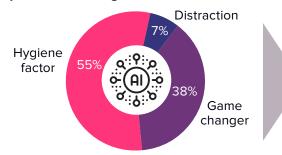
- Automating digital infrastructure management and security
- 2 GenAl
- Modernizing legacy business-critical applications

Anticipated challenges in 2024

- 1 Cybersecurity and data privacy
- **2** C
- Business continuity and disaster recovery



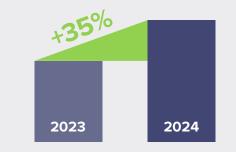
Impact of AI on organizations



Top tech/business areas most impacted by AI

- 1 Personalization and CX
- 2 Cybersecurity and threat detection
- 3 Talent and workforce management

Edge computing spending increase



Edge use cases most impacted by Al

- 1 Real-time analytics and insights
- 2 Retail and CX
- 3 Industrial automation and manufacturing



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BFSI Overview (2/2)

BFSI ITBDMs say Al deployment challenges exist surrounding IT support, employee fear, and sufficient business cases. With so much demand for Al technologies, it is no surprise that recruiting talent with the necessary skills is more difficult for Al-related positions. Despite this, 98% of BFSI respondents said they have either invested or are planning to invest in GenAl. The greatest interest in GenAl applications is for business intelligence, customer interaction management, and productivity. This will help drive digital business capabilities, enabling faster innovation for new products and services in the BFSI sector.

Top challenges when deploying Al

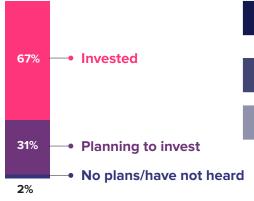
- Lack needed support from IT for successful automation deployment
- Employees are concerned that Al will threaten their jobs
- Challenge in making business case for AI tech

Recruitment difficulty

Respondents selected "Extremely/ moderately difficulty"



GenAl investment



GenAl types of interest

- Business intelligence (by finding patterns, surfacing insights, and making ad hoc queries easier)
- 2 Customer interaction management
 - Productivity (personal, developer (code generation), and data analysts)

Preparation for GenAl

- 1 Employee skill development
- 2 Networking infrastructure
- Inbuilding high computing capacity

- 1 High dependence on third party
- Model capability limitations (in terms of training data required, token limit)
- Monitoring for potential misuse and Al hallucinations





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Retail Overview (1/2)

Retailers are digitally transforming and investing at scale to meet the industry's high demands of a customer-led, technology-enabled seismic shift. IT and business leaders view Al as something to be taken seriously to keep up with competitors: 62% say it will be a game changer for their business. In 2024, they are prioritizing CX. They are focused on protecting and managing the organizations' assets by investing in stronger cyber resiliency and a unified control plane for their digital infrastructure. Cybersecurity and data privacy are anticipated as the top challenge.

Top business priorities in 2024

- 1 Higher CX and satisfaction
- 2 Employee productivity improvement
- Emerging technologies (e.g., GenAl, etc.)

Top tech investment priorities in 2024

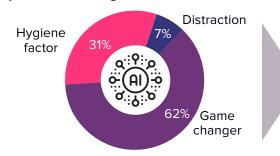
- Better cyber resiliency to address ransomware & malware attacks
- Unified management control plane for all digital infrastructure resources
- Automating digital infrastructure management and security

Anticipated challenges in 2024

- 1 Cybersecurity and data privacy
- 2 Digital transformation
- 3 c



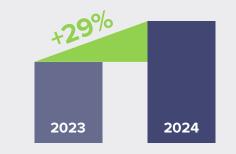
Impact of AI on organizations



Top tech/business areas most impacted by Al

- 1 Enhanced analytics and insights
- 2 Cybersecurity and threat detection
- 3 Intelligent automation and robotics

Edge computing spending increase



Edge use cases most impacted by AI

- 1 Retail and CX
- 2 Real-time analytics and insights
- 3 IoT device management



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Retail Overview (2/2)

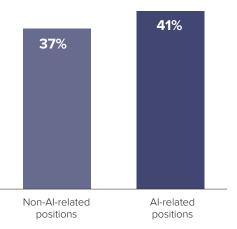
Retail ITBDMs say deployment challenges surround IT support, employee fear, and lack of training for self-service tools. With so much demand for AI technologies, it is no surprise that recruiting talent with the necessary skills is more difficult for AI-related positions. Despite this, 97% of respondents said they have either invested or are planning to invest in GenAI. They want to use GenAI for sales and marketing support, conversational AI, and business intelligence. They face challenges with limited model capabilities, security, and the risk of misuse and AI hallucinations.

Top challenges when deploying Al

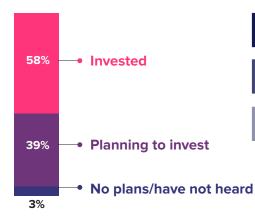
- Lack needed support from IT for successful automation deployment
- Employees are concerned that Al will threaten their jobs
- Lack of training for use of selfservice Al tools (low/no code apps)

Recruitment difficulty

Respondents selected "Extremely/ moderately difficulty"



GenAl investment



GenAl types of interest

- 1 Sales and marketing support
- 2 Conversational Al
- Business intelligence (by finding patterns, surfacing insights, and making ad hoc queries easier)

Preparation for GenAl Top

- 1 Employee skill development
- Inbuilding high computing capacity
- 3 End-to-end network security

- Model capability limitations (in terms of training data required, token limit)
- 2 Security
- Monitoring for potential misuse and AI hallucinations





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Healthcare Overview (1/2)

The healthcare industry is at an inflection point driven by the need to master Al everywhere and the thoughtful application of automation. ITBDMs are prioritizing business agility as a top priority in 2024. While healthcare tends to be a risk-adverse industry, GenAl is still seen as a top tech investment along with unified management of digital infrastructure and stronger cyber resiliency. Respondents expect to face challenges with data management and analytics as well as talent acquisition. Ensuring high-quality patient care requires decision-makers to proceed with greater caution, as they have a lower tolerance for errors.

Top business priorities in 2024

- 1 Increased business agility & responsiveness
- Reducing business risk & cyber threats
- Emerging technologies (e.g., GenAl, etc.)

Top tech investment priorities in 2024

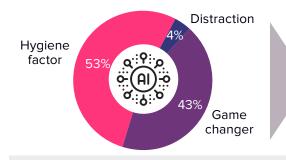
- Unified management control plane for all digital infrastructure resources
- 2 GenAl
- Better cyber resiliency to address ransomware & malware attacks

Anticipated challenges in 2024

- 1 Data management and analytics
- 2 Talent acquisition and retention
- 3 Digital transformation



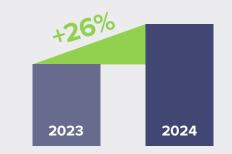
Impact of AI on organizations



Top tech/business areas most impacted by AI

- 1 Cybersecurity and threat detection
- 2 Enhanced analytics and insights
- 3 Personalization and CX

Edge computing spending increase



Edge use cases most impacted by Al

- 1 Real-time analytics and insights
- 2 Remote monitoring and telehealth
- 3 Video surveillance and security



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Healthcare Overview (2/2)

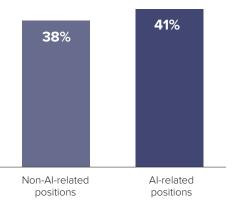
Healthcare ITBDMs say Al deployment challenges exist surrounding training, employee fear, and lack of support from IT. While recruiting for Al-related positions is slightly more complex, the healthcare industry is challenged to source the necessary talent to keep up with the demand for services. 97% of respondents said that they have either invested or are planning to invest in GenAl and are interested in using GenAl for business intelligence, cost efficiency, and design and writing assistants.

Top challenges when deploying Al

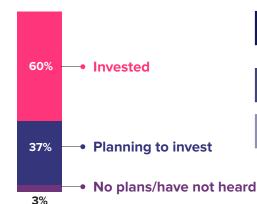
- Lack of training for use of self-service AI tools (low/no code apps)
- Employees are concerned that Al will threaten their jobs
- Lack needed support from IT for successful automation deployment

Recruitment difficulty

Respondents selected "Extremely/ moderately difficulty"



GenAl investment



GenAl types of interest

- Business intelligence (by finding patterns, surfacing insights, and making ad hoc queries easier)
- 2 Enhancing cost efficiency
 - 3 Design and writing assistants

Preparation for GenAl

- 1 Employee skill development
- 2 Networking infrastructure
- Inbuilding high computing capacity

- Model capability limitations (in terms of training data required, token limit)
- Monitoring for potential misuse and Al hallucinations
- 3 Government regulations



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Government Overview (1/2)

The appetite for emerging tech, and awareness for Al in particular, within government, is high, with 69% of respondents indicating that the impact of Al on organizations is a game changer—substantially higher than any other industry surveyed. GenAl is viewed as a top tech investment along with modernizing infrastructure and legacy applications. The challenges foreseen in 2024 relate to data management, cybersecurity, and data privacy. Ultimately, government ITBDMs will need to enable secure, agile, and data-driven organizations supported by an innovative workforce to support evolving citizen requirements.

Top business priorities in 2024

- Emerging technologies (e.g., GenAl, etc.)
- 2 Better data-driven decision making
- 3 Accelerating revenue & profit growth

Top tech investment priorities in 2024

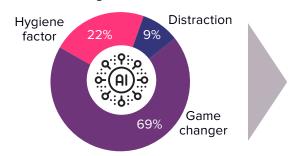
- Modernizing Infrastructure for Micro-services Oriented Architecture
- 2 GenAl
- Modernizing legacy business-critical applications

Anticipated challenges in 2024

- 1 Data management and analytics
- 2 Cybersecurity and data privacy
- 3 Digital transformation



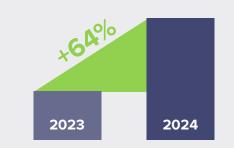
Impact of AI on organizations



Top tech/business areas most impacted by AI

- 1 Cybersecurity and threat detection
- 2 Predictive maintenance and IoT
- 3 Personalization and CX

Edge computing spending increase



Edge use cases most impacted by Al

- 1 IoT device management
- 2 Autonomous vehicles
- Real-time analytics and insights



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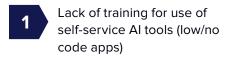
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Government Overview (2/2)

Government ITBDMs say Al deployment challenges exist surrounding training, IT support, and employee fears. Recruiting talent with Al skills is more complex than in non-Al-related positions. 69% of respondents said that they invested in GenAl, with almost the remaining proportion saying they plan to do so. They want to use GenAl for conversational Al, business intelligence, and design and writing assistance.

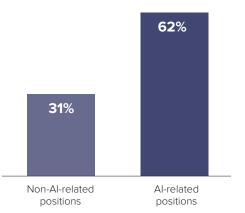
Top challenges when deploying Al



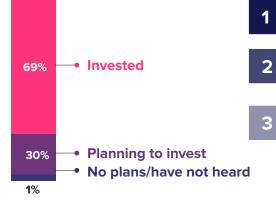
- Lack needed support from IT for successful automation deployment
- Employees are concerned that Al will threaten their jobs

Recruitment difficulty

Respondents selected "Extremely/ moderately difficulty"



GenAl investment



Preparation for GenAl

- 1 Employee skill development
- End-to-end network security
- Inbuilding high computing capacity

GenAl types of interest

- 1 Conversational Al
- Business intelligence (by finding patterns, surfacing insights and making ad hoc queries easier)
- 3 Design and writing assistants

- 1 Reliable data platform
- Monitoring for potential misuse and Al hallucinations
 - 3 Security



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Agribusiness Overview (1/2)

GenAl holds tremendous promise in transforming agriculture by enhancing crop optimization, disease detection, pest management, and climate-resilient crop breeding. In addition to higher CX, agribusinesses are focused on better data-driven decision-making in 2024. GenAl is in the top three tech investments, along with unified infrastructure management and edge infrastructure buildout. The challenges foreseen in 2024 are data management and analytics as well as cybersecurity and digital transformation. All has the potential to improve predictive maintenance and IoT, key aspects of agricultural operations.

Top business priorities in 2024

- 1 Higher CX and satisfaction
- Better data-driven decision making
- Reducing business risk & cyber threats

Top tech investment priorities in 2024

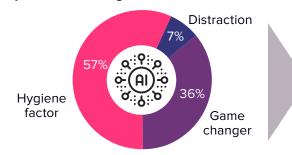
- Unified management control plane for all digital infrastructure resources
- Edge infrastructure buildout and management
- 3 GenAl

Anticipated challenges in 2024

- 1 Data management and analytics
- 2 Cybersecurity and data privacy
- 3 Digital transformation



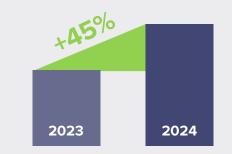
Impact of AI on organizations



Top tech/business areas most impacted by AI

- 1 Predictive maintenance and IoT
- 2 Cybersecurity and threat detection
- 3 Enhanced analytics and insights

Edge computing spending increase



Edge use cases most impacted by Al

- 1 Real-time analytics and insights
- 2 Industrial automation and manufacturing
- Remote monitoring and telehealth



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Why Lenovo

Agribusiness Overview (2/2)

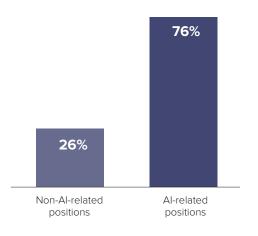
Agribusiness ITBDMs see Al deployment challenges around employee job loss fears, IT support, and problems keeping up with Al tech requirements. Recruiting talent with Al skills is much more complex than recruiting talent for non-Al-related positions. 57% of respondents said that they invested in GenAl, and 36% said they plan to do so. They want to use GenAl for conversational Al, knowledge management, and business intelligence. GenAl can use data from sensors, satellite imagery, and historical yield statistics to develop optimized planting patterns and cultivation strategies.

Top challenges when deploying Al

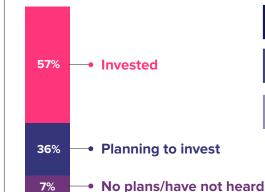
- Employees are concerned that AI will threaten their job
- Lack needed support from IT for successful automation deployment
- Difficulty keeping up with Al tech requirements

Recruitment difficulty

Respondents selected "Extremely/ moderately difficulty"



GenAl investment



GenAl types of interest

- 1 Conversational Al
- 2 Knowledge management
- Business intelligence (by finding patterns, surfacing insights and making ad hoc queries easier)

Preparation for GenAl

- 1 Employee skill development
- 2 Networking infrastructure
- 3 End-to-end network security

- Monitoring for potential misuse and Al hallucinations
- 2 Security
- 3 Government regulations



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Canadian ITBDMs are prioritizing higher CX and satisfaction as top business priorities in 2024. While in Canada, cost optimization remains a top business focus, respondents in the USA are targeting revenue and profit growth. GenAl is in the top three tech investments along with modernizing infrastructure and investing in better cyber resiliency. Challenges are foreseen regarding data management and analytics as well as digital transformation. According to respondents in Canada, Al will impact areas that are priorities for both business and technology decision-makers.

Top business priorities in 2024

- 1 Higher CX and satisfaction
- Emerging technologies (e.g., GenAl, etc.)
- 3 Cost optimization and savings

Top tech investment priorities in 2024

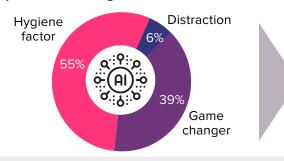
- Modernizing Infrastructure for microservices oriented architecture
- 2 GenAl
- Better cyber resiliency to address ransomware & malware attacks

Anticipated challenges in 2024

- 1 Data management and analytics
- 2 Digital transformation
- 3 Cybersecurity and data privacy



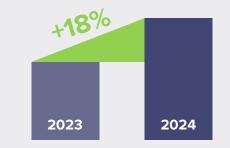
Impact of AI on organizations



Top tech/business areas most impacted by AI

- 1 Personalization and CX
- 2 Cybersecurity and threat detection
- 3 Predictive maintenance and IoT

Edge computing spending increase



Edge use cases most impacted by AI

- 1 Real-time analytics and insights
- 2 Industrial automation and manufacturing
 - 3 Retail and CX



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Canada Overview (2/2)

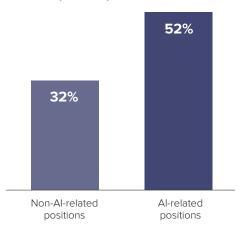
Canadian ITBDMs say Al deployment challenges surround employee fears of threats to their jobs, IT support, and lack of training. Recruiting talent with Al skills is much more complex than recruiting talent for non-Al-related positions. 50% of respondents say that they've invested in GenAl, and an additional 47% say they are planning to do so. They want to use GenAl for business intelligence, cost efficiency, and conversational Al.

Top challenges when deploying Al

- Employees are concerned that Al will threaten their jobs
- Lack needed support from IT for successful automation deployment
- Lack of training for use of self-service AI tools (low/no code apps)

Recruitment difficulty

Respondents selected "Extremely/ moderately difficulty"



GenAl investment



Preparation for GenAl

- Employee skill development
- Inbuilding high computing capacity
- End-to-end network security

GenAl types of interest

- Business intelligence (by finding patterns, surfacing insights and making ad hoc queries easier)
- Enhancing cost efficiency

- Model capability limitations (in terms of training data required, token limit)
- Monitoring for potential misuse and AI hallucinations
- Security





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United States Overview (1/2)

American ITBDMs are prioritizing higher customer experience and satisfaction as top business priorities in 2024. While cost optimization remains a top business focus in Canada, American respondents are targeting revenue and profit growth. GenAl is the top tech investment indicated by US respondents, followed by automating digital infrastructure management and security and high-performance computing platforms for Al/ML workloads. US respondents were also more likely to identify the impact of Al as a game changer for organizations when compared to Canadian respondents.

Top business priorities in 2024

- 1 Higher CX and satisfaction
- Emerging technologies (e.g., GenAl, etc.)
- 3 Accelerating revenue & profit growth

Top tech investment priorities in 2024

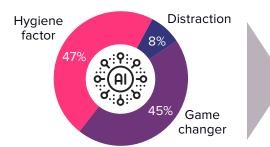
- 1 GenAl
- Automating digital infrastructure management and security
- High-performance compute platforms for Al/ML Workloads

Challenges foreseen in 2024

- Cybersecurity and data privacy
- 2 Data management and analytics
- 3 Talent acquisition and retention



Impact of AI on organizations



Top tech/business areas most impacted by AI

- 1 Cybersecurity and threat detection
- 2 Personalization and CX
- 3 Intelligent automation and robotics

Edge infrastructure buildout and management



Edge use cases most impacted by Al

- 1 Real-time analytics and insights
- 2 Retail and CX
- 3 IoT device management



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United States Overview (2/2)

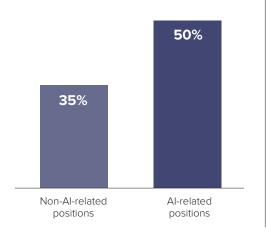
American ITBDMs say AI deployment challenges surround employee fears, lack of training, and IT support. Recruiting talent with AI skills is proving to be much more difficult than recruiting talent for non-Al-related positions. 57% of respondents say that they've invested in GenAl, and 40% say they plan to do so. These decision-makers are interested in using GenAl for conversational Al, business intelligence, and productivity.

Top challenges when deploying Al

- Employees are concerned that Al will threaten their jobs
- Lack of training for use of self-service AI tools (low/no code apps)
- Lack needed support from IT for successful automation deployment

Recruitment difficulty

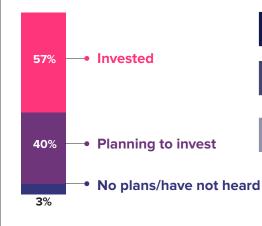
Respondents selected "Extremely/ moderately difficulty"



GenAl investment

Preparation for GenAl

capacity



Employee skill development

Inbuilding high computing

Networking infrastructure

GenAl types of interest

- Conversational Al
- Business intelligence (by finding patterns, surfacing insights, and making ad hoc queries easier)
- Productivity (personal, developer (code generation) and data analysts)

- Monitoring for potential misuse and AI hallucinations
- High dependence on third party
- Model capability limitations (in terms of training data required, token limit)





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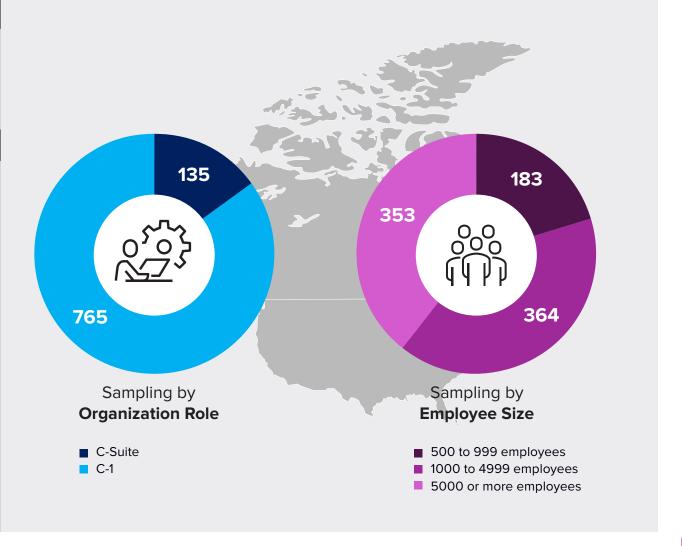
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CIO Technology Playbook 2024 Research Methodology

The playbook was developed based on 900 surveys, with the following sampling breakdown:

| MARK | ETS COVERED | SAMPLE SIZE | | |
|--------------------------------|---------------|-------------|--|--|
| (*) | Canada | 300 | | |
| | USA | 600 | | |
| INDUSTRIES COVERED SAMPLE SIZE | | | | |
| | BFSI | 117 | | |
| | Manufacturing | 95 | | |
| | Retail | 95 | | |
| 112 | Telco | 6 | | |
| | Healthcare | 95 | | |
| <u> </u> | Government | 74 | | |
| 100 | Agribusiness | 42 | | |
| | Other | 376 | | |



CIO Playbook 2024 Message from Sponsor

Lenovo

Lenovo Al for All

Bringing AI to your Data, when and where you need it.

At Lenovo, we recognize the challenges that come with adopting AI as a business imperative, and we also acknowledge the immense potential AI can bring to your business and people. Our robust infrastructure solutions coupled with our deep ecosystem of independent software vendors (ISVs) ensures the seamless and scalable AI solutions that are suitable for business of all shapes and sizes.

Al: From Pocket to Cloud





Lenovo Al Infrastructure

8 Platform

Categories

804

AI-Ready Platforms

High Performance Storage, Compute DC, and Edge portfolio that scales with your demand

Lenovo Al Discover Center of Excellence

4

180+

Global COEs

Find Faster Time to Value by Leveraging Lenovo's Al Center of

Served

Lenovo
Al Innovators

50+

165+

Al Solution Partners Enterprise Al Solutions

Leverage Certified Solution
Partners to Confidently Address
Your Requirements

Commitment to Honest Al



We believe technology should solve some of humanity's toughest challenges, that's why Lenovo is committed to ensuring AI is used in the most ethical and beneficial way. We have committed to support initiatives such as the "Women & AI Pledge" and launched Lenovo's Responsible AI Committee to ensure Responsible AI is part of our Product Diversity Office.

Explore the Possibilities of AI and Lenovo



Smart Healthcare

Lenovo Virtual Care and AI is helping care providers get in front of potential critical health issues.

Patient care is at the forefront of all healthcare providers. SickbayTM by Medical Informatics is an FDA-cleared platform that provides hospitals with one of the most innovative vendor-neutral, integrated patient monitoring solutions in healthcare. Sickbay aids hospitals in reducing costs, length of stay, code blue events, and time on vent. Sickbay achieves this by standardizing patient monitoring, supporting care teams with flexible virtual care models, and enabling the development of near real-time patient-centered analytics.



Make Zero Incidents A Priority in Your Organization with Lenovo Al

Incorporate Lenovo and Graymatics™ into your organization's best practices for safety to help manage risk and practice continuous improvement of processes. Graymatics offers an Al-based solution that detects workplace hazards such as accidents, defective machinery, and fire.



Smart Retail

Lenovo AI Shapes the Self-checkout of Tomorrow

Happy customers and loss prevention is a recipe for success for retailers! The Everseen Visual Al™ platform can enable a retail solution for your organization. Learn how Lenovo and supermarket retailer Kroger® leveraged the Everseen Visual Al platform to create a better customer experience while reducing loss.



To learn how to bring AI to your business so you can grow & innovate

Message from Sponsor

Lenovo Al Innovators

Partner Ecosystem

Adopt & Fast-Track Your Al Journey

Lenovo's Al Innovators Program encompasses a network of top-tier software partners collaborating with Lenovo to furnish customers with customized, proven, and readily deployable AI solutions across their entire operations, encompassing computer vision, audio recognition, predictive analytics, security, and virtual assistants tailored to every industry's unique needs.



Partners access Lenovo Al-ready infrastructure

Working with our Al Innovator partners, we finetune our Al-ready, best-inclass servers to help ensure rapid ROI and ongoing success for our mutual



Partners leverage Lenovo AI expertise and ecosystem

Our ecosystem includes Al centers of excellence. serving 180 countries and more than 20.000 business partners, for customized proofs of concept.



Collaboration brings customers rapid deployment

By providing performance-optimized Al-ready solutions across various industries, we ensure customers can deploy Al faster, and more confidently

165+

Al Solutions Partners

Channel Partners

Lenovo Smarter Al For All

Driving Intelligent Transformation from Pocket to Cloud



Healthcare

- Medical Imaging / diagnosis treatment
- Clinical decisions support (CDS)
- Customer service agents



Manufacturing

- Predictive Maintenance / Digital Twin
- Quality Control / Visual Inspection
- Demand forecasting



Retail

- Loss Prevention
- Logistics / Shelf restocking
- Omni-channel analytics & engagement / sales automation



Smart Cities

- Crowd Management and Analytics
- Distributed Edge and large scale
- Orchestration



Finance

- Credit decisions
- Fraud detection & Threat Intelligence
- Risk management

Leading in AI Optimized Infrastructure Solutions:

SE350 V2

Lenovo

ThinkAnile

Leveraging the most comprehensive portfolio of industry leading AI solutions for cloud, data center and edge.

Industry Leading AI Solutions

Data Management

Public Cloud Al

Powering the world's most

Data Center/HPC Al

For AI at the Edge



SE450

ThinkAgile HX ThinkAgile MX and SXM















SE360 V2







To learn how to bring AI to your business so you can grow & innovate

Lenovo

ThinkSystem

SE455 V3

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