MIT Technology Review
Insights

Produced in association with

Gold sponsor

GENESYS

Silver sponsor

SGINNOVATE

Trends in AI adoption, leading use cases, challenges, and the future of data sharing in North America

The global AI agenda series

The global AI agenda: North America

North America has been at the forefront of AI research and development for decades. At its elite universities, bright minds hatched the technical advances behind the industry's progress, like neural networks and deep learning. Home-grown tech companies, especially in the US, dominate the global league tables in AI investment and intellectual property development. North American businesses have been among the quickest to find real-world applications, from retailers optimizing supply chains to Hollywood studios using deep-fake technology for time-travel science fiction movies.[1] North American voices—government, the private sector, and civil society groups—are also prominent in contemporary debates over AI ethics.

How do executives in the US and Canada see AI playing out in their business? What are the main benefits reaped so far, and what challenges do they face in AI

deployment? This executive summary examines regional nuances from a global MIT Technology Review Insights survey which polled the views of 1,004 senior executives based in equal proportions across Asia, the Middle East and Africa, Europe, Latin America, and North America, from sectors including consumer goods and retail, financial services, travel, telecommunications, and manufacturing.

A robust AI innovation ecosystem

North America's strong engagement with AI reflects the long history of AI already in the region's business and academic communities. This is the home of IBM, whose iconic Deep Blue chess-playing computer was a precursor to the game-playing innovations pioneered by DeepMind, a British firm snapped up by Alphabet. It is also the birthplace of Microsoft, which has positioned itself as an AI leader. IBM and Microsoft are the most AI active-patent applicants globally, according to the World Intellectual Property Organization's (WIPO) 2019 rankings (with Asian players, including Toshiba, Samsung, and NEC close behind, and the State Grid Corporation of China recently joining the top 20).[2]

US firms are also dominating innovation in AI subfields, like Facebook in facial recognition and network analysis and Amazon in consumer analytics. These firms are not just leveraging AI for themselves: they are building commoditized systems that the wider business community, large and small, can harness. Amazon developed personalization algorithms back in the early 2000s. Today, companies can leverage its insights through tools like Amazon Personalize, part of the Amazon Web Services (AWS) platform.[3]

At North America's elite universities, bright minds led the science around neural networks and deep learning that is driving the AI industry's progress. Home-grown Technology companies also dominate global league tables in AI research and investment.

About The global AI agenda

This report is part of "The global AI agenda," a thought leadership program by MIT Technology Review Insights examining how organizations are using AI today and planning to do so in the future. Featuring a global survey of 1,004 AI experts conducted in January and February 2020, it explores AI adoption, leading use cases, benefits, and challenges, and seeks to understand how organizations might share data with each other to develop new business models, products, and services in the years ahead.

The respondents are evenly distributed globally, with 20% based in each of North America, Europe, Asia, Latin America, and the Middle East and Africa. Some 26% of respondents are C-level executives, 30% are directors, 16% heads of AI, and 10% heads of data or analytics. Over half (55%) of the organizations they represent are large, earning annual revenue of $1 billion or more; nearly one-third (32%) generate revenue of $5 billion or more.

Of the 11 sectors represented, the largest contingents come from manufacturing (15%), IT and telecommunications (14%), consumer goods and retail (13%), financial services (11%), and pharma and health care (10%). The other sectors in the survey are professional services, energy and utilities, transport and logistics, travel and hospitality, media and marketing, and government.

In addition, MIT Technology Review Insights conducted in-depth interviews with leading AI experts globally, from organizations such as the World Economic Forum, Emirates Group, Vodafone, Walmart, Bank of Singapore, Lemonade Insurance Company, and Loom.ai, among others.

Canada is also producing AI-driven products to support the wider business technology ecosystem. Shopify, founded in 2004, has disrupted e-commerce by allowing companies to sell without any of the technical obstacles they would once have faced, making it a leader in the "no-code/low-code" revolution that is democratizing the digital economy. AI is part of its offerings, feeding into everything from product personalization to marketing planning. Montreal-based Element AI is also customizing AI for enterprises, helping widen access to these powerful tools.

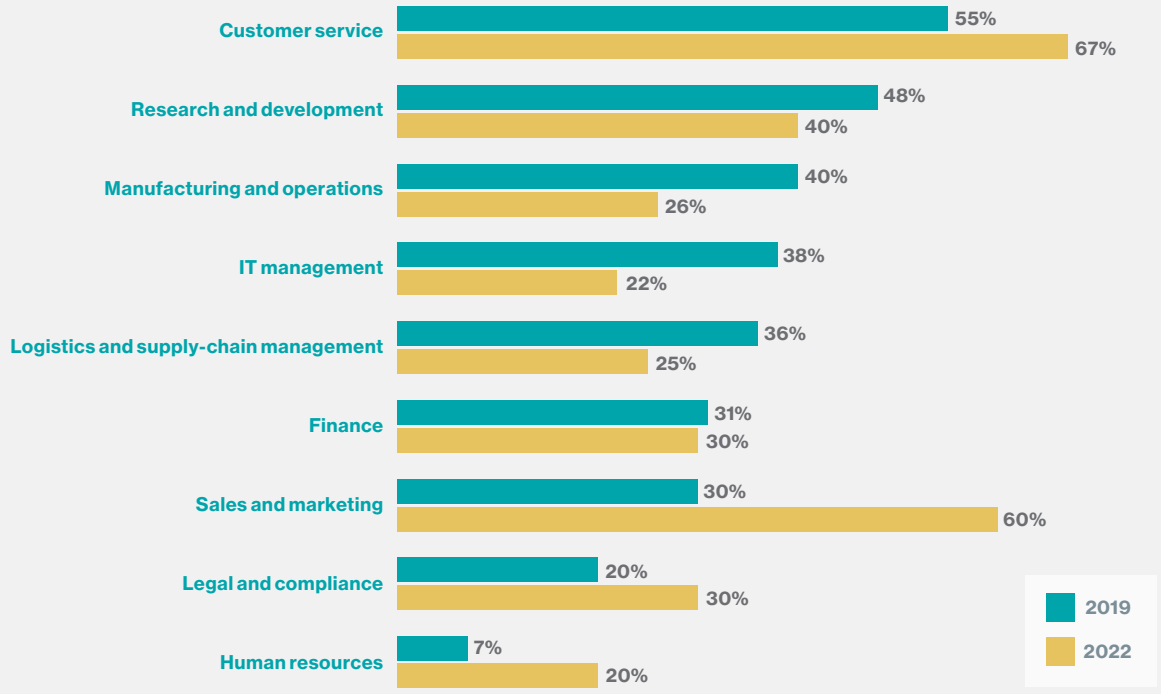
Canada stands out in the health-care AI domain thanks to a strong talent pool and top science universities. Notable products include Toronto-based BlueDot, whose infectious disease models provided early warnings for the spread of Zika and Covid-19.[4] Canada's government is promoting AI as part of its pro-science industrial strategy. It's Superclusters[5] initiative will channel C$950m over 10 years into areas including health care, next-generation manufacturing, supply chains, and oceans, and Prime Minister Justin Trudeau has spearheaded the development of a G7 AI committee to shape the sector going forward.

Customer service is the leading use case

According to "The global AI agenda" survey data, North American organizations were among the earliest to launch AI programs, with 11% deploying AI as early as 2015, twice the global average. Then adoption slowed, with Asian and European businesses pressing ahead much faster in the subsequent years. But by the end of 2019, more than 85% of North American respondents report that they had launched AI initiatives.

The business functions to which AI was being most actively applied by North American firms currently are customer services (selected by 55%), followed by R&D (48%) and manufacturing and operations (40%). The

Figure 1: In which departments are AI technologies being used most actively today and three years from now? (% of respondents, North America)



Source: MIT Technology Review Insights survey, March 2020

biggest expected increase in activity will be in sales and marketing, rising from 30% to 60%, and human resources (from 7% to 20%).

While much North American AI innovation is coming from startups and tech giants, the region is also showing how AI can be applied in its age-old industries like manufacturing and retail. General Motors's acquisition of Cruise, a self-driving car startup[6], and the subsequent launch of Cruise Origin—a self-driven, electric, shared car service—sent a signal that automakers, among America's most established and historic sectors, will be central to America's industrial future.[7]

Walmart, an iconic retailer born in 1962, is another marquee brand using AI to respond to disruptive competitors. In 2019 the company built an intelligent retail lab to test in-store technologies close to customers in a 50,000-square-foot Neighborhood Market store in Levittown, New York, one of the busiest in the country. "We toyed with building a lab where our engineering capacity is located," says Mike Hanrahan, CEO of Walmart's Intelligent Retail Lab (IRL). "But we felt that to properly 'productionize' AI, we needed to put the IRL in a living store that has hundreds of associates, 35,000 products, and all the interactions and nuance that you would expect in a real-world Walmart."

Also critical to successful AI rollout, says Hanrahan, was rigorous prioritization to figure out where AI would really make a difference. "The first thing we had to invest time in was deciding where we should focus our resources." The team identified over 250 use cases and then filtered them down to a handful. "The filtering process was pretty complex in deciding what we should work on," says Hanrahan. "It came down to deciding which cases were the most practical to scale."

Insurance is another major North American industry moving to the AI age. Between 2019 and 2025, spending on AI is expected to record a compound annual growth rate of 30%, rising from $412.6 million to $2.6 billion by 2025.[8] Major players such as State Farm, Liberty Mutual, Allstate, and Progressive are embedding AI in areas such as customer service, monitoring of client data, and market analytics, while Cigna, the health insurer, is using AI to check if patients are taking their medications by aggregating medical, pharmacy, lab, and biometric data, such as from glucometers that measure blood sugar.

"The first thing we had to invest time in was deciding where we should focus our resources. The filtering process was pretty complex in deciding what we should work on. It came down to deciding which cases were the most practical to scale."

Mike Hanrahan
CEO, Walmart's Intelligent Research Lab

Three traits of the industry—size, consumer indifference, and lack of dynamism—make it "very fertile ground for doing something different and innovative, and starting from scratch," says Daniel Schreiber, CEO of Lemonade, a property and casualty insurance startup whose backers include Google Ventures and Softbank. The company combines AI and behavioral economics to digitize insurance processes, using bots and machine learning to collect data quickly, build predictive models, and quicken the customer process. Schreiber believes AI-powered bots such as Lemonade's are "the future of insurance."

Greatest gains in operational efficiency and cost savings

AI's benefits will be felt unevenly across sectors. Consulting firm McKinsey estimates the annual potential value created by AI and analytics to range between $9.5 trillion to $15.4 trillion across industries.[9] Chatbots alone are expected to bring savings of $7.3 billion by 2023 globally.[10] Accountancy PwC estimates North America to be one of the biggest winners when it comes to the use of AI, which could drive a boost of 14.5% of GDP to 2030 (or $3.7 trillion).[11]

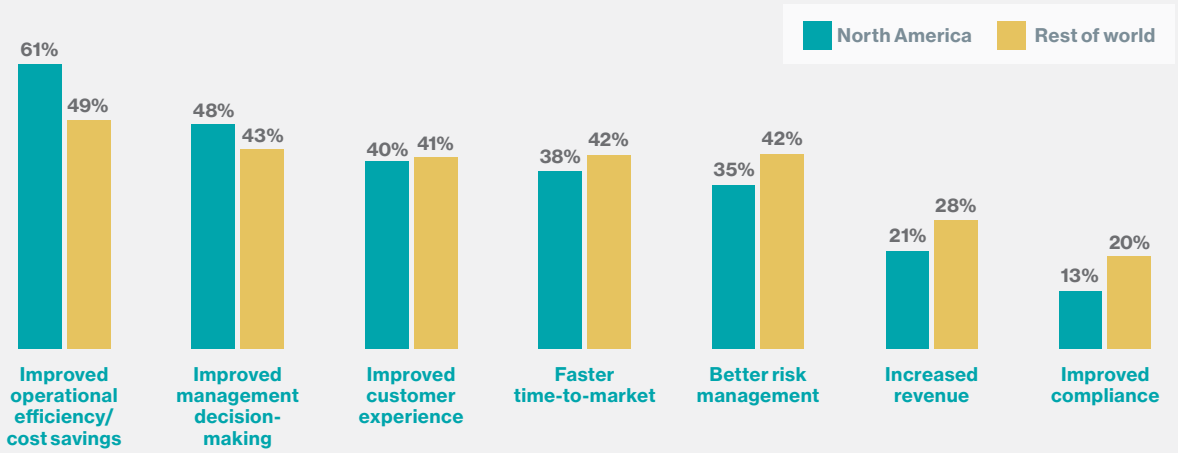
A majority of North American firms in our survey (61%) report efficiency and cost reductions as their biggest gains from AI (compared to 41% in Asia) and 48% report the biggest benefits in improved management decision-making (compared to 43% of respondents in the rest of the world). They are struggling, however, to realize revenue gains, with only 21% reporting improvements, compared to 28% of respondents in other regions.

Regulation is catching up

US regulators have typically had a light touch in promoting the AI industry. While this lack of regulation benefits some organizations, others need more of a helping hand. Financial services observers have pointed to the absence of a federal regulatory "sandbox" which would allow for live testing of digital innovations and promote the fintech industry. While initiatives do exist at the state level (such as in Arizona), a comprehensive national approach as in the UK, Malaysia, Singapore, and Canada has not been developed.[12]

The leading AI benefit to organizations in North America has until now been to improve operational efficiency and drive cost savings. Just a fifth of companies in the region report increased revenue as a top three benefit.

Figure 2: What are the top three benefits realized through your AI investments?
(% of respondents, North America and Rest of world)



Source: MIT Technology Review Insights survey, March 2020

In some industries, existing and potentially outdated regulation hinders the wider application of AI-enabled innovations. A case in point is algorithm-based insurance pricing, which, according to Lemonade's Daniel Schreiber, is currently allowed in only a handful of US states. "In the US, the world's largest insurance market, the regulatory environment has not yet made allowances for these next-gen technologies," he says.

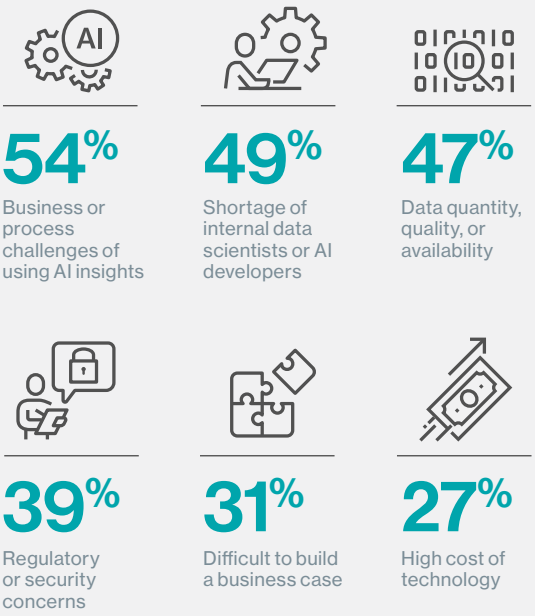
Health care is an example of an industry where regulators are moving to the AI age. The US spends more money on health than any other OECD country, yet has worse—and worsening—life expectancy, showing a dire need for some of the efficiencies and improvements that AI can offer, from disease diagnostics to drug development. Consultancy Accenture estimates that AI applications can create savings of $150 billion in the US health-care sector by 2026.[13]

Jeroen Tas, chief innovation and strategy officer at health-care company Philips, says national health systems generally can do more to facilitate digital innovations, including AI. One major change would be to restructure the health-care model that reimburses inputs rather than outcomes, with doctors "essentially being paid for a consultation, a diagnostic test, a procedure, medication, and hospital visits," he says. Tas notes that the US Food and Drug Administration is "getting proactive in embracing AI and finding the right way to deal with it." It is also approving digital health innovations, including "digital pills" (which add sensors to ingestible therapies that can let clinicians monitor patient compliance) and apps to support people with substance abuse.

Change management is the leading AI challenge

While regulatory or security concerns is a top-three AI challenge for almost 40% of North American respondents to the global survey, a greater proportion struggle with business or process challenges of using AI insights (54%), a shortage of internal AI talent (49%), and data quantity, quality, or availability (47%). These trends are broadly in line with those in other regions, except for the shortage of talent, which is more acute in North America than elsewhere, according to the survey. Less than a third of respondents in Asia-Pacific pointed to talent as a top-three AI challenge, compared to half of those in the US and Canada.

Figure 3: What are the greatest constraints to your company's use of AI?
(% of respondents, North America)



Source: MIT Technology Review Insights survey, 2020

Will North American companies share data?

"The global AI agenda" explores how AI, in combination with other technologies, can facilitate efficient and secure data sharing between companies, and the benefits that could result from powerful AI models built on shared data. The benefits could take the form of new efficiencies, new products and services, or even new value chains that form around data-sharing arrangements. But how willing are executives in North America to share data, and what benefits would they be striving to gain?

Overall, survey respondents in North America are among the most enthusiastic globally about the prospect of data sharing. Almost a quarter (23%) said they are "very willing" to share data with third parties for the purpose of building new value chains, products, or services, and a further 52% described themselves as "somewhat willing." Just a fifth said they were not willing to share data, compared with 40% of respondents in

Europe and the Middle East and Africa. The benefits they would hope to achieve through data sharing are faster and more innovative product development (according to 64% of respondents), followed by increased visibility across supply chains (54%). To accelerate this trend, more than two-thirds of North American executives said they would need greater regulatory clarity as well as agreed industry standards on data sharing.

Data alliances set to scale

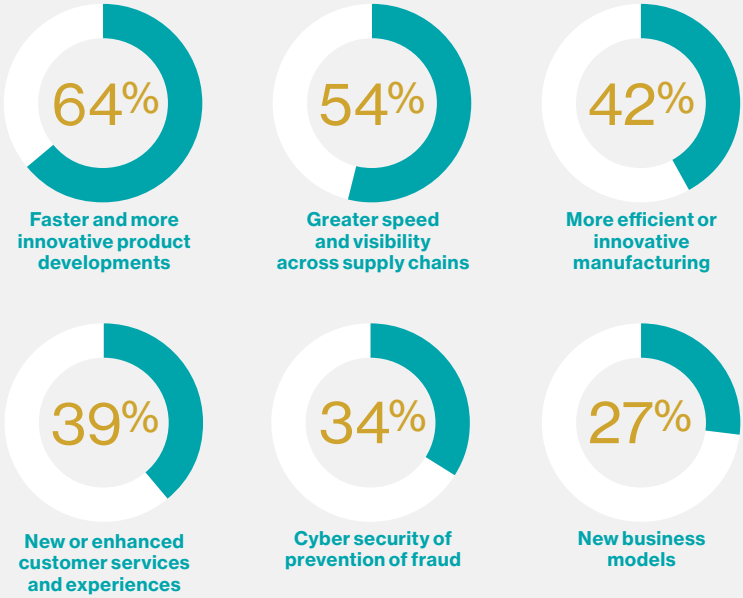
To extract maximum insights from data, scale and quantity are key, which has led many companies to explore new forms of data partnerships and collaborations even in sectors once highly reluctant to open their doors. Open innovation, patent sharing, and data partnerships between companies and public authorities, like municipal authorities, are all emerging practices that recognize the need for scaled-up data.

Companies now see the virtue of data sharing and are willing to make data available to facilitate that, says Hossein Rahnama, founder and CEO of Flybits, a Toronto, Ontario-based technology company that Rahnama describes as a platform-builder. Its technology enables companies to build AI-powered tools that can systematically upsell customers with "hyper-personalized" offers of related products or services at scale.

"They realize that innovating with AI requires access to data that few organizations have at their sole disposal." The biggest constraint, he says, is the reservations firms have about data portability – namely how to encrypt and tokenize it to guarantee anonymity of customer and other sensitive data. The arrival of the EU's General Data Protection Regulation and its stateside versions, notably California's privacy bill, could lead to new rules in other states and global markets.

North American players are showing an appetite for data partnerships. In the pharmaceuticals industry, not historically famed for collaboration, one initiative, led by Google Venture-backed Owkin, based in New York and Paris, allows pharma companies to train drug-discovery machine-learning algorithms on each other's data. It uses blockchain technology to combine the insights from large data sets with appropriate restrictions on commercially sensitive information.[14]

Figure 4: What do you envision are the top three benefits of sharing data between companies in your own or adjacent industries? (% of respondents, North America)



Source: MIT Technology Review Insights survey, March 2020

Key takeaways

1 **North America has closed the AI gap with Asia and Europe.** North American organizations were among the earliest to launch AI, with 11% deploying AI as early as 2015. Then adoption slowed, with Asian and European businesses pressing ahead faster in the subsequent years. But by the end of 2019, more than 85% of North American respondents report that they had launched AI initiatives.

2 **Sales and marketing will become a priority area for AI.** The business functions to which AI was being most actively applied by North American firms currently are customer services (selected by 55%), followed by R&D (48%) and manufacturing and operations (40%). The biggest expected increase in activity will be in sales and marketing, rising from 30% to 60%, and human resources (from 7% to 20%).

3 **North American respondents are positive about data sharing.** Almost a quarter of respondents (23%) are "very willing" to share data with third parties for building new value chains, products, or services, and a further 52% described themselves as "somewhat willing." They would specifically seek out faster and more innovative product development as well as greater visibility across supply chains. Just 20% said they were unwilling to share data, compared with 40% of respondents in Europe and the Middle East and Africa.

This report, "The global AI agenda: Asia-Pacific," is an executive briefing paper by MIT Technology Review Insights produced in partnership with Genesys and SGInnovate. It is part of a series of regional papers published as part of The global AI agenda research program. Claire Beatty was the editor of this report, Nicola Crepaldi was the producer.

About MIT Technology Review Insights

MIT Technology Review Insights is the custom publishing division of MIT Technology Review, the world's longest-running technology magazine, backed by the world's foremost technology institution—producing live events and research on the leading technology and business challenges of the day. Insights conducts qualitative and quantitative research and analysis in the US and abroad and publishes a wide variety of content, including articles, reports, infographics, videos, and podcasts. And through its growing MIT Technology Review Global Panel, Insights has unparalleled access to senior-level executives, innovators, and thought leaders worldwide for surveys and in-depth interviews.

Footnotes

1 "Deepfakes: Hollywood's quest to create the perfect digital human," Financial Times, October 2019
2 "WIPO Technology Trends 2019: Artificial Intelligence," World Intellectual Property Organization, 2019 (pdf, p.15)
3 "Amazon Personalize is Now Generally Available," Amazon Web Services, June 2019
4 "How this Canadian start-up spotted coronavirus before everyone else knew about it," CNBC, March 2020
5 "Canada's New Superclusters," Government of Canada, January 2020
6 "GM buys Cruise Automation to speed self-driving car strategy," Reuters, 11 March 2016
7 "GM's Cruise unveils its first driverless vehicle," BBC, 22 January 2020
8 "Artificial Intelligence in United States Insurance Industry - Forecast to 2025: A $2.62 Billion Opportunity - ResearchAndMarkets.com," Business Wire, 28 March 2019
9 "Notes from the AI Frontier," McKinsey, April 2018 (pdf, p.17)
10 "Bank cost savings via chatbots to reach $7.3 billion by 2023," Juniper Research, February 2019
11 "Sizing the prize: PwC's Global Artificial Intelligence Study: Exploiting the AI Revolution," PwC, 2017 (pdf, p.1)
12 "It's time for a federal fintech sandbox," Forbes, 6 December 2019
13 "Artificial intelligence: Healthcare's new nervous system," Accenture, 2017
14 Pharma groups combine to promote drug discovery with AI," Financial Times, 4 June 2019

Illustrations

Cover Illustration by Michele Singh. Page 4 Illustration by Michele Singh with elements by davooda/Adobe stock. Page 6 icons by davooda/Adobe stock.

MIT Technology Review Insights

www.technologyreview.com

@techreview @mit_insights

insights@technologyreview.com