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Canada's Generative AI Opportunity

Commissioned by Microsoft Canada

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Note: All figures in this report are in Canadian dollars (CAD) unless otherwise noted.

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Executive Summary

Generative AI (Gen AI) could play a key role in addressing Canada's productivity challenge – by saving Canadian workers up to 125 hours a year, boosting productivity by 8% by 2030.

Productivity is essential to enabling a prosperous future for Canadians. However, since 2015, Canada's labour productivity has grown by only 0.6%. This is close to 10 times slower than the OECD average (5.9% over the same period).

Urgent action is required, and Gen AI is part of the solution. By the end of the decade, Gen AI could save Canadian workers up to 125 hours a year by helping workers complete tasks faster and by automating routine tasks.

This saving – equivalent to half an hour every working day – could lift labour productivity by 8% by 2030.

Gen AI could add \$187B annually to the Canadian economy by 2030.

This value, generated through productivity gains and the creation of new Gen AI products and services, is roughly equivalent to the GDP generated by Canada's finance and insurance sector.

Gen AI's benefits will not be limited to large businesses. By 2030, small and medium-sized enterprises could realize \$100B each year in economic value through use of Gen AI – \$70B from small businesses and \$30B from medium-sized businesses.

Unlocking the potential benefits of Gen AI will require getting adoption right, but Canada is lagging its peers.

The impact of Gen AI on the economy will depend in part on the breadth and depth of adoption. Gen AI must be adopted for Canada to realize its economic benefits.

However, Canada lags its OECD peers in AI adoption. And only 9% of Canadian businesses are using Gen AI. At the same time, public trust in AI is low: Only 31% of Canadians trust AI, 23 percentage points lower than the global average.

A responsible approach to adoption would help to support public trust, building willingness to harness Gen AI's potential.

Responsible adoption means jointly lifting adoption and public support; Canada has made some progress to date.

Pursuing both outcomes at the same time is essential as neither will sustainably grow without the other.

Canada has made progress towards responsible adoption, including through its pioneering Pan-Canadian AI Strategy. With the Artificial Intelligence and Data Act, Canada is looking to build a foundation for responsible AI design, development, and deployment. Canada is also engaged with international organizations such as the G7, OECD, GPAI, and UN to drive interoperable AI regulations.

Most recently, the Canadian government announced a \$2.4 billion investment in AI as part of Budget 2024 to build infrastructure and drive adoption.

But more work remains to be done; to expand responsible adoption, six key enablers must be in place:

1. Public trust in Gen AI
2. Clear policy framework
3. Skilled workforces
4. Progressive organizational culture and leaders
5. Access to affordable models and infrastructure
6. Collaborative ecosystem.

Industry and government must act immediately to ensure that enablers of responsible adoption are well supported. Canada should pursue a three-pronged approach:

- 1) Strengthen the foundation:** Government and industry should immediately implement a broad set of low-risk initiatives to strengthen the key enablers of responsible adoption. See [Exhibit ES1](#) for more detail.
- 2) Seed adoption:** Canada should immediately begin experimenting with initiatives to de-risk and incentivize responsible adoption, and to demonstrate value.¹ DIGITAL, Scale AI, or the Canadian Institute for Advanced Research (CIFAR) could be well placed to lead this effort. See [Exhibit ES2](#) for more detail.
- 3) Refine and scale:** Successful pilots should be refined based on learnings from the previous two phases and then expanded to cover more sectors and organizations.

EXHIBIT ES1

Key actions to strengthen the foundation

GOVERNMENT

- G1** Engage with international partners to develop interoperable regulatory frameworks; ensure Canada's AI Safety Institute collaborates with the emerging network of AI safety institutes and partners.
- G2** Role model adoption of / experimentation with Gen AI for low-risk use cases within government.
- G3** Measure adoption and public support in a consistent and timely fashion, across sectors.

INDUSTRY

- I1** Develop and implement in-house AI adoption policies to establish clear internal guardrails.
- I2** Collaborate with skilling organisations to develop AI / Gen AI training programs for senior leaders and enrol them in those programs.

JOINT OR BOTH

- J1** Amplify success stories in Gen AI adoption through, for example, marketing campaigns and public awards.
- J2** Develop education campaigns through collaborations between government, local incubators, business coalitions, chambers of commerce, and large businesses.
- J3** Convene stakeholders from industry, government, academia, and civil society through forums such as roundtables, conferences, and policy labs.
- J4** Enhance international collaboration and information sharing around solutions to drive responsible adoption of Gen AI.

See Section 4.2.1 for more detail.

¹ Canadians have an entrepreneurial spirit but a strong fear of failure. This could be hindering adoption of Gen AI. Financial incentives could unlock greater deployment.

EXHIBIT ES2

Suggested approach to seed adoption of Gen AI

The proposed program seeks to de-risk adoption of Gen AI by offering financial incentives through a series of small-scale pilot projects.

Summary of key implementation recommendations

- 1.** Incentives should be tailored to different sectors and business sizes.
- 2.** The program should combine consultation with experimentation.
- 3.** The program should be robustly monitored and evaluated.
- 4.** Incentives must be easy to access and carry a low administrative burden.
- 5.** The program should mitigate risk of organizations becoming reliant on incentives.
- 6.** Participation should be contingent on participants sharing outcomes & learnings.

See Section 4.2.2 for more detail.

Gen AI is a transformative technology with the potential to deliver significant value



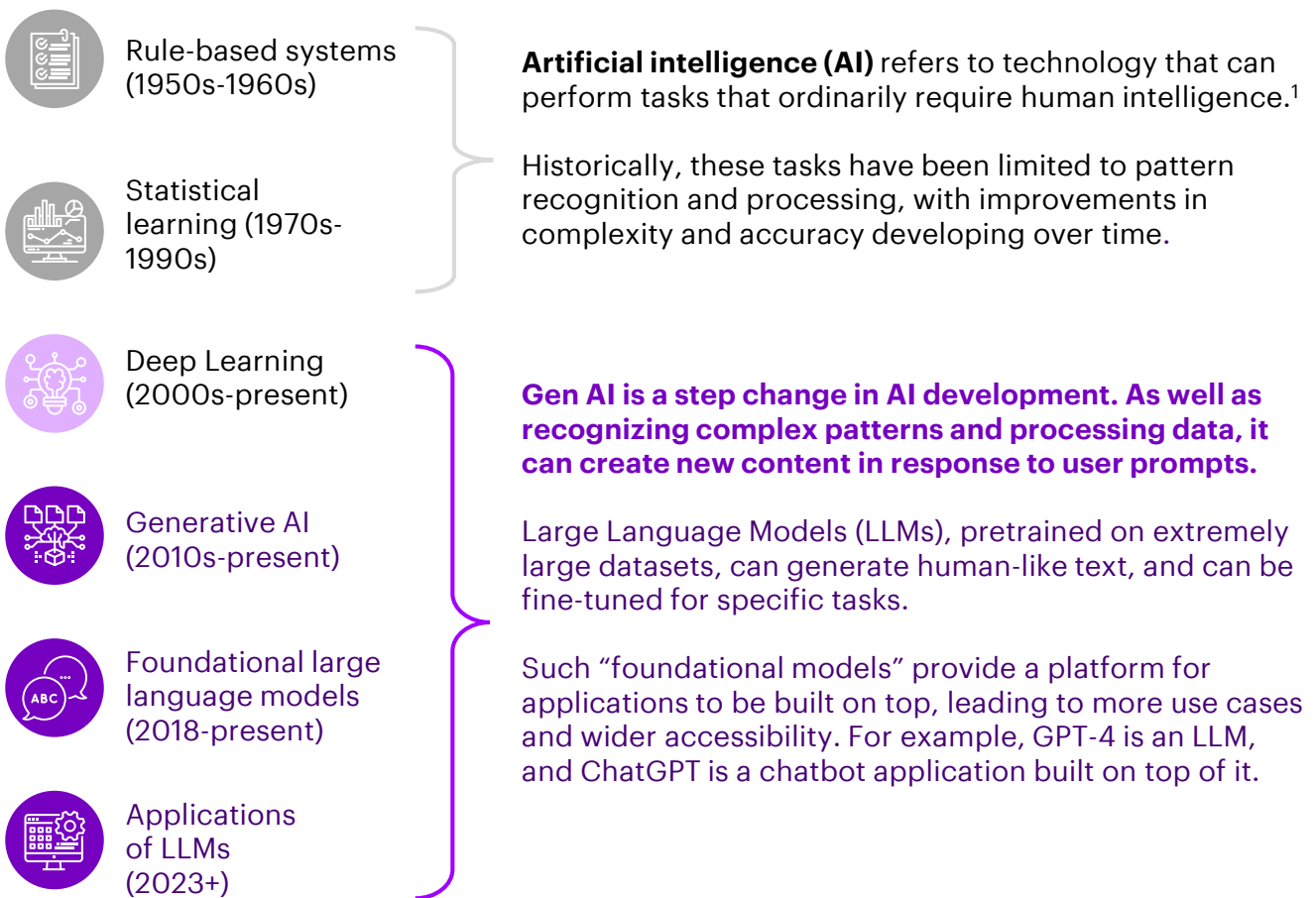
1.1 Generative AI creates novel content in response to user prompts, and is becoming more powerful and accessible than ever before

Generative AI (Gen AI) represents a significant leap forward in how machines understand and generate human-like material (see [Exhibit 1](#)). It goes beyond simply analyzing or classifying existing data.² Gen AI is a type of AI that can create new content in many forms, including text, code, image, audio, and video – making it useful for activities like writing, programming, idea generation, and customer service (see [Exhibit 2](#)).

Recent improvements in computing hardware and infrastructure (like cloud computing), along with the availability of large-scale and diverse training datasets, have been instrumental in enabling the development of larger and more powerful Gen AI models.

EXHIBIT 1

Generative AI is a step change in the evolution of AI



Note: (1) Definition of AI adapted from Government of Canada (2024).

² Accenture, 'A new era of generative AI for everyone' (2023).

Modern Gen AI models can perform “generalist” functions. These include writing natural language, coding and mathematics, and the ability to plan and problem solve.³ Each new generation of models demonstrates broader and more sophisticated capabilities. Leading models, like GPT-4 and Claude 3, demonstrate advanced cognitive abilities. They can also go beyond processing and outputting text to work across multiple modalities such as audio and images.

Along with improved capability, innovations in technology have also led to increased accessibility of Gen AI for businesses and users.

Leading models, like GPT-4, have seen price decreases of over 80% since November 2023.⁴ The development of more commercially available, user-friendly tools and interfaces has also made Gen AI more accessible to a wide range of users. For example, online chatbot applications like ChatGPT, Bing Chat, Claude, Google Gemini, and Le Chat, make it easy for people without technical experience to access and use the latest Gen AI models. These developments have democratized Gen AI, enabling a wide range of use cases for businesses and workers across all sectors of the economy.

In addition, several open-source models are now available, and their capabilities are improving.⁵ These models offer developers and businesses the opportunity to explore and integrate advanced Gen AI functionalities without licensing fees or restricted access. This accelerates innovation and fosters a competitive environment in which developers can improve and expand these models, creating a thriving ecosystem of AI tools and applications.

Gen AI models depend on robust infrastructure, like cloud computing, and are trained on large datasets.

At the core of Gen AI are “foundational models” such as Large Language Models (LLMs). These foundational models are deep neural networks, built on robust computing infrastructure and trained on large datasets. Cloud computing supports the immense processing required to train and run them. Large datasets are critical to training the models to produce content in response to user prompts. After training, models are fine-tuned using techniques like RLHF (Reinforcement Learning through Human Feedback) to encourage more human-like responses. Accessibility and usability are later enhanced through interfaces and applications built on top of the foundational models.

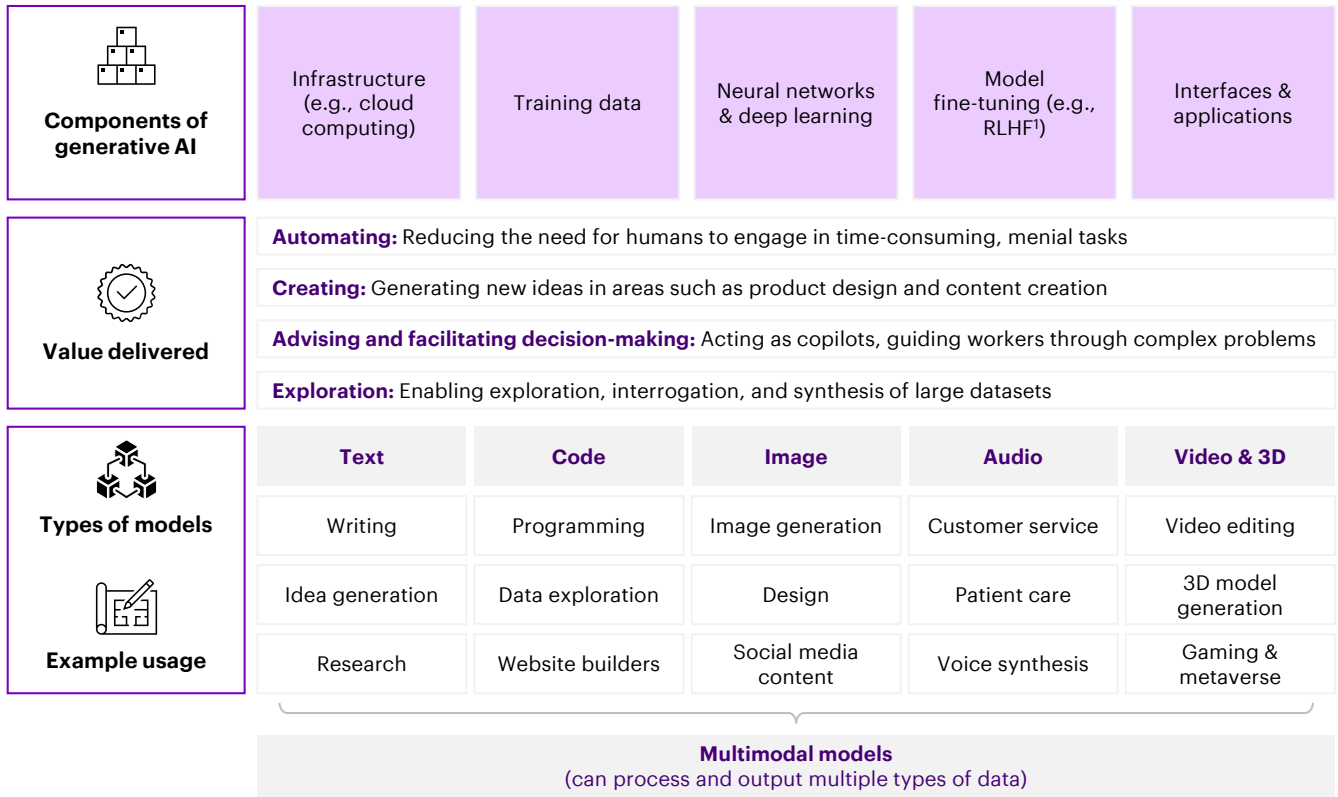
³ Eloundou et al., ‘GPTs are GPTs: An Early Look at the Labour Market Impact Potential of Large Language Models’ (2023).

⁴ OpenAI dropped prices in November 2023, January 2024, and May 2024.

⁵ Hugging Face, ‘Open LLM Leaderboard’ (2024).

EXHIBIT 2

An overview of generative AI



Notes: Reinforcement Learning through Human Feedback (RLHF) refers to the process used to further refine and train models like InstructGPT and ChatGPT.

1.2 Generative AI creates economic value through two key channels: improving labour productivity and supporting the creation of new products and services

Improving labour productivity

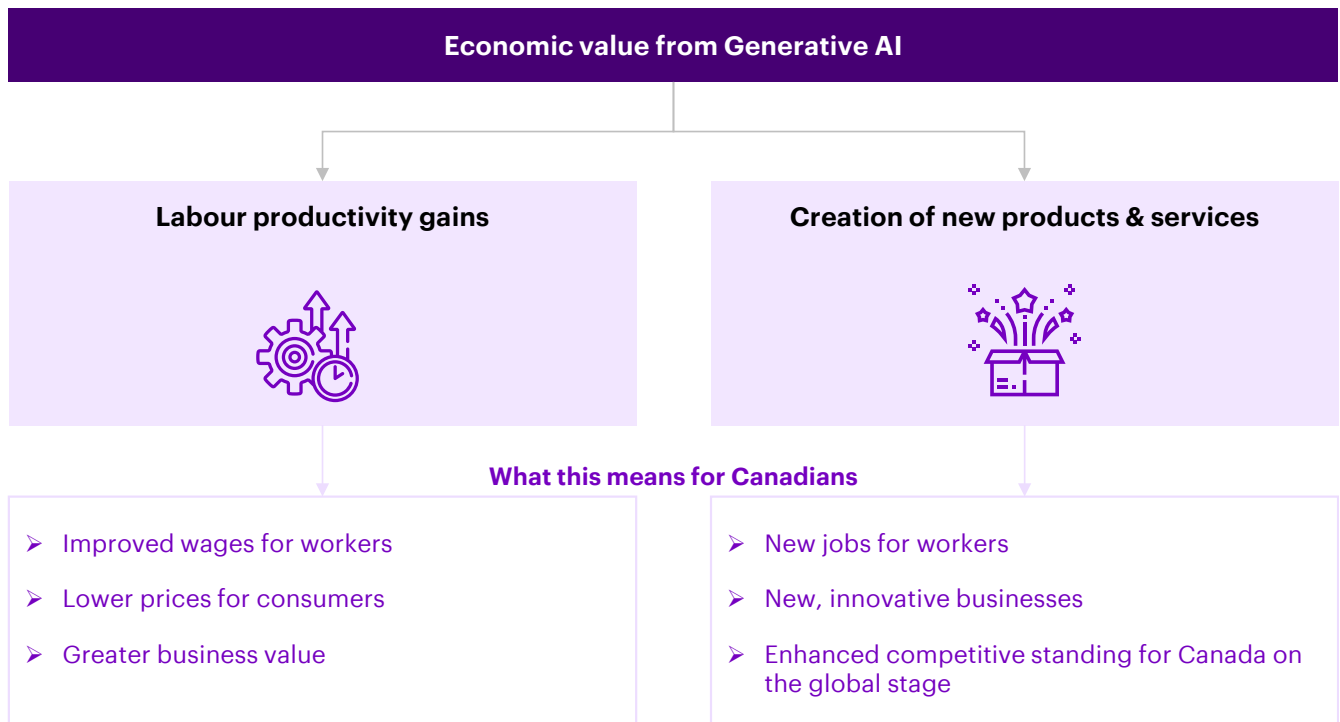
Gen AI is creating economic value by making workers more productive. It does this by saving them time – helping them complete tasks faster and streamlining menial tasks. This allows workers to allocate more time to tasks that require human intelligence and creativity. Greater productivity means that workers can create more value in the same or less time. This can lead to greater business value, higher wages, more innovation, and lower prices for consumers. It can also make government more efficient in policy development and service provision activities.

Supporting the creation of new products and services

Beyond improving productivity, Gen AI supports the development of new products and services that were not previously possible. For example, it enables high-quality, personalized virtual assistants, and interactive wearable health devices. The creation of new products and services generates new employment opportunities, businesses, and export opportunities.

EXHIBIT 3

The two key channels of economic value created by Gen AI



Notes: Identification of these two channels is based on current capabilities. It is likely that additional channels will emerge as models become more capable and widespread. Note that there is also potential for quality gains, but these are hard to measure and translate to economic contribution. Moreover, we have not quantified potential flow-on benefits from these two channels. For example, our estimates do not include the economic benefits of better healthcare resulting from enhanced drug discovery enabled by Gen AI.

Jobs impact – a brief aside

Canadians are concerned about the possibility of AI-driven job loss through automation.⁶ But Gen AI is more likely to augment tasks than automate them.

Our analysis finds that Gen AI has the potential to automate 14% of tasks (see Exhibit 6). This means that even if 100% of businesses adopted Gen AI to full capacity, 86% of tasks across the economy would likely not be automated and thus would still require human output.

Even for tasks that are exposed to automation, human verification will likely be necessary. Since models are based on likelihoods and predictions, workers will likely need to double check output to ensure quality.

In addition, there is still a need for human workers to be able to reason and plan tasks, and to guide Gen AI tools for task completion. For example, Gen AI may be able to suggest a range of solutions to a given legal problem, but a human lawyer with years of experience is needed to know which proposal is suitable given the context.

⁶ Leger, 'Usage of AI Tools' (2024); Innovation, Science and Economic Development Canada, 'Views of Canadians on Artificial Intelligence: Final Report' (2020).

And task automation does not necessarily lead to job loss.

For example, of the 270 occupations listed in the US census in 1950, only one occupation has ceased to exist due to automation – the elevator operator.⁷

Moreover, Gen AI has the potential to boost productivity and create jobs.

While technological change is often associated with workforce change, high productivity has historically been correlated with low levels of unemployment.⁸

Productivity growth can reduce demand for some roles; however, country-level employment tends to expand as productivity rises. This is because productivity's positive effects, including increased incomes and consumption, outweigh any negative impacts.⁹

Where automation does occur, it leads to increased efficiency for businesses, the benefits of which may be invested into higher-value activities. Alternatively, savings may result in either lower prices or higher wages. In either case, the surplus generated by automation spurs economic growth, in turn creating new jobs in the economy.¹⁰

1.3 Generative AI has already started creating value across different occupations and for Canadian businesses, governments, and citizens

Generative AI is already creating value across various sectors of the economy by acting as a co-pilot for workers in different occupations. For example, software programmers using Gen AI coding tools complete tasks in 56% less time than non-users. Additionally, in 2022, 14% of surveyed creatives were already using Generative AI in their work (see [Exhibit 4](#)).

Gen AI tools have also been shown to significantly enhance productivity and efficiency for writing tasks. Studies have demonstrated that these tools can reduce the time required for writing tasks by 37%, while also improving the overall quality of the output.

Beyond augmenting individual workers, Gen AI is creating value for businesses, governments, and citizens in Canada through innovative applications. Organizations are using Gen AI as a catalyst for invention and reinvention. One example is Ottawa-based Contextere, which leverages Gen AI for its industrial AI chatbot, Madison, to empower frontline workers with the maintenance, repair, and operation of complex industrial systems (see [Exhibit 4](#)).

Another example is Canadian Tire Corporation, which has launched a Gen AI-powered shopping assistant to support customers in selecting the right tires for their vehicles, offering real-time local inventory updates, and providing direct links to purchase from Canadian Tire's iOS app.¹¹

Municipalities are also benefiting from Gen AI's capabilities. The City of Kelowna, for instance, is enabling 24-hour access to its non-emergency municipal information services for its citizens by using AI and cognitive search technologies.

⁷ Bessen, 'How Computer Automation Affects Occupations: Technology, Jobs, and Skills' (2016).

⁸ Atkinson, 'ICT Innovation, Productivity, and Labor Market Adjustment Policy' (2018).

⁹ Autor and Salomons, 'Does Productivity Growth Threaten Employment?' (2017).

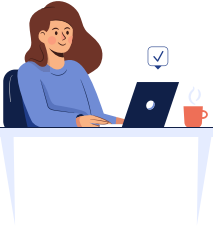
¹⁰ Aghion et al., 'The Direct and Indirect Effects of Automation on Employment: A Survey of the Recent Literature' (2022).

¹¹ More broadly, research shows that companies applying Gen AI to customer-related initiatives can expect to see significant dividends. See Accenture, 'Generative AI for customer growth' (2024) for more detail.


EXHIBIT 4

Generative AI has already started creating value in the economy


By acting as a co-pilot for workers across different occupations...



Software coders using Gen AI tools to aid in coding complete tasks in 56% less time than non-users.¹




In 2022, 14% of surveyed creatives were already using Generative AI in their work.²




Gen AI tools have been shown to reduce the time of writing tasks by 37%, with improved quality.³


By creating value for businesses, governments and citizens in Canada...



Contextere leverages Gen AI to empower frontline workers with the maintenance, repair, and operation of complex industrial systems.⁴



Canadian Tire Corporation has launched a Gen AI-powered shopping assistant to support customers in selecting the right tires for their vehicles.⁵



The City of Kelowna is embracing AI chat and voice technology to expand access for citizens to its municipal services.⁶

Sources: (1) Peng et al., 'The Impact of AI on Developer Productivity: Evidence from GitHub Copilot' (2023); (2) Shutterstock, 'What Do Creators Think About Generative AI?' (2022); (3) Noy and Zhang, 'Experimental evidence on the productivity effects of generative artificial intelligence' (2023); (4) Contextere (2024); (5) Microsoft (2024); (6) Microsoft (2023).

Gen AI could generate \$187B
in economic value for the
Canadian economy by 2030

2

2.1 Productivity is crucial to Canada's future prosperity, but it is faltering

Productivity growth is the primary driver of economic growth in Canada. 92.5% of GDP per capita growth over 1981-2019 is attributable to labour productivity growth.¹² Productivity measures how much output is being produced for each unit of input, such as labour.

Higher GDP per capita means greater living standards and wealth. It is the foundation for government spending on health, education, infrastructure, and more.

Increasing labour productivity is good for all Canadians because it can increase wages, reduce prices, and deliver greater business value.¹³ It can drive these outcomes by increasing efficiency; this then allows managers to decrease prices, increase wages, or both.¹⁴

However, Canada's labour productivity has fallen in 6 of the last 7 quarters – a phenomenon not seen in Canada for over 20 years. Canada's productivity challenge predates the most recent 7 quarters, with flat productivity since 2015 – in sharp contrast to the OECD average (see [Exhibit 5](#)).

The gap to the US is especially pronounced. Since 2019, when their productivity trajectories diverged, the US has experienced over 6% growth, while Canada's labour productivity has fallen. And over the broader period from 2015 to today, US productivity has grown 15 times faster than Canada's.

¹² *Statistics Canada: Economic and Social Reports, 'The COVID-19 pandemic and gross domestic product per capita growth in Canada' (2022).*

¹³ *Noy and Zhang, 'Experimental evidence on the productivity effects of generative artificial intelligence' (2023).*

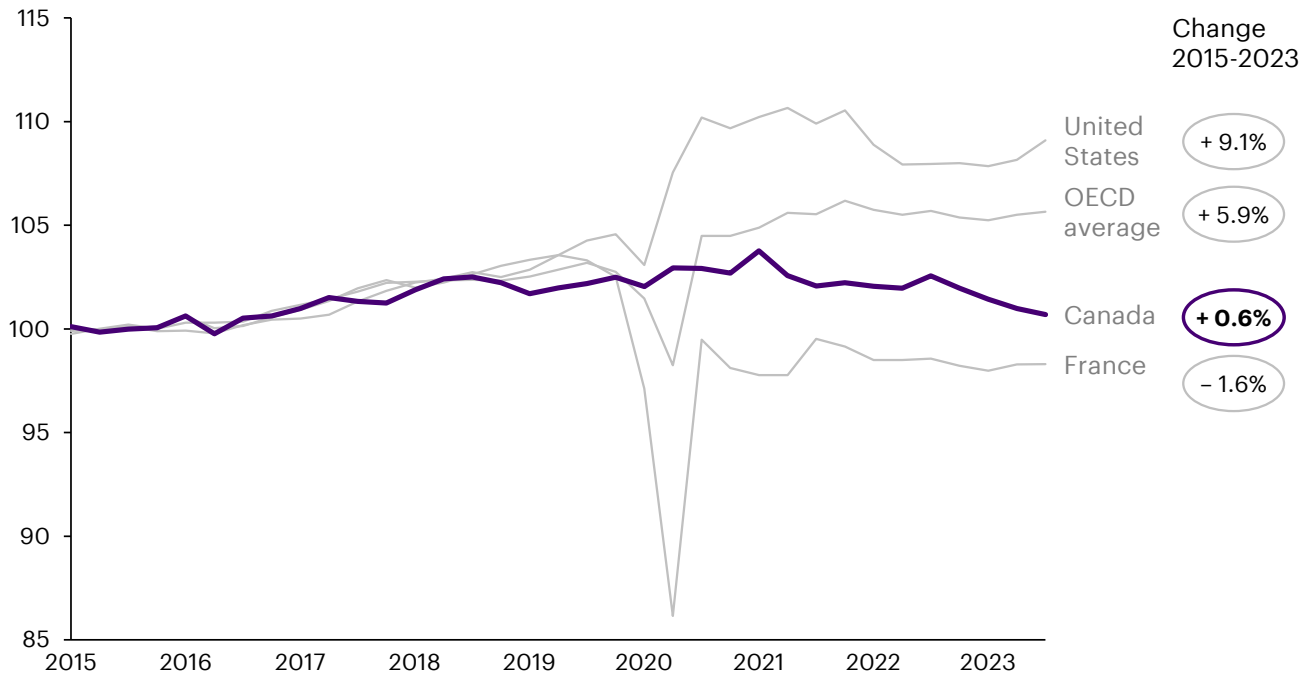
¹⁴ *Note that the extent to which cost reductions lead to changes in prices and wages depends on a host of factors, including competitive dynamics and employee bargaining power.*

EXHIBIT 5

Canadian labour productivity has grown only 0.6% since 2015

Labour productivity over time

Real GDP per hour worked (index, 2015 = 100)



Source: OECD Economic Outlook No 114 - November 2023.

Leading explanations for this stagnation include:

- a lack of private-sector investment
- a lack of competition
- slow adoption of new technology.¹⁵

To ensure a prosperous future, Canada must boost productivity. This imperative is particularly urgent because of Canada's aging population, which is likely to exacerbate labour shortages and increase healthcare costs.¹⁶ Productivity growth could mitigate the effects of a shrinking workforce and support increased spending on healthcare.¹⁷

The Deputy Governor of the Bank of Canada recently described Canada's stagnant productivity growth as an emergency:

"[Canada has a] long-standing, poor record on productivity... You've seen those signs that say, "In emergency, break glass." Well, it's time to break the glass."

Carolyn Rogers, Deputy Governor, Bank of Canada March 26, 2024

Addressing Canada's productivity emergency will likely require a collection of good solutions; Gen AI is one of them.

¹⁵ OECD, 'Economic Policy Reforms 2023: Going for Growth' (2023); The Conference Board of Canada, 'Real Talk: How Generative AI Could Close Canada's Productivity Gap and Reshape the Workplace' (2024); Bank of Canada, 'Digitalization: Productivity' (2023); Canadian Chamber of Commerce, 'Policy Matters: Canada's Productivity Problem' (2024).

¹⁶ Other macro challenges that underscore the importance of increasing productivity include a systematically increased risk of inflation, increasing global competition, the energy transition, and the economic impacts of climate change.

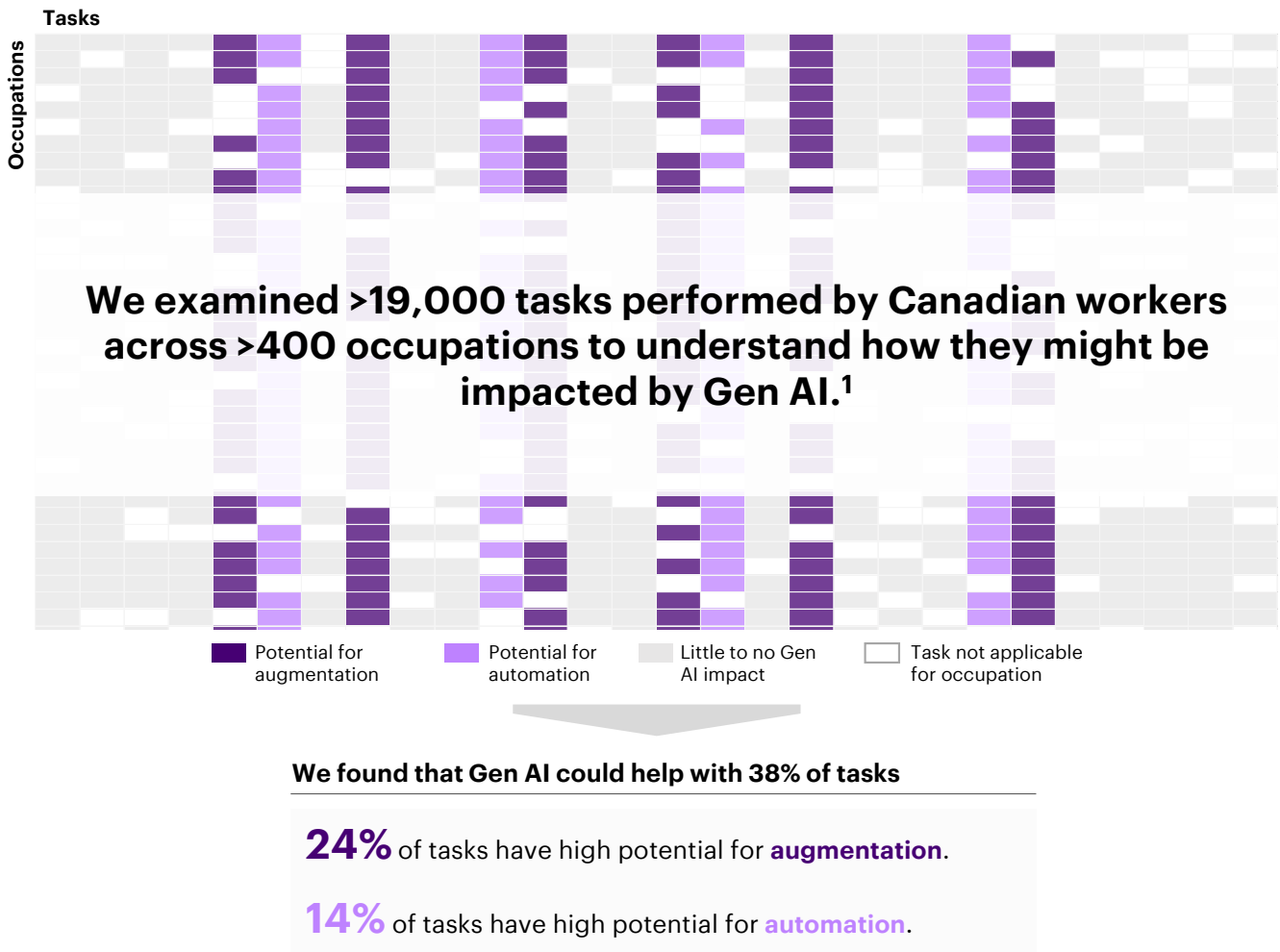
¹⁷ OECD, 'Ageing and Fiscal Challenges across Levels of Government' (2020).

2.2 Gen AI represents an opportunity to boost productivity, delivering greater prosperity for Canadians

Gen AI can boost productivity by helping workers complete tasks faster, and by streamlining menial tasks. To evaluate this productivity-boosting potential across the Canadian economy, we reviewed over 19,000 work tasks and found that Gen AI could help with 38% of them (see Exhibit 6).

EXHIBIT 6

Gen AI could help with 38% of work tasks performed by Canadians



Note: (1) We classified tasks based on three criteria: (A) requires human to human interaction; (B) non-routine and/or non-well-defined; (C) requires human involvement enforced by law, ethics, or social conventions. We used a combination of human and machine learning classification to classify all the tasks. Occupations were taken from the International Labour Organization and later converted to equivalent National Occupational Classification (NOC) codes. See appendix for more detail. Gen AI could help with 46% of task hours; of these, half have a high potential for augmentation and half have a high potential for automation. The graphic is illustrative. Source: Accenture analysis based on O*NET and International Labour Organization (ILO) data.

Tasks that have high potential to be augmented by Gen AI include explaining policies or procedures, preparing draft documents or reports, and evaluating data quality. Tasks that have high potential to be automated by Gen AI include reading and summarizing large documents, responding to simple customer inquiries, and reconciling datasets. Tasks that are unlikely to be impacted include inspecting facilities and equipment, sorting materials, and providing food services.¹⁸

¹⁸ For more analysis and discussion on the impact of Gen AI on tasks, see World Economic Forum, 'Jobs of Tomorrow: Large Language Models and Jobs' (2023).

Gen AI's ability to augment and automate tasks can substantially raise worker productivity. For example, ChatGPT, a Gen AI application, was shown to reduce the average time taken to complete a professional writing task by 40%.¹⁹



At a macroeconomic level, Gen AI could boost labour productivity by 8% by 2030, assuming around 40% adoption (see Exhibit 7).

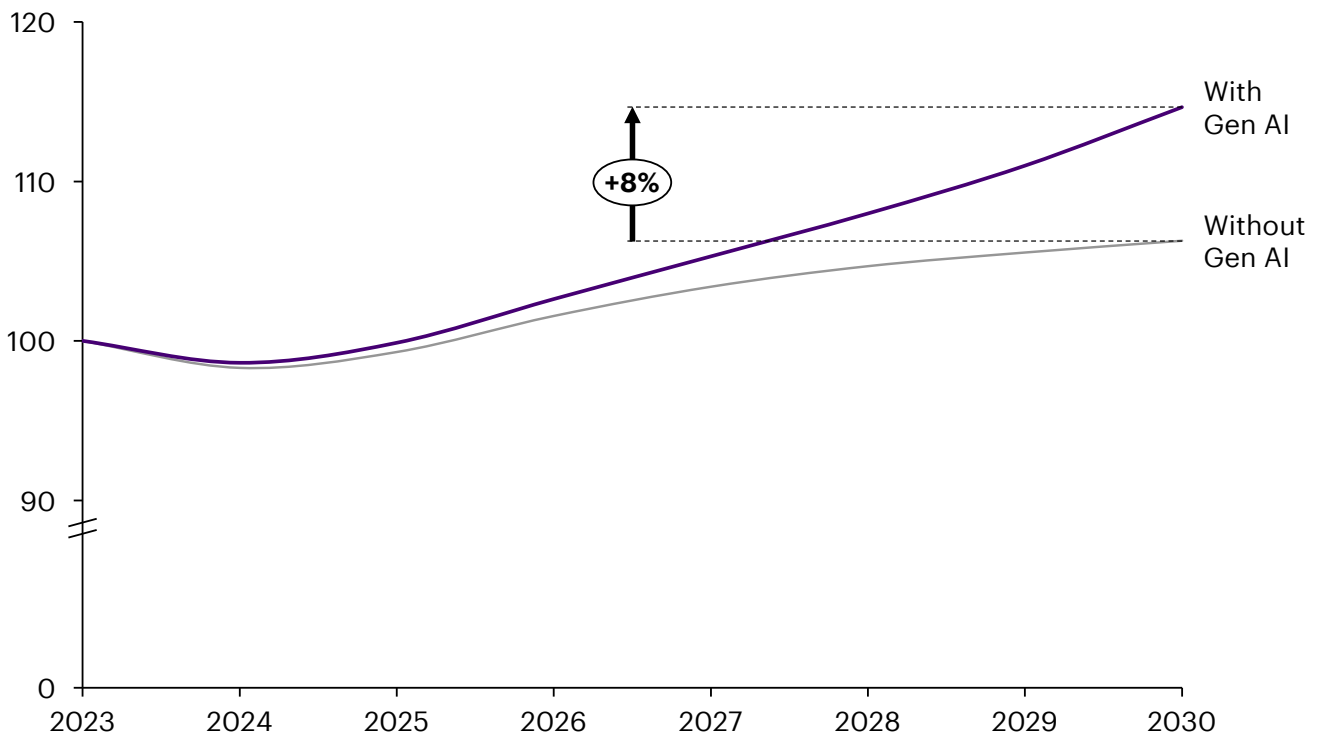
This is equivalent to a 1.1 percentage point boost to annual labour productivity growth to 2030 – a significant prospect for a country that has seen labour productivity growth of only 0.6% across the last nine years.

EXHIBIT 7

By 2030, Gen AI could boost labour productivity by 8%

Forecast labour productivity with and without Gen AI

Real GDP per hour worked; index, 2023 = 100 (assuming ~40% adoption in 2030)



Sources: Oxford Economics GDP forecasts; Canadian Occupational Projection System; Accenture analysis

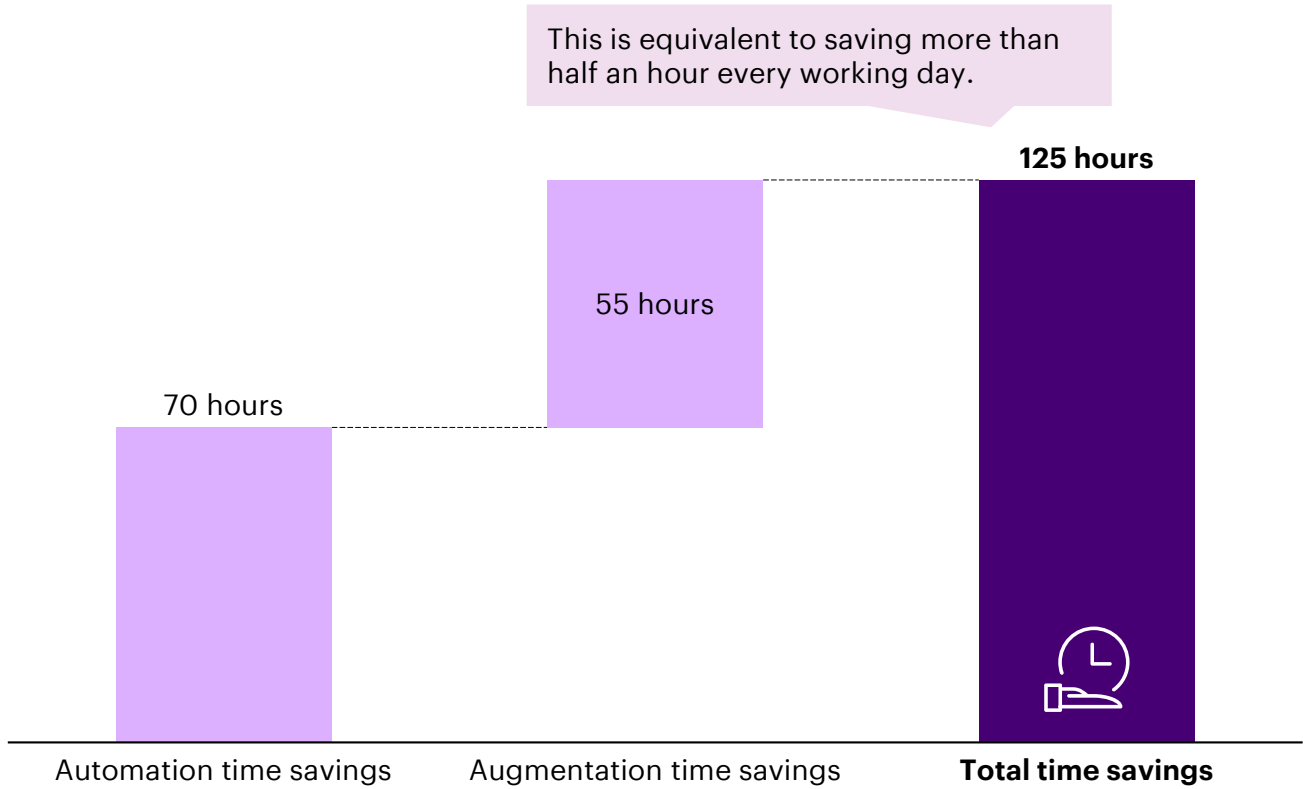
Such a boost in labour productivity would save workers time – up to 125 hours each year by 2030, on average per worker (see Exhibit 8).

¹⁹ Brynjolfsson, Li & Raymond, 'Generative AI at Work' (2023); Noy and Zhang, 'Experimental evidence on the productivity effects of generative artificial intelligence' (2023); Kalliamvakou, 'Research: quantifying GitHub Copilot's impact on developer productivity and happiness' (2022).

EXHIBIT 8

By 2030, Gen AI could save Canadian workers half an hour every working day

Estimated time saved each year per Canadian worker in 2030
Average hours per Canadian worker in 2030 (assuming ~40% adoption in 2030)



Source: Accenture analysis.

This would enable workers to focus on more interesting, value-adding tasks (see [Exhibit 9](#)).

More broadly, use of Gen AI can have substantial positive flow-on effects. Gen AI significantly increases job satisfaction; workers enjoy discovering and working with Gen AI.²⁰ Employees who use Gen AI feel their work is more engaging and fulfilling.²¹ And Gen AI could stimulate greater creativity and innovation if workers are given the space and time to develop new ideas.

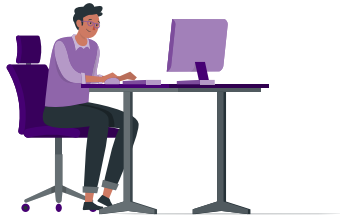
²⁰ Noy and Zhang, 'Experimental evidence on the productivity effects of generative artificial intelligence' (2023).

²¹ Kalliamvakou, 'Research: quantifying GitHub Copilot's impact on developer productivity and happiness' (2022).

EXHIBIT 9

Gen AI enables workers to spend less time on routine tasks

Customer support agent

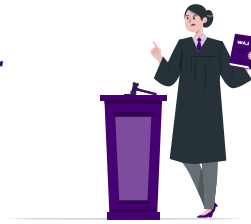


A Gen AI support agent guides customers through simple troubleshooting.

If an issue is complex, a human support agent steps in.

Post-call, Gen AI analyzes the conversation, providing feedback to the agent.

Lawyer



Gen AI conducts initial client consultations, gathering case details.

Legal analysis remains with human lawyers, but a Gen AI assistant helps with ideation and drafting.

2.3 Gen AI could deliver \$187B in value annually by 2030; this impact will be felt by Canadians across several sectors and by businesses of all sizes

Gen AI could have a substantial impact on Canada's economy by improving productivity and by supporting the creation of new products and services. The combined impact could be as high as \$187B in annual value added by 2030 (see [Exhibit 10](#)).

That is roughly equivalent to the economic contribution of Canada's finance and insurance sector in 2023. Or put differently, it is around 30% greater than the contribution of Canada's retail trade sector in 2023.²²

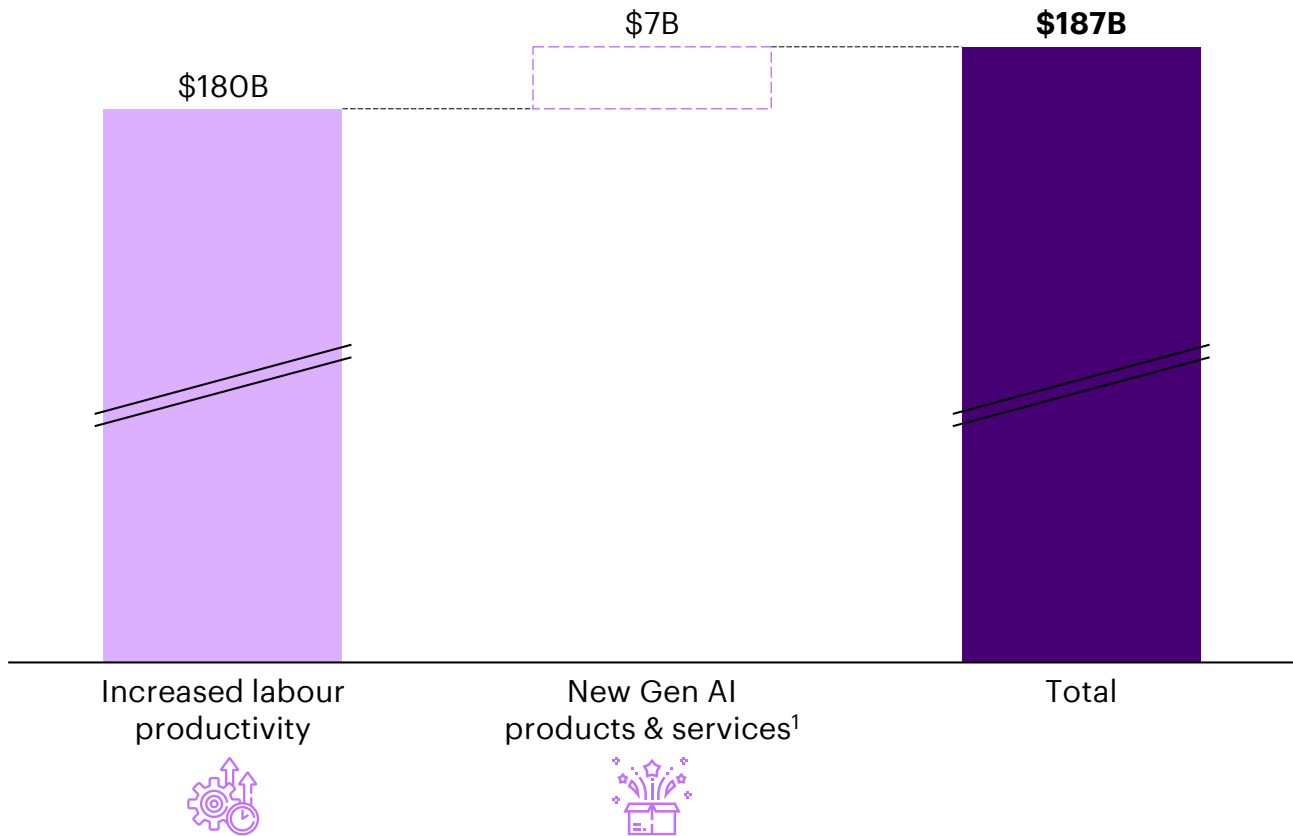
²² In 2024 dollars, the finance and insurance sector's GDP contribution was \$192B in 2023; the retail trade sector's GDP contribution was \$140B in 2023, according to Statistics Canada ([2024](#)) and the Bank of Canada ([2024](#)).

EXHIBIT 10

Gen AI could deliver \$187B in value annually by 2030

Gen AI's annual economic impact in 2030

Annual value added in 2030 (CAD; 2024 dollars) (assuming ~40% adoption in 2030)



Note: (1) The \$7B in potential economic benefits from new Gen AI products and services is an early estimate. It is contingent on several factors, including how Gen AI's capabilities develop, how strong international competition is, the extent to which Canadian businesses pursue this new market, and more.
Source: Accenture analysis.

The value created by increased labour productivity makes up the vast majority of the total impact. As discussed in Sections 1.2 and 2.1, this value could be realized through increased wages, greater business value, more efficient government, or any combination of these.

The value created through the creation of new products and services is significantly smaller than through productivity growth, but it still represents a considerable economic opportunity.

Canada has experienced substantial success in launching AI companies in recent years – it places 5th in the world over 2013-23 in newly funded AI companies.²³ This bodes well for the Gen AI opportunity.





If Canada is able to capture a share of the Gen AI software or application market, it would deliver significant economic benefits – creating new businesses and jobs, and new opportunities to export made-in-Canada products and services to the world.

Gen AI's impact – on productivity and the creation of new products and services – will be felt across the economy, presenting opportunities for growth in several sectors (see Exhibit 11).

²³ Stanford University Human-centered Artificial Intelligence, 'AI Index Report' (2024).

EXHIBIT 11

Gen AI could create significant opportunities in healthcare, natural resources, government, and finance and insurance

Sector	Gen AI opportunity Annual value-add by 2030	Key outcome
 Healthcare	\$11B	More one-on-one patient care due to reduced medical administration
 Natural resources	\$8B	Enhanced global competitiveness, and potential flow-on benefits, including lower prices for Canadians
 Government	\$14B	Greater and better access to government services for citizens
 Finance and insurance	\$17B	Faster and higher quality service for bank and insurance customers

Notes: (1) Assuming ~40% adoption in 2030. (2) We use abbreviations for some sectors; in this report "health care and social assistance" is "healthcare", "mining, quarrying, and oil and gas extraction" is "natural resources", and "public administration" is "government".

Source: Accenture analysis.

The following sections elaborate on the potential for Gen AI to create value in the above sectors.

2.3.1 Benefits of Gen AI for the healthcare sector

Healthcare spending in Canada is projected to continue increasing,²⁴ and despite high levels of spending, wait times and access to services rank behind peer nations.²⁵ Gen AI has significant potential to improve the accessibility, efficiency, and quality of healthcare delivery. It represents an economic opportunity worth \$11 billion a year for the healthcare sector (see [Exhibit 11](#)).

Gen AI can enable more one-on-one patient care by reducing time spent on admin, improve personalization by being embedded in wearable devices, and support the transition towards more proactive models of healthcare by allowing earlier diagnosis, at scale. The key to realizing these benefits will be robust protocols that ensure patient privacy, confidentiality, and safety are maintained (see [Exhibit 12](#) for an illustrative use case).

Example use cases of Gen AI in the healthcare sector:

- Supporting faster and better quality medical note-taking for medical professionals, through use of audio-to-text models.
- Aiding diagnostic medical reasoning and conversations with patients for medical professionals.²⁶
- Synthesizing new medical research to improve the diagnostic ability of doctors.
- Generating questions based on a patient's symptoms, medical history, demographic profile, and other characteristics.

²⁴ Canadian Institute for Health Information, 'National health expenditure trends' (2023).

²⁵ Fraser Institute, 'Canada's high level of health-care spending not producing high performance' (2023).

²⁶ Google Research, 'AMIE: A research AI system for diagnostic medical reasoning and conversations' (2024).

- Generating patient-specific educational materials and recommendations for follow-up care.
- Aiding in the discovery and development of new drugs.²⁷
- Reducing administrative activities, through, for example, automated patient check-in forms, prior authorization drafting, imaging report generation, and automated referrals.
- Supporting medical imaging analysis to improve the accuracy of disease detection.

EXHIBIT 12

Gen AI could act as a copilot for medical professionals, enabling more one-on-one patient care

Illustrative use case of Generative AI in the healthcare sector

During & after consultation



Impact



Gen AI could assist medical professionals to quickly get up to speed on a patient's medical history by summarizing data on record.



Gen AI could transcribe audio during the consultation.



It could then summarize key points for the patient to refer to later

With less time spent on administration, more time can be spent on:

- Building a connection with the patient
- Investing in professional development / training
- Providing high-touch care for complicated cases



Using Gen AI to enhance patient care and reduce physician burnout

The Ottawa Hospital (TOH) has started trialling Microsoft's DAX Copilot, marking the first use of this AI-powered system in Canadian healthcare. Designed to alleviate administrative burdens, after receiving patient consent the DAX Copilot utilizes ambient, conversational, and generative AI to transcribe physician-patient conversations into draft clinical notes, reducing the time physicians spend on manual charting.

This enables healthcare professionals at TOH to focus more on patient care, potentially increasing care quality and reducing physician burnout.

²⁷ CB Insights, '7 applications of generative AI in healthcare' (2023); The Economist, 'AIs will make healthcare safer and better' (2024).



Leveraging Generative AI for rapid COVID-19 drug discovery

The Raven2 initiative, a collaboration between Variational AI, adMare BioInnovations, DIGITAL and the Vancouver Prostate Centre (affiliated with the University of British Columbia), leveraged Gen AI to accelerate the development of new drugs against COVID-19.

Utilizing Variational AI's Enki platform, Raven2 rapidly identified drug candidates that were experimentally validated, leading to the filing of two patents for COVID-19 antiviral drugs.

This initiative underscores the transformative role of Gen AI in revolutionizing the \$1.6T global pharmaceutical industry to improve the efficiency of preclinical drug discovery by ~10x while increasing the probability of clinical success.²⁸

2.3.2 Benefits of Gen AI for the natural resources sector

Generative AI represents an economic opportunity worth \$8 billion a year for the natural resources sector (see Exhibit 11). Gen AI has significant potential to improve efficiency, sustainability, and worker safety. It can enable predictive maintenance of equipment, optimize resource extraction and processing, enhance environmental monitoring, and support safer field operations through augmented reality and robotics. These benefits could enhance the global competitiveness of Canada's natural resources sector and lead to flow-on benefits, including lower energy prices for Canadians. Critical to achieving these benefits will be the development of systems that are transparent, ethical, and designed to comply with stringent environmental standards.

Example use cases of Gen AI in the natural resources sector:

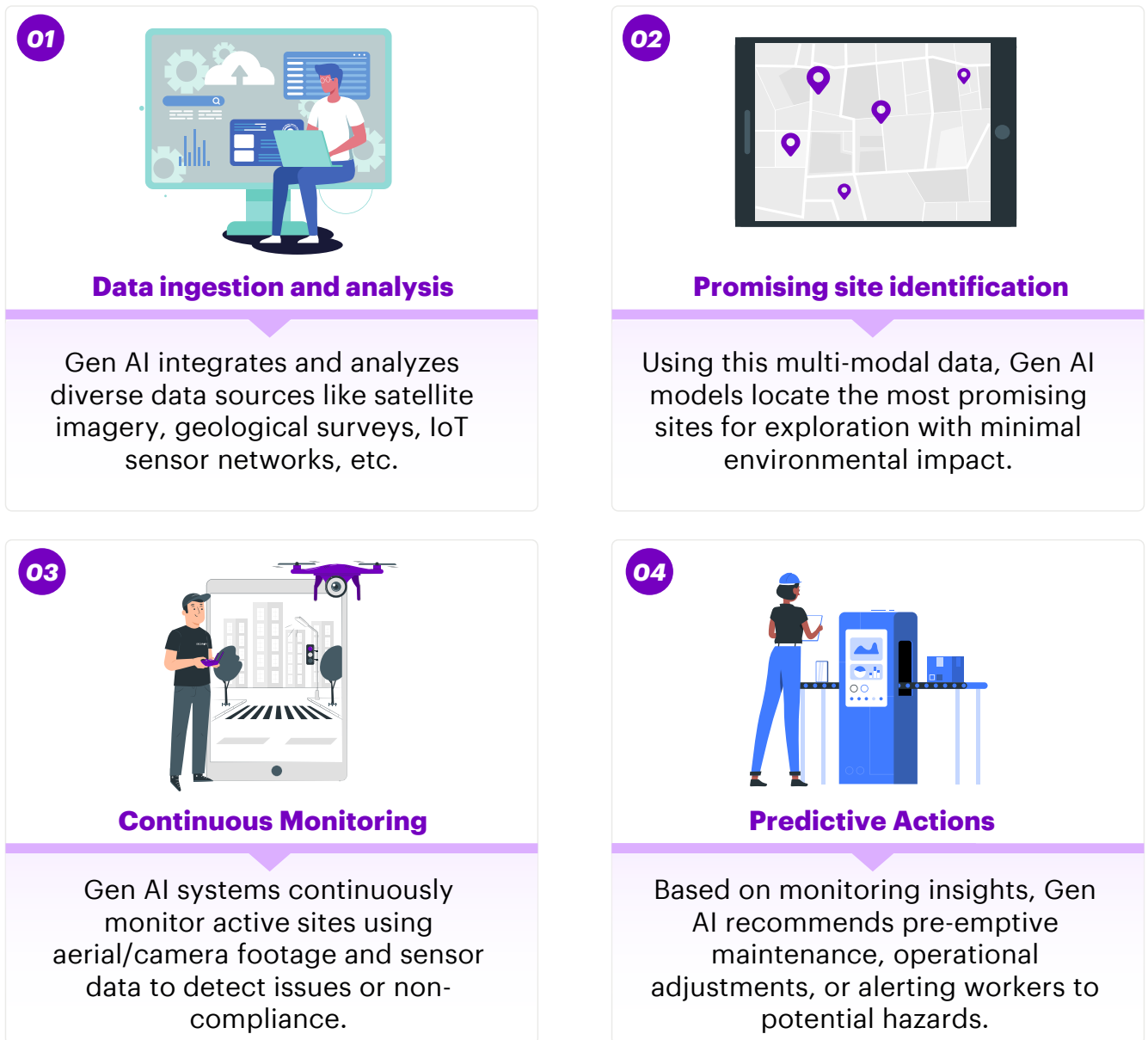
- Enabling predictive maintenance of machinery and equipment using sensor data and AI models, reducing downtime, and extending asset lifecycles.
- Optimizing extraction and processing through AI-driven process control and supply chain optimization.
- Improving exploration efforts by analyzing geospatial, geophysical, and geological data to identify promising sites.
- Enhancing environmental monitoring and impact assessment through analysis of satellite imagery, sensor data, and other datasets.
- Enabling safer field operations through augmented reality simulations, autonomous robotics, and AI surveillance.
- Supporting regulatory compliance through automated report generation and intelligent document processing.
- Synthesizing research across disciplines to guide sustainable practices and technological innovation.

²⁸ Following Raven2, Variational AI has applied Enki to drug targets implicated in oncology and immunology and signed commercial agreements with leading pharma/biopharma companies.

EXHIBIT 13

Generative AI could enhance exploration and environmental monitoring in the natural resources sector

Illustrative use case of Generative AI in the natural resources sector



2.3.3 Benefits of Gen AI for government

Generative AI represents an economic opportunity worth \$14 billion a year for the government (see Exhibit 11). Gen AI has the potential to reduce red tape, increase efficiency, and improve the delivery of government services for Canadians. For citizens it could enable easier, more personalized access to government services. For government policy and decision makers, it can help reduce administrative burden, allowing more time for better policy development and program delivery for Canadians. To realize these benefits, there must be robust data governance (privacy, security) and oversight of algorithms.

Example use cases of Gen AI in government:

- Guiding citizens through government services (i.e., pension, employment insurance, tax, medical rebates) through integration in digital platforms (e.g., My Service Canada Account (MSCA), Canada Revenue Agency My Account, and provincial health services).
- Assisting citizens, SMEs, and NGOs in writing grant applications, improving access to funds for small businesses, community organizations, and regional communities.
- Expediting fulfillment and processing of citizen inquiries and service requests.
- Automating routine backend processing of applications, forms, and documentation.
- Augmenting policy analysis and development through automated research synthesis.
- Detecting fraud, abuse, and non-compliance through anomaly detection across diverse data sources.
- Personalizing citizen communications and service delivery through intelligent content generation.

EXHIBIT 14

Gen AI can improve access to government services

Illustrative use case of Generative AI in government

A pathway to government support with Gen AI



Start conversation with virtual support assistant

These conversational assistants can assist with navigating government websites, understanding eligibility criteria, and submitting support request forms.

Automated document processing

Gen AI can automate processing of request forms, reducing admin for staff and speeding up application processing.

Personalized service planning

Gen AI can assist in generating personalized service plans by considering the person's needs, goals, and available support.



Service provider matching

Gen AI models can recommend the most suitable options, considering factors such as expertise, availability, and service quality indicators.



Providing AI-enabled immersive training to Canadian defence authorities

Immersive training and development for aerospace and naval industries is costly and time consuming. Yet it is critical for the protection of Canadian citizens.

OVA, in partnership with DIGITAL, Cognitive3D, Masterpiece Studio, Toronto Metropolitan University, Babcock Canada, and the Royal Canadian Navy, has created virtual spaces and scenarios to enable immersive training at lower cost.

Gen AI enables conversational avatars, offering a dynamic experience. It also helps users quickly build interactive training environments. The result is an immersive training solution that saves government and industry time and cost.²⁹

²⁹ OVA's tech is a part of Canada's prestigious Pathway to Commercialization program. Facilitated by Innovation, Science and Economic Development Canada (ISED), this program allows OVA to accelerate the deployment of AI-enabled spatial technologies to enhance training, preparedness, and public engagement initiatives.

2.3.4 Benefits of Gen AI for the finance and insurance sector

Generative AI represents an economic opportunity worth \$17 billion a year for the finance and insurance sector (see Exhibit 11). Data plays a key role in the finance and insurance sector. Banks and insurance companies use advanced analytics in a variety of areas, including to serve clients, model risk, and detect fraud. This makes the sector a prime candidate for Gen AI transformation. Gen AI has significant potential to enhance customer experiences, improve risk management, and drive operational efficiencies. It can enable conversational AI assistants, automate document processing, detect fraud and anomalies, and augment human expertise in areas like investment analysis and financial planning. To realize the full potential benefit, a robust governance framework is necessary to ensure responsible AI use, data privacy, and security.

Example use cases of Gen AI in the finance and insurance sector:

- Monitoring for fraud and money laundering through anomaly detection using multi-modal data.
- Intelligent document processing for automated data extraction, contract review, and regulatory compliance.
- Automating back-office processes like account openings, loan underwriting, and claims processing.
- Supporting virtual assistants and chatbots for personalized banking services, query resolution, advisory, and transaction processing.
- Providing hyper-personalized product recommendations, financial advice, marketing content, and next-best actions based on customer needs.
- Augmenting investment research, portfolio management, financial planning, and advisory services by analyzing vast datasets and surfacing relevant insights.

EXHIBIT 15

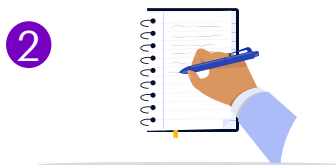
Generative AI can assist in risk management across the finance and insurance sector

Illustrative use case of Generative AI in the finance and insurance sector

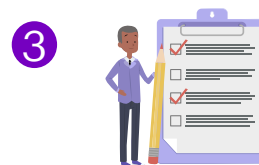
Banking and finance



1 A Gen AI application scans and monitors diverse data, detecting anomalies in risk metrics and generating immediate alerts.



2 Upon detection of an anomaly, the application analyzes root causes and evaluates the affected market segments, providing insights into potential impacts.



3 The application enables the bank to model and test various response strategies by simulating their effects under different potential future scenarios.

Note: For more analysis and discussion on AI's role in banking, see Accenture, 'The age of AI: Banking's new reality' (2024).

2.3.5 Across sectors, small and medium-sized enterprises (SMEs) could realize up to \$100B in economic value by 2030 through use of Gen AI


SMEs are critical to the Canadian economy:

- 99.7% of all Canadian employers are SMEs
- 65% of all workers are employed by SMEs
- around 50% of Canadian GDP is generated by SMEs.³⁰

And they are well placed to benefit from Gen AI. Gen AI models are becoming more affordable for SMEs, with price decreases of over 80% in recent months.³¹ Accessibility to leading models has also grown, including through the proliferation of open source models.³² Taken together, it is clear that the benefits of Gen AI will not be limited exclusively to large enterprises.

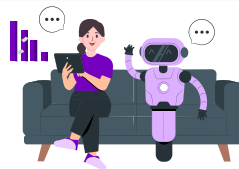


EXHIBIT 16

Illustrative use cases of Gen AI for a small business owner



Meet Eva

Eva runs a small e-commerce clothing store. Despite a passionate following, Eva has noticed a concerning dip in business sales over the past quarter.

	Use case	Proof point for use case
 <p style="font-weight: bold; color: #4a4a8a;">Generate ideas</p>	<p>Eva provides her Gen AI advisor with context and asks it to generate possible reasons for the fall in sales.</p>	<p>Entrepreneurs with access to a Gen AI advisor are 15% more profitable than those without.¹</p>
 <p style="font-weight: bold; color: #4a4a8a;">Analyze data</p>	<p>Eva uses Gen AI to cross-analyze her detailed sales data against customer reviews. It highlights a pattern of declining sales from customers who comment on delivery times.</p>	<p>Gen AI has been shown to perform data analytics tasks at a level at or above professional human data analysts.²</p>
 <p style="font-weight: bold; color: #4a4a8a;">Develop action plan</p>	<p>Using the AI's writing assistant, Eva drafts a memo outlining the key challenge and describing a strategy to reduce delivery times.</p>	<p>Gen AI tools have been shown to reduce the time of writing tasks by 37%, with improved quality.³</p>

Sources: (1) Otis et al., 'The Uneven Impact of Generative AI on Entrepreneurial Performance' (2024); (2) Cheng, Li, Bing, 'Is GPT-4 a Good Data Analyst?' (2023); (3) Noy and Zhang, 'Experimental evidence on the productivity effects of generative artificial intelligence' (2023).

³⁰ Innovation, Science and Economic Development Canada, 'Key Small Business Statistics 2023' (2023).

³¹ OpenAI dropped prices in November 2023, January 2024, and May 2024.

³² Hugging Face, 'Open LLM Leaderboard' (2024).

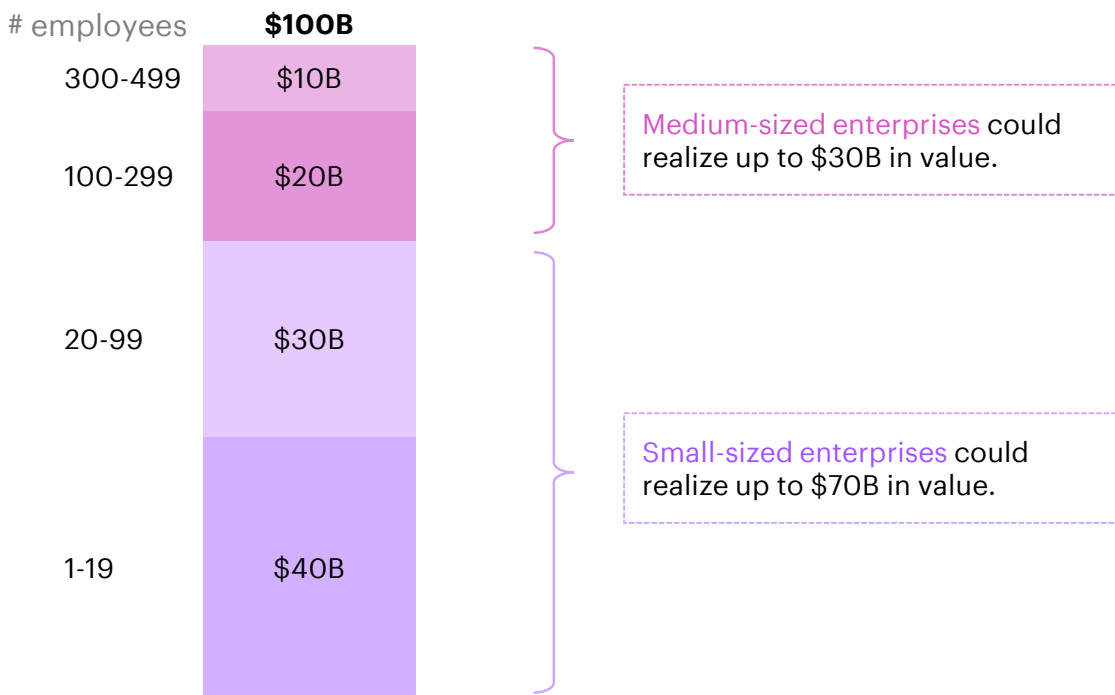
From a macroeconomic perspective, small businesses could realize up to \$70B in annual economic value by 2030 from Gen AI, with the majority of that value flowing to enterprises with 19 employees or less (see Exhibit 17). Medium-sized businesses are also poised to benefit, with \$30B in economic value realized annually by 2030.

EXHIBIT 17

SMEs could realize up to \$100B in economic value by 2030 through use of Gen AI


Gen AI's annual economic impact in 2030 for SMEs

Annual value added in 2030 (CAD; 2024 dollars) (assuming ~40% adoption in 2030)



Source: Accenture analysis.

SMEs in Canada are already generating value using Gen AI:



Leveraging Gen AI to enhance technician productivity for the Royal Canadian Air Force

The Royal Canadian Air Force collaborated with Contextere to implement their industrial AI chatbot, Madison, for Avionics Systems Technicians in Winnipeg. This initiative aimed to evaluate the advantages of machine learning-driven decision support software.

Madison, which was trained on more than 15,000 maintenance documents, reduced the time technicians spent searching for and referencing information by 80%.

Equipped with real-time capabilities, Madison empowered technicians by speeding up troubleshooting processes and enhancing overall efficiency, all without requiring additional training.

Responsible adoption is key
to unlocking the potential
economic benefits of Gen AI

3

3.1 Canada is a global leader in AI research, yet it lags in adoption, risking potential productivity gains

Canada has a long history of being a leader in AI research. In every year since 2019, Canada has ranked first among G7 nations in the number of AI-related papers per capita.³³ And it is one of the world's leading countries in AI talent per capita.³⁴ Some of the most important advances in AI research, which laid the foundation for Gen AI, were funded by the Government of Canada and led by the scientific leaders of Canada's three National AI institutes – Vector Institute, Mila and Amii.³⁵

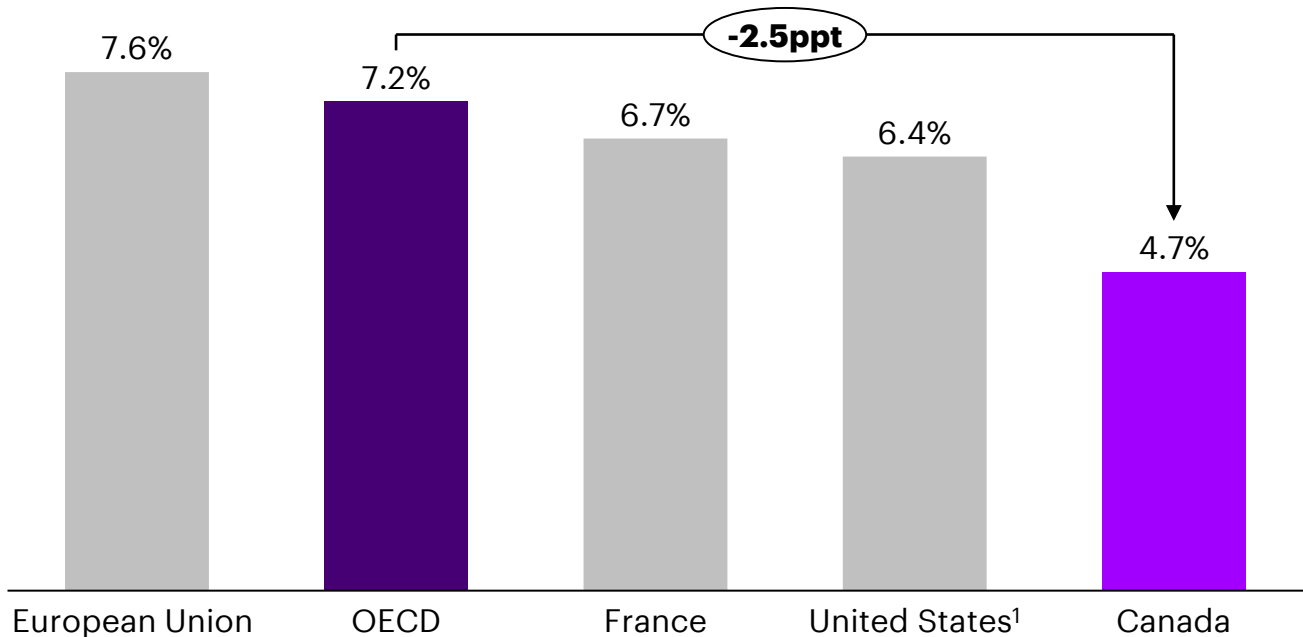
Despite impressive contributions to the field of AI and a robust talent pool, Canadian businesses have not adopted AI technologies as extensively as their international peers.³⁶ This suggests a gap between academic leadership and industrial application.

According to OECD estimates, only 4.7% of Canadian firms have integrated AI into their operations. This lags the OECD average of 7.2%, as well as France and the United States, where the adoption rates are 6.7% and 6.4%, respectively (see Exhibit 18).³⁷

EXHIBIT 18

Canada lags peers like the US, France, and Europe in AI adoption

AI adoption in Canada and select OECD peers
% of businesses (with 10 or more employees) using AI, 2021



Note: (1) US estimate is based on latest data available from the OECD without a timeseries break (2017). This figure was also validated by comparing with findings from the paper, "AI Adoption in America: Who, What, and Where" from the National Bureau of Economic Research, which estimated this share to be around 6% for the US.
Source: OECD.

³³ CIFAR, 'The impact of the Pan-Canadian AI Strategy' (2023).

³⁴ Deloitte, 'Canada leads the world in AI talent concentration' (2023).

³⁵ CIFAR, 'The impact of the Pan-Canadian AI Strategy' (2023).

³⁶ Lockhart and Angus 'Automation Nation? AI Adoption in Canadian Businesses' (2023).

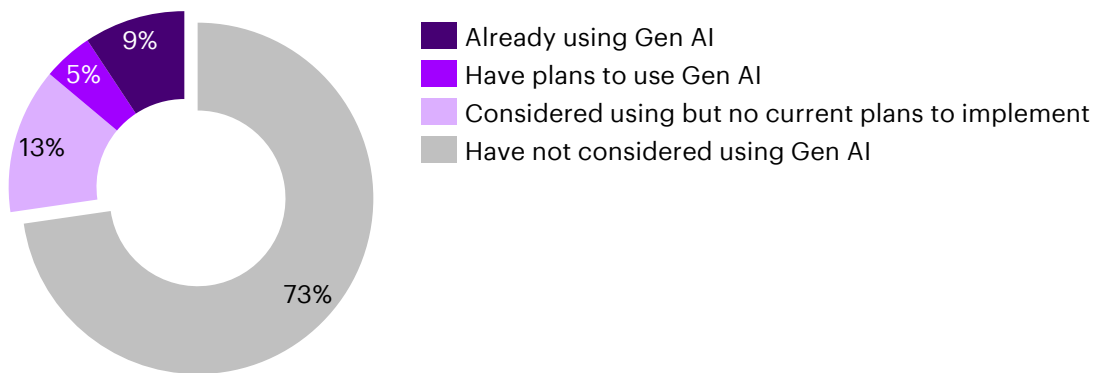
³⁷ Other sources also place Canada below the global average but estimate a much higher adoption rate. This is likely because these surveys are comprised of mostly large firms (see The Dais (2023) for more detail).

This discrepancy in AI adoption between Canada and its peers underscores a hesitancy among Canadian businesses to adopt AI systems. And the gap appears even more pronounced for Gen AI. Less than one in ten Canadian businesses are using Gen AI, according to a 2024 survey by Statistics Canada (see [Exhibit 19](#)).

EXHIBIT 19

Only 9% of Canadian businesses are using Gen AI, and most (73%) have not considered using it

Use of Generative AI among Canadian businesses
% of businesses (across all industries), first quarter 2024



Source: Statistics Canada, 'Business's use of Generative AI, first quarter of 2024' (2024).

Larger organizations are adopting at higher rates than smaller ones, but their adoption remains low. 15% of organizations with 100 or more employees are using Gen AI, and a further 14% have plans to use Gen AI. Still, the majority (52%) of these larger organizations have not considered using Gen AI.³⁸

Our research shows that Gen AI can boost Canada's productivity. Yet it must be adopted for Canada to realize its economic benefits. If low adoption persists, Canada risks being left behind by peer nations. Stagnant adoption could mean that Canadian businesses are less able to compete in global markets, leading to "brain drain", diminished sovereign capabilities, and fewer export opportunities.³⁹

3.2 Public trust in AI is low, potentially due to a lack of familiarity with AI and concerns around risk; to drive uptake, a responsible approach to adoption is required

Public sentiment towards AI in Canada is marked by skepticism and distrust. Only 31% of Canadians trust AI, 23 percentage points lower than the global average (see [Exhibit 20](#)). And most Canadians (54%) reject the growing use of AI.⁴⁰ This skepticism may stem in part from a lack of familiarity; roughly a third of Canadians (32%) are not familiar with AI tools like ChatGPT.⁴¹ This could be contributing to heightened apprehension about the technology's implications and risks.

³⁸ Statistics Canada, 'Business's use of Generative AI, first quarter of 2024' (2024).

³⁹ Prato, 'The Global Race for Talent: Brain Drain, Knowledge Transfer, and Growth' (2022); Wagner, 'Exports and productivity: a survey of the evidence from firm level data' (2007).

⁴⁰ Edelman, 'Edelman Trust Barometer, Supplemental Report: Insights for the Tech Sector' (2024).

⁴¹ Leger, 'Usage of AI Tools' (2024).

The concerns Canadians have about AI are not solely driven by a lack in familiarity, but also by specific concerns regarding its proliferation. Over three quarters of Canadians are worried about privacy concerns, that AI can lack the emotion or empathy required to make good decisions, and that society may become too dependent on AI.⁴² These concerns underscore the importance of clear communication about how AI can benefit all Canadians and how responsible AI use can mitigate risk.

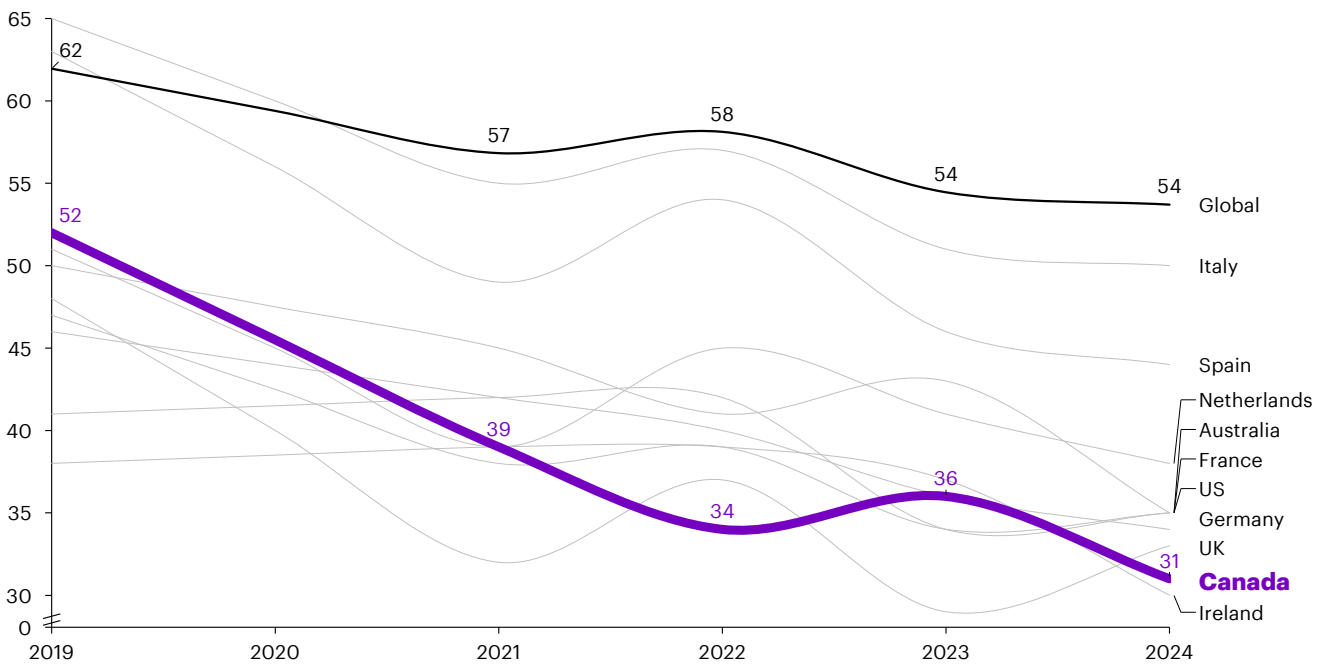
It should be noted that perceptions of AI vary between demographic cohorts. For example, younger generations are typically more trusting of AI and optimistic about its potential to improve livelihoods.⁴³ Similarly, higher income earners and people with higher education levels are more likely to report greater levels of trust and optimism.

EXHIBIT 20

Trust in AI in Canada has fallen over the past five years and is now among the lowest across Western nations

Trust in AI by country

% of survey respondents who trust businesses in AI



Note: The chart has been interpolated in 2020 as there is no available survey data for that year.
 Source: Edelman, 'Edelman Trust Barometer, Supplemental Report: Insights for the Tech Sector' (2024).



A responsible approach to lifting adoption is required to support public trust and build willingness to harness Gen AI's potential.

To drive adoption and ensure the benefits of Gen AI are realized, Canada needs to develop public trust in AI. This will require enhancing understanding of AI technologies among citizens and proactively addressing concerns regarding AI risks and safety.

⁴² Leger, 'Usage of AI Tools' (2024).

⁴³ Stanford University Human-centered Artificial Intelligence, 'AI Index Report' (2024).

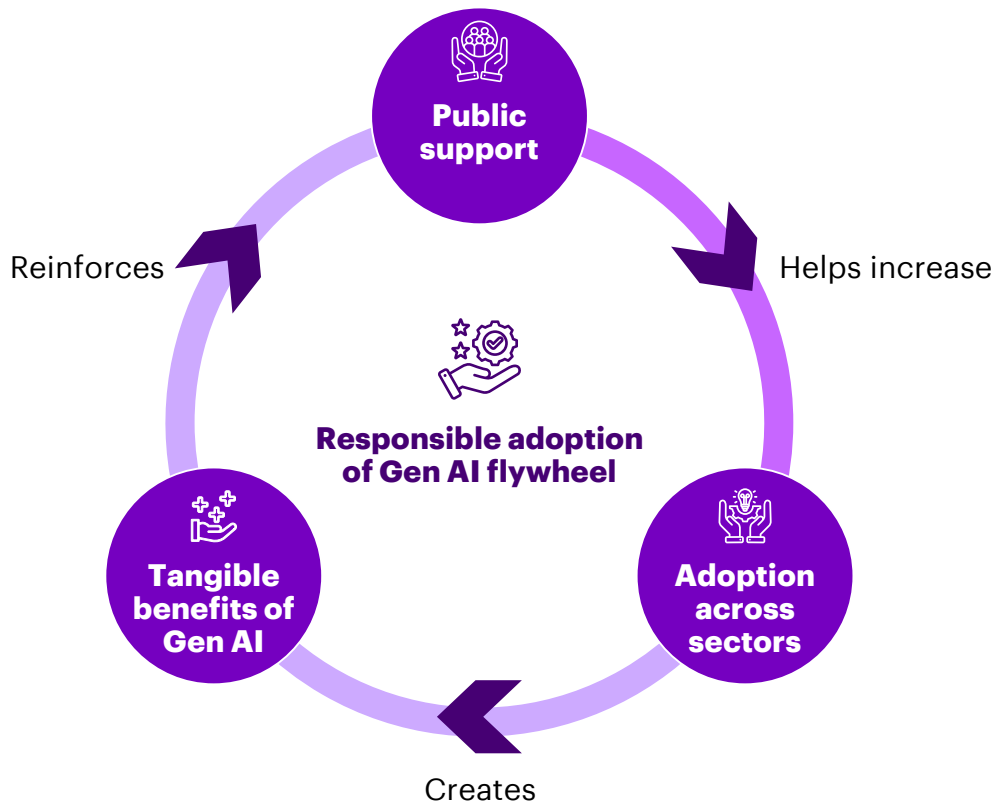
3.3 Responsible adoption means *jointly* lifting adoption and public support; this could create a virtuous cycle

Responsible adoption of Gen AI goes beyond the careful integration of the technology into organizational operations.⁴⁴ It requires a comprehensive approach that seeks to expand public support and adoption simultaneously. This dual approach is essential because a lack of broad public endorsement and understanding could limit the pace and scope of Gen AI use.

Public support of Gen AI can lead to a “flywheel effect”, or virtuous cycle, that drives broader and deeper adoption. As public support grows, organizations are more likely to implement customer-facing Gen AI.⁴⁵ This increased adoption drives tangible benefits, which demonstrate Gen AI's value to Canadians. This, in turn, solidifies public support and drives further adoption (see Exhibit 21).

EXHIBIT 21

Responsible adoption of Gen AI can be thought of as a flywheel



For example, enhanced healthcare diagnostics, streamlined customer service through responsive chatbots, and improved education through personalized learning experiences, will demonstrate the positive impact of Gen AI. This visibility can help demystify AI technologies, diminish fears or misconceptions, and bolster public trust and approval. This will then enable organizations to commit more deeply to Gen AI adoption.

⁴⁴ Careful integration is critical and can be accomplished through “responsible AI”. There are a multitude of frameworks for thinking about responsible AI, including from [Microsoft](#) and [Accenture](#).

⁴⁵ 72% of C-suite leaders agree that public backlash against Gen AI will slow investment in Gen AI, according to Accenture, ‘Pulse of Change Index’ (2024).

3.4 Canada has made some progress towards responsible adoption, including through its pioneering Pan-Canadian AI Strategy

Some of the key milestones in Canada's progress towards responsible adoption include:⁴⁶

- In 2017, Canada became the first country to launch a national AI strategy – The Pan-Canadian AI Strategy, which positioned Canada as a leader in AI. It included a \$125 million investment, managed by CIFAR, and funded three leading AI institutes: the Vector Institute in Toronto, Mila in Montreal, and Amii in Edmonton.
- In 2020, Canada reinforced its international leadership in AI by joining the Global Partnership on Artificial Intelligence (GPAI). As a founding member, Canada helped steer the conversation on AI towards responsible development and use on a global scale. GPAI provides a forum for countries to collaborate on guiding AI governance and ensuring it aligns with human rights and democratic values.
- In 2022, the Artificial Intelligence and Data Act (AIDA) was tabled as part of Bill C-27. It was a first step towards a new regulatory system designed to guide AI innovation and to encourage the responsible deployment of AI in Canada.
- In 2023, the voluntary code of conduct for advanced Gen AI systems was introduced. This allows industry to sign voluntary commitments to demonstrate responsible development and management of Gen AI systems. The code serves as a bridge between now and when AIDA might come into force.
- In 2023, Canada was a signatory to the G7 Hiroshima Process, which will create guiding principles for organizations developing advanced AI systems, and to the Hiroshima Process Code of Conduct for Organizations Developing Advanced AI Systems.
- Most recently in 2024, the Government of Canada announced a substantial \$2.4 billion investment in AI in the 2024 budget. This consists of a \$2 billion investment to build and provide access to computing infrastructure for AI researchers, start-ups and scale-ups. Other measures include boosting AI adoption in critical sectors, helping SMEs deploy AI solutions, supporting workers impacted by AI, creating a new AI safety institute, and strengthening enforcement of AIDA.

While Canada has made notable progress in promoting responsible AI adoption through these initiatives, more work remains to be done.

⁴⁶ Government of Canada ([2022](#), [2023](#), [2023](#), [2024](#)); Government of Canada, 'G7 Leaders' Statement on the Hiroshima AI Process' ([2023](#)); Prime Minister of Canada, 'Securing Canada's AI advantage' ([2024](#)).

To expand responsible adoption, key “enablers” must be in place; this requires action from industry and government

4

Through roundtable discussions with Canadian leaders and input from global experts, we have identified several key enablers of responsible adoption in Canada and the actions required to support those enablers. For more detail on that consultative process and a summary of some of the actions suggested at those roundtables see [Appendix: Stakeholder consultation](#).

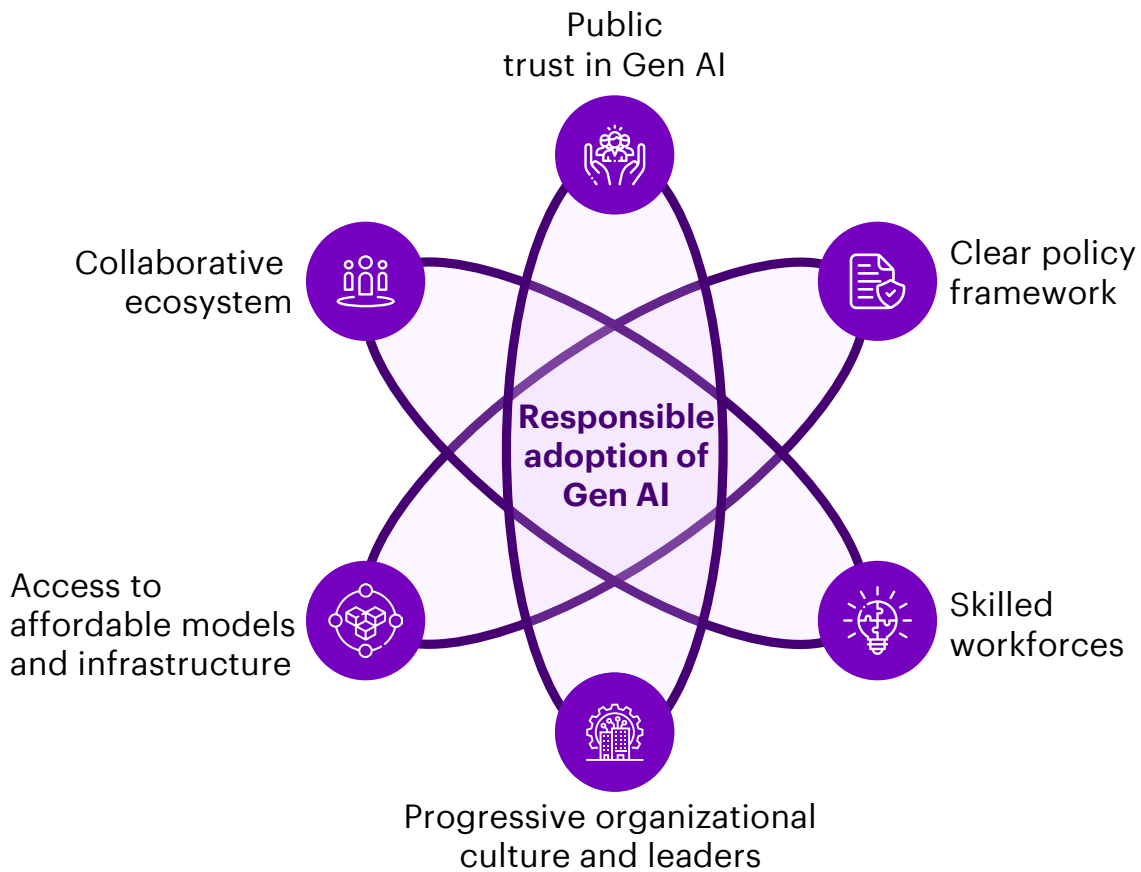
4.1 Responsible adoption depends on six key “enablers”

Collectively, “enablers” describe the conditions needed in Canada for responsible adoption to expand. We have identified six priority enablers (see [Exhibit 22](#)).

It is worth noting that enablers are interconnected and can influence and shape each other. For example, a skilled workforce may improve organizational culture; a clear policy framework may improve public trust; access to affordable and capable models may support the development of skilled workforces; and so on.

EXHIBIT 22

Six key enablers of responsible adoption



Source: Accenture synthesis of roundtable discussions and other expert input.

Public trust in Gen AI: A public that understands the potential impacts of Gen AI and is confident that Gen AI can deliver positive outcomes for Canadians.

Clear policy framework: Internationally interoperable regulation that establishes clear guardrails for those developing, deploying, and using Gen AI, while balancing the need for innovation and adoption.

Skilled workforces: Domestic workforces capable of adopting, using, and developing Gen AI.

Progressive organizational culture and leaders: A culture that values experimentation and innovation; leaders that understand the benefits, costs, and risks of Gen AI adoption.

Access to affordable models and infrastructure: Availability of inexpensive Gen AI models and infrastructure capable of meeting the needs of a broad range of organizations, including SMEs.

Collaborative ecosystem: Strong collaboration and cooperation across industry, government, academia, and civil society within Canada and with other nations.

Industry and government must act immediately to ensure that these enablers are well supported. The following subsection offers some recommendations on how they should do so.

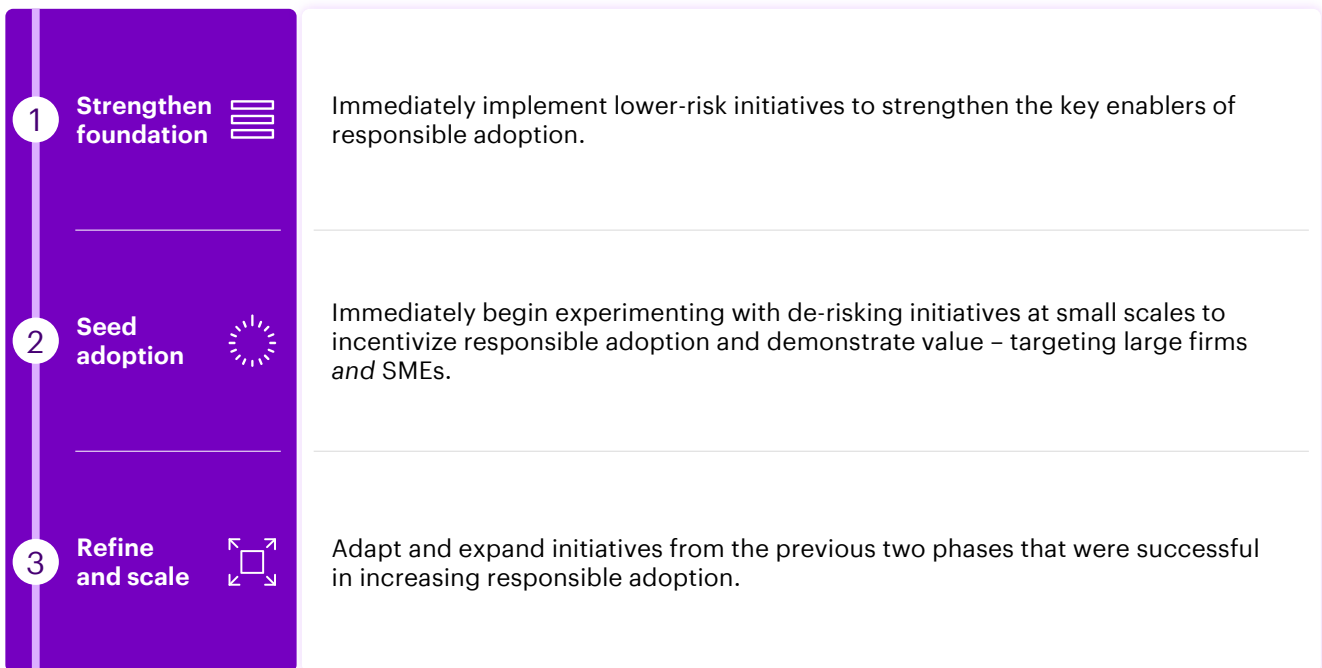
4.2 To support enablers of responsible adoption, industry and government must act

Industry and government should act now to support enablers of responsible adoption. As mentioned in Section 3.4, the Government of Canada is pursuing several measures to accelerate responsible adoption – but more can be done.

Exhibit 23 offers a path forward. Industry and government should immediately implement low-risk initiatives to strengthen the foundation needed for responsible adoption. They should also immediately begin experimentally seeding adoption of Gen AI across sectors. Later, industry and government should refine and scale initiatives that succeed in expanding responsible adoption.

EXHIBIT 23

A three-pronged approach to lifting responsible adoption in Canada






Source: Accenture synthesis of roundtable discussions and other expert input.

4.2.1 Strengthen the foundation

There are several low-risk actions that can be implemented now to promote responsible adoption (see Exhibit 24).

EXHIBIT 24

Key actions for government and industry to strengthen the foundation

 Government	
G1	Engage with international partners to develop interoperable regulatory frameworks; ensure Canada's AI Safety Institute collaborates with the emerging network of AI safety institutes & partners.
G2	Role model adoption of / experimentation with Gen AI for low-risk use cases within government.
G3	Measure adoption and public support in a consistent and timely fashion, across sectors.
 Industry	
I1	Develop and implement in-house AI adoption policies to establish clear internal guardrails.
I2	Collaborate with skilling organisations to develop AI / Gen AI training programs for senior leaders and enrol them in those programs.
 Joint or both	
J1	Amplify success stories in Gen AI adoption through, for example, marketing campaigns and public awards.
J2	Develop education campaigns through collaborations between government, local incubators, business coalitions, chambers of commerce, and large businesses.
J3	Convene stakeholders from industry, government, academia, and civil society through forums such as roundtables, conferences, and policy labs.
J4	Enhance international collaboration and information sharing around solutions to drive responsible adoption of Gen AI.

Source: Accenture synthesis of roundtable discussions and other expert input.

G1: Engage with international partners to develop interoperable regulatory frameworks; ensure Canada's AI Safety Institute collaborates with the emerging network of AI safety institutes & partners.

This would support development of a clear policy framework, public trust in Gen AI, and a collaborative ecosystem. Government should continue engagement with organizations such as the OECD, G7, GPAI, and the UN. Regulatory frameworks should focus on the highest risk use cases and the most capable models. Effective policy action will help to manage the potential risks posed by the use of AI while encouraging responsible innovation and AI adoption. The recently announced Canadian AI Safety Institute, including through its collaboration with the emerging network of AI safety institutes and partners, should support this agenda.

G2: Role model adoption of / experimentation with Gen AI for low-risk use cases within government.

This would help to grow public trust of AI and inform policy. Government should start with experimenting internally by using Gen AI to make bureaucratic processes more efficient. To facilitate this experimentation, government should establish clear internal guardrails around adoption and use of AI.

G3: Measure adoption and public support in a consistent and timely fashion, across sectors. This would support efforts to design effective policy, build public trust, and promote a progressive organizational culture and leaders. It is critical because it allows government and others to evaluate the success of initiatives intended to boost responsible adoption. It should be implemented immediately to support these efforts. Measurement should focus on three main aspects:

1. The level of adoption: the proportion of organizations adopting Gen AI – by sector, by organization size, and by depth of integration.
2. The nature of adoption: how organizations are adopting Gen AI.
3. The impacts of adoption: how adoption is affecting organizational performance.

I1: Develop and implement in-house AI adoption policies to establish clear internal guardrails. This would enable organizations to proceed with Gen AI adoption without finalized, enforceable regulation. This is particularly important as government regulation may struggle to keep pace with the speed of change in Gen AI. In-house organizational policy would also help support public trust in Gen AI.

I2: Collaborate with skilling organizations to develop AI / Gen AI training programs for senior leaders and enroll them in those programs. This would support the continued development of progressive organizational leaders and skilled workforces. A key barrier to adoption appears to be that leaders are unclear on the best use cases for their organization, how to integrate Gen AI, what benefits it could bring, and how risky adoption might be. Training programs for organizational leaders could help address these questions. They could also train leaders in the practicalities of implementation, such as how to ensure their organization's technology infrastructure and data environment support Gen AI adoption. This could increase the likelihood of investments in critical enabling technologies like cloud computing, which in turn, would further support their adoption of Gen AI.⁴⁵

J1: Amplify success stories in Gen AI adoption through, for example, marketing campaigns and public awards. This would play a critical role in setting in motion the flywheel of responsible adoption (see Exhibit 21) by demonstrating the tangible benefits that Gen AI already delivers. It would also help promote a progressive business culture in Canada by demonstrating that initiative and innovation are recognized and rewarded.

J2: Develop education campaigns through collaborations between government, local incubators, business coalitions, chambers of commerce, and large businesses. This would support the development of skilled workforces, progressive organizational leaders, a public understanding and trust in Gen AI.⁴⁷

J3: Convene stakeholders from industry, government, academia, and civil society through forums such as roundtables, conferences, and policy labs. This would help foster a collaborative ecosystem around Gen AI and inform policy. Our experience convening diverse stakeholders for roundtables to inform this report underscored the value that these forums can provide.⁴⁸ Additionally, policy labs offer a unique medium to support collaboration. They are innovative spaces where government officials collaborate with external experts, away from daily duties, to develop and test proactive policy initiatives. These labs provide a safe environment to explore creative ideas without reputational risk, integrating diverse expertise from the initial stages of policymaking.

⁴⁷ Recent initiatives from the [Business Development Bank](#) and [CPA Canada](#) are good examples.

⁴⁸ See Appendix: Stakeholder consultation for more information on the roundtables.

J4: Enhance international collaboration and information sharing around solutions to drive responsible adoption of Gen AI. This would ensure that Canada can learn from nations that are adopting Gen AI at a faster pace. It could inform policy around expanding responsible adoption and help drive a progressive organizational culture in Canada.

4.2.2 Seed adoption

Canada should introduce initiatives to help de-risk adoption of Gen AI. While Canadians generally have an entrepreneurial spirit, they also have a strong fear of failure.⁴⁹ This could be hindering adoption of Gen AI. Canada could unlock broader adoption of Gen AI by reducing implementation risks. It could do this through a program of financial incentives.⁵⁰

To ensure incentives are efficient and effective, the program should test potential mechanisms (e.g., direct subsidies, tax credits, loans, reconfiguring existing grants, subsidized training or advisory) by conducting pilot studies.⁵¹ In addition to helping test potential mechanisms, the pilots could help build public trust in Gen AI by proving its benefits at small scales.

DIGITAL, Scale AI, or the Canadian Institute for Advanced Research (CIFAR) could be well placed to administer the program; alternatively, a government body (e.g., Regional Development Agencies) could be suitable. **Exhibit 25** offers some recommendations on how to implement the proposed program.

EXHIBIT 25

Suggested approach to seed adoption of Gen AI

The proposed program seeks to de-risk adoption of Gen AI by offering financial incentives through a series of small-scale pilot projects.



Summary of key implementation recommendations

- 1 Incentives should be tailored to different sectors and business sizes.
- 2 The program should combine consultation with experimentation.
- 3 The program should be robustly monitored and evaluated.
- 4 Incentives must be easy to access and carry a low administrative burden.
- 5 The program should mitigate risk of organizations becoming reliant on incentives.
- 6 Participation should be contingent on participants sharing outcomes & learnings.

Source: Accenture synthesis of roundtable discussions and other expert input.

⁴⁹ The Conference Board of Canada, 'Innovation Report Card' (2024).

⁵⁰ As mentioned in Section 3.4, the government is already taking action to this end. The 2024 federal budget committed \$200M for Regional Development Agencies to support the adoption of AI in critical sectors, such as agriculture, clean technology, health care, and manufacturing.

⁵¹ While an incentive program would, no doubt, require some incremental government expenditure, measures could be taken to reduce cost – including by refining or repurposing existing grant programs to support adoption.

1: Incentives should be tailored to different sectors and business sizes. Businesses in different sectors and of different sizes will respond differently to the same incentive. Thus, Canada cannot adopt a “one size fits all” approach. However, there is a trade-off between differentiation and administrative cost; it is not feasible to have a bespoke program for each sector and business size.

2: The program should combine consultation with experimentation. The program should consult with industry bodies and businesses to inform initial views on optimal incentive sizes and mechanisms, and on how incentives should be adapted for different sectors and organization sizes. The program should then experimentally test the most promising mechanisms through a series of pilot studies.

3: The program should be robustly monitored and evaluated. Monitoring and evaluation are key to ensuring the program delivers on its ambition to de-risk adoption. Monitoring and evaluation should focus on three main aspects: the level of adoption, the nature of adoption, and the impacts of adoption – as described for initiative G3 in Section 4.2.1. Regarding the impacts of adoption, the evaluation should consider the effects of the incentives both during and after the program.

4: Incentives must be easy to access and carry a low administrative burden. If participation in the program is too onerous, there will be reduced uptake of incentives. This is especially true for SMEs, which have limited capacity to overcome high administrative burdens.

5: The program should mitigate risk of organizations becoming reliant on incentives. There is a risk, as with all incentive programs, that organizations become reliant on subsidies. Pilots – and later, the scaled program – should clearly articulate the conditions under which incentives cease, for example, through sunset dates.

6: Participation should be contingent on participants sharing outcomes & learnings. Sharing outcomes and learnings is critical in supporting the selection and refinement of successful pilots. Sharing would also help build public awareness, trust, and support for Gen AI adoption. Additionally, learnings would help inform adoption of Gen AI by organizations which are unable to participate in the incentive program.

4.2.3 Refine and scale

This phase would follow the other two. It would include the expansion of pilots that proved to be successful in seeding responsible adoption.

However, before scaling, it will be important to refine the program after completing the pilots, for a few reasons:

- organizations will better understand the value of Gen AI;
- the general level of adoption in Canada will be different;
- scaled initiatives will cover some sectors not part of the pilots;
- models may be more capable;
- economic conditions may be different; and
- regulation may be different.

Once programs have been refined, they can be expanded to cover a greater number of organizations and sectors.

How individual organizations can navigate expanding responsible adoption

Recent Accenture research suggests that disruption is on the rise and that reinvention is becoming the default strategy for success. In that context, Gen AI represents an opportunity to accelerate reinvention. Accenture sees five imperatives the C-suite must address to reinvent in the age of Gen AI.⁵²

1. **Lead with value:** Shift the focus from siloed use cases to prioritizing business capabilities across the entire value chain. Pursue Gen AI investments in two areas: “no regrets” investments that offer productivity improvements and “strategic bets” that offer truly novel competitive advantage including reshaping how industries operate.
2. **Understand and develop an AI-enabled, secure digital core:** Elevate IT for the age of Gen AI; connect disparate data sets and technologies via an AI-enabled, secure digital core.
3. **Reinvent talent and ways of working:** Leaders should set and guide a vision for reinventing work and preparing workers for a Gen AI world.
4. **Close the gap to responsible AI:** Design, deploy, and use Gen AI to drive value while mitigating risks.
5. **Drive continuous reinvention:** Leaders must build the capability to continuously reinvent. Companies must constantly build their organizational agility – a switch to a state of openness, requiring a cultural and operational mindset for continuous change.

⁵² Accenture, 'Reinvention in the age of generative AI' (2024).

Appendix

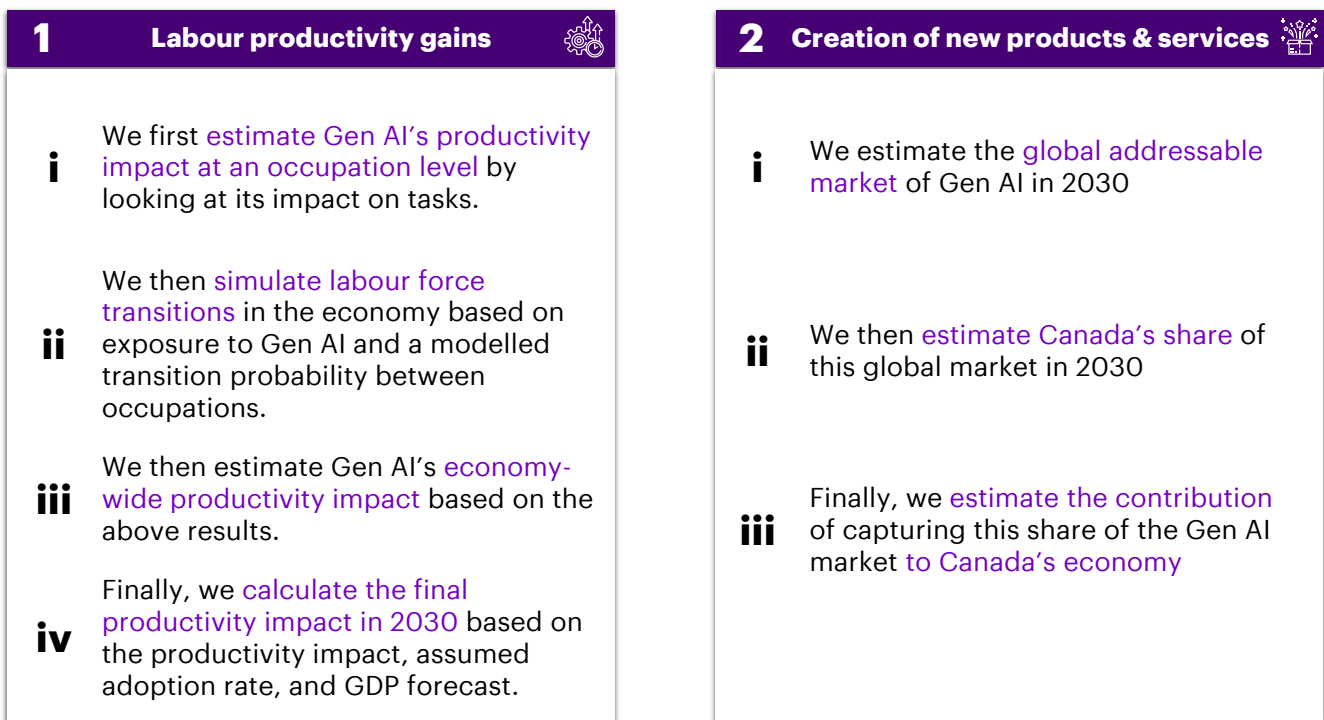
Appendix: Methodology

A1. Calculating the economic opportunity of Generative AI

To estimate the annual economic contribution of Generative AI in Canada by 2030, we combine both labour market analysis and market sizing activities. There are two components of the economic opportunity that are estimated – 1) Labour productivity gains; 2) Creation of new products and services. Exhibit 26 provides an overview of the approach.

EXHIBIT 26

Overview of methodology to estimate the economic opportunity of Gen AI by 2030 in Canada



Note: Identification of these two channels is based on current capabilities. It is likely that additional channels will emerge as models become more capable and widespread. Note that there is also potential for quality gains, but this is hard to measure and translate to economic contribution, and the impact is likely to be smaller than for productivity gains.

A1.1 Labour productivity gains

As detailed in Exhibit 26, our approach for estimating the labour productivity gains from Gen AI involves four key steps. Each step is further detailed below.

Step i) Estimating the productivity increase at an occupation level

- The Occupational Information Network (O*NET) database from the US Department of Labor is one of the primary sources of occupational information for the US economy. The database provides an overview of the tasks performed by workers in over 900 occupations in the US economy, and the frequency of tasks.

- Data from O*NET and the International Labour Organization (ILO) is used to map the occupation-task information to the Canadian workforce. We calculate the share of time spent on tasks for each occupation, based on the task frequency of >19,000 tasks and >900 occupations.
- We then investigate the potential of Generative AI to automate or augment each task. Tasks are first tagged as being "Language" or "non-Language" tasks. Language tasks are those that require a certain level of language ability (natural, mathematical, or computational).⁵³ We next assess the level of knowledge skill required on the task. This considers whether the task involves – a) solving ambiguous problems; b) collaborating with others in real-time; c) Validation from SMEs (Subject Matter Experts). Language tasks that meet none of these criteria are labelled with the 'automation' tag. If a language task meets just one of the criteria it is labelled with the 'augmentation' tag. A combination of human tagging and machine learning classification (few shot prompting of LLMs like gpt-4) is used to label each task.
- The share of time spent on tasks for an occupation, is combined with the task labels result to determine the share of task hours that can be automated or augmented by Gen AI for an occupation. This gives us the overall potential for Gen AI to transform an occupation.
- We combine the transformation potential results with real world productivity gain estimates from academic experiments to calculate the final productivity gain for an occupation. There are existing research papers (some referenced in Exhibit 4) which estimate the productivity impact of Gen AI on certain tasks, such as writing or coding. We use a regression to predict the productivity impact of Gen AI on other tasks.
- The productivity gain for an occupation is an average of the productivity increase for all tasks in that occupation, weighted by the time share of each task.

Step ii) Simulate labour force transitions

- It is likely that Gen AI will impact the composition of the labour force, i.e., the number of workers in each occupation. Occupations that benefit most from Gen AI in terms of productivity may experience an excess supply of workers, and vice versa.
- To balance the supply and demand across occupations, we simulate transition of workers.
- To determine where workers may go, we model how likely (or unlikely) it is for a person to move from one job to another.
- A worker in occupation "A" is more likely to transition to occupation "B" if the two occupations share similar characteristics. Key characteristics considered are – skill similarity, wage similarity, job popularity, education requirements, previous experience, training opportunities provides, expected future growth potential. Data is sourced from Lightcast US job postings data and US Bureau of Labor Statistics 2022.
- We built a machine learning model to predict the likelihood of transition between a pair of occupations, based on the above characteristics. The model is trained using data from the US Current Population Surveys Annual Social and Economic supplement (2019-2022), which reports frequency of change between jobs.
- The outcome of this analysis is a new labour composition, after accounting for the impact of Gen AI and likelihood of transitions between jobs.

⁵³ Since LLM's have shown significant leaps in capability and performance, we focus our assessment on these models. This means the analysis does not include the impact of image-generating models and other modalities.

Step iii) Calculate the economy wide productivity boost

We next calculate the economy wide productivity boost, which is the ratio of the aggregate wage bill post- and pre-Gen AI adoption minus one. The formula to calculate this is as follows:

$$\text{Productivity boost} = \frac{\sum_{i=1}^I w_i(1 + p_i)\hat{L}_i}{\sum_{i=1}^I w_i L_i} - 1$$

Where:

- w_i is the average wage for workers in occupation i
- p_i is the productivity increase for workers in occupation i
- L_i is the labour force size pre Gen AI adoption for occupation i
- \hat{L}_i is the labour force size post Gen AI adoption for occupation i

Step iv) Calculate final productivity benefit in 2030

- The adoption of new technologies typically follows a distinct pattern known as an S-curve.⁵⁴ An S-curve begins with a gradual incline as early adopters come on board, then sharply rises as the majority adopt, and finally tapers off as the market approaches saturation. Our base case S-curve is informed by the pattern of Internet adoption in Canada, refined with expert input to better anticipate the proliferation of Gen AI to 2030. Based on this we arrive at ~40% adoption rate for Gen AI in 2030.
- We next source GDP forecast in 2030 for Canada from Oxford Economics data.
- GDP growth due to Gen AI is then calculated by multiplying the productivity boost by the adoption rate in 2030 and the forecasted GDP.⁵⁵

Note that the productivity benefits of Gen AI are contingent on several factors, including the pace, scale, and depth of adoption; how Gen AI's capabilities evolve; and the extent to which a "people-centric" approach is taken. It is not clear how these factors will evolve. Thus, any estimate of the productivity benefits of Gen AI is uncertain.

In this report, we focus on one plausible scenario for Gen AI adoption. Accenture's "Work, workforce, workers" report (2024) explores three scenarios, which vary the pace and quality of adoption. The figures in this report align with the "cautious" scenario of that report. Another difference between the two reports is the timeframe. Accenture's "Work, workforce, workers" report (2024) focuses on a 2038 timeframe, and includes estimates of Gen AI's economic contribution in each year to 2038. This report, on the other hand, focuses on a 2030 timeframe to illustrate the short term potential of Gen AI to address Canada's productivity challenge.

1.2 Creation of new products and services

There are broadly three categories of products and services that Gen AI enables: hardware, software, and services. Hardware includes chips, devices, and other physical products. Software includes products/services like Microsoft Copilot, AI assistants, and image generation tools. Services include consulting, technology implementation services, cloud computing, and more.

Consultations suggested that Canada is unlikely to capture a material share of the Gen AI hardware market by 2030. As a result, we focus on software and services. Our approach is as follows:

1. **We estimate the global 'total addressable market' of Generative AI software and services in 2030:** Total addressable market is the total revenue opportunity for businesses selling Gen AI software (e.g., applications that are built on top of foundational models) and those providing IT or business services around Gen AI (e.g., consulting for organizations on how they should adopt Gen AI). We leveraged Bloomberg Intelligence global Gen AI software and services spend forecasts up to 2030 which were published in March 2024.⁵⁶

⁵⁴ Rogers, 'Diffusion of Innovations' (2003).

⁵⁵ Assumes constant labour and capital shares, and no changes in relative wages.

⁵⁶ Bloomberg, 'Generative AI races toward \$1.3 trillion in revenue by 2032' (2024).

2. **We estimate Canada's share of this global market, using Canada's share of newly funded AI companies as a proxy.** We assume that the share of the global Gen AI software and services market in 2030 that is captured by Canada will correlate with the number of new AI companies founded in Canada in the past. We use the share of newly funded Canadian AI companies over the last 10 years as a proxy.⁵⁷
3. **We estimate the contribution of the Gen AI market to Canada's economy.** Finally, we estimate the value created for the Canadian economy from this Gen AI market. This value is based on the revenue earnings, previously estimated. To calculate the final economic value, we use the average ratio of GDP to total income in Canada's ICT sector over the last 10 years.

This estimation uses forecasts external to Accenture's productivity model. As a result, those external forecasts do not consider the adoption assumptions used in this report. This could be a limitation if (1) external forecasts rely on different adoption assumptions to ours and (2) the level of Gen AI adoption by organizations in Canada influences Canada's share of the global Gen AI products and services market.

A2. Estimating the economic opportunity across sectors and business sizes

Estimating the economic opportunity across sectors

The methodology to estimate the economic impact of Gen AI on specific sectors followed a similar approach to that taken for the economy wide estimate. We simply repeated steps iii) and iv) but on a sector level. Mathematically, this approach can be represented as:

GDP gain for sector x = GDP contribution of sector x × productivity boost for sector x × adoption rate in year t

Where:

- *Productivity boost for sector x = $\frac{\sum_{i=1}^I w_i(1+p_i)\hat{L}_{i,x}}{\sum_{i=1}^I w_i L_{i,x}} - 1$*
- *L_{i,x} is the number of employees in sector x in occupation i before Gen AI*
- *$\hat{L}_{i,x}$ is the number of employees in sector x in occupation i after Gen AI*
- *w_i is the average wage for workers in occupation i*
- *p_i is the productivity increase for workers in occupation i*

The GDP contribution of each sector is sourced from Statistics Canada.

Estimating the economic opportunity across business sizes

The methodology to estimate the economic impact of Gen AI on specific business sizes is more complicated than for specific sectors. This is because there is limited quality data available on Canadian workers by occupation type, by business size (for example, the number of accountants who work for small businesses). The result is that we cannot replicate the general method for the economy wide estimate.

However, there is data on Canadian workers by business size, by sector. Using this data, we can apportion each sector's impact to businesses of varying sizes. Mathematically, this approach can be represented as:

GDP gain for business size s = \sum_x GDP gain for sector x × $\frac{\text{Aggregate wage bill in sector x for business size s before Gen AI}}{\text{Aggregate wage bill in sector x before Gen AI}}$

⁵⁷ Stanford University Human-centered Artificial Intelligence, 'AI Index Report' (2024).

Appendix: Stakeholder consultation

This report was informed by input from a wide range of sources across industry, government, academia, and civil society, providing both Canadian and global perspectives. Two roundtable events, hosted in person in Canada, provided a large share of that input.

Roundtable one

The first roundtable was held in Ottawa. It included representation from the Government of Canada and executives from leading industry bodies.

The roundtable focused on developing a collective understanding of what capabilities and resources Canada would need to be in place to support responsible adoption – the “enablers”.

Some of the key outcomes and insights from the discussion were:

- Canada faces a significant challenge around public understanding and trust of AI.
- Adoption is critical to ensuring Canada remains internationally competitive.
- SMEs face unique challenges in adopting AI.
- Government has an opportunity to lead by example in integrating Gen AI.
- Canada should focus on developing a compelling narrative around AI, education and skills (including lifelong learning), improving access and affordability, creating clear regulatory frameworks, and cultivating an innovation culture.

Roundtable two

The second roundtable was held in Toronto. It included former and current leaders in the Government of Canada, business executives, industry bodies representatives, economists, and leaders in academic institutions.

The roundtable included two sessions. The first focused on clarifying, adding to, and prioritizing the enablers identified in the first roundtable. The second involved identifying the key actions that government and industry should take to support the key enablers.

The roundtable was supplemented by an expert dinner on AI, which included similar representations to the roundtable, in addition to leaders from civil society.

Some of the key outcomes and insights from the discussions were:

- Rapidly expanding responsible adoption is critical to keep Canada internationally competitive.
- Canada should celebrate winners and successes more to help cultivate a progressive business culture.
- Adopters should pursue low-risk applications first (particularly in government).
- There should be increased experimentation with Gen AI.
- Canada needs to expand collaboration between industry, government, academia, and civil society; and across provinces and internationally. Canada is a small nation and should act as a team.
- “Public trust” was generally the most prioritized enabler for government, former government, and academia participants. “Infrastructure” was often prioritized by those in industry or academia working closely with AI.
- Canada should explore the potential for Gen AI to close labour/skill gaps, retain people in the public sector, and support remote communities (including Indigenous communities)
- Concrete actions raised include: Reconfigure existing grants to incentivize adoption; “Procurement conversations” (make government have conversations with general AI companies to show potential of adopting; focus on low risk to start); Measure adoption closely; Celebrate success (e.g., recognition program, awards, etc.); Purchase sovereign compute; Promote collaboration between industry, government, academia, civil society (e.g., conferences, roundtables, superclusters, etc.); Training for senior leaders (e.g., education programs, lectures, demonstrations of potential, etc.); Change organizational culture (longer-term challenge), industry should be primarily responsible; Government should encourage innovation by boosting competition.

