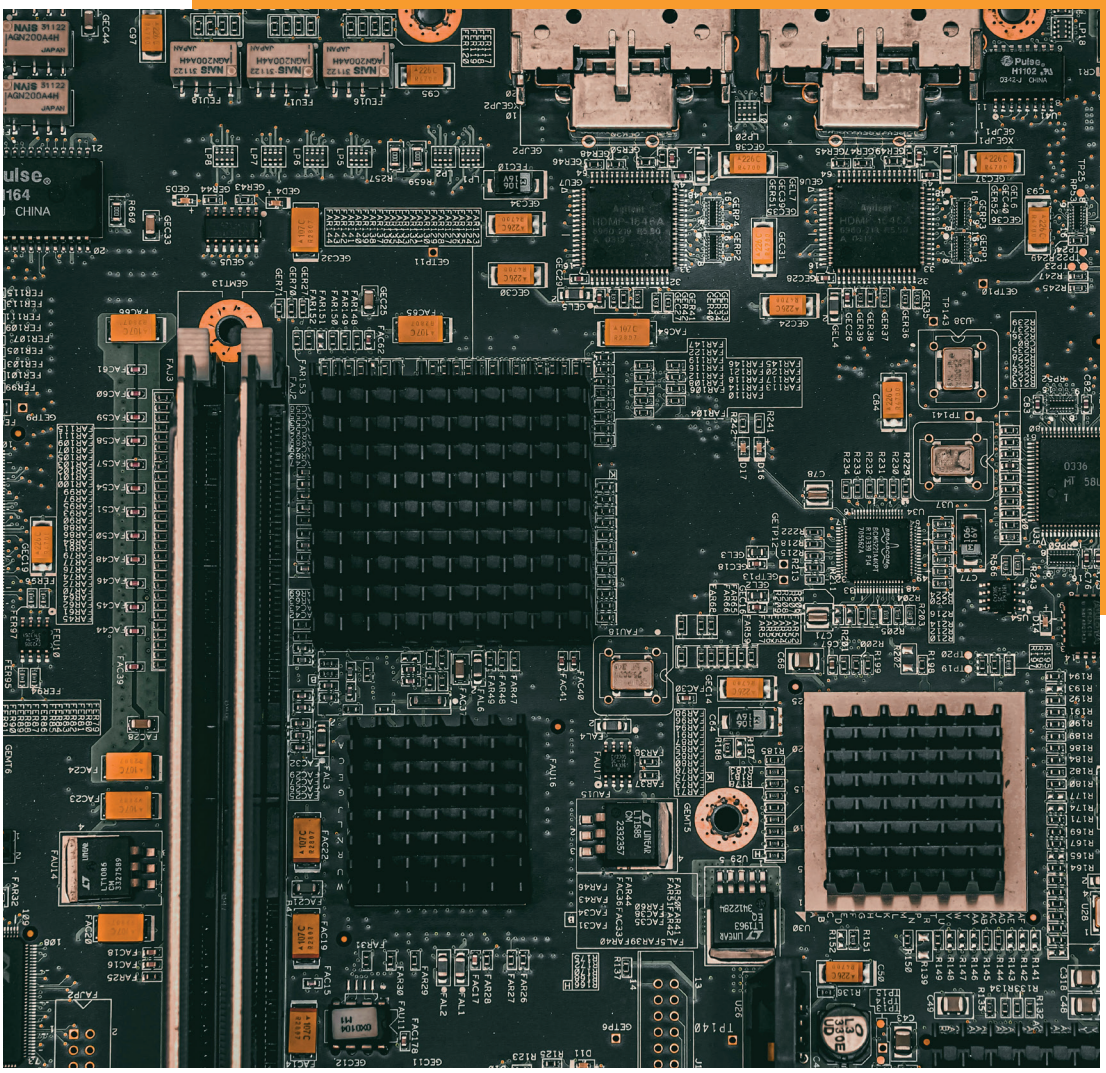

Artificial intelligence adoption by small- and medium-sized enterprises:

Insights from G7 case studies and Canada's experience

amii

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Mila

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Government of Canada Gouvernement du Canada

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About this report

This report examines SME AI adoption across G7 nations, highlighting lessons learned to inform future scaling strategies. It combines a literature review of global trends and public data on G7 AI adoption with case studies from each G7 country, gathered collaboratively. Canadian experiences were consolidated through a research process with the national AI institutes (Amii, Mila, Vector), drawing on their programs targeting AI commercialization and deployment in SMEs. This involved internal data, case studies, surveys, and a joint working session. Insights from five subject matter expert interviews are also included.

The report is structured into four sections: (1) an introduction to global AI adoption and key definitions; (2) context on AI adoption across G7 countries; (3) G7 case studies and lessons learned, and; (4) conclusions outlining possible directions to support wider AI adoption.

0. Executive summary

AI adoption offers companies opportunities for greater efficiency and competitiveness with studies projecting sizable national and global economic gains driven by productivity and new business possibilities. This report takes a look at AI adoption experiences by SMEs across the G7. It draws on secondary research on AI adoption trends, case studies, insights from Canada's three national AI institutes (Amii, Mila, and Vector), as well as expert interviews. The report highlights not only types of adoption, but also key factors that enable adoption, barriers that persist, and lessons that can inform efforts to expand and scale SME AI adoption.

Businesses around the world are rapidly experimenting with AI, yet full integration remains limited, especially for small- and medium-sized enterprises (SMEs). Across G7 countries, AI adoption rates remain generally low among smaller firms and capital- and labour-intensive sectors, while larger firms and knowledge-intensive industries have higher adoption rates. In Canada, adoption by SMEs has grown in recent years but remains modest overall. Similar barriers to wider adoption by SMEs are observed across all G7 countries: financial constraints, limited awareness, skills shortages, and data challenges, among others.

Lessons from the SME AI adoption journey

Leadership, skills, and internal capacity are critical enablers. Many SMEs begin their AI journey with limited awareness, technical expertise, and capacity to scope or manage projects. Without foundational AI literacy and applied skills, firms struggle to identify use cases, allocate resources, navigate risk—firms may also question the return on investment (ROI) of adopting AI. Across case studies from the G7, successful adoption was tied to early leadership engagement, practical training, and the presence of applied talent. Moving from experimentation to sustained adoption requires internal capacity across technical, strategic, and operational domains.

Organizational culture and internal alignment strongly influence adoption success. A culture open to experimentation, paired with early staff engagement and cross-functional alignment can improve adoption outcomes. Common barriers include fear of job loss, change fatigue, and limited communication between leadership and staff.

Accessible, productized AI tools lower technical barriers. Many SMEs adopt AI through pre-trained models, packaged software, and commercial platforms. Simplifying access to these intuitive tools reduces the need for deep technical expertise or large upfront investment. SMEs can also benefit from applied talent who can translate business needs into AI-enabled solutions.

Data readiness and infrastructure constraints limit AI adoption. Access to high-quality, labeled, and structured data remains a major challenge. SMEs often face fragmented systems, inconsistent data, and poor documentation. Infrastructure gaps—such as limited compute access and high cloud costs—constrain the ability to test, deploy, and scale AI solutions. Long-term adoption depends on building strong data foundations and affordable access to infrastructure.

Commercialization and sustainability remain key challenges beyond initial adoption. While many SMEs can demonstrate early success through pilots or proofs of concept, fewer are able to scale these into commercial offerings. Key challenges include limited internal expertise for integration, lack of business planning for AI, and insufficient access to commercialization pathways. Continued support—such as deployment roadmaps, legal/IP guidance, and access to mentorship—can help firms move from early testing to sustainable value creation.

Clear business use cases and de-risked solutions help SMEs adopt AI. Narrow, well-scoped use cases enable faster results, clearer ROI, and easier training of relevant datasets. Firms can benefit from phased rollouts, sandbox testing, and human-in-the-loop approaches that allow them to trial AI with minimal disruption. In regulated or sensitive domains, adoption depended on systems that were transparent, auditable, and supported by expert review. Given SMEs time and capacity pressures, accessible tools and guided experimentation can be especially useful.

Lessons on the external environment of SMEs

Sector-specific support facilitates adoption by aligning AI with industry realities. AI adoption patterns vary by sector, with knowledge-intensive fields often leading due to higher digital maturity and more available expertise. In contrast, capital- and labour-intensive industries face barriers like legacy systems and lower technical capacity. Tailored sector strategies—including playbooks, regulatory guidance, and mapped use cases—can help firms understand how to apply AI in context. Innovation sandboxes allow for controlled experimentation in more complex or regulated sectors.

Accessible, productized AI tools lower technical barriers and accelerate uptake. Most SMEs engage with AI through user-friendly, off-the-shelf tools—not by building custom models. These solutions, including pre-trained models and commercial platforms, allow firms to experiment without deep technical investment. More applied professionals who understand both the tools and the business context are needed to bridge the gap between SMEs and AI solutions.

Ecosystem connections, startup collaborations, and trusted intermediaries strengthen adoption outcomes. Firms with stronger networks—whether with startups, accelerators, or peer SMEs—tend to advance more quickly in AI adoption. Trusted intermediaries helped companies identify solutions, assess risks, and navigate available support. Partnerships with startups can be effective in bringing in flexible, targeted AI applications aligned with sector-specific needs.

The findings underscore that while SME interest in AI is growing, adoption remains a gradual process shaped by both firm-level readiness and broader ecosystem conditions. There is no one-size-fits-all approach: recognizing the variety of factors influencing adoption is essential, as the challenges SMEs face along the adoption path are often multilayered and complex.

1. Introduction

Unlocking the potential of AI: Opportunities and challenges for SMEs

Multiple studies assert that AI adoption holds the potential to unlock major gains in productivity and economic growth around the world. AI adoption is forecasted to add €600 billion to Europe's economy by 2030.[1] In the US, AI adoption could boost GDP growth by 0.4 percentage points and productivity by 1.5 percentage points annually over a decade.[2] In Canada, the use of generative AI could boost national productivity by 1% to 6% in the span of a decade,[3] contribute up to $187 billion[4] annually to the Canadian economy by 2030, and save workers 125 hours per year.[5] However, estimates and projections should be viewed with caution, as they commonly rely on specific assumptions about the pace of adoption, the success of implementation, and future economic conditions.

For companies, these high-level figures translate into tangible operational gains—essential for staying competitive in an increasingly complex environment. The versatility of AI applications can strengthen SMEs' competitive advantage through a diverse array of integration paths. Adopting AI can streamline internal operations, reduce manual workloads, accelerate data analysis and enhance strategic decision-making.[6] Beyond efficiency gains, adopting AI can also assist in designing new products and services, and can help mitigate the complexities of scaling operations.

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[1] https://www.aboutamazon.eu/news/job-creation-and-investment/ai-adoption-forecast-to-unleash-600-billion-growth-in-europes-economy

[2] https://www.goldmansachs.com/insights/articles/ai-may-start-to-boost-us-gdp-in-2027

[3] https://businessdatalab.ca/wp-content/uploads/2024/05/Prompting_Productivity_Report_May_2024.pdf

[4] All figures in this report are in Canadian dollars, unless otherwise stated.

[5] https://news.microsoft.com/en-ca/2024/06/04/new-report-highlights-how-generative-ai-can-transform-canadas-future-with-a-potential-to-add-187b-to-the-canadian-economy-by-2030/

[6] https://www.bcg.com/publications/2025/from-buzz-to-bottom-line-cost-reductions-using-genai

There is evidence of a rapid increase in private sector exposure to AI around the world. For example, a survey conducted across 101 countries noted a rise in the share of organizations where employees reported using AI in at least one business function, reaching 78% in mid-2024, up from 55% in 2023. The most common applications were found in marketing and sales, product and service development, service operations, software engineering, and IT.[7] While the study did not assess company-wide adoption, the findings highlight the broad reach of AI into day-to-day activities.

But international studies point to adoption being an uneven and complex process, with widespread experimentation not necessarily meaning deeper integration. A survey conducted across Asia, Europe, and North America found that companies are struggling to capture business value from AI: while 98% of companies surveyed were experimenting with AI, only 26% have moved beyond pilot projects, and just 4% were truly leveraging AI at scale.[8] Similarly, a study focused on US companies[9] found that while some activity or interest in AI is widespread, only 1% of company leaders believed that they had integrated AI into their operations to a point of "maturity", which is defined in this report as full integration into workflows and supporting significant business outcomes.[10] Differences in the pace of AI adoption across sectors have also been documented, with knowledge-intensive sectors such as IT, finance, legal, and professional and technical services showing a clear lead over capital- and labour-intensive sectors.[11]

Importantly, there is evidence that smaller firms face notable disadvantages in AI adoption compared to larger firms. Extensive international reviews confirm that while both SMEs and large firms see AI's potential value to business operations, SMEs struggle with financial constraints, organizational resistance, system complexity, and skill shortages.[12] [13] Furthermore, large firms can spread AI costs over larger sales volumes more easily than smaller firms, reducing unit costs. Moreover, larger companies can typically offer more competitive salaries helping them attract and retain talent, crowding out smaller firms in a competitive labour market. International survey findings examined in the context of this report show a strong positive correlation between firm size and AI adoption, with larger firms not only more likely to adopt AI but also to implement multiple AI technologies.[14]

The differences in AI adoption between sectors and between SMEs and large firms — and how to account for them when designing public policies — remain an active and evolving topic of discussion. Contributing to this conversation, this report explores AI adoption by SMEs across different sectors, focusing on Canada and the experiences of its three national AI institutes—Mila, Amii, and Vector. The report also highlights lessons from program engagement that can inform future strategies in Canada and beyond. And finally, while the focus of this report is the Canadian context grounded in the institute's on-the-ground experience, the report also examines broader G7 use case studies to provide additional context and demonstrate points of cohesion in experiences.

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[7] https://www.mckinsey.com/capabilities/quantumblack/our-insights/the-state-of-ai. The survey was conducted in July 2024 and included 1,491 participants across 101 countries, covering diverse regions, industries, and company sizes.

[8] https://web-assets.bcg.com/a5/37/be4ddf26420e95aa7107a35aae8d/bcg-wheres-the-value-in-ai.pdf. Based on a global survey of 1,000 senior executives across 59 countries in Asia, Europe, and North America

[9] Conducted in late 2024, the survey included 3,613 employees and 238 C-level executives, mostly from the US (81%) and from Australia, India, New Zealand, Singapore, and the United Kingdom. Most findings focus solely on US workplaces.

[10] https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/superagency-in-the-workplace-empowering-people-to-unlock-ais-full-potential-at-work

[11] https://www.oecd.org/en/publications/the-adoption-of-artificial-intelligence-in-firms_f9ef33c3-en/full-report/executive-summary_161ab6ac.html#execsumm-d1e124-7cf2a601e7

[12] https://www.sciencedirect.com/science/article/pii/S2444569X25000320

[13] https://www.tandfonline.com/doi/full/10.1080/00472778.2024.2379999#

[14] https://www.oecd.org/en/publications/the-adoption-of-artificial-intelligence-in-firms_f9ef33c3-en/full-report/executive-summary_161ab6ac.html#execsumm-d1e124-7cf2a601e7

Key definitions informing this report

Guiding definition of an SME for this report

This report adopts the commonly used Canadian definition of SMEs as businesses with fewer than 500 employees.[15] While this serves as a guiding standard throughout the report, we recognize that definitions vary across jurisdictions. Accordingly, data presented from different regions may be based on differing SME criteria.

Furthermore, this report focuses primarily on AI adoption by established businesses (operating for several years), as opposed to startups (often defined as newly established businesses).16 While startups are not strictly excluded from the analysis, the report acknowledges that the challenges in AI adoption faced by these two types of companies differ.

Stages of AI adoption: the company's perspective (demand side)

There are multiple frameworks to describe AI adoption reflecting different purposes and perspectives.[17] Some frameworks provide practical roadmaps to guide implementation while others use maturity models that assess progress in areas such as technical readiness, organizational capability, or business transformation. These take a demand-side perspective on AI adoption focusing on companies as users of AI. It should be acknowledged that these models simplify the AI adoption journey and suggest a somewhat linear progression. However, not all firms follow this path. For instance, businesses (such as startups) may be built from the outset around leapfrog or unprecedented uses of AI, bypassing certain stages of the model. A synthesis of common elements is presented below.

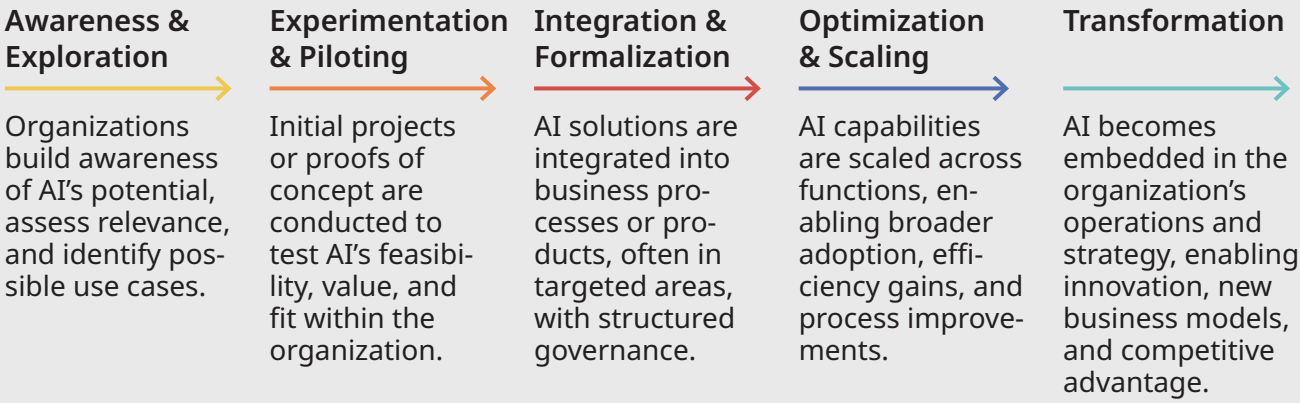
AI adoption is not a linear process. Instead, companies occupy different positions along a spectrum shaped by the complexity and scope of AI use, the diversity of business objectives, and their level of digital maturity. In terms of complexity, SME adoption ranges from basic use of off-the-shelf tools (e.g., automated note-taking or LLM-based assistants) to advanced, customized solutions (e.g., AI agents for market analysis trained on proprietary data). In terms of scope, adoption may be narrow and task-specific (e.g., AI for translation) or broad and enterprise-wide, supporting multiple functions through systems that manage information, coordinate workflows, or automate interdepartmental processes. A firm's level of digital integration further influences its position on this spectrum—determining the types of AI tools to adopt, their efficacy and the speed at which AI adoption progresses.

[15] https://ised-isde.canada.ca/site/sme-research-statistics/en/key-small-business-statistics/key-small-business-statistics-2024#notes

[16] https://www.bdc.ca/en/articles-tools/entrepreneur-toolkit/templates-business-guides/glossary/start-up

[17] Models reviewed by authors: McKinsey & Company, Boston Consulting Group, Gartner, Microsoft, Vitrine AI Québec, The Global Partnership on Artificial Intelligence, and The AI Adoption Initiative.

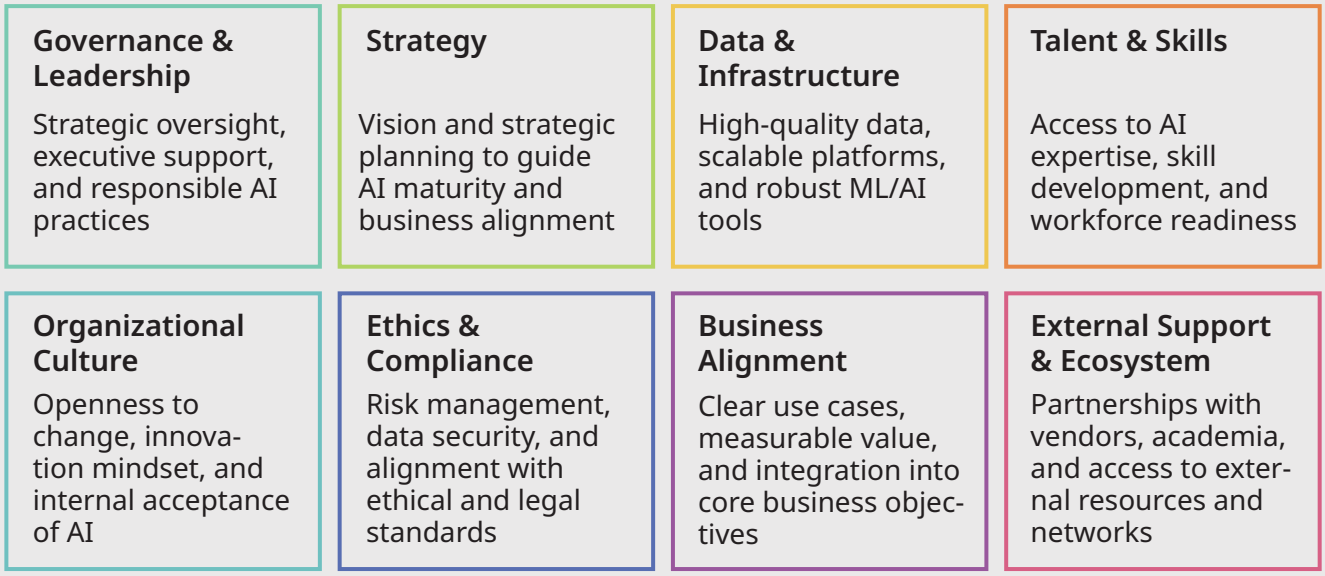
Figure 1. Common stages of AI adoption identified across AI adoption frameworks



Source: Synthesis of common elements across frameworks by McKinsey & Company, Boston Consulting Group, Gartner, Microsoft, Vitrine AI Québec, The Global Partnership on Artificial Intelligence, and The AI Adoption Initiative.

Conceptual frameworks also commonly refer to company-level foundations or enablers of AI adoption within companies. For example: governance, data readiness, infrastructure, skilled talent, and an organizational culture that supports innovation.[18]

Figure 2. Common foundations or enablers for AI Adoption across conceptual frameworks



Source: Synthesis of common elements across frameworks by Boston Consulting Group, The Global Partnership on Artificial Intelligence, Vitrine AI Québec, and Godadaw Ayinaddis (2025).

[18] Frameworks analysed by: Boston Consulting Group, The Global Partnership on Artificial Intelligence, Vitrine AI Québec, and Godadaw Ayinaddis (2025).

Technology components of AI adoption (supply side)

Understanding AI adoption also requires recognizing a supply-side perspective, meaning a focus on the tools that are available to companies. It is also helpful to acknowledge that AI is not a single, unified technology but rather a stack of interconnected layers that collectively enable its functionality. A recent publication offers a helpful illustration, highlighting three key layers.[19]

To some extent, the tools and solutions relevant to any given SME are also tied to its level of digital maturity. For instance, having experience with the adoption and deployment of new software can facilitate the process of adopting AI tools. Likewise, a firm's history of data gathering practices can help determine which AI tools to adopt and plays a crucial role in honing AI models to specific business needs.

Figure 3. An illustration of the three layers of the "AI stack"

AI Applications	Off-the-shelf AI apps like chatbots use LLMs for tasks like coding and content creation. They require little technical knowledge and are already boosting business productivity.
AI Tooling	AI tooling lets users customize generative AI with their data and external models, enabling fine-tuning, advanced features, and regulatory compliance.
Compute Infrastructure	Compute infrastructure provides the power and tools to build foundation models, mainly used by advanced firms with strong engineering and data resources.

Source: Synthesis of Ouimette et al. (2024). *AI everywhere, all at once: A new policy agenda for AI success through faster adoption*. The AI Adoption Initiative. https://adopt-ai.org/wp-content/uploads/2025/04/AIAI_0325_AI-Everywhere-All-At-Once_Updated-Final.pdf

[19] https://adopt-ai.org/wp-content/uploads/2025/04/AIAI_0325_AI-Everywhere-All-At-Once_Updated-Final.pdf

2. SME AI adoption across the G7

2.1 Overview of G7 SME AI adoption data

The 2024 *G7 report on driving factors and challenges of AI adoption and development among companies, especially micro and small enterprises*, highlighted AI's potential for innovation and resilience. However, that report also noted barriers including high costs, limited skills, and low awareness. The 2024 report stressed the need for support mechanisms and inclusive policies to unlock the benefits of AI.[20] A year later, how far has AI adoption come? This section offers an overview of recent national-level data on AI adoption by SMEs across G7 countries, with a focus on official sources, where available (excluding Canada, which is examined in greater detail in the following section).

Although international data are not directly comparable,[21] AI adoption by SMEs varies significantly across G7 countries, yet certain common patterns emerge. In **Germany**, 2024 data showed AI adoption rates of 16.9% among small SMEs (10–49 employees) and 28.2% among larger SMEs (50–249 employees). In **France**, the figures were 8.5% and 14.5%, respectively, while in **Italy**, they stood at 6.9% and 14.7%. The **EU-27** average was 11.2% and 21.0%.[22] Across the three EU countries examined, adoption is most common in information and communication industries while sectors such as construction and hospitality report lower uptake.[23]

[20] https://www.g7italy.it/wp-content/uploads/FINAL_REPORT_AI_MSMEs_Ministerial_10_Oct_2024.pdf

[21] Comparing AI adoption across the G7 is challenging due to differences in how surveys define and measure adoption, with some taking a broad view that includes casual use of tools like language models, and others requiring formal integration into business processes. Variations in scope, firm-size categories, sectoral coverage, and sample sizes further complicate comparisons. Given these inconsistencies, the figures presented offer illustrative rather than harmonized insights and should be interpreted with caution.

[22] https://ec.europa.eu/eurostat/databrowser/view/isoc_eb_ai/default/table?lang=en

[23] https://ec.europa.eu/eurostat/databrowser/view/isoc_eb_ain2/default/table?lang=en

In **Japan**, a 2025 survey found 16% of SMEs using AI with a stronger uptake in the service sector.[24] 2024 surveys reported adoption rates between 17.3% (for generative AI)[25] and 24%, with 35% of firms planning to adopt AI in the near future.[26]

In the **UK**, a 2023 survey reported adoption rates of 8% among smaller SMEs (10–49 employees) and 10% among those with 50–149 employees,[27] while a 2024 report indicated higher rates—23% for firms with 10–49 employees and 26% for those with 50–249 employees.[28]

In the **US**, data from early 2024 showed adoption rates of 3.4% among firms with 10–19 employees and 4.8% among those with 100–249 employees.[29] It is worth noting that non-government sources have reported higher AI adoption rates, between 20% and 40%, largely due to methodological differences.[30] Across sources, AI use in the US is most common in information and professional services with lower adoption reported in fields like construction and hospitality.

Based on national sources reviewed, adoption tends to be higher among larger companies and in knowledge-intensive sectors. Barriers to AI adoption are also similar across sources reviewed and include high implementation costs, limited skilled personnel, uncertainty about returns, financial constraints, operational complexity, and concerns about privacy or the perceived relevance of AI to the business.

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[24] https://global.rakuten.com/corp/news/press/2025/0129_01.html

[25] https://english.kyodonews.net/news/2024/08/0f9dfc1d0b1e-less-than-20-of-japanese-firms-using-generative-ai-survey.html

[26] https://www.reuters.com/technology/artificial-intelligence/more-than-40-japanese-companies-have-no-plan-make-use-ai-2024-07-17

[27] https://www.ons.gov.uk/economy/economicoutputandproductivity/productivitymeasures/articles/managementpracticesandtheadoptionoftechnologyandartificialintelligenceinukfirms2023/2025-03-24

[28] https://www.britishchambers.org.uk/wp-content/uploads/2024/07/BCC_PERTEMPS_REPORT_FINAL.pdf

[29] https://www.census.gov/library/working-papers/2024/adrm/CES-WP-24-16.html

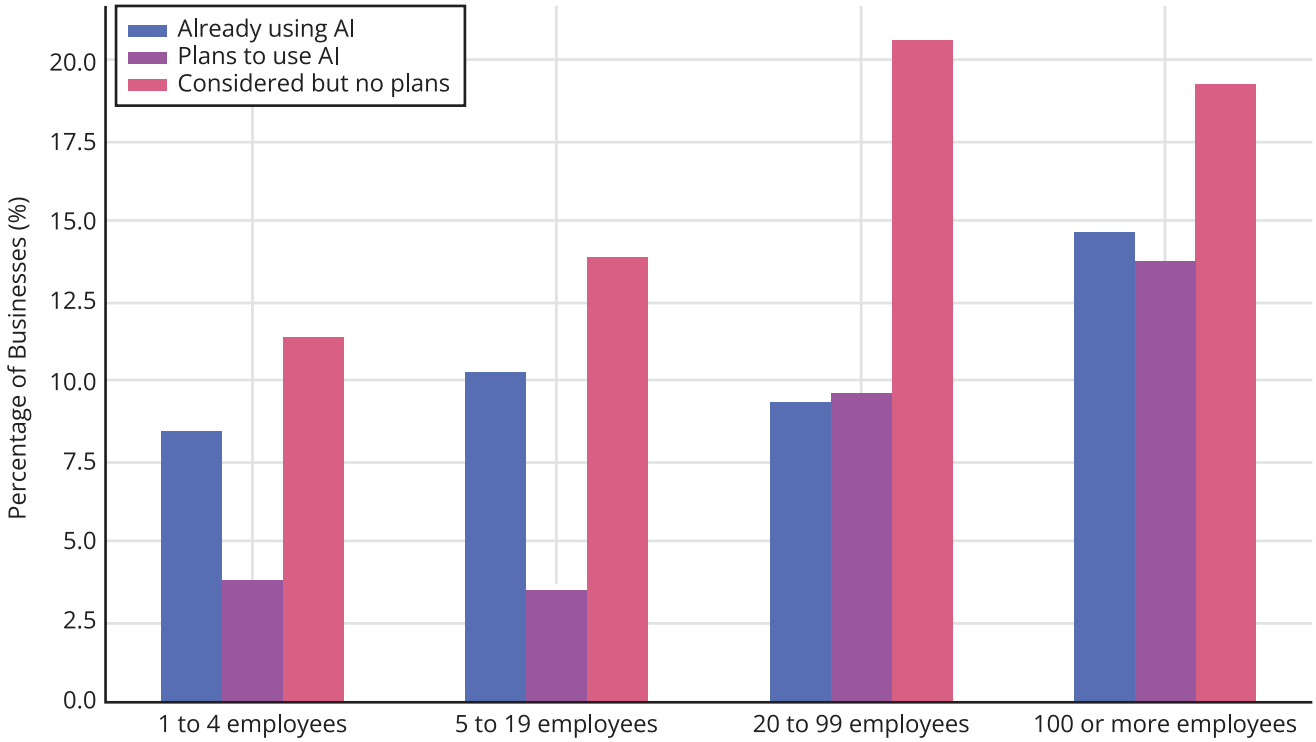
[30] https://www.federalreserve.gov/econres/notes/feds-notes/measuring-ai-uptake-in-the-workplace-20240205.html

2.2 Canada in-depth: SME AI adoption and the road ahead

AI adoption in Canada by SMEs has increased in recent years, but there is still a road ahead to widespread and deep integration. Observing the usage of software and hardware using AI, a 2023 survey found that uptake among companies with 0 to 19 employees rose from 1.7% in 2019 to 5.9% by 2023.[31] Companies with 20–99 employees followed a similar trend with adoption increasing from 3.5% in 2019 to 8.0% in 2023. But a 2024 survey asking about businesses using AI for producing goods or delivering services—this question suggesting a high level of AI integration—shows lower uptake: 5.9% (1-4 employees) 6.3% (5-19) and 6.4% (20-99).[32] These two surveys refer to adoption of AI in broad terms without any specificity.

In contrast, surveys examining generative AI[33] specifically show a faster pace of adoption. According to a 2024 survey 8.5% of the smallest firms (1–4 employees) were using generative AI, increasing to 10.3% among firms with 5–19 employees and 9.4% among those with 20–99 employees. The highest adoption rate was reported by large enterprises (100+ employees) at 14.7%.[34] The same survey also showed highest adoption by information and cultural industries (24.1%) followed by professional, scientific and technical services (18.8%), and finance and insurance (16.9%). Sectors such as construction and accommodation and food services report lower adoption rates, at around 5% to 6%.[35]

Figure 4. Generative AI use in Canada increases with firm size (first quarter of 2024)



Data source: Statistics Canada. (2024). *Canadian Survey on Business Conditions: Business's use of Generative AI.* https://www150.statcan.gc.ca/t1/tbl1/en/cv.action?pid=3310078401

[31] https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=2210011701

[32] https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3310082501

[33] Generative AI creates content from user prompts by predicting likely outputs based on large training datasets. https://www.canada.ca/en/government/system/digital-government/digital-government-innovations/responsible-use-ai/guide-use-generative-ai.html#toc-2

[34] https://www150.statcan.gc.ca/t1/tbl1/en/cv.action?pid=3310078401

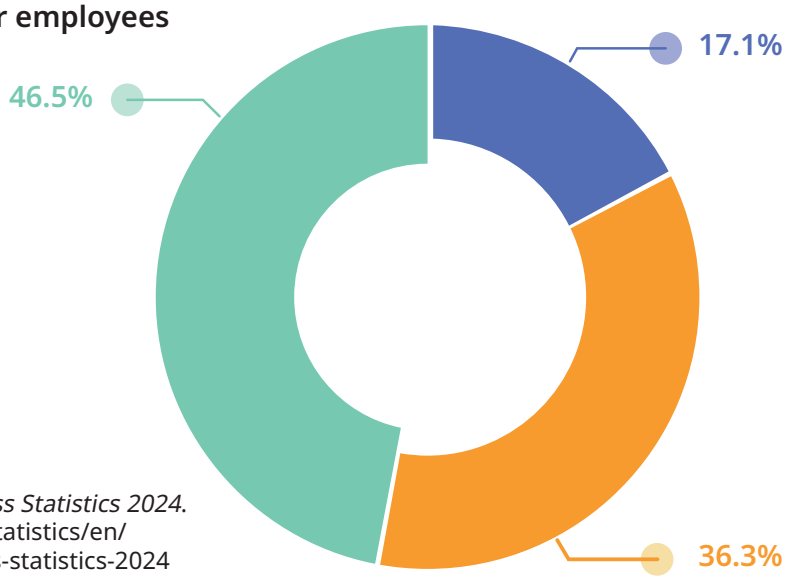
[35] https://www150.statcan.gc.ca/t1/tbl1/en/cv.action?pid=3310078401

The urgency of meeting SMEs needs in AI adoption

SMEs are a cornerstone of the Canadian economy. SMEs employ over 7.9 million people—more than 63% of the private labour force—and contribute significantly to job creation. SMEs also made up 38.2% of Canada's goods export value in 2023. Economically, SMEs contributed nearly half of Canada's private-sector GDP in 2021—small-enterprises generating 34.4% and medium-enterprises 13.9%, respectively.[36]

Figure 5. Distribution of private sector employees by business size in 2023

46.5%	Small-enterprises (1-99 employees)
17.1%	Medium-enterprises (100-499 employees)
36.3%	Large businesses (500+ employees)



Source: Innovation, Science and Economic Development Canada. (2025). *Key Small Business Statistics 2024.* https://ised-isde.canada.ca/site/sme-research-statistics/en/key-small-business-statistics/key-small-business-statistics-2024

Although SMEs play a vital role in the economy, they face important productivity challenges. Across various measures, smaller firms tend to innovate less than larger ones[37] due to barriers like limited technical skills, challenges in hiring qualified talent, or constrained access to financing. SMEs have also been observed to underutilize technologies like automation, advanced ICT tools, and fibre-optic internet, limiting their digital transformation potential.[38] Furthermore, productivity is particularly low in sectors such as agriculture, hospitality, retail trade, construction, and personal services, which have a high concentration of employment in SMEs.[39]

Given these challenges, advancing AI adoption among SMEs emerges as a critical strategy to boost productivity. A 2024 study estimates that generative AI could enable SMEs to generate up to $100 billion in annual economic gains by 2030—driven by labour productivity and the development of new products and services.[40] These gains could translate into sector-specific impacts: by 2030, generative AI could drive annual gains of $17 billion in the finance sector, $14 billion in government, $11 billion in healthcare, and $8 billion in natural resources.[41] However, other projections are more sober,

[36] https://ised-isde.canada.ca/site/sme-research-statistics/en/key-small-business-statistics

[37] https://www.desjardins.com/qc/en/savings-investment/economic-studies/canada-disruptive-innovation-sme-oct-16-2023.html. Referring to product, process, organizational, and marketing innovation, as well as R&D activity and IP ownership

[38] https://www.desjardins.com/qc/en/savings-investment/economic-studies/canada-disruptive-innovation-sme-oct-16-2023.html

[39] https://www.desjardins.com/qc/en/savings-investment/economic-studies/canada-disruptive-innovation-sme-oct-16-2023.html

[40] https://news.microsoft.com/en-ca/2024/06/04/new-report-highlights-how-generative-ai-can-transform-canadas-future-with-a-potential-to-add-187b-to-the-canadian-economy-by-2030/

[41] https://www.microsoft.com/en-us/industry/microsoft-in-business/wp-content/uploads/sites/28/2024/06/Canadas-Generative-AI-Opportunity-White-Paper-FINAL-English.pdf

acknowledging the significant uncertainties that remain. For instance, a June 2025 OECD [41B] analysis of G7 economies projects that AI's contribution to annual labour productivity growth could range from as low as 0.2 percentage points to 1.3 percentage points over the next decade, depending heavily on the pace of adoption and a country's sectoral composition. This wide variance in potential outcomes underscores the urgent imperative to move beyond simply tracking adoption metrics and toward a deeper understanding of its specific barriers and enablers in order to help realize the technology's greatest economic impact. Equally important is distinguishing between different types of AI adoption and the underlying business objectives, as not all use cases may deliver comparable results.

While AI offers promising solutions to productivity challenges such as task automation, demand forecasting, and efficiency gains, Canadian SMEs also report multiple corresponding barriers including high costs, data requirements, data privacy concerns, and limited technology awareness. Furthermore, a recent survey among SME owners found that barriers for AI adoption are more likely to affect smaller, older firms and businesses in rural areas.[42] A 2024 survey found that the main reason why SMEs do not plan to use AI is because they thought the technology not relevant for their business, followed by lack of knowledge of AI capabilities, finding AI not mature enough, concerns about privacy or security, and high costs.[43] Sectoral gaps in AI readiness have also been documented, which may impact SMEs. A 2024 report highlighted that health, public services, and education, for example, face technology infrastructure and data challenges; manufacturing, retail, and real estate lag in technology investment and skills; while natural resources and agriculture show low skills readiness and low current AI adoption levels.[44]

Canada's AI programs for SMEs supporting productivity and innovation

The Canadian government is implementing a range of initiatives designed to promote responsible AI use, boost productivity, and strengthen the country's competitiveness. The following does not provide an exhaustive list of all Canadian programs. The focus is on recent nationwide initiatives, as this report emphasizes country-level perspectives. In fall 2024, Canada launched two SME-focused programs: the Regional Artificial Intelligence Initiative (RAII) and the AI Assist Program.[45] RAII will invest $200 million over five years through regional development agencies to support SME-led projects in sectors such as agriculture, clean tech, life sciences, and manufacturing. The RAII program offers interest-free repayable funding for businesses and non-repayable contributions for non-profits, prioritizing commercialization, ecosystem development, cybersecurity, and sustainability.[46] The $100 million AI Assist Program, supports innovative SMEs developing or integrating generative AI and deep learning by funding research, product develop-

[41B] https://www.oecd.org/en/publications/macroeconomic-productivity-gains-from-artificial-intelligence-in-g7-economies_a5319ab5-en.html

[42] https://www.bdc.ca/en/about/analysis-research/the-ai-imperative-for-canada-entrepreneurs

[43] https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3310087901. Considering an average for companies with fewer than 100 employees.

[44] https://thoughtleadership.rbc.com/wp-content/uploads/GenAI-Report-EN.pdf

[45] https://www.canada.ca/en/innovation-science-economic-development/news/2024/10/federal-government-launches-programs-to-help-small-and-medium-sized-enterprises-adopt-and-adapt-artificial-intelligence-solutions.html

ment, and testing.[47] In spring 2025, an AI Compute Access Fund was launched with $300 million to help SMEs in life sciences, energy, and advanced manufacturing access high-performance computing, covering up to two-thirds of eligible costs.[48]

In December 2024, the Business Development Bank of Canada (BDC) launched its Data to AI Program to help Canadian small and medium-sized enterprises (SMEs) adopt artificial intelligence (AI), improve productivity, and enhance competitiveness by offering tailored guidance, training, and financing to support digital transformation—including AI integration, automation, and cybersecurity. The program includes tools to raise awareness and create structured roadmaps for implementation and provides expert assessments of business needs, personalized advice, and access to partnerships.[49] The program also offers preferential-rate financing with flexible terms.[50]

In 2017, Canada launched the Pan-Canadian Artificial Intelligence Strategy (PCAIS), the world's first national AI strategy, with a first phase aiming to strengthen AI talent and global research competitiveness.[51] In its second phase, the strategy focuses on commercialization by helping businesses apply AI; standards, by developing regulations and guidelines; and further developing talent and advancing research by training researchers and expanding computing resources.[52] In parallel, Canada's federal government funds Canada's Global Innovation Clusters, which help drive innovation in five sectors through activities that support ecosystem growth, commercialization, talent development, and SME scale-up: digital technology, protein industries, advanced manufacturing, Scale AI and ocean.[53] The Scale AI Cluster, one of five clusters across the country, uses AI to build smarter supply chains across sectors, helping businesses improve efficiency, predict demand, and boost sales. Such activities support start-ups, offer end-to-end assistance, promote AI skills training, and run programs in industry projects, business acceleration, workforce development, and global promotion.[54]
The 2024 Fall Economic Statement provided additional funding to support commercialization activities under the PCAIS. This includes $150 million over three years for the Global Innovation Clusters (starting in 2024–25) and $24 million over two years for the National AI Institutes (starting in 2025–26) to support ongoing AI commercialization efforts.[55]

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[46] https://www.canada.ca/en/economic-development-quebec-regions/financing-services/regional-artificial-intelligence-initiative.html

[47] https://www.canada.ca/en/innovation-science-economic-development/news/2024/10/federal-government-launches-programs-to-help-small-and-medium-sized-enterprises-adopt-and-adapt-artificial-intelligence-solutions.html

[48] https://ised-isde.canada.ca/site/ised/en/canadian-sovereign-ai-compute-strategy/ai-compute-access-fund

[49] https://www.bdc.ca/en/about/mediaroom/news-releases/bdc-launches-data-ai-program-help-canadian-businesses-adopt-artificial-intelligence-boost-productivity-and-competitiveness

[50] https://www.bdc.ca/en/consulting/data-ai-program

[51] https://ised-isde.canada.ca/site/ised/en/public-consultations/securing-canadas-ai-advantage-foundational-blueprint

[52] https://ised-isde.canada.ca/site/ai-strategy/en

[53] https://ised-isde.canada.ca/site/global-innovation-clusters/en

[54] https://ised-isde.canada.ca/site/global-innovation-clusters/en/canadas-ai-powered-supply-chains-cluster-scale-ai

[55] https://budget.canada.ca/update-miseajour/2024/home-accueil-en.html

2.3 Canada's AI institutes support for AI adoption

About the national AI institutes

In 2021, the Canadian government launched the second phase of the Pan-Canadian Artificial Intelligence Strategy to boost responsible adoption and commercialization, linking top research with real-world impact. As part of this phase, the government allocated funding to Canada's national AI institutes to support the commercialization of AI research and help businesses adopt AI technologies.[56]

Canada's national AI institutes support SMEs through three main program areas: applied project and R&D support, training and AI literacy, and advisory and research consultations. Applied support includes hands-on collaboration through internships, residencies, and applied research projects that help companies develop AI solutions, generate IP, and integrate new talent. Training programs build organizational AI capacity through foundational courses, executive education, and sector-specific seminars. Advisory and research consultations guide businesses in identifying AI opportunities, validating project feasibility, and connecting with researchers and experts to tailor solutions to their needs.
Collectively, the institutes work with companies across most Canadian provinces as well as internationally. Their programs serve a wide range of sectors, but with a concentration coming from technology, healthcare, financial services, manufacturing, biotechnology, professional services, and energy, among others.

Since 2021, the institutes have supported more than 2,150 companies through their programs, including around 199 companies via applied projects and R&D support, more than 1,490 through training and AI literacy, and 468 through advisory and research consultations.

Through their SME support programs, Canada's national AI institutes have demonstrated that SMEs successfully leverage AI to develop new products, improve offerings, and streamline operations—often advancing from proof-of-concept to production-ready solutions. Many SMEs achieve internal efficiencies such as cost savings and better decision-making. Corresponding support programs provide technical mentorship, help build in-house AI capacity, and support talent development. Canadian SMEs are also connected to funding, networks, and commercialization support on account of these programs.

[56] https://www.canada.ca/en/innovation-science-economic-development/news/2022/06/government-of-canada-launches-second-phase-of-the-pan-canadian-artificial-intelligence-strategy.html

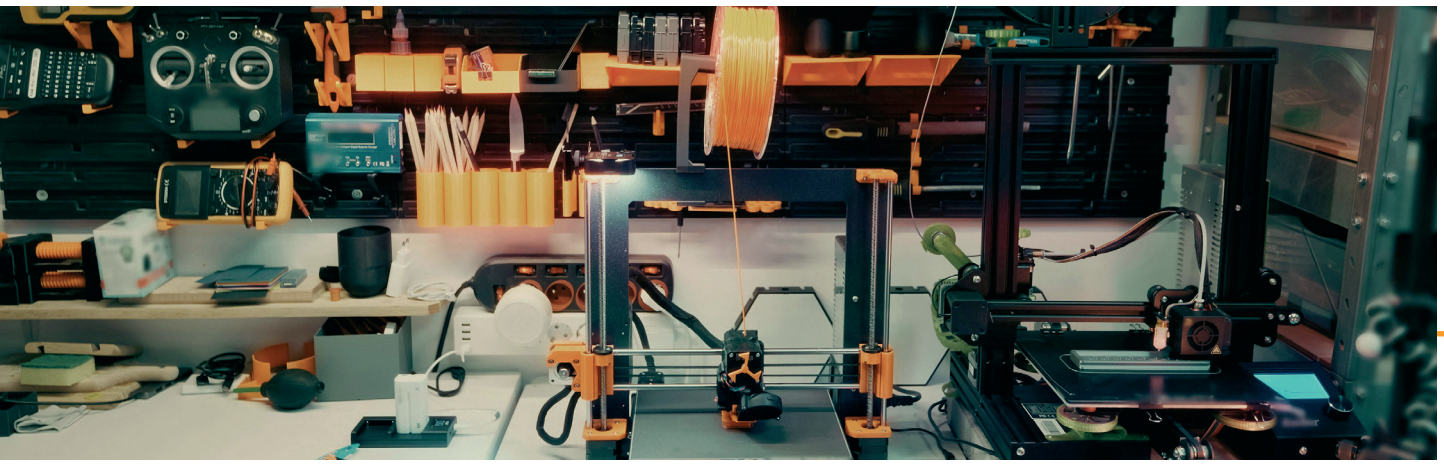
A growing diversity of AI solutions sought by SMEs and the need for tailored support

SMEs from a rapidly growing range of sectors are now turning to Canada's three AI Institutes for support. For example, in the **entertainment** sector, deep learning is being used to enhance the cinematic experience through AI models that analyse audio and visual cues in films and automatically control haptic theater seats—delivering precisely timed movements that create a more immersive experience for audiences. In the field of **mental health**, a company is applying AI to explore the therapeutic potential of music by analyzing emotional and neurological responses. Their efforts have led to AI-driven music recommendations tailored to individual needs and supported the development of non-invasive treatments, with clinical trials showing outcomes comparable to medication.

Beyond consumer applications, the institutes have helped SMEs develop highly technical and specialized uses of AI. In **architecture**, a company is using generative AI tools to make home design and renovation more accessible by allowing users to create floor plans without specialized expertise. In **IT** services, a company has used AI to develop an anomaly detection model that boosts operational efficiency and customer satisfaction. In **health**, a company has fine-tuned large language models to create advanced clinical transcription tools, supporting the development of AI-powered physician assistants. In **pharmaceuticals**, a company is leveraging AI grounded in biological data to reduce costs, accelerate product development, and grow its client base. In **wealth management**, a company uses generative AI to summarize large volumes of investment reports, resulting in important time savings.

AI applications are also making inroads into resource-intensive industries. In upstream **oil & gas**, a production-optimization firm is partnering with a national AI institute to build a reinforcement learning system that scales its existing AI platform. The goals are to boost well efficiency and output, cut operating costs, and reduce methane emission events through real-time data analysis and more precise autonomous well control. Further, in collaboration with a national AI institute, a company developed a computer vision system for precision **agriculture** to improve yield forecasting and resource management. The system detects crop rows from imagery and estimates plant density per square foot, enabling more accurate yield models and targeted use of inputs like water and fertilizer.

The broad range and diversity not only in sector, but in type of application and solutions required demonstrate that one-size-fits all solutions are rarely what is required by SMEs. As interest and adoption grows, SMEs will continue to require tailored solutions that meet not only their goals but their levels of readiness.



3. G7 case studies and lessons learned

This section examines a selection of case studies from G7 countries, showing the AI adoption journey of SMEs through a standardized lens covering the problem or opportunity before AI adoption, the AI solution(s) implemented and the approach, outcomes and impact, and challenges encountered. The following table presents an overview of all case studies, while an expanded version of each is found in the Annex of this report.

The Canadian case studies were chosen by the national AI institutes to showcase the dynamics of their SME support programs. Three main criteria guided the selection of case studies. First, cases with a focus on productivity and operational gains, to highlight tangible outcomes of AI adoption (such as cost reduction) that can be easily understood and applied across companies. Second, experiences of established SMEs with several years of operation, ensuring that lessons are relevant to companies at various stages of digital transformation and AI integration. Third, diversity of industries, to illustrate the applicability of AI across a broad range of Canadian economic sectors. Information on the experiences was provided by the national AI institutes and the featured companies.

Case studies from other G7 countries were submitted by national ministries. Each country provided select examples of SME AI adoption—some are documented in publicly available websites, while others were collected and shared by the ministries. Some case studies are anonymized.

While the limited scope of this exercise does not capture the full national picture for any one G7 country, it offers valuable insights into real-world conditions faced by SMEs, the versatility of AI applications and the ingenuity of companies in leveraging technology to meet their goals. The cases span diverse sectors, including agriculture, manufacturing, and services, and reveal practical ways AI is driving transformation.

The limitations of the case study methodology are acknowledged. Each case reflects unique circumstances, and given the small sample size, the lessons obtained can be illustrative but not necessarily transferable to all contexts.

Country / Company	Problem or opportunity before AI adoption	AI solution implemented and approach	Outcomes and impact	Challenges encountered
CANADA Kuva Canada Inc. Develops methane detection technologies for the oil and gas sector.	Improve methane detection accuracy, reduce false positives, cut operational costs, and build in-house AI capabilities.	Partnered with Amii to integrate Machine Learning (ML) into platform; Amii helped scope opportunity, recruit ML resident, and provided scientific guidance. Collaboration ensured technical integration, knowledge transfer, and business alignment.	Zero false positives during testing (METEC verified); improved operational efficiency; creation of in-house AI capability; AI resident hired full-time.	Data labeling challenges; domain knowledge transfer needs.
CANADA Nolinor Aviation Specialized charter airline, serving remote and international destinations.	Manual processing of safety reports and investigations was resource-intensive.	Partnered with Mila to develop a two-phase AI system: Large Language Model (LLM) to process reports and apply risk matrix; agentic AI for investigations; human-in-the-loop design.	Reduced manual input from 40 hours to 5 hours; improved report quality; launched CIRRUS Intelligence spin-off.	Needed to structure operational data; Mila had to learn aviation-specific workflows.
CANADA PAVE AI Provides AI-powered vehicle inspections for the automotive sector.	Vehicle Identification Number (VIN) and odometer reading extraction required 20 full-time staff and was error-prone; off-the-shelf tools only achieved 55% accuracy.	Partnered with Vector Institute; collaborated with 4 Machine Learning (ML) associates to build custom VIN and odometer models using proprietary data.	Achieved 98% accuracy; eliminated manual data entry; improved turnaround times; all 4 ML associates hired full-time.	Leadership initially lacked AI understanding; data readiness required extensive labeling.
EUROPEAN UNION: SPAIN ENKI TECHNOLOGIES, S.L. Hydroponic farming technology.	Manual strawberry harvesting in hydroponics was labour-intensive, inefficient, and prone to damage.	Developed robotic strawberry harvesting system with AI-based perception (YOLO models), automated trajectory planning, sensor-driven gripper, ultrasonic feedback, monitoring dashboard. Collaboration with DIH4CAT for development and testing.	30% reduction in labour costs; 95% detection accuracy; 20% lower damage rate; 2-year estimated Return on Investment (ROI); improved scalability and crop quality.	Hardware limitations in robotic gripper; lighting variation affecting AI; fruit occlusions affecting detection.
EUROPEAN UNION: CROATIA RIS d.o.o. Business software solutions including enterprise resource planning (ERP) and procurement platforms.	High volume of routine support queries overwhelmed staff, causing delays, inconsistency, and lack of 24/7 service.	Developed AI-powered digital assistant using Retrieval-Augmented Generation (RAG) and LLMs; trained on internal FAQs/manuals; features auto-classification, intelligent retrieval, AI-drafted responses, dashboard; built with Python and Streamlit. Collaboration with EDIH Adria.	50-60% reduction in manual workload; 70% faster responses; 40% fewer escalations; 24/7 availability without extra hires; improved customer satisfaction.	

Country / Company	Problem or opportunity before AI adoption	AI solution implemented and approach	Outcomes and impact	Challenges encountered
FRANCE Company I Techbio company focused on precision oncology, offering an AI platform for genomic data integration and analysis to accelerate cancer research and drug development.	Enable scalable analysis of multi-source, multi-omic cancer data; reduce manual reannotation time; improve clinical development success rates; enhance research efficiency.	Developed an AI-powered clinical data harmonization module for large-scale multi-omics analysis. AI mimics human curation for quality assurance and integrates diverse data sources.	Compressed manual reannotation from days to minutes; enabled analysis of 4x more datasets; harmonized over 95,000 patient profiles; expected to double clinical trial success rates.	Infrastructure deployment; model performance stability; cost management; recruitment of interdisciplinary AI/ML/oncology team; explainability to users; secure patient data handling.
FRANCE Company K Specializes in climate and energy engineering, particularly in Heating, Ventilation, and Air Conditioning (HVAC) systems for the perfumery, cosmetics, and fragrance industries, offering patented energy and pollutant solutions.	Integrate AI into HVAC systems for predictive maintenance and energy optimization, reducing costs and increasing equipment lifespan.	Developed AI models for predictive maintenance and energy efficiency using real-time monitoring and dynamic adjustments, adaptable across industrial and tertiary markets.	Reduced unplanned repairs by up to 40%; cut energy use by a mid-teen percentage; extended equipment lifespan; enabled expansion into new markets.	Required deep technical expertise in AI and HVAC; needed adaptable models; limited resources for development and infrastructure.
FRANCE Company R An intellectual property (IP) consultancy serving diverse sectors with services in patents, trademarks, and legal support, integrating AI to optimize internal operations.	Streamline internal IP processes like patent drafting and trademark registration through automation; maintain quality, accuracy, and confidentiality.	Built an AI conversational assistant using OpenAI's application programming interface (API) with custom prompt workflows; integrated into internal systems via low-code platforms for automation.	Halved drafting time and administrative effort; doubled throughput per engineer; supported revenue growth without increasing headcount.	Cultural and process changes; integration with legacy systems; ensuring transparency and regulatory compliance.
GERMANY Bremskerl Reibbelagwerke Emmerling GmbH & Co. KG Specialist in friction materials.	Manual optical inspection of brake pads was time-consuming and dependent on skilled workers.	AI-supported camera-based quality control using classification, object detection, segmentation; compact camera system with Nvidia hardware; YOLO models for defect detection. Collaboration with Mittelstand-Digital Innovation Hub Hannover and IFW for feasibility study and model development.	83.5% accuracy detecting inclusions; 74.8% accuracy detecting optical anomalies; processing under 1 second/image; improved objectivity, efficiency, and scalability in quality control.	

Country / Company	Problem or opportunity before AI adoption	AI solution implemented and approach	Outcomes and impact	Challenges encountered
GERMANY DeltaTest GmbH Service company in non-destructive material testing using eddy current and ultrasonic methods.	Manual evaluation of pipe testing measurement data was slow, prone to fatigue-related errors.	Developed AI-based classification of measurement signals; used convolutional neural networks (CNNs) and MiniROCKET; trained on labeled defect datasets; based on cross-industry standard process for data mining methodology (CRISP-DM). Collaboration with Mittelstand-Digital Innovation Hubzentrum Hannover for AI model development.	CNN detected/classified up to 97% of defects; MiniROCKET detected 96% of defects; improved inspection quality and speed; identified additional defects not in original labels.	
ITALY R-tree technologies Developer of information/ knowledge management solutions	Leveraging all of a company's technical research & development (R&D) can be difficult without efficient information management systems.	R-tree developed a solution called BoK (Branches of knowledge) to convert an engineering and design studio's technical R&D knowledge into accessible information. This was achieved through training generative AI and augmented reality 3D modeling on previous R&D results.	The client was able to make the knowledge from an R&D project a stable and accessible digital asset, even years after the project was completed. The perceived value of R&D services increased.	
JAPAN TOHSHINPARTNERS HOLDINGS CO., LTD. Real estate planning, development, sales, and management company.	Needed to achieve early leasing and improve operational efficiency; aimed to reduce vacancy periods and enhance security.	Developed 'IntelliRent' AI model from past lease data; created in-house text generation AI ('ChatTPG') using Azure OpenAI; integrated cloud services (Box) and zero trust security; acquired Internet of Things (IoT) vendor for smart locks.	Reduced average vacancy period by 11 days; annual idle loss reduction ~47 million yen; rent increases; secure use of generative AI; reduced IT management costs; seamless service access; entry into new markets via mergers & acquisitions (M&A).	
JAPAN Higuchi Manufacturing Co., Ltd. Manufacturer of metal press parts.	Limited visibility into operations of manual equipment and into production data hindered efficiency and responsiveness.	Developed internal portal for company-wide data sharing; 'Check Master' system for equipment automation; 'Hawk AI' for manufacturing feasibility from 3D drawings; 'Lai-ser' AI to communicate production/maintenance precautions.	Reduced 8,100 hours/ year of labour; productivity per employee increased from 2.12M JPY/day (2022) to 2.85M JPY/day (2024); reduced customer audit time by 40%; defect count down from 3.59/month to 0.79/ month; defect loss ratio reduced from 0.79% to 0.46%.	

Country / Company	Problem or opportunity before AI adoption	AI solution implemented and approach	Outcomes and impact	Challenges encountered
UNITED KINGDOM S4C Welsh public broadcaster	Faced with fragmented audience data across platforms. S4C sought to gain clear, actionable insights to inform their content strategy: engage younger, digital-native Welsh speaking audiences.	With support from UK government funded AI accelerator programmes, S4C developed an AI-powered analytics tool using ChatGPT, Replit, and a retrieval-augmented generation (RAG) system to consolidate and interpret audience and competitor data. Using deep insights provided by blending fragmented data sources the AI tool enables data-driven decisions about youth content strategy. Complex data can now be presented visually via an intuitive interface accessible to non-technical teams.	Engagement increased and the board committed to developing a proof of concept. S4C plans to refine Welsh language data processing, test the tool with content teams, and explore partnerships to extend its impact across the Welsh media sector.	
UNITED KINGDOM Drax Group Renewable energy company	Drax operates a generation portfolio of biomass, hydro-electric and pumped hydro storage assets across four sites in England and Scotland. Monitoring and maintenance of such equipment is complex and constant.	By partnering with Aveva, Drax deployed an AI predictive analytics tool for tracking operational behaviour and forecasting faults in equipment.	Upon deployment, the tool uncovered issues including potentially serious faults which would have caused a 4-week unplanned stop. Resolving these issues preventively prevented negative impacts on operations.	
UNITED STATES OF AMERICA Eventus Advisory Group	Drafting technical accounting memos was a time-consuming and challenging task, often requiring significant effort to be both technically accurate and clear.	Eventus Advisory Group developed a specialized bot to draft technical accounting memos. They used their existing body of memos and applied Retrieval-Augmented Generation (RAG) to prepare the data for analysis by a large language model (LLM). This involved dividing the memos into smaller, focused «chunks,» which were then vectorized and stored in a vector database, as well as extensive “fine-tuning” with highly specific examples to minimize risks of model hallucination. A human in the loop reviews and corrects the memos as needed.	The time required to draft an accounting memo was reduced from a four-hour task to a 30-minute task. The AI model also served as an introduction to AI for many employees.	The project was a highly customized implementation that required approximately 60 hours of work from an internal AI expert. Cost of development and the need for a specific skill set to create such a solution were also noted as challenges.

3.1 Key lessons learned

This section synthesizes key lessons learned from G7 case studies, identifying both enablers and barriers to AI adoption by SMEs. While these insights are illustrative rather than universal, they aim to contribute to the broader understanding of factors driving AI adoption and inform effective scaling approaches.

This discussion was also informed by perspectives from Canada's three national AI institutes and specifically their experiences supporting Canadian SMEs. Their observations draw on program data, documentation, and qualitative insights. A collective assessment was formed by identifying common themes through a survey followed by a validation and consensus working session. Although national AI institutes have supported a broad range of SMEs, their experiences may not fully represent the full diversity of SMEs in Canada, but rather show perspectives from three organizations who have built and adapted programs for this specific purpose since 2021.

These findings are complemented by perspectives from five subject matter experts in industry, technology, and public policy, offering additional insights on AI adoption and further context on the SME landscape.

In alphabetical order, with the focus of their perspectives noted in brackets:

Kevin Allison
President at Minerva Technology Futures (technology policy)

Julien Billot
CEO at Scale AI (AI commercialization support)

Ashley Francisco
Head of Accelerator & Startup Ecosystem for Americas at Google (startup ecosystem and technology)

Nicole Janssen
Co-Founder & Co-CEO at AltaML (applied AI)

Marc-Étienne Ouimette
Global Lead of AI Policy at Amazon Web Services (AI policy)

A. Strong data foundations are essential for AI adoption

Case studies across the G7 showed that high-quality, labeled, and structured data are critical to training accurate and reliable AI models. Several projects invested heavily in data annotation or relabeling to ensure consistency and performance. Domain-specific data preparation directly improved model outcomes. Additionally, some companies emphasized the need to refine datasets over time to reflect variations in environment or usage.

Data readiness can be a challenge for SMEs. Many SMEs either lack usable data or face difficulties preparing it for AI use such as insufficient labeling, poor data quality, or challenges in merging data from different sources. While firms may technically own data, the same firms may find that it is often not structured or accessible in ways that support model training and deployment.

B. Firms' attributes such as size, sector or digital maturity influence their AI adoption journey

Knowledge-intensive sectors such as IT, software, health, and financial services tend to lead in AI adoption. Their higher adoption rates flow from an advantage in digital infrastructure, in-house technical expertise, and a culture experienced in adapting innovation into business practice. In contrast, capital- and labour-intensive sectors such as manufacturing, transportation, construction, and agriculture tend to show lower levels of adoption. Challenges in these sectors include legacy systems, limited digital maturity, and a lack of internal AI expertise. These industries often require more tailored external support for greater levels of AI adoption, as they face steeper barriers to integrating new technologies into existing workflows.

Company size can influence adoption patterns as much as the sector it belongs to. Larger firms may pursue advanced or experimental use cases while smaller SMEs gravitate toward more immediate, low-risk applications. Smaller firms often prefer off-the-shelf solutions to minimize risk and cost while larger organizations are more inclined to invest in custom builds aligning with their strategic priorities.

Expert insights 1. How accessible tools are key to SME AI adoption

Marc-Étienne Ouimette, Global Lead of AI Policy at Amazon Web Services, notes that SME engagement with AI is often misunderstood: too much attention is placed on access to raw compute infrastructure, while in reality, most SMEs rely on productized tools and pre-trained models that operate at higher layers of the AI stack. He cautions that focusing policy on the foundational layers (such as compute) risks overlooking how most SMEs actually integrate AI into their business workflows. "The number of organizations or companies, and certainly not SMEs, who access AI through raw compute to then build their own net new models—they are very few," he illustrates.

Kevin Allison, President at Minerva Technology Futures, echoes this view. He described the rise of the "software tooling layer for AI" that allows companies, including SMEs, to leverage AI via increasingly accessible software tools and commercial applications—without necessarily requiring deep technical knowledge. "It's using models that others have trained and using software tools that are becoming more intuitive… to create your own customized AI applications for your business," he explains.

C. Human oversight and phased rollouts build trust and reliability

Across G7 case studies it emerged that human oversight and phased rollouts are key to building trust and reliability in AI adoption. Phased implementation helps reduce risk and allows gradual integration into existing workflows, particularly in sensitive domains. Human-in-the-loop approaches were essential in regulated or safety-critical sectors, where expert review and validation of AI outputs ensured accuracy and accountability. In several cases, fallback mechanisms and manual approval were built into AI systems as safeguards, reinforcing trust and maintaining quality control during deployment.

D. Building internal AI capacity requires talent, training, and cross-disciplinary expertise

Across the G7 case studies, projects that built or embedded AI teams reported stronger long-term capacity. Combining technical expertise (e.g., ML, data engineering) with deep domain knowledge (e.g., oncology, HVAC systems, IP law) was essential for success. Training, communication, and talent retention were ongoing challenges, particularly in niche or complex sectors.

The lack of AI and data talent is a critical obstacle to AI adoption among SMEs. Companies may face the challenge of having few or no full-time staff with AI expertise—making it difficult to scope projects, evaluate candidates, or manage implementation of AI projects. SMEs also have to contend with intense competition for skilled talent, as larger tech companies often outcompete smaller firms in attracting and retaining AI professionals. Skills gaps can delay progress or force SMEs to rely heavily on external support.

Embedding AI talent directly within SMEs through internships, residencies, or collaborative projects, as in some Canadian experiences with the national AI institutes, can be a solution. These approaches can help deliver immediate results and create talent pipelines that support internal longer-term team development.

Expert insights 2. Aligning talent development with practical needs

When considering the talent requirements to support wider AI adoption, Mr. Ouimette favours large-scale training of applied professionals through micro-credentialing and college programs.

Mr. Allison emphasizes the need to consider cultivating a broader set of skills that includes applied, domain-specific knowledge and digital fluency, highlighting “AI-adjacent” roles—professionals who can connect business needs with available tools without building models from scratch. “You can think of it as training someone to be an AI craftsman—someone who understands how different, commercially available tools can best be used to solve specific problems, almost like an AI technician,” he explains.

Offering a perspective on organizational culture, Nicole Janssen, Co-Founder & Co-CEO at AltaML, points to the need for culturally ready teams and practical training at all organizational levels. “If you can’t get an organization truly educated, truly online, bought into the vision of becoming an AI-forward organization, then your adoption stops right there,” she adds.

E. AI literacy is essential for organizational alignment

Low AI literacy among leadership and staff often hinders strategic alignment and decision-making. Limited understanding of AI's capabilities and risks can lead to hesitation or unrealistic expectations while better-informed leaders are more likely to prioritize relevant use cases and invest with confidence. As a result, AI adoption can often begin with building foundational literacy and clarifying the AI adoption journey to support more effective engagement. Effective AI literacy programs should engage technical teams and leadership while also influencing broader organizational culture through a combination of knowledge-building and practical training.

F. Clear, practical use cases drive measurable impact

AI adoption was most successful when anchored in narrow, well-defined use cases that addressed real business needs. Focusing on specific tasks—like automated VIN detection, strawberry harvesting, or HVAC fault prediction—helped SMEs demonstrate quick wins and justify further investment. These targeted applications also made it easier to define performance metrics and train relevant datasets.

G. Strong leadership and organizational alignment accelerate AI adoption

Leadership engagement played a critical role in securing resources, aligning teams, and guiding change management. Projects benefited when leadership understood the potential of AI, communicated clearly with staff, and promoted a culture of experimentation. Internal adoption was smoother when cross-functional teams were aligned early, and when staff received adequate training and support to integrate AI into daily workflows.

Organizational and strategic limitations can be major obstacles to AI adoption. Many firms lack a clear AI roadmap, governance structures, or frameworks to assess ROI and manage risk, all of which are factors that limit buy-in and stall progress beyond the pilot stage. These challenges often reflect leadership-level issues with AI frequently treated as an "off-the-side-of-the-desk" task rather than a strategic priority. Cultural barriers may further complicate adoption, as many SMEs lack formal change management processes and face internal resistance including concerns over job loss as AI tools become more accessible.

H. Robust infrastructure, model operations, and technical integration are core to sustainable AI

Sustainable AI adoption requires more than just a working model—it depends on solid technical infrastructure and well-managed machine learning operations (ML Ops). SMEs needed cloud-based systems, continuous performance monitoring, and the ability to retrain or update models as data evolved. Integrating AI tools with existing workflows and platforms (e.g., CRMs, ticketing, or internal data systems) was equally critical to usability and adoption. Over time, models had to adapt to changing operational contexts, such as new data sources, business requirements, or environmental conditions. Designing with scalability, flexibility, and maintainability in mind was essential for long-term success.

SMEs frequently lack access to the compute resources (e.g., cloud services, GPUs) needed for experimentation and scaling. This lack of technical infrastructure restricts their ability to test or refine AI solutions particularly in the absence of dedicated IT teams, typically not found in SMEs.

The high cost of AI infrastructure such as cloud computing, data storage, or specialized software licenses is another common challenge for SMEs. These external requirements can make it prohibitively expensive for SMEs to scale beyond a proof-of-concept particularly when they rely on third-party tools and platforms. Even when cloud credits or subsidies are available, uptake levels by SMEs are often uneven either due to lack of awareness or limited technical capacity or both.

Expert insights 3. Reducing risk and complexity for SME AI adoption

Time, cost, and risk remain major constraints for SMEs when adopting AI, making it essential for support to be tailored to their specific needs. “When you have to build something customized, you need to invest first, and so you have to lower the risk of investment. And that’s where subsidizing—what we do at Scale AI—basically, we subsidize the adoption allowing also the creation of Canadian-owned IP by third party AI service and product providers,” notes Julien Billot, CEO at Scale AI.

Mr. Allison notes that SMEs often lack the time and bandwidth to take on AI projects and emphasizes the need for simple, easy-to-use tools. “Time is a huge challenge. I myself am running a small business…You need to find ways to de-risk the upfront investment of time and resources needed to develop and deploy AI to solve real problems… I need to clearly see value at the end of the tunnel.”

Mr. Ouimette emphasizes that SMEs should begin by leveraging existing tooling and working closer to the productive edge of their capacity, rather than being expected to build new innovations from scratch.

I. Ethics, trust, transparency, and security must be built into AI from the start

Responsible AI adoption requires more than technical performance—it must also ensure ethical use, data protection, and transparency. SMEs working in sensitive fields, such as healthcare or legal services, emphasized the need for explainable AI outputs that users can understand and trust. Regulatory compliance, ethical AI practices, and secure handling of sensitive data were all essential, particularly where client or patient information was involved. Companies used tools like prompting interfaces, workflow documentation, and strict data handling protocols to uphold trust and meet external requirements.

Regulatory and legal uncertainty can be a significant deterrent to AI experimentation especially in sectors like health, finance, and environmental monitoring. SMEs may lack in-house legal expertise to assess compliance risks making them hesitant to deploy AI solutions that interact with sensitive data or regulated processes.

J. Trusted networks and ecosystem connections support SME AI adoption

Particularly in the Canadian experience, it emerged that SMEs without strong networks may find it difficult to connect with AI experts, R&D institutions, or innovation hubs that could help accelerate their projects. Highlighting the value of trusted organizations or advisors who can act as connectors—helping SMEs find the right tools, experts, and programs to move forward with AI more confidently. An accelerated pace of AI adoption by SMEs could stimulate companies to innovate through peer pressure, allowing companies to learn from one another or gain confidence through shared success.

Expert insights 4. Why SME–startup collaboration matters for AI adoption

Ashley Francisco, Head of Accelerator & Startup Ecosystem for Americas at Google, highlighted the important role startups play in accelerating AI adoption among SMEs. Ms. Francisco pointed to successful collaborations where health tech startups are helping pharmacies modernize services, and agri-tech innovators are boosting productivity for small-scale farmers. Such partnerships allow SMEs to adopt AI faster and more effectively by leveraging solutions tailored to their sector needs. “Startups can offer very targeted, adapted, efficient AI solutions and very niche use cases in a way that’s nimble and flexible and personalized—which we know is critically important for SMEs,” she notes.

K. External support and ongoing guidance help SMEs adopt and grow with AI

External support that is tailored to an SME's industry, stage, and specific challenges has greater impact than one-size-fits-all programs. Practical assistance—such as early-stage prototyping, scoping advice, and sector-specific mentorship—helps SMEs define use cases, manage risk, and apply AI meaningfully in their operations. Creating structured opportunities for experimentation through sandbox environments, pilot testing, and prototyping tools enables firms to test and refine AI solutions with minimal risk. Sector-specific guidance, such as practical playbooks, could be especially helpful in orienting SMEs on the technical, organizational, and regulatory steps involved in AI adoption.

Beyond initial implementation, continued support is essential to help SMEs move past the proof-of-concept stage toward scaling and commercialization. This includes access to deployment roadmaps, sustained mentorship, compute infrastructure, ecosystem connections and guidance on commercialization and intellectual property management.

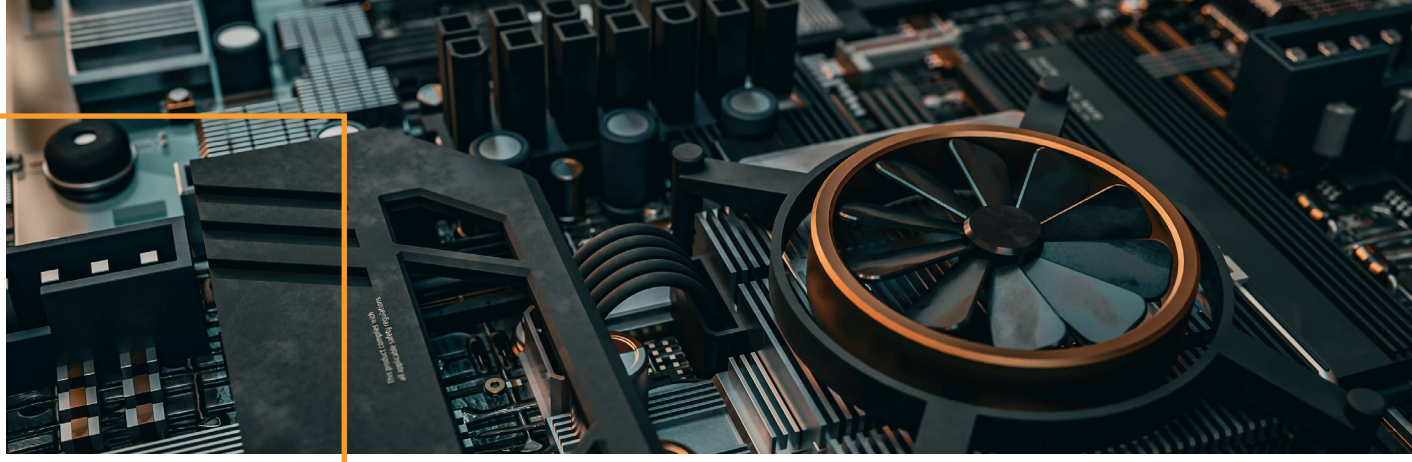
Expert insights 5. Focusing AI adoption on sector needs and tangible business value

Experts highlight the need for tailored, sector-specific strategies rooted in practical realities and measurable outcomes. Mr. Ouimette points to Singapore's Go Digital[57] model as an example of effective targeting, noting how it aligns AI support with both industry and job-specific needs. "What Singapore did really well was the hard work of analyzing individual sectors and mapping out their specific needs. They went further by identifying distinct user personas within each sector and mapped and matched existing AI solutions to each persona. Then they have specific programs to finance or accompany you in adopting those solutions," he explains.

In addition to strategic targeting, experts emphasize the importance of shifting the narrative away from abstract promises toward tangible business value. Ms. Janssen encourages reframing the conversation around present-day priorities: "What are your biggest business challenges right now—and then let's see if AI is the right tool," she explains.

Mr. Billot underscores that the benefits of AI adoption are already visible across sectors. "We see KPI improvements—often 10 to 30%. Gains include better asset use, fewer maintenance issues, time and cost savings, and improved sales. Many strong use cases in demand forecasting, marketing cost optimization, logistics, predictive maintenance, inventory, and warehouse management," he illustrates.

[57] https://www.imda.gov.sg/how-we-can-help/smes-go-digital



4. Conclusions

This report draws on G7 AI adoption case studies, Canada's national AI institutes experiences, and expert interviews to highlight key factors that enable or hinder SME AI adoption. This section summarizes what these different perspectives reveal about a range of common AI adoption enablers (as outlined on Figure 2 earlier in this report). Although based on the experiences of a limited number of SMEs, these lessons offer valuable insights into approaches that have worked in practice. The goal is not to prescribe a single pathway, but rather to expand knowledge on a range of tested, practical support options SMEs can draw on based on their specific needs.

AI adoption enablers: factors that support or limit SME adoption

Governance & Leadership. Strong leadership engagement is critical for effective AI adoption. Engaged leadership is consistently linked to successful AI implementation, playing a vital role in aligning teams, communicating vision, and fostering a culture of experimentation. AI literacy programs can help leadership understand AI's capabilities, enabling better prioritization of use cases, resource allocation, and risk management.

Strategy. Structured support helps SMEs move from vague interest to business-aligned AI strategies. Many SMEs struggle to define use cases, assess returns, or move beyond the pilot phase. Structured guidance—such as scoping sessions, prototyping, or mentorship—can help SMEs identify narrow, high-impact problems and turn them into testable, measurable AI projects.

Data & Infrastructure. Strong data foundations and fit-for-purpose infrastructure are essential, but remain challenging for many SMEs. High-quality, labeled, and structured data are critical to model performance. Yet, SMEs often lack usable or accessible data, face integration issues, or deal with fragmented systems. Infrastructure gaps—such as insufficient compute, limited cloud access, or lack of MLOps capabilities—are major obstacles to experimentation and scaling.

Talent & Skills. Embedded talent programs and applied training help build internal AI capacity. Shortages of technical talent (e.g., ML engineers, data scientists) and limited cross-disciplinary expertise can be major AI adoption barriers. Programs that embed AI professionals—residents, interns, or associates—enable SMEs to de-risk early-stage adoption while building internal capabilities. Experts emphasize the need for "AI-adjacent" roles—practical, applied professionals trained to use commercial AI tools without building models from scratch—supported by micro-credentials and college programs.

Organizational Culture. Openness to change and cross-functional collaboration are key enablers. Organizational readiness—including internal communication, staff training, and trust-building—shapes AI outcomes. Resistance to change, fear of job loss, or lack of change management processes can delay adoption. SMEs should invest in cultural readiness by engaging staff early, aligning cross-functional teams, and delivering practical AI education.

Ethics & Compliance. Ethical practices, regulatory clarity, and trust are essential for responsible AI. Especially in sectors handling sensitive data (health, finance, legal), there is a need for transparent, explainable AI and robust data protection. Human-in-the-loop mechanisms, phased rollouts, fallback systems, and workflow documentation are used to ensure accountability and build trust. Regulatory uncertainty and limited legal expertise can make SMEs hesitant to experiment with AI.

Business Alignment. Clear use cases and measurable outcomes help de-risk adoption and build confidence. Successful projects usually begin with tightly defined problems that align with business priorities—such as cost savings, efficiency gains, or product improvement. Narrow use cases allow for targeted prototyping and performance measurement. Leadership and teams are more likely to invest when AI is positioned as a practical tool to solve immediate business needs.

External Support & Ecosystem. Hands-on support, trusted networks, and tailored programs enable adoption—but access is uneven. SMEs benefit most from support aligned with their industry, maturity level, and needs. Case studies showed that sector-specific mentorship, prototyping support, and commercialization pathways help SMEs move from interest to scaling. Trusted intermediaries, startup partnerships, and ecosystem connectors are vital in helping firms navigate the AI landscape.

The way forward: systemic conditions to support AI adoption

Sector-specific guidance and regulatory support. AI adoption is uneven across sectors. Knowledge-intensive industries (such as IT, health, finance) lead in adoption due to higher digital maturity, while capital- and labour-intensive sectors (such as manufacturing, construction, agriculture) face steeper barriers such as legacy systems and limited internal expertise. Tailored playbooks and sector roadmaps can help firms understand how to structure, pilot, and scale AI while complying with regulations. Innovation sandboxes can create safe spaces to experiment and derive real-world insights.

Support systems that reflect the diversity of SME paths. AI adoption is not a linear process and varies widely by firm size, sector, and digital capacity. Many SMEs use off-the-shelf, productized AI tools rather than building custom models. Others pursue more advanced, integrated solutions. Support systems must reflect this spectrum. Accessible guidance, practical tooling, and applied talent are essential for smaller firms, while more mature organizations benefit from integration and scaling support. Avoiding one-size-fits-all approaches can increase the effectiveness of national programs to support AI adoption.

Scaling talent through applied and cross-disciplinary pathways. The skills gap remains a key constraint. Large-scale reskilling through applied programs—focusing not just on technical roles but also business translators, AI-adjacent professionals, and technicians—can broaden the base of capable AI users. Training must align with business needs, focus on usability, and be accessible at different organizational levels.

Building AI literacy and change readiness at all levels. AI adoption begins with awareness. Low literacy among decision-makers often results in stalled adoption or misguided projects. Organizational readiness requires not only leadership engagement but also staff confidence. Broad-based literacy programs, combined with experiential training, help firms move from passive interest to strategic engagement.

Enabling low-risk experimentation and rapid validation. SMEs are time- and resource-constrained. Policies and support mechanisms must reduce the perceived risk of AI investment. This includes subsidizing prototyping, offering easy-to-use tools, and promoting human-in-the-loop models that allow gradual integration. Demonstration projects and phased rollouts help validate use cases and increase confidence in scaling.

Ecosystem integration and trusted connectors. SMEs often struggle to navigate the AI ecosystem. Trusted intermediaries—startups, accelerators, R&D institutions, and support agencies—play a critical role in matching SMEs with the right tools and experts. Peer learning, trusted networks, and targeted partnerships (e.g., with startups offering sector-specific AI) can boost adoption and help spread best practices.

Supporting SME AI adoption requires balancing diverse approaches to reflect the varying needs of firms across multiple sectors. While tailored, hands-on support delivers strong results, broader AI adoption depends on expanding access through simplified, widely available tools. Some sectors are ready for advanced experimentation while others need foundational support and low-risk entry points. Strategies must also balance the drive for innovation with regulatory and safety considerations. Addressing this diversity—between customization and scale, advanced and accessible tools, experimentation and oversight—highlights the complexity of the challenge.

Annex: Expanded case studies

Canada

Kuva Canada Inc. partnered with Amii to enhance methane detection using AI, reducing false positives, cutting operational costs, and building in-house AI capabilities. The collaboration offered lessons on the importance of data quality, integrating AI talent, and close collaboration between technical and domain experts.

Kuva Canada Inc, a Canadian-American SME founded in 2016, specializes in methane detection technologies for the oil and gas sector. With over 40 employees across Canada and the US, the company developed a patented Short Wave Infrared (SWIR) imaging system and a cloud-based platform to deliver accurate, real-time monitoring of methane emissions. The system overcomes the limitations of traditional thermal imaging, which often produces false positives due to environmental interference like fog, steam, or temperature variation.58

To further improve detection accuracy, Kuva partnered with the Alberta Machine Intelligence Institute (Amii) to integrate machine learning into their platform. Amii supported Kuva through a structured engagement that began with scoping the business opportunity and identifying the talent needed to address the ML problem. A full-time machine learning resident was recruited with Amii's help, then embedded within Kuva for a year-long project, supported by Amii scientists and project managers. This collaboration ensured technical guidance, smooth integration with Kuva's business needs, and strong knowledge transfer.

The project led to significant outcomes: zero false positives during testing confirmed by METEC, an industry-recognized independent testing facility at Colorado State University, improved operational efficiency, and the creation of an in-house AI capability. The resident was hired full-time after the engagement, helping establish Kuva's AI team. Challenges such as data labeling and domain knowledge transfer were addressed through close collaboration between Kuva and Amii.

The collaboration with Amii revealed key lessons for SME AI adoption: integrating AI talent builds internal capacity, quality labeled data is critical, and close teamwork between technical and domain experts ensures practical, effective solutions.

Sources: *Kuva Canada Inc. and Amii.*
https://www.naturalgasworld.com/kuva-systems-harnessing-infrared-imaging-tech-for-monitoring-methane-emissions-gas-in-transition-106560

Nolinor Aviation partnered with Mila to streamline its safety management system using AI, cutting manual effort by up to 80% and improving report quality. The project also led to a new spin-off company and highlighted lessons on phased integration, human-in-the-loop design, and effective industry-research collaboration.

Founded in 1992, Nolinor Aviation is Canada's largest commercial specialized charter airline, serving Quebec, other provinces, the U.S., and global destinations—including remote areas with gravel and ice runways. A leader in aviation safety, Nolinor was the first Canadian airline to implement a Safety

[56] Includes information from: https://www.naturalgasworld.com/kuva-systems-harnessing-infrared-imaging-tech-for-monitoring-methane-emissions-gas-in-transition-106560

Management System two decades ago. Like many airlines, Nolinor has traditionally relied on human evaluation and processing of safety reports and investigations—

a process that remains manual, time-consuming, and resource-intensive. Over the past two decades, as safety culture has strengthened across the aviation industry, the workload for safety departments has significantly increased. As a result, safety investigations and risk analyses now often require anywhere from 5 to over 100 hours of human effort for interpretation, assessment, and documentation. To modernize this workflow, Nolinor partnered with Mila in 2023 on an applied research project using artificial intelligence.

Together, they developed a two-phase AI system. In the first phase, a large language model (LLM) processed employee reports by structuring the information, identifying key details, and applying Nolinor's internal risk matrix to assess potential outcome severity and barrier effectiveness. In the second phase, Mila enhanced the LLM with agentic AI to support full investigations—drawing from flight data, manuals, internal databases, and other sources. The system flags any gaps for human review, maintaining a human-in-the-loop approach critical to safety oversight.

The impact was substantial: what once took 40 hours of manual work now requires only five hours of human input. Investigators can focus on validating and improving reports rather than administrative tasks. The AI enhances—not replaces—human expertise. Based on this success, Nolinor is launching a spin-off, CIRRUS Intelligence, to bring the solution to the wider aviation industry.

The project also faced challenges. Nolinor had to structure operational data for AI use, while Mila needed to understand aviation-specific workflows, which are often implicit within the industry. Months of close collaboration, process mapping, and knowledge sharing helped bridge this gap and translate operational needs into AI-ready solutions.

Key lessons emerged: phased deployment reduced risk, external partnerships accelerated innovation, and human-in-the-loop design ensured trust. Automating low-value tasks maximized human contribution, and the success of the project underscores how local partnerships can drive scalable, globally relevant innovation in safety-critical industries.

Sources: *Nolinor Aviation and Mila.*

PAVE AI partnered with the Vector Institute to build custom AI models for Vehicle Identification Number (VIN) and odometer readings replacing manual work by 20 staff with high accuracy. The project showed the value of engaged leadership, clean data, focused use cases, and hands-on collaboration to hire top AI talent.

Founded in 2017 and based in Toronto, PAVE AI is a fast-growing technology company in the automotive sector, offering AI-first guided vehicle inspections through image-based assessments. A critical part of their intelligence platform involves extracting VINs and odometer readings from customer-submitted photos. Originally, this task required 20 full-time data entry staff and was prone to error. Off-the-shelf computer vision tools tested by the company only achieved 55% accuracy prompting PAVE to seek a more reliable solution using an AI-enabled tool.
Through Vector's program, PAVE collaborated with four machine learning associates (AI talent support) to build two custom AI models: one for VIN detection and the other for odometer readings using the company's proprietary data. The company's new AI-enabled models were in production within just two months. The solution achieved 98% accuracy and eliminated the need for manual data entry, freeing up capacity, reducing costs, and improving turnaround times.

The project addressed some challenges: PAVE's leadership initially lacked a strong understanding of AI capabilities making it difficult to scope the opportunity and align it with strategic goals. The collaboration helped close that gap. Another challenge was data readiness: the company's team needed to label and prepare high volumes of image data. Building an internal annotation pipeline necessa-

ry to address data readiness ultimately became a valuable byproduct of the project. Furthermore, through refinement exercises, the company clarified key technical challenges and identified high-impact AI use cases aligned with business goals and data readiness.

A major outcome of the collaboration for PAVE was talent acquisition. With limited in-house AI expertise, PAVE had struggled to evaluate and recruit technical talent. Working with machine learning associates (MLAs) enabled the company to evaluate both technical compatibility and team dynamics. By the end of the project, all four MLAs were hired full-time allowing PAVE AI to confidently build a core AI team while minimizing the typical risks associated with new hires.

The experience offered multiple lessons: clear use cases, clean data, engaged leadership, and hands-on collaboration are key to successful AI adoption in an SME context. Furthermore, PAVE's experience with the national AI institute demonstrates how structured support and immersive talent development help SMEs scale AI with confidence.

Sources: *PAVE AI and Vector.*

EUROPEAN UNION MEMBERS (summaries of original materials)

Spain's ENKI TECHNOLOGIES' HARVBot automates strawberry harvesting with 95% accuracy, cutting labour costs and advancing agri-tech.

ENKI TECHNOLOGIES, a Spanish micro-SME, collaborated with the Digital Innovation Hub of Catalonia (DIH4CAT) to develop HARVBot, a robotic system for automating strawberry harvesting in hydroponic farming. Aimed at addressing labour shortages and inefficiencies in manual harvesting, the solution integrated AI-driven perception, precision grippers, real-time monitoring, and advanced motion planning. The system achieved 95% detection accuracy, reduced fruit damage by 20%, and cut labour costs by 30%. Beyond operational gains, the project advanced ENKI's digital maturity, fostered agri-tech innovation, and promoted sustainable farming. Challenges such as lighting variability and fruit occlusions led to key lessons for improving future implementations, including better datasets and hardware adaptability. HARVBot demonstrates the transformative potential of AI and robotics in precision agriculture.

Source: *https://european-digital-innovation-hubs.ec.europa.eu/knowledge-hub/success-stories/harvbot-automated-robotic-solution-strawberry-harvesting-hydroponics*

Croatia's RIS d.o.o. deployed an AI assistant to automate support, cutting workload, speeding replies, and enabling 24/7 service while boosting SME digital maturity.

RIS d.o.o., a Croatian SME offering business software, partnered with the European Digital Innovation Hub Adriatic Croatia (EDIH Adria) to pilot an AI-powered digital assistant that automated customer support using Retrieval-Augmented Generation (RAG) and Large Language Models (LLMs). Trained on internal FAQs and support data, the assistant classified emails, retrieved relevant answers, and drafted responses, integrating seamlessly with existing workflows via a Streamlit-based interface. The solution cut manual workload by 50–60%, sped up responses by 70%, reduced escalations, and enabled 24/7 support without added staff. It also improved customer satisfaction, operational efficiency, and digital maturity, while highlighting key lessons on data quality, human oversight, and integration planning for broader AI adoption among SMEs.

Source: *https://european-digital-innovation-hubs.ec.europa.eu/knowledge-hub/success-stories/ai-powered-digital-assistant-customer-support*

FRANCE (summaries of original materials)

I developed an AI-powered multi-omics platform that accelerates cancer research by harmonizing large-scale genomic data for precision oncology.

I, a small techbio enterprise, created an AI-driven platform to streamline cancer R&D by aggregating, normalizing, and analyzing vast amounts of multidimensional genomic data from diverse sources. Designed to support precision oncology, the platform enables researchers to drastically reduce the time required for reannotating clinical data—from days to minutes—and enhances biomarker discovery through the harmonization of over 95,000 patient profiles. It integrates AI to mimic and augment human curation, driving faster insights and improving the likelihood of clinical trial success by up to threefold. Despite its success, I faced major hurdles: deploying the platform at scale required building robust infrastructure, managing costly ML operations, ensuring data security, and improving model explainability for biologists and pharma clients. Recruiting and retaining a multidisciplinary team added further complexity. With over €2M invested over 30 months, the platform quadrupled research throughput and enabled deeper collaboration across hundreds of partners—offering transformative value to cancer science and immuno-oncology drug development.

Source: *Ministry of Economics, Finance and Industrial and Digital Sovereignty of France.*

K applied AI to HVAC systems for predictive maintenance and energy efficiency, unlocking major cost savings and new market opportunities.

K, a French SME serving energy-intensive industries like perfumery and cosmetics, launched an AI and IoT-enabled project to enhance the efficiency and reliability of HVAC systems. The AI solution predicts system failures and energy overconsumption in real time, helping clients shift from reactive to predictive maintenance and reducing downtime, repair costs, and energy use. The system also adapts dynamically to different environments and seasonal usage, extending equipment life and supporting regulatory compliance. Key challenges included developing AI models that could handle varied HVAC configurations, advancing algorithms to adapt to changing operational conditions, and delivering results without heavily relying on new hardware. Despite resource constraints, K completed the project in 36 months with a budget under €500k. The initiative reduced unplanned repairs by up to 40%, cut energy use by mid-teen percentages, and extended equipment lifespan—while enabling expansion into tertiary building markets and projecting single-digit annual revenue growth.

Source: *Ministry of Economics, Finance and Industrial and Digital Sovereignty of France.*

R deployed a conversational AI assistant to automate IP workflows, boosting productivity and enabling scalable, tech-driven client service.

R, a mid-sized IP consultancy firm, developed an AI assistant to streamline core operations like patent drafting and trademark filings. Built using OpenAI's API and enhanced with a tailored prompt library, the assistant automates complex tasks while preserving legal accuracy and confidentiality. The firm focused on ensuring the AI system integrated with existing platforms, building user trust through transparency, and aligning with AI regulations. Organizational change management was central: employees received targeted training, leadership championed the tool's supportive role, and feedback loops refined prompt engineering. The low-code integration approach minimized disruption while embedding the AI into real workflows. Within 24 months and under €500k in costs, the assistant cut administrative workloads by up to 40%, halved turnaround times for drafting, and doubled case throughput per engineer. The freed-up capacity enabled R to grow revenue without increasing headcount and reinvest in high-value advisory services—bolstering client satisfaction and competitive advantage.

Source: *Ministry of Economics, Finance and Industrial and Digital Sovereignty of France.*

GERMANY (summaries of original materials)

BREMSKERL piloted AI-based quality control for brake pads, boosting defect detection and efficiency while reducing manual effort.

BREMSKERL, a mid-sized manufacturing company, implemented an AI-powered quality control system to optimize its brake pad production process. The project aimed to reduce manual inspection efforts and enhance product quality through automated AI-supported image recognition of friction surfaces. The prototype confirmed the feasibility of using AI for reliable defect detection, improving objectivity and consistency in quality assurance. This approach not only helps address a skilled labour shortage by automating repetitive tasks but also positions the company for greater innovation and competitiveness in the manufacturing sector. A feasibility study showed that AI-powered image processing can enhance brake pad quality control, detecting defects with over 83% accuracy and processing images in under a second, boosting efficiency and easing skilled labour demands.

Sources: *https://dp-plattform.de/view/index.php?p=projekt&page=851*

https://www.ifw.uni-hannover.de/de/institut/news-und-veranstaltungen/news/aktuelles-detailansicht/news/qualitaets-kontrolle-fuer-bremsbelaege-ki-unterstuetzt

DeltaTest automated pipe defect detection with AI, achieving 97% accuracy and improving speed and reliability.

DeltaTest GmbH, a specialist in non-destructive material testing, undertook a project to automate defect detection in pipe testing using AI-based classification of eddy current measurement signals. Traditionally reliant on time-intensive manual analysis by experts, the process was optimized by developing two AI models—CNNs and MiniROCKET—that could identify and classify material defects with up to 97% accuracy. The project involved extensive data labeling, preprocessing, and the transformation of time series data into image formats for classification. The AI models demonstrated robust performance, even with unseen data, and proved effective in detecting both internal and external defects. The solution significantly reduces manual effort, minimizes error rates from fatigue, and enables faster, more reliable inspections. This project highlights how AI can strengthen quality assurance, lower costs, and enhance competitiveness for SMEs through scalable, automated analysis of measurement data.

Source: *https://digitalzentrum-hannover.de/praxisbeispiele/ki-basierte-klassifikation-von-messsignalen-zur-materialpruefung/*

ITALY (translation of original material)

R-Tree Technologies has developed a solution called BoK (Branches of Knowledge) to make the technical R&D knowledge of a client, an engineering and design studio, accessible to their end-user client.

This was accomplished using Generative AI and 3D modeling in augmented reality. The solution allowed the client to communicate the value and distinctive competencies applied during the R&D process for a new concept car in an innovative way. This was achieved through the use of web-based 3D graphics connected to the BoK knowledge management system.

The solution addresses several key challenges:

- Providing simple, conversational access to the entire knowledge base related to R&D activities for the new concept car.
- Using web 3D technology to navigate both the exterior and interior of the concept car, making the content accessible through any standard browser.
- Allowing the end client to interact with the R&D knowledge both conversationally, by asking questions in natural language via a cognitive chatbot based on Generative AI, and visually, by interacting with the 3D model in real time with simple clicks.
- Interactively communicating all the technical skills, innovative solutions, materials, and style choices that were applied in the concept car, highlighting the added value provided by the client throughout the R&D process.
- Enabling the end client to independently access all the details and knowledge developed and applied in the R&D project.

The business impact of this solution includes:

- The client improved the accessibility of their R&D knowledge and skills to their own clients through Generative AI.
- The client was able to make the knowledge from an R&D project a stable and accessible digital asset, even years after the project was completed.
- The client increased the perceived value of their R&D services by making their distinctive competencies available in a structured, visual, and conversational way, which also ensured consistency in the storytelling over time.

***Source**: Competence Industry Manufacturing 4.0 and the Ministry of Enterprises and Made in Italy.*

JAPAN (summaries of original materials)

Toshin Partners optimized real estate leasing with in-house AI and cloud tools, reducing vacancy times and achieving significant annual savings.

Toshin Partners Holdings Co., Ltd. implemented AI and cloud technologies to optimize leasing operations in real estate. Through the "IntelliRent" project, the company developed an in-house AI model using historical lease data to propose optimal rental conditions, cutting property vacancy periods by 11 days and reducing idle losses by approximately 47 million yen annually. The company also created a proprietary generative AI tool ("ChatTPG") using Azure OpenAI, introduced cloud storage (Box), adopted zero-trust security architecture, and unified authentication systems for seamless access. Strategic M&A enabled internal smart lock development, paving the way for new market opportunities in IoT-based services.

***Source:** Ministry of Economy, Trade and Industry (METI) of Japan.*

Higuchi Manufacturing used in-house AI tools and centralized data to automate factory operations, cutting labour time, reducing defects, and boosting productivity and responsiveness.

Higuchi Manufacturing Co., Ltd. leveraged AI and data integration to automate and enhance factory operations. It developed several in-house AI systems including "Check Master" for equipment automation, "Hawk AI" for assessing manufacturing feasibility via 3D drawing analysis, and "Lai-ser" to relay production and maintenance alerts to staff. Company-wide data was centralized through an

internal portal, enabling real-time information sharing and data-driven decisions. Results included an annual labour time reduction of 8,100 hours, a 40% cut in customer audit response time, reduced defect rates, and improved productivity per employee. These gains were reinvested into skill development and creative work, boosting overall performance.

Source: *Ministry of Economy, Trade and Industry (METI) of Japan.*

UNITED KINGDOM

Drax Group plc, one of the top producers of low carbon electricity in the UK, leverages AI to enhance operational reliability.

Drax partnered with Aveva which is a British technology consulting company that offers its clients enhanced reliability with AI driven predictive maintenance. They deployed a predictive analytics tool for tracking operational behaviour and forecasting faults in equipment. Upon deployment, the tool uncovered issues including potentially serious faults which would have caused a 4-week unplanned stop. This was promptly resolved to prevent impacts on operations.

Source: *UK's Department for Science, Innovation & Technology*

S4C,a Welsh language public broadcast channel, leveraged AI to enhance data analytics and internal information dissemination to boost strategic decision-making.

S4C is a Welsh language public broadcast channel who were aiming to engage younger, digital-native Welsh speaking audiences. Faced with fragmented audience data across platforms they sought to gain clear, actionable insights to inform their content strategy.

Via access to an AI expert on the accelerator programme, S4C developed an AI-powered analytics tool using ChatGPT, Replit, and a RAG system to consolidate and interpret audience and competitor data. Using deep insights provided by blending fragmented data sources the AI tool enables data-driven decisions about youth content strategy. The tool presented insights via an intuitive interface, making complex data accessible to non-technical teams.

By presenting AI insights visually instead of technically executive engagement increased and the board committed to developing a proof of concept. S4C plans to refine Welsh language data processing, test the tool with content teams, and explore partnerships to extend its impact across the Welsh media sector.

Source: *UK's Department for Science, Innovation & Technology*

UNITED STATES of AMERICA

Eventus Advisory Group, based in Memphis, Tenn., provides financial services, including fractional CFO and controllership roles, to private and small-to-midsize public companies. To address the time-consuming and technically demanding task of drafting accounting memos, the company created a specialized AI solution.

The firm often needed to produce these memos, which require a high level of technical detail and clear, understandable writing, making them an ideal candidate for AI automation. The solution involved using a technique called retrieval-augmented generation (RAG) to prepare the firm's existing collection of accounting memos for analysis by a large language model (LLM). This process broke the memos into smaller, topically focused chunks, which were then vectorized and stored in a vector database. The final bot, powered by OpenAI's Assistants API platform, can access this content to generate coherent and contextually relevant responses. The team also fine-tuned the bot with hundreds of examples and instructions to reduce the possibility of AI hallucination.

The AI solution has had a significant impact, reducing the time it takes to create an accounting memo from four hours to just 30 minutes, which includes careful human review. The project was a highly customized implementation that required about 60 hours of work and specialized expertise. Despite the upfront investment of time and cost, the memo bot proved to be a win for the firm. The success of this project as well as the presence of AI expertise has led the company to create other task-specific AI models. However, the expert noted that such a custom project may not be a cost-effective solution for all organizations, as it requires a specific skill set and can be a costly undertaking.

Source: *https://www.journalofaccountancy.com/issues/2025/jun/real-life-ways-accountants-are-using-ai/*