Bridging the Imagination Gap

How Canadian companies can become global leaders
in AI adoption

As artificial intelligence comes of age, Canada finds itself at a crossroads. While we possess world-class research and a robust talent pool, the country is falling behind as global competitors race ahead in AI adoption. The core challenge is not a lack of technology or talent, but a pervasive "imagination gap"—a widespread inability among Canadian businesses, especially small and medium-sized enterprises (SMEs), to see AI as relevant or beneficial to their operations. Only 12% of Canadian firms have integrated AI into their production or services, placing Canada among the lowest in AI adoption in the OECD. Data from the OECD also shows that Canadian firms tend to explore a more limited set of use cases for AI than other nations.

And yet, the upside is clear. A recent Business Development Bank of Canada survey revealed that 97% of AI-adopting SMEs reported 'tangible' benefits. And Statistics Canada data showed that AI's impact on task reduction is particularly pronounced in companies with fewer than 100 employees—underscoring significant potential for SMEs. The issue was also high on the agenda at the G7 in Kananaskis, Alberta, where leaders committed to "double down" on AI adoption efforts to improve prosperity.

To better understand why Canadian businesses have been so slow to adopt AI, RBC Thought Leadership partnered with the University of Toronto's Munk School of Global Affairs & Public Policy and conducted more than two dozen in-depth interviews with senior business, public service and technology leaders in Canada. Here's what we learned about the barriers that companies, both big and small, are facing. And some lessons from organizations that have taken the challenge of AI adoption head-on.

1. First-Mover Dilemma: Certain Costs, Uncertain Benefits

Some companies that have been slow to adopt AI are locked in inertia. The costs associated with AI adoption are immediate and tangible, while the benefits seem distant and notional. For chief technology officers, AI initiatives carry fixed, up-front financial costs, as well as reputational costs if the project fails. But, as some of the leaders we spoke with recognized, late adoption carries the risk of lagging behind quick-moving competitors. It's a double-edged sword: move early and risk losing scarce capital and personnel resources; move late and risk competitive disadvantage.

Several technology leaders noted that these uncertainties frequently stall approvals by six to 12 months. Adding to that, they expressed frustration that Canadian industry leaders often failed to clearly perceive the benefits competitors were already achieving through AI. Technology developers even cited achieving greater success pitching their AI solutions to U.S.-based divisions of Canadian companies than their domestic counterparts.

To navigate these obstacles, successful AI transformation leaders recommended clearly quantifying AI investments by contrasting the costs of immediate action versus the cost of inaction. Tools such as 'cost of delay' dashboards help clarify the opportunity costs of not acting sooner.

Bell Canada: Overcoming Inertia Bias

When GPT 4 burst onto the scene in early 2023, Bell's directors wanted to know *immediately* what waiting to implement might cost them. Within weeks, the AI Group President convened two board level tutorials and unveiled 'cost of delay' analysis that contrasted lost productivity with the modest price of pilot projects. The numbers were decisive: capital to fund AI applications was released the same quarter. Real time speech analytics now mines 100% of the firm's 50,000 daily customer calls, surfacing friction points that were previously buried in anecdotal samples. This has enabled AI voice and chat agents to handle inquiries with greater accuracy.

Cultivating a 'culture of entrepreneurship and experimentation' has also allowed Bell to grow innovative AI use cases from the bottom up, developing novel AI applications that vastly improve communication processes, workflows and customer satisfaction.

2. AI Literacy: Moving from Apprehension to Opportunity

Whether it's a fear that AI is coming to take their jobs or just a lack of understanding of its benefits, Canadians are skeptical of AI. One recent KPMG study found that 79% of Canadians are concerned about negative AI outcomes. And it's estimated that less than one-in-four Canadian employees have received AI training. Simply put, most Canadians haven't engaged sufficiently with AI to demystify it.

While having an AI champion in the corner office or a single business unit dedicated to experimentation and implementation helps, if AI expertise remains confined to a narrow

'priesthood,' widespread adoption stalls. Our research indicates that companies that invest in AI literacy for its staff see faster scale-up of AI projects, stronger employee engagement, and growing organizational confidence. Knowledge is a powerful catalyst for continuous innovation and competitive differentiation.

Hopper: Workforce Reskilling for Enhanced Efficiency

Rather than using AI to displace its customer support staff, Hopper, a Montreal-based travel platform, trained employees to take on roles focused on AI content, training, and testing. Up-skilling its staff to embed AI into its customer support function not only addressed employee hesitation, it allowed Hopper to handle customer inquiries 75% faster—reducing average resolution time from 15–20 minutes to 3–5 minutes. It did this without compromising customer satisfaction and led to cost savings of ~90% compared to human-driven interactions.

Canada's most successful adopters match grassroots experimentation ("super agency" employees who already prompt, patch and prototype with GenAI) with an executive mandated transformation agenda. When only the bottom layer is active, shadow IT proliferates and pilots stall for lack of budget or risk authority. When only the top pushes, initiatives feel imposed, and staff revert to old workflows.

Lumberhub: Bottom Up "Super Agency" in Traditional Industry

When a chronic pricing lag between sawmills and home builders kept eating into margins, George McKeown, a PhD chemist turned lumber trader, asked a simple question: *Why do we accept this inefficiency?*

Lacking a deep coding background, he turned to GenAI pair programmers to develop over 40,000 lines of code and in less than three months built a conventional react/typescript web app running on Amazon Web Services that ingests real time futures data, spits out dynamic quotes for every stock keeping unit (SKU), and auto generates purchase orders for suppliers.

- **AI as an enabler, not the end product:** The final platform runs on conventional SQL + Python; the *code* itself was written multiple times faster thanks to Copilot-style tools.

- **Immediate payoff:** The quote to order cycle time dropped from days to minutes, mitigating inefficient and volatile price swings.

- **Leadership unlock:** Once the CEO saw a live demo, the lumber mill fenced budget to refine the prototype and plugged it into the ERP stack inside.

3. Paralysis of Plenty: Too Many Use Cases

AI has opened the floodgates. To a technologist's eye, every process, product, and customer touch point looks like it can be automated. But abundance can lead to inaction—'choice paralysis.' The bottleneck is often choosing the first use case. To accelerate the decision process, some firms tapped the expertise of their staff, including hosting a 'use case tournament' to evaluate options.

But even if a pilot program is selected and initiated, mid-size Canadian firms frequently encounter significant barriers to scaling projects. Our interviews highlighted three primary factors impeding AI initiatives:

- **Budget cliff:** Public incentives frequently support only initial pilot phases, covering equipment or personnel but rarely address subsequent integration, training, and retrofitting costs. Many initiatives stall after pilot phases because ongoing costs typically fall into operating budgets instead of capital expenditure.

- **Champion churn:** Key sponsors, such as plant managers or IT leads, often rotate or are promoted after pilots begin, leaving successors to inherit risks without corresponding enthusiasm or clarity around the initiative's original vision.

- **ROI lost in translation:** Tangible benefits essential for scaling rarely make it into capital allocation discussions. Technical improvements proposed by engineers must translate into clear cash-flow projections. Consequently, potential operational expenditures must be explicitly justified by cash-flow benefits rather than abstract metrics like 'defects-per-million.'

4. Data: Fragmented and Low-Quality

Many of the leaders interviewed cited the enormous lengths they had to go through to get to a place where AI usage was even possible, underscoring how foundational data architecture is to successful AI adoption. Some leaders flagged the shortage of high-quality, production-level data in manufacturing. That, in combination with the difficulties around unifying diverse datasets, creates a data integration burden that ends up thwarting or delaying AI implementation. Significant upfront investments are often required to improve data quality, reliability, and governance before AI can even be contemplated, which acts as a deterrent to adoption.

Strengthening Canada's data foundations by building robust, AI-ready data ecosystems is essential. Many SMEs, nearly half of which are more than 20 years old, face significant hurdles adapting legacy systems and fragmented datasets. Legacy management information systems capture data in incompatible formats, riddled with gaps and duplicative records. The time spent cleaning and stitching these sources drains enthusiasm and budgets long before benefits materialize.

St. Michael's Hospital: What Canada forfeits when data stays in silos

GEMINI, Canada's largest hospital-data platform for research, was established to facilitate the creation of large health data sets to improve healthcare.

Despite successfully integrating more than 60% of Ontario's hospital medical care within its platform and supporting more than 1,000 clinicians through a $140 million research grant, challenges persist. A disparate web of hospital systems with incompatible data formats slow governance processes, and infrequent data refresh cycles block progress. These barriers highlight what Canada will miss out on if data integration efforts are not improved.

Platforms like GEMINI can automate patient matching into trials and efficiently capture health outcomes, reducing the cost of trials by up to 80% and enhancing Canada's attractiveness as a clinical trial hub. Large-scale, richly detailed datasets are critical for health AI. GEMINI and its partners in Alberta and Quebec have started taking steps to overcome barriers, aspiring to build a 100-hospital near real-time data sharing network called 'VITAL.' Large and detailed datasets like GEMINI are critical for health AI and accelerating their development will be key to Canada's ability to be a leader in this field.

5. Blind Spots: Overlooking the Unknown

It is common to invest in AI to automate the *known knowns* (repetitive tasks) or to analyse the *known unknowns* (questions we can articulate but cannot answer). Yet, some of the biggest wins came from the *unknown unknowns*—insights managers didn't realize they were missing until they were unearthed by the model.

AI models can ingest years of sensor data, call logs, or shipment records, which can lead to the surfacing of correlations and anomalies that may have otherwise escaped human analysis. For example, excess energy use on a single production line, chronic micro stoppages in a distribution network, or an unexpected cross sell pathway in e commerce. Budgets, KPIs and risk reviews are designed for defined problems, the ability of an AI to augment 'discovery value' widens a firm's operational possibilities.

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Linamar: Turning 'Unknown Unknowns' into Competitive Advantage

Uncovering hidden inefficiencies and unexpected solutions in complex manufacturing environments is transforming Linamar's approach to overlooked data, revealing tangible competitive advantages.

When Linamar piped 10 years of shop-floor data into Acerta's LinePulse Industrial AI and Analytics platform, the first surprise was a set of micro-fluctuations in pump pressure that engineers had never tracked. Fixing them halted a silent cost in their manufacturing process in parts for EV gearboxes. The software's machine learning root-cause analysis tool then flagged the single upstream variable most responsible for 'noise, vibration, and harshness' from one of more than 100 parameters that no human could have correlated in real time. On another manufacturing line, the model showed that a non-bottleneck station within the assembly line was slowing throughput. By adopting an industrial AI platform that can solve problems in virtually any discrete manufacturing environment, Linamar has re-positioned AI as a continuous diagnostic instrument rather than as a one-off cost-saver. Each unexpected insight frees capacity, trims launch challenges and even wins business.

6. Digital Infrastructure: Compute-Capacity Deficit

Much like how railways or electricity grids fueled economic growth in the past, robust AI compute capacity—supercomputers and GPU clusters—underpin innovation. Currently, Canada's compute capacity significantly lags the growing demand for training and deploying cutting-edge AI models. Canada trails every other G7 nation in AI computing infrastructure, possessing only one-eighth to one-tenth of the available compute performance per capita compared to countries like the U.S. Without sufficient domestic compute capacity, Canadian innovators may be held back in comparison to other countries that are providing subsidized and extensive compute capacity to their leading AI firms and researchers. And Canadian institutions may rely on foreign cloud providers which, in the context of sensitive data or government-facing AI applications, could heighten risks to sovereignty, security and economic resilience.

AI leaders shared that waiting in domestic compute queues can extend training cycles from hours to days—killing iteration speed. Procurement rules and cautious public-sector buying also slow the build-out of sovereign clusters that could attract anchor tenants. Without targeted 'compute credits' or pooled infrastructure, even world-class research talent cannot fully commercialise models at home.

Provincially, initiatives like Alberta's Artificial Intelligence Data Centres Strategy help to align more localized strengths, such as skills or energy, with the economic opportunities offered by AI compute infrastructure. Such initiatives are valuable complements to federal strategies, which broadly incentivize compute infrastructure development.

And recent federal initiatives, notably the $2 billion Canadian Sovereign AI Compute Strategy, represent important steps toward addressing this gap. The program's first project—a domestic supercomputing partnership between Cohere and CoreWeave—will provide Canadian AI firms access to essential computing resources on Canadian soil. Accelerating and expanding such strategic investments can significantly enhance Canada's domestic AI infrastructure, enabling solutions to be securely and swiftly developed without reliance on external providers.

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7. Regulation and Policy: Duplicative and Uncertain

Regulatory responsibility is currently divided among several bodies—including Innovation, Science and Economic Development (ISED), Office of the Privacy Commissioner (OPC), Competition Bureau—as well as sector-specific regulators (e.g. Health Canada, and Transport Canada). Plus, provinces are increasingly drafting their own distinct guidance (e.g., Québec's Bill 25 privacy amendments), creating what some describe as a 'mini-EU' landscape of 13 distinct regimes.

A major regulatory obstacle cited in most of the interviews was the absence of federal leadership. Recent attempts, notably the Artificial Intelligence and Data Act (AIDA), ultimately failed amid political challenges. AIDA drew criticism not only for its overly cautious, burdensome compliance demand, but also for procedural shortcomings and inadequate stakeholder engagement. Canada could benefit from a clear regulatory framework that facilitates innovation, involves meaningful public participation, and enables practical AI implementation.

This absence of clear federal guidance disproportionately affects SMEs—Canada's economic backbone. Smaller businesses typically have limited resources to independently navigate regulatory ambiguities, leading to hesitation around investing in AI. Many technology leaders interviewed by RBC lamented how repeated announcements without substantive guidelines have created persistent uncertainty, pushing companies toward overly cautious approaches. As a result, organizations often limit their AI implementations to conservative use cases, wary of significant future compliance costs if regulations become stricter. Clarity would help.

Conclusion: Five Lessons for Leaders

Despite the obstacles, there are many examples of Canadian firms successfully embedding AI in their operations and reaping the competitive benefits. Successful firms:

- **Quantify the costs associated with both action and inaction** to ensure decisions about capital allocation are informed by both the risks and the rewards of AI adoption.

- **Educate employees about the benefits of AI** and teach them how to utilize the technology, both to advance their careers and to improve operational effectiveness.

- **Address the problem of 'too many ideas, too little focus'** by pulling employees into the evaluation process, empowering them to drive solutions.

- **Invest in data governance**, ensuring data is standardized, consolidated, and AI-compatible.

- **Formalize an 'exploration budget'**—a portion of annual AI spend reserved for open-ended data mining to ensure that hard-to-find opportunities are discovered. Embedding that mindset among employees turns every new dataset into a hunting ground for hidden efficiencies and growth opportunities.