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Canada's AI imperative

Start, scale, succeed

omnia**AI**



The ‘Queen of the Hurricanes’ knew a thing or two about adopting new technologies and demonstrating our nation’s values on the global stage. Canadian innovator and pioneer **Elsie MacGill** was the first woman in the world to earn an aeronautical engineering degree, then transformed Canada into a powerhouse for aircraft production. We believe Canadian businesses that are starting, or scaling up, their artificial intelligence (AI) efforts will—like Elsie—create a pathway for others to follow, and establish Canada as a world leader in AI.

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Artificial intelligence (AI) is one of the leading economic drivers of our time. Canada's research strength, talent pool, and startups that have capitalized on AI offer us the opportunity to lead the global pack. But shaping an AI-driven world will take something more: true leadership. That means taking steps now to establish a world-class AI ecosystem in Canada and increase the demand for AI.

Introduction

Throughout Canada's history, progress in innovation and technology has led to profound transformation in the lives of its citizens. But Canada has been slow in seeing this potential.

Since the launch of the first report in Deloitte's *Canada's AI imperative* series, *From predictions to prosperity*, AI's capacity to effect change—not just for businesses, but for society as a whole—has become even clearer. Canada, a world research leader and home to exceptional AI-powered businesses, has played a significant role in the advancement of AI. But research and startups are not sufficient to make Canada a global leader. To reach this goal, we need a healthy AI ecosystem, including strong business and consumer demand for AI.

This report is the fourth in our series on artificial intelligence in Canada. Our first report established that our high-quality domestic supply of AI researchers and talent must be matched with robust demand. Without home-grown demand, Canada might end up providing the talent, research, and startups that bolster economic growth in other countries instead of in our own. It's worrying that, despite having the third-largest global concentration of AI experts, Canada is well behind our competitors in AI demand. For Canada to lead on AI, that must change.

Our second report, *Overcoming risks, building trust*, dug deeper into the demand problem. We explored individual Canadians' perceptions of AI to more fully comprehend the lack of understanding and trust that keeps demand low, and to map out how business and government could best respond.

This laid the groundwork for our third report, *Public policy's critical moment*, which outlined specific public policy actions Canada needs to take to secure an AI leadership position.

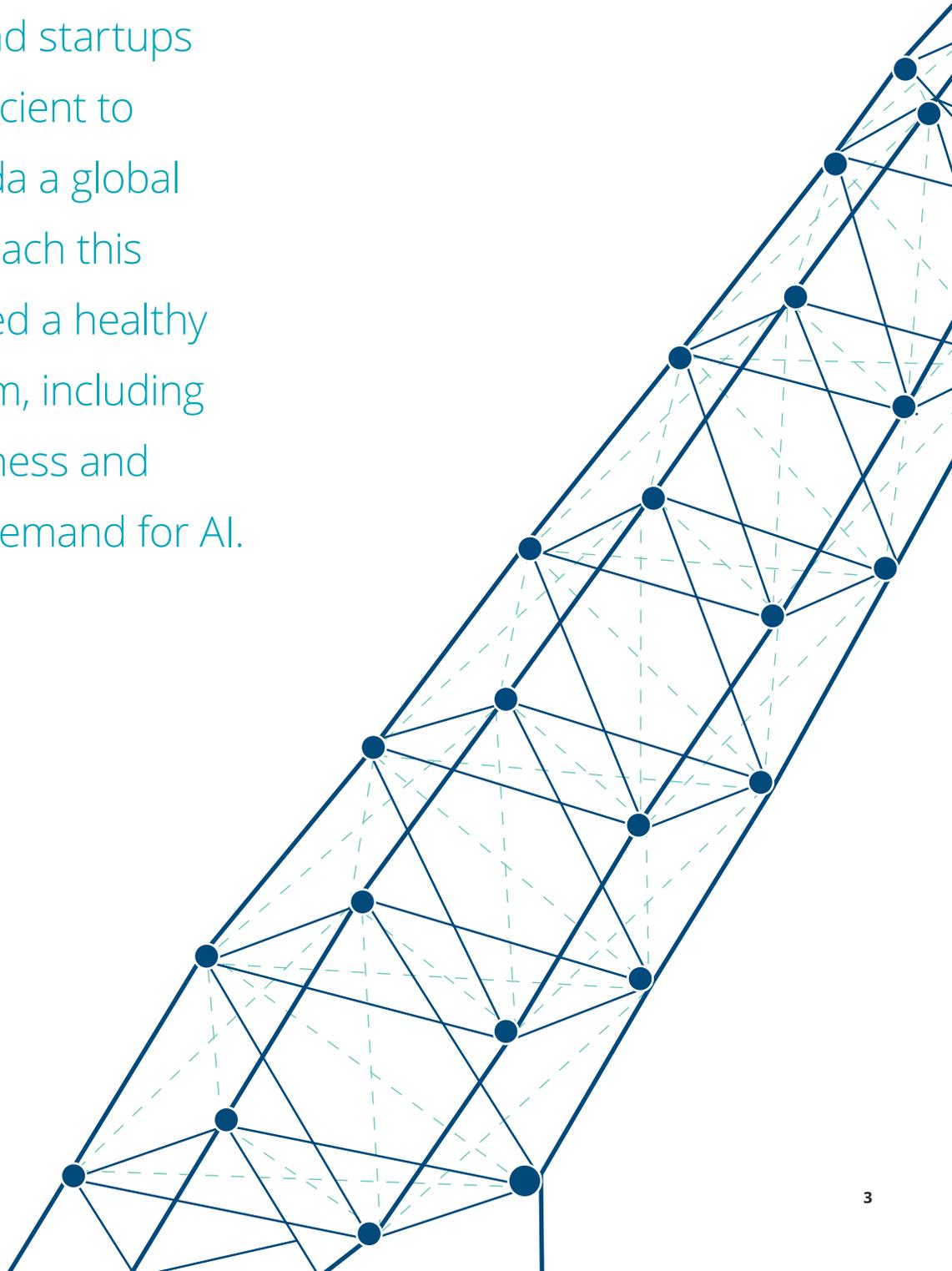
In this, our fourth report, we explore the Canadian AI demand gap in the context of the findings from our previous reports.

- First, we discuss why the demand gap matters, and what's causing it.
- Then, we turn to those companies that have not started using AI to explore why not—and how they can begin their journey with AI.
- Next, we look at the challenges faced by companies that are starting to adopt AI, and what they need to understand in order to scale.
- Finally, we profile the AI adoption experiences of several businesses to showcase the lessons they learned along the way.

With this latest report, we also call company leaders across Canada to action: **for the nation to lead globally on AI, you must provide the demand locally by adopting AI within your own businesses.** To help Canada fulfill its potential for world leadership in the adoption and deployment of AI, Canadian businesses that don't already use AI need to adopt it, and those businesses already using it need to scale up their AI deployment.

By showcasing the experiences of Canadian businesses that are already integrating AI, our goal is to build a pathway for others to follow to secure both their future and the future of our nation.

Research and startups are not sufficient to make Canada a global leader. To reach this goal, we need a healthy AI ecosystem, including strong business and consumer demand for AI.



The AI demand gap in Canada

Businesses around the world clearly see the potential of AI. Almost two-thirds of global businesses surveyed by Deloitte said AI technologies are important to their business success, and four in 10 said AI will be critically important within two years.¹ A large majority said they are using AI technologies to move ahead of their competition, and that AI is empowering their workforce.²

The AI story in Canada, however, is starkly different:

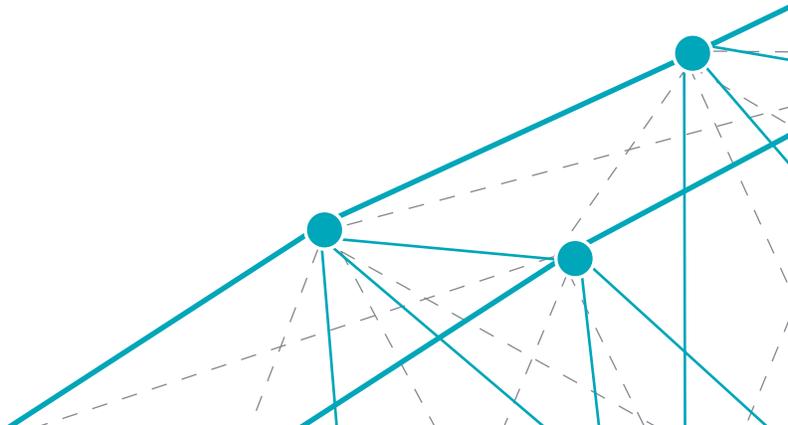
Canadian businesses significantly trail their peers on AI adoption. At least 71 percent of Canadian businesses have not even begun their AI journey,³ while Canada's early adopters are struggling to scale their pilots.⁴ These findings are consistent with previous research showing that, on the whole, Canadian businesses tend to be technology followers, not leaders.⁵

Canadian companies lack innovation investment.

In 2018, Canada spent only 1.5 percent of GDP on research and development (R&D), compared with the Organisation for Economic Co-operation and Development (OECD) member country average of 2.4 percent. Furthermore, the percentage of Canadian GDP allocated to R&D has seen a steady decline, falling from 2.1 percent in 2000.⁶ This downward slide is concerning because experts suggest AI is best viewed not as a traditional technology deployment but as an investment in a company's future. As one interviewee in our survey (see "Our approach") put it, "AI is actually R&D—it's more like innovation than it's like any other traditional technology."

An AI "fast follower" approach won't work.

This approach might have worked for many Canadian businesses in the past, but if companies today don't get started early they could struggle to catch up.⁷ That's because AI requires time to integrate into the business, with each solution customized to business needs. This slower integration progress requires companies to iterate AI solutions and approaches, learning and improving as they go. In addition, the process of deploying AI in one business context is unlikely to apply fully and precisely to another business, even within the same industry. For these reasons, Canadian businesses cannot afford to adopt a wait-and-see or fast-follower AI approach without putting significant market share at risk.



Diagnosing the demand gap

The problem

Canadian businesses and consumers lag when it comes to AI adoption. Unless the AI demand gap is addressed soon, they risk being permanently left behind—but closing the gap requires paying close attention to the concerns that are preventing businesses from adopting AI. Here's a look at what's holding them back.

Our approach

Survey

From February 6 to 24, 2019, Deloitte surveyed more than 1,000 Canadian businesses to better understand their attitudes and concerns about adopting AI.

The margin of error for this sample is +/- 3.1 percentage points, 19 times out of 20. The group was designed to be representative of the Canadian business community, and all results were weighted by both business size and geographic region.

Within this sample, we asked specific quantitative and qualitative questions to explore the concerns and viewpoints of companies that were not adopting AI ("AI non-adopters") and those that were ("AI adopters").

We also asked AI non-adopters about their likelihood of adopting AI over the next five years, and what would prompt them to do so. This qualitative data was analyzed using a network mapping tool to reveal constraints and opportunity areas.

Interviews

Deloitte also interviewed Canadian business leaders to understand the challenges and concerns they face as they undertake the AI adoption journey.

Interviewees included business leaders who are adopting AI solutions or supplying AI solutions to other businesses. We also spoke to intermediary organizations that support research and deployment in the AI sector.

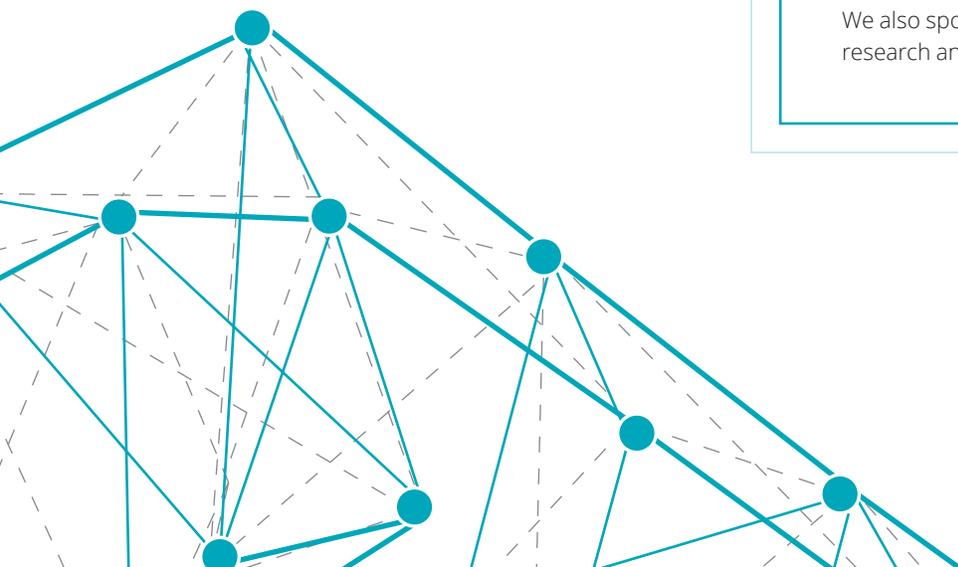
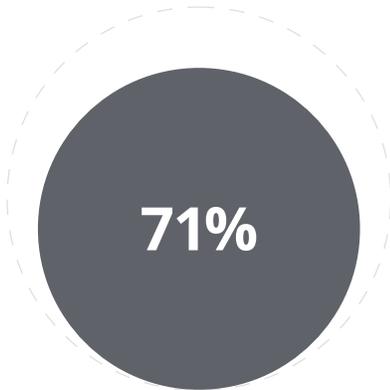
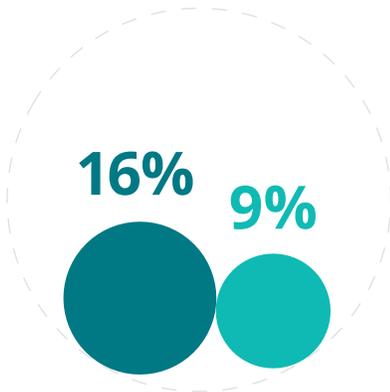


Figure 1

At a glance: AI non-adopters vs. adopters



AI non-adopters: In 2019, 71% of Canadian businesses do not make use of AI.



AI adopters: Only 16% of Canadian businesses in 2019 make use of AI, and 9% told us they're in the process of adopting an AI application.

Note: 4% of respondents said they were unsure if their company was adopting AI or not.

Non-adopters



Don't plan to use AI in the future

Only **1 in 10** non-adopters are highly likely to adopt AI over the next five years.



Struggle to see value in AI

50% struggle to see where AI can be of value to their businesses.



But think Canada should be a leader in AI

More than half (**52%**) agreed Canada needs to be a global leader in AI.

Adopters



Believe AI will greatly affect them

83% of adopters agreed AI will have a great impact on their industry over the next five to 10 years.



Strongly believe Canada needs to be a leader in AI

62% agreed Canada needs to be a global leader in AI.



Realize there is hype around AI

Most (**70%**) agreed there is a lot of hype around AI.

The diagnosis

Companies that start adopting AI aren't as different from non-adopters as you might think.

While exploring the differences between AI adopters and AI non-adopters (see "Our approach"), we learned that the biggest difference is that adopters just get started. That is, they don't wait to start their AI journey until after they've addressed any challenges and concerns—they start despite them.

This distinction is critically important, as it shows there isn't one single barrier preventing Canadian businesses from adopting AI. Rather, viewed from this perspective, companies that haven't adopted AI could be seen as choosing not to, with their challenges and concerns being the main barrier. Accordingly, to help these companies move forward collectively we must address these challenges and concerns head-on.

Closing the demand gap

Our research found the challenges companies say they face depend on whether they're just starting on their AI journey or they're looking to scale their AI usage.

For companies that haven't started adopting AI, the following section, "Starting the AI journey," brings together the perspectives of many companies that are in the same position, and provides insights from those that have found a way to get started. We aim to clarify many of the misperceptions companies have about AI, and thereby encourage businesses to learn as they start their AI deployment.

For those companies that have started to adopt AI solutions, the "Scaling AI applications" section adds further context by examining the challenges other companies face as they scale.

Starting the AI journey

We found that companies with higher levels of knowledge and optimism about AI, coupled with a base level of technological readiness, were far more likely to start their AI journey.

Adopters look to AI for increased efficiency and savings, as well as for opportunities to eliminate repetitive tasks, reduce human error, and increase productivity.

Many adopters told us they expect AI to help them gain a competitive advantage. Some called AI “the way of the future,” suggesting they must “adopt or be left behind” as today’s competitive edge may be a minimum requirement going forward.

In the early stages of a company’s AI journey, the differentiating factor between those that adopt and those that do not can be understood as the organizational determination to pursue effective and efficient problem-solving approaches. AI adopters demonstrate that businesses need to be willing to embrace new technologies and a different way of working.

What encourages Canadian businesses to get started on their AI adoption journey?

As part of our survey we asked AI non-adopters how likely they are to start using AI-based technologies and solutions over the next five years.

Our analysis of the responses suggests there are four factors driving future adoption:

- Knowledge of AI and industry-specific applications
- Optimism about AI in general
- Digital capabilities and technological readiness
- Understanding the potential value of AI for the business (e.g., to leapfrog the competition)

Non-adopters' concerns about AI

AI non-adopters raised a number of concerns that most businesses face when adopting any new technology (see Figure 1).

Due to the complex nature of using AI, however, some of these challenges can pose bigger barriers than usual. As a result, compared to a traditional IT project, adopting AI requires organizations to surmount more hurdles.⁸

On the next few pages, we detail the five major concerns non-adopters raised.



Lack of resources

Of all the concerns raised by non-adopters, the “cost of entry” was the most pressing. This concern was felt most acutely by businesses with less staff; respondents in this category simply felt under-resourced to deal with AI. For instance, some respondents told us their staff couldn't even find the time to inform themselves about AI.

“[We have a] lack of financial resources to experiment.”

“AI is in its early stages for some applications and as such the cost now is prohibitive.”

“AI does not provide any benefits to a small company with low-volume niche electronics manufacturing.”



Access to skills

In addition to the cost of entry, many non-adopters are concerned about their lack of access to highly skilled employees. The cost of acquiring talent or upskilling existing employees can seem insurmountable, especially to small and medium-sized enterprises (SMEs). Also, businesses headquartered outside of large cities feel they are even more disadvantaged when it comes to attracting talent.

"We already have an issue finding individuals in the rural areas to do specific skilled trades; this I believe will fall into the same realm."

"Employees who work for our company are all hands-on, methodical people who know our sector in and out, but are not technology [sic] advanced."

"We may have the desire to adopt AI, but we don't have the people to use it and oversee it. We likely would not be able to use it for its full attention [sic] and thus it would not be worth our investment."

Leadership buy-in

A lack of leadership buy-in is also a key barrier to getting started. For most technologies, leaders don't usually need to understand the proposed approach beyond the surface level. But AI is different. Due to the volume of data involved and the cost associated with testing AI applications, a basic level of AI understanding on the part of the company's leadership is crucial. In addition, because AI requires business and IT leaders to work together, support from the C-suite is essential for success.⁹

"We tend to be very late adopters due to fear and a lack of literacy in upper management."

"There is no champion to push the idea."

"AI is unknown to the majority of executives."



Limited understanding/trust

Many non-adopters told us that AI is “just not applicable” to their industry, or that they don’t see how it could be. Some expressed very strong concerns about AI’s larger implications for humanity, and a lack of trust in their ability to use AI without negatively affecting society.

“Not aware of any current applications. Most likely we are uninformed and uneducated on the matter.”

“Do not know where we could apply it.”

“Do not trust it. There are untrustworthy undercurrents lurking behind any AI.”



Technical readiness

Non-adopters struggle with the data, systems, and general digital capabilities needed to get started on AI. Data that is not in a usable format can be overwhelming to clean, and out-of-date or siloed systems can prevent companies from centralizing their data, even if the data itself is usable.

“Our organization has very poor data management. Individual employees keep track of data on hundreds of Excel spreadsheets.”

“We have a lack of technical knowledge and poor systems management.”

“We are not there yet technically or conceptually to start adopting AI.”

Overall, non-adopters face numerous challenges. But optimism about and understanding of AI can help cut through them.

How companies can start adopting AI



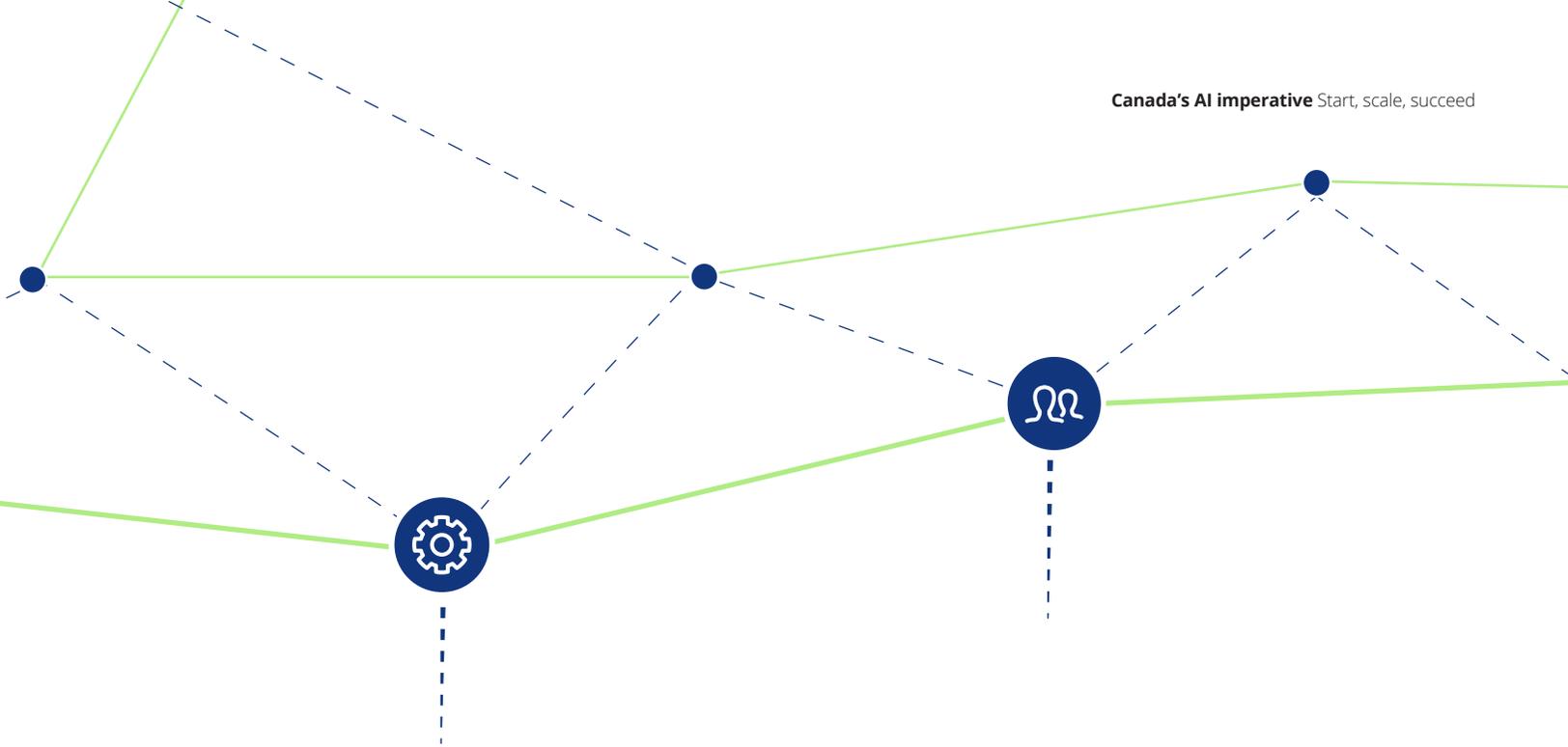
During the course of our research, early adopters of AI gave advice drawn from their experience starting an AI journey—and, specifically, how to overcome the five challenges identified in the last section.

Dealing with a lack of resources

We're too small and lack the resources to even think about this. How are we supposed to get started?

For businesses that are just getting started, a lack of resources can feel overwhelming. Our interviewees told us that at this point, taking the time to reach out to experts in the AI industry can be enough to help accurately scope a company's high-level needs.

Most respondents told us once a business gets this initial understanding under its belt, startup costs were not as daunting as previously feared. For instance, one interviewee found that a free, open-source chatbot provided a quick win, demonstrating the potential of AI to save employee time and energy. With this validated proof of concept in hand, the interviewee was able to make the case internally for more high-value AI applications.



Accessing skills

We heard we need very specialized, scarce, and expensive talent. How can we find it?

Non-adopters told us they find it hard to fill even non-AI talent gaps, and they expect AI will add another barrier to sourcing qualified employees.

When looking for AI talent, many businesses specify credentials that are nearly impossible to fill, such as a PhD in data science, five years of experience in AI, project management skills, and an MBA. As it turns out, however, these types of extensive credentials are often largely unnecessary for a company looking to experiment with AI.¹⁰

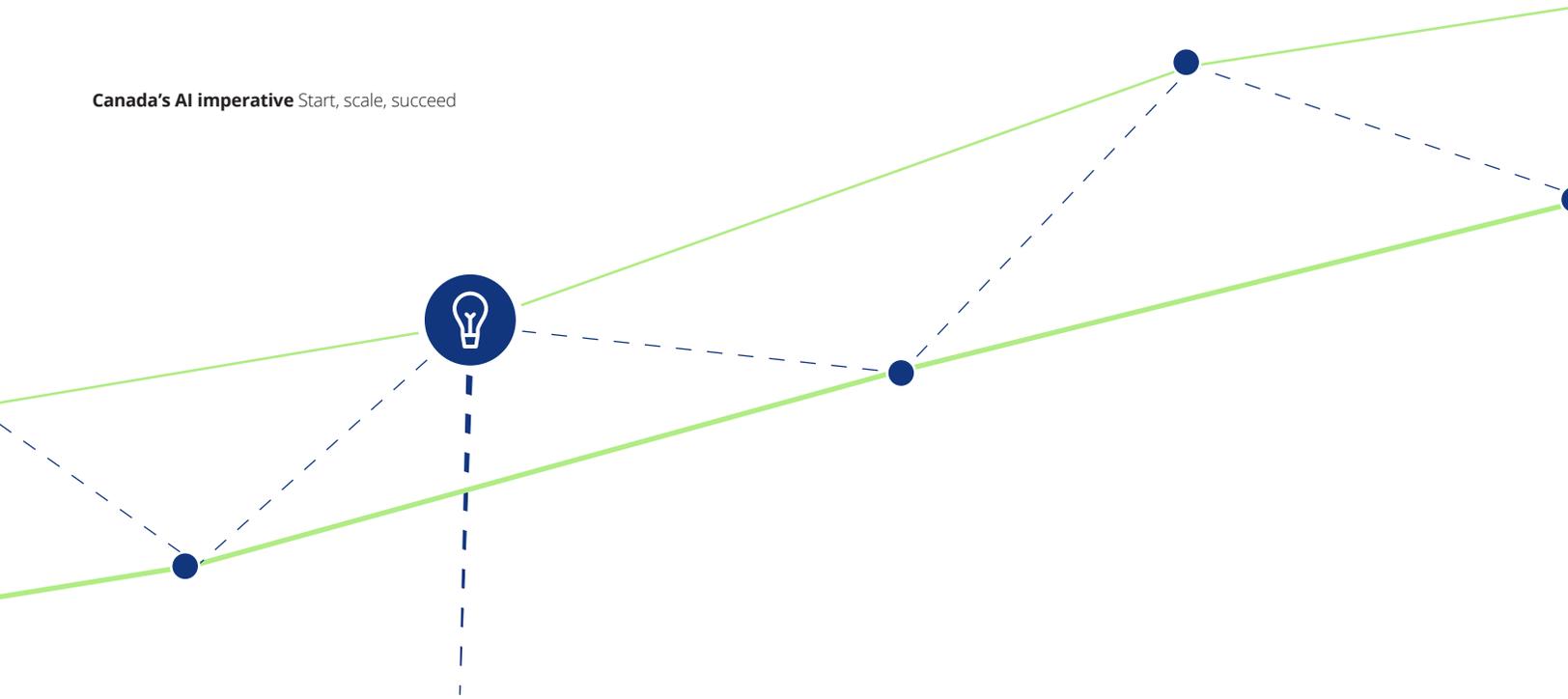
Curious employees may also find ways to solve problems on their own, if enabled through in-house training and re-skilling. Institutions such as the Alberta Machine Intelligence Institute (AMII), for example, can function as a source of talent, working with industry partners to expand access to skilled AI talent from universities, thereby providing an alternative to costly hiring processes seeking hard-to-find expertise.¹¹ This model can be expanded to full partnerships between academia and industry, as exemplified by the Vector Institute and various hospitals across Canada.¹²

Obtaining initial leadership buy-in

Most leaders in our firm are reluctant to experiment with AI. How do we convince them?

Leaders are more likely to be convinced to pursue an AI journey when an initial AI test project can show value early on. This may require making multiple small bets on AI, instead of taking on a large or complicated project. Business leaders told us a champion is needed to push projects forward, and to convince leadership of AI's value to the business. We also heard specifying a particular outcome may be less important than "just getting started," as once businesses start experimenting, the process of discovery often produces valuable results.

In the end, respondents told us, what's important is communicating to leadership that an AI test resulted in the organization gaining insights it could not have accessed without experimenting with AI. For instance, one business found that while its initial AI use case wasn't feasible, the process of AI experimentation allowed it to identify three other high-value problems that could be solved using AI—which was enough for leadership buy-in.



Overcoming limited understanding

We can't see how AI applies to our business or our industry. Will it actually affect us?

Many non-adopters said AI doesn't apply in industries in which clear examples of AI-driven value already exist, including the legal, accounting, and construction industries (see "Exploring AI's impact on industries"). This mismatch between understanding and current reality shows businesses need to spend time and resources evaluating the applicability of AI to their specific business, rather than just assuming AI isn't applicable to them.¹³

Our survey also found a number of non-adopters who expressed trust issues with AI. Our previous research, *Overcoming risks, building trust*, showed a lack of trust is often underpinned by a lack of understanding. To remedy trust challenges, companies should invest in building awareness of both the possibilities and the risks of AI throughout their organization.

As experimentation with AI begins, businesses should consider their internal communication strategy carefully.¹⁴ In particular, they should take care to avoid hiding automation efforts from employees or misleading them about the implications, especially to their jobs. Hiding information and misleading staff will make it harder to build trust and understanding, and will slow AI adoption in the long run.

Exploring AI's impact on industries

While our survey respondents in consumer-facing organizations indicated they were aware of how AI could disrupt their industry, respondents in more business-oriented fields felt AI was not relevant to their industry. For example:



Many companies in the **legal field** firmly expressed that AI “just isn’t relevant” to their business.

“There isn’t much room for AI in legal consulting.”

“Programs are limited in application [for] the legal profession.”

“I am a lawyer and [my] work is highly customized personal service work.”

“Our lawyers are neither patient with technology nor technologically savvy, so it wouldn’t be prudent to ‘force’ AI on them until there is an identified need.”

“No idea what we could use it for. We are a law firm.”

Despite our respondents’ misgivings, AI is quickly changing the landscape of tedious legal work, performing tasks such as drafting briefings and searching for applicable cases. For instance, consider the Canadian companies Kira Systems and ROSS Intelligence. They provide AI solutions that analyze text in contracts and cases, respectively, both of which are highly applicable in the legal profession.



Accounting is another industry where participants expressed uncertainty about AI’s applicability.

“I don’t think it’s required for the accounting field.”

Accounting, too, is facing rapid and significant disruption as a result of AI. Large firms, including Deloitte, are deploying proprietary solutions, but other firms are buying software designed specifically for the audit profession. For example, MindBridge AI provides AI-powered solutions that

uncover unknowns in large sets of financial data, thereby augmenting the capacity of firms no matter their size.

Construction was the largest industry group to tell us that not only AI “does not apply” but also that it “doesn’t exist in our field.”



“It doesn’t exist in our field. There are computer programs but nothing intelligent.”

“No use that is applicable in the building/construction of custom homes.”

“We are in construction and change comes slowly.”

While it may be true that industries such as construction are in the initial stages of exploring the applicability of AI, we nevertheless found examples of partnerships, such as the one AltaML recently launched with the largest contracting organization in Canada, PCL Construction, to “digitally disrupt construction.” This project plans to apply advanced analytics and machine learning to the data generated in their digital construction platform.¹⁵

Other industries in specialized areas also believe they won’t be affected by AI. One respondent described their work as cleaning fish tanks—and thus AI would not apply.



“It’s fish-tank cleaning. You can’t make a robot drive around and clean fish tanks.”

As it turns out, there is a fish-tank cleaning robot with AI-related capabilities in development¹⁶—meaning that even in areas where it may be hard to imagine an AI application, automation will eventually replace or supplement many human tasks. While the use case may not always be obvious, we want to encourage every business to investigate AI’s reach and applicability for themselves.



Establishing technical readiness

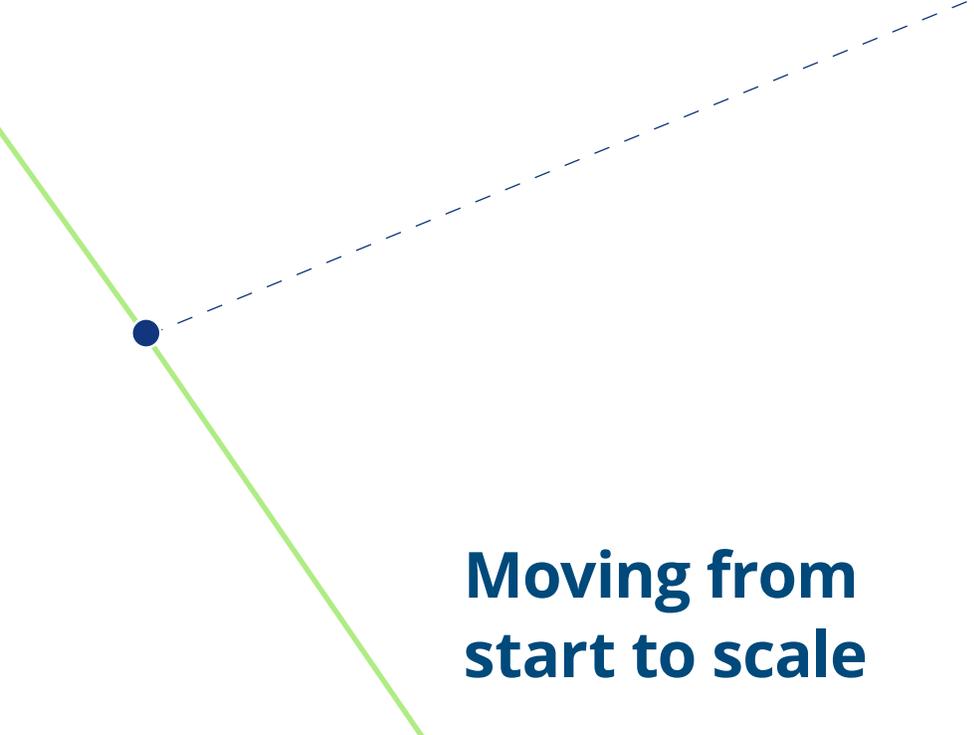
We're not very digital and we don't have the right kind of data. Does this mean we can't use any AI?

A large majority of non-adopters believe AI adoption is only possible for highly digital organizations. Although companies that adopt AI have more digital capabilities than non-adopters, the majority of adopters (63 percent) have only a moderate level of digitalization.¹⁷ (Curiously, 8 percent of non-adopters ranked themselves as "highly digital," suggesting that while digital maturity is important, it alone may not be sufficient for AI adoption.)

In fact, simply starting on the journey of AI adoption pushes businesses to become more digital. As one interviewee recounted to us, "A client promised us that they had all the data required for the AI application—and then some. The next day, they showed up with boxes of paper ledgers! We were surprised, but then we started scanning and helped them work on digitizing their data and moving to using AI."

Many non-adopters are concerned about the state of their data, particularly if their organization doesn't actively collect data, or the data is of low quality. Even companies with large volumes of data raised data governance as a barrier to AI adoption. Many companies believe they can't start on AI adoption until they have "perfect data"—but waiting for perfection is worse than forging ahead. Instead of waiting, businesses should pinpoint areas in their organization where data is already used to make decisions. Repetitive activities done at scale are also good starting points to explore the use of AI.

The data needed for AI can also sometimes come from unexpected sources. For instance, computer vision typically facilitates maintenance more accurately, efficiently, and with less manual work than traditional visual inspections that are carried out by analyzing video footage.¹⁸ These kinds of applications don't require other processes within the organization to be highly digital, but provide an example of how companies can get creative about collecting and using data even if they're not a highly digital organization.



Moving from start to scale

All in all, there are fewer obstacles to getting started than many businesses may think. Companies with a problem-solving attitude are able to move past challenges and start adopting AI, and that attitude can also facilitate the move to scaling AI deployment.

In the next section, we explore the challenges businesses face as they scale their AI applications, and review how some Canadian businesses have successfully tackled these challenges.

Scaling AI applications

While experimenting is an important first step to closing Canada's AI demand gap, it's not enough. Without moving those experiments to deployment at scale, AI applications are unlikely to provide a competitive advantage for Canadian businesses. To successfully scale, however, businesses will need to overcome a host of challenges.

Challenges with scaling

Many companies find that scaling can be the hardest part of their AI journey. After getting started, the optimism and excitement of the first quick wins can dissipate and shift to a realistic assessment of the larger organizational challenges.

From our interviews and surveys, we found the areas where challenges appear are largely similar, but the nature of each challenge evolves. Also, as one challenge (e.g., understanding of AI) drops off as a key challenge, a new one (e.g., measuring and proving the results of AI) emerges as a new barrier to adoption.





Adequate budget

Difficulty getting commitment to spend resources remains a challenge for AI adoption even after organizations move past the proof-of-concept stage. As adopters move to scale, implementation often requires significant resources, such as more technical talent or new vendors. Our respondents found that making the case for this extra budget while competing with existing priorities—in essence, getting companies to make a big bet on AI—can be difficult.

“Tactical thinking is prevalent when [AI] should be seen as a strategic investment.”

“Primarily available resources and overall costs compete with other projects.”



People problems

As businesses scale AI applications, finding the right kind of talent remains an issue, but a new dimension also arises: talent disruption. Adopters often find it hard to balance the need to re-skill their existing workforce with not stoking the fear of AI replacing jobs.

“Without the proper onboarding, people can be opposed to it and think it will take their jobs. AI is not about that.”

“Augmenting human workers to make them more effective is a challenge.”



Need for leadership

When starting out, a single champion is often enough to move AI testing forward. As companies scale their AI deployment, however, leadership from across the firm needs to buy in, including both business and technical leaders. The champion's role will also evolve to balancing technical and business needs while motivating and bringing the workforce along on the journey.

“Old managers that do not have experience with technology can be a barrier.”



Technical capabilities

Initial technical readiness and digital maturity in certain pockets of the business might be enough for pilot projects, but when scaling, these capabilities become a necessity throughout the organization.

Difficulties with data remain top-of-mind for many adopters who are looking to scale. These range from struggling with a lack of the amount of data required to train machine-learning models at scale to wrestling with “dirty data” that could potentially introduce bias. Dealing with legacy technologies that don’t communicate with each other or allow for the easy sharing of data can pose additional hurdles.

“Limiting/removing bias through utilization of good data is a challenge.”

“The interpretation and technical accuracy of AI and the model used can be challenging.”



Measuring results

Adopters face a new trial as they scale: measuring the return on investment (ROI) of their AI projects. Due to AI’s R&D nature, typical ROI measurements used for regular IT projects may not be applicable. As a result, businesses struggle to think beyond traditional methods of measurement to pick the right outcomes to measure.

Adopters also told us that maintaining leadership buy-in throughout the time and effort it can take to see results may be a concern when trying to measure results, adding further strain to scaling AI applications.

“Determining the cost benefit of adopting AI solutions is challenging.”

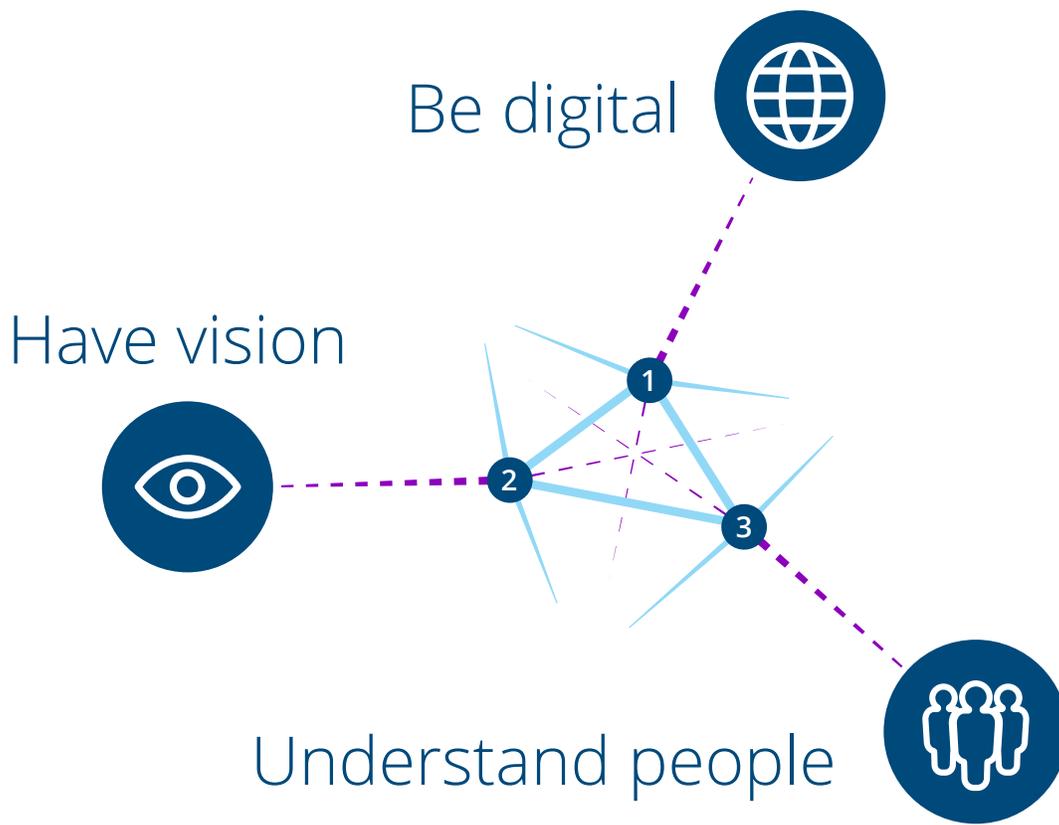
“Evaluating that it has met expectations can be a concern.”

What it takes to scale

Our research found there's no one single solution to the problems businesses face as they move from starting to scaling their AI applications. If the problems laid out in the earlier section had easy solutions, Canada would likely have much higher rates of AI adoption.

After the initial phase is done, AI deployment moves from "just a technological implementation" into a research-led transformation of the company. Due to the fears and uncertainty employees may have regarding AI, deployment can also involve a considerable change-management exercise.¹⁹ The barriers companies face as they transform will be company-specific, and Canadian businesses will each have to prepare to undertake their own unique journey.

With these findings in mind, we found evidence of three critical success factors to scaling AI: being digital, having vision, and understanding people. Our research shows the presence of these three factors greatly improved an organization's chances of successful AI implementations at scale.





Be digital

While not required to start an AI journey, companies looking to scale AI deployment will have to pivot to become digital-first in their operations, as AI relies on well-managed data and digitized processes.²⁰ Managing AI projects can look different from managing traditional technological implementations, due to the lack of clear paths to success. Businesses will need to get used to working in a much more agile way, with continuous iterations becoming the new norm (see “Building an enterprise-wide AI capability at Loblaws”).

Building an enterprise-wide AI capability at Loblaws

Canadian supermarket chain Loblaws is no stranger to handling the rise of new technologies.

In 2012, it founded Loblaws Digital, an e-commerce division focused on growing online sales to boost revenues. Loblaws Digital operates as an in-house startup with enterprise-level resources and a team of digital experts that includes product designers, developers, data scientists, and product managers. Building on its success, Loblaws has focused on creating a data- and insight-driven business over the past few years. At an organizational level, it agreed on what role each group will play from a data and analytics perspective, following a hub-and-spoke model.

When asked about what set Loblaws on its AI journey, Senior Vice President of Information Technology David Markwell told us: “I don't think there was a singular event. We weren't hit by lightning. We're evolving, we're changing, and we're seeing that we would benefit from continuing to push on this capability.”

Loblaws's hub-and-spoke model has allowed for business units, or spokes, to access a centralized function—the hub—to meet their technology needs, including AI, data ingestion, and data platforms. Over time, Loblaws found the most proficient teams across spokes would start asking the hub additional questions

about solving problems that might require machine learning, unsupervised learning, and computer vision. Once several teams started asking for similar AI tools and platforms, the hub would build an enterprise capability to meet their needs. During 2018, this process evolved with AI pilots in several groups, each of which moved at a different speed depending on business needs.

How challenging for Loblaws was scaling these AI pilots? “Like any adoption of new technology, there are always learnings,” said Markwell. “We're a large business and different groups move at different speeds, so it becomes a challenge of consistency.”

He emphasized, however, that the initial growing pains of scaling a number of analytics projects in 2015 and 2016 provided a wealth of experience to draw on in tackling AI scaling challenges. Loblaws addressed its technical readiness early on, and this allowed the company to rely on enterprise-wide technical capabilities as it scaled.

Starting AI required access to skills, and increasing in-house capabilities as the company scales. To address the talent challenges every business faces, Loblaws has focused on building capacity internally. It offers progressive training programs in data science to interested employees. This in-house upskilling approach, combined with the hub-and-spoke model, allows the company to scale in the right places, at the right times, with the right people. Furthermore, embracing interested employees provides an internal antidote to fear about AI throughout the organization.



Have vision

We found that a business can be completely digital, yet still struggle to scale if they don't have a senior AI champion and C-suite support.

The companies we spoke to told us leaders across the organization need to collaborate closely to establish goals and lay out a roadmap for change, for both its people and its technology.

This outcome is more likely to happen when there's a champion who can secure funding for this collaboration, effectively translate between business and technical leadership, and understand what results both teams are looking for (see "Using the power of AI to deliver value at TD Bank").

Using the power of AI to deliver value at TD Bank

For a business looking to rapidly scale its AI efforts and catalyze organizational change, one option is to acquire an AI firm. TD did just that when it acquired Layer 6, a globally recognized Canadian AI company, in January 2018. The acquisition was part of TD's broader AI strategy, which also includes working with leading fintechs, to create more personalized experiences for customers.

Layer 6 not only brought some of AI's brightest minds to help TD grow in an AI-first world, but the culture of the Layer 6 team also aligned well with TD's: they had the same focus on delivering experiences to enrich the lives of customers.

Since the acquisition, TD has made significant progress in unlocking the opportunity of AI. Its first objective has been to improve existing processes to serve customers better, and the Layer 6 team has delivered machine-learning models that have helped improve prediction

capabilities. The ability to blend the deep industry expertise within the bank with the small, agile team of AI experts at Layer 6 has been a key factor in the bank's success.

With this dynamic, a "translator" is sometimes required to bridge the gap between financial services knowledge and AI expertise. That's where TD Vice-President and Head of Machine Learning for Enterprise Data & Analytics Matt Fowler comes in. He focuses on building a shared understanding of both business and AI needs and solutions.

As with many large organizations, readiness for AI varies across the business. Part of Matt's role is to help Layer 6 determine which solutions to work on. Together, they look for three factors to determine readiness: Good data that is labelled and meaningful for the business problem; availability of AI models that fit the task at hand; and a meaningful result. This approach allows Layer 6 to focus its time and expertise on AI solutions that will bring the most benefit to TD's customers, colleagues, and community.



Understand people

The key ingredient to success in AI is people. While effective change management is a commonly prescribed antidote to the “people” problems of any technological implementation, due to the nature of AI, traditional approaches to building political will and training employees to use new tools may not be enough. If employees don't trust AI throughout the organization, their responses to AI efforts may be strongly negative.²¹

To counteract these potential problems, proactive internal communications strategies that focus on demystifying a company's AI plans for employees are essential. Invite knowledgeable employees to host informal presentations on AI, or form communities of practice that explore AI. Creating a culture of learning and demystifying AI for non-technical employees will build understanding.

The goal for employers should not be to convince employees that AI is trustworthy, but to empower employees to understand what is risky and what isn't, while ensuring that employees see their place in the future AI-augmented workforce (see “Doubling down on AI at ATB Financial”).

Doubling down on AI at ATB Financial

Alberta-based ATB Financial has been quick to recognize—and act on—AI's potential to transform the financial services industry. Its focus has been on creating a robust strategy to take advantage of AI and doubling down on AI investments and partnerships. It recognized early on that technical readiness will be key to staying competitive, especially as a smaller financial institution.

One key challenge it encountered was that, as a smaller organization, it was not able to directly compete on resources with the largest banks in Canada and around the world. To overcome this limitation, it has been deliberate about the types of bets it makes, and focused on organizational culture to ensure the bets are adopted.

As it embarked on its AI journey, ATB learned that demystifying AI applications and showing how they're able to solve meaningful business problems is key to getting employee and leadership buy-in. As a result, ATB goes out of its way to ensure that leadership and employees feel comfortable navigating the AI transition. For instance, it brought in an artist to create illustrated comics that were sent to leaders and employees to kick-start discussions on automation.

ATB's head of AI, Dan Semmens, said this: “We're trying to have a bit of fun, but it's also very intentional from our end to take the fear out of this process.”

Education and familiarity with AI are also a deliberate part of ATB's strategy as it moves from pilot to large-scale implementation. It focuses on bringing employees into its AI lab in Calgary, giving them a tour, providing updates on progress toward strategic goals, and engaging in frank conversations about the challenges.

So what advice would ATB give other organizations about bringing people along on the AI adoption journey? “Be thoughtful at the beginning, where cultural resistance might exist in the organization, and highlight what it is,” said Semmens. “Let leadership know where the resistance spots lie, and make a plan for communication and education.”

One of the best options for accessing AI talent is to upskill existing employees. Long-time employees who have an understanding of both business problems and AI techniques are critical to unlocking the value of AI, and valuable for maintaining employee buy-in (see “Punching above its weight with AI at Pure Technologies Ltd.”).

Punching above its weight with AI at Pure Technologies Ltd.

Pure Technologies, a Canadian water technology firm, highlights how even small organizations can benefit from AI.

Pure Technologies started on its AI journey nearly 20 years ago, before the term “AI” hit the mainstream. The company has many valuable lessons to teach other companies in the process of adopting the technology.

Vice President of Research and Development Xiangjie Kong noted that to use AI effectively, you have to truly understand your business and be able to balance your existing domain knowledge with AI. Most importantly, he said, “Don’t think AI can solve everything.”

In the early days, Pure Technologies worked with a number of talented engineers and universities to

solve unique problems using large quantities of data. Starting early with AI paid off, as it took time to train its algorithms to be viable and consistent. As these AI solutions delivered value, however, clients started asking for similar solutions.

Throughout its journey, the company faced—and still faces—obstacles in finding the right kind of talent. “The challenge for us isn’t to adopt AI but to find people who can use it,” said Kong. “We’re not concerned about employees getting replaced, since they have so much domain expertise and we value that expertise.”

He also emphasized that every business’s journey is different and, as a result, you need to understand where AI can help your organization. In addition to AI talent, there is also a need for leadership, and a champion who “gets it.” Leaders must understand where their employees can use AI to add a competitive advantage to the business, and be willing and able to stick with AI until they see results, which takes time.

Conclusion

At the beginning of Deloitte Canada's series on Canada's AI imperative, we laid out our goal of engaging business and policy leaders across the country in what it would take for Canada to claim a leadership position in AI.

Specifically, we asked two questions:

- **What would a prosperity strategy look like in practice?**
- **What would it really take for Canada to lead?**

Over the course of this project, we've engaged in discussions with businesses, public policy leaders, and citizens across Canada in order to better understand the potential of AI and the ways in which Canada could lead. We've explored the barriers to AI leadership from an ecosystem perspective, and highlighted the knowledge and trust gaps concerning AI that exist in Canada.²² We've talked to ordinary Canadians about what those gaps look like in practice, and how to overcome them.²³ We've also presented a public-policy roadmap to building a sound and effective AI ecosystem.²⁴

And now, we pass the baton to the business community.

To enable a flourishing economy and secure Canada's future as an AI leader, we urge leaders throughout Canada to accelerate AI adoption—from start to scale. In particular, we'd encourage them to think about the following:

- By taking on a problem-solving mindset, companies can overcome the common challenges (e.g., a lack of resources, skills, or technical readiness) that come with starting to use AI.
- Scaling brings different and unique challenges to each organization, but they can be overcome with a mixture of becoming more digital, having a vision for AI usage over the long term, and ensuring employees understand the change process that comes with AI.
- Companies can look to their peers for valuable lessons on how to test and scale AI, and as evidence that AI deployment can produce dividends for every company, regardless of size, age, or industry.

Throughout our research, our fundamental belief in AI has not changed: AI could be one of the most transformative technologies of our time. It has already touched almost every industry and sector of society, and will undoubtedly transform them over time, even if people are divided over what the appropriate speed and scale of that transformation should be. Businesses operating in Canada have a duty to be prepared for that transformation and to become leaders in shaping it—to secure our economic prosperity in an AI-driven future.

As we look ahead to Canada's future, the imperative to lead on AI is clear. Let's work together to ensure we build a stronger nation.

Endnotes

1. "AI investment by country: Survey | Deloitte insights," accessed May 13, 2019, <https://www2.deloitte.com/insights/us/en/focus/cognitive-technologies/ai-investment-by-country.html?id=us:2em:3pa:emerging-technologies:eng:di:050619#end-note-sup-11>.
2. "AI Investment by country: Survey | Deloitte insights," accessed May 13, 2019, <https://www2.deloitte.com/insights/us/en/focus/cognitive-technologies/ai-investment-by-country.html?id=us:2em:3pa:emerging-technologies:eng:di:050619#end-note-sup-11>.
3. Deloitte survey of more than 1,000 Canadian businesses (2019).
4. *Canada's AI imperative: From predictions to prosperity*, Deloitte, accessed June 12, 2019, <https://www.canada175.ca/en/reports/ai-imperative>.
5. "Innovation and business strategy: Why Canada falls short," Council of Canadian Academies, June 2009, [http://www.scienceadvice.ca/uploads/eng/assessments%20and%20publications%20and%20news%20releases/inno/\(2009-06-11\)%20innovation%20report.pdf](http://www.scienceadvice.ca/uploads/eng/assessments%20and%20publications%20and%20news%20releases/inno/(2009-06-11)%20innovation%20report.pdf).
6. "Research and development: Gross domestic spending on R&D," OECD data, accessed April 24, 2019, <http://data.oecd.org/rd/gross-domestic-spending-on-r-d.htm>.
7. Vikram Mahidhar and Thomas H. Davenport, "Why companies that wait to adopt AI may never catch up," *Harvard Business Review*, December 6, 2018, <https://hbr.org/2018/12/why-companies-that-wait-to-adopt-ai-may-never-catch-up>.
8. Erik Brynjolfsson, Daniel Rock, and Chad Syverson, "Artificial intelligence and the modern productivity paradox: A clash of expectations and statistics," *Working Paper*, National Bureau of Economic Research, November 2017, <https://doi.org/10.3386/w24001>.
9. Thomas H. Davenport and Janet Foutty, "AI-driven leadership," *MIT Sloan Management Review* (blog), accessed May 24, 2019, <https://sloanreview.mit.edu/article/ai-driven-leadership/>.
10. Megan Beck, Thomas H. Davenport, and Barry Libert, "The AI roles some companies forget to fill," *Harvard Business Review*, March 14, 2019, <https://hbr.org/2019/03/the-ai-roles-some-companies-forget-to-fill>.
11. "About Us: Alberta Machine Intelligence Institute," *Amii* (blog), accessed June 12, 2019, <https://www.amii.ca/about-us/>.
12. "Vector Institute funds Pathfinder Project at Kimia Lab," accessed June 17, 2019, <https://uwaterloo.ca/systems-design-engineering/news/vector-institute-funds-pathfinder-project-kimia-lab> (source)
13. Kristian J. Hammond, "Please don't hire a chief artificial intelligence officer," *Harvard Business Review*, March 29, 2017, <https://hbr.org/2017/03/please-dont-hire-a-chief-artificial-intelligence-officer>.
14. "AI transformation playbook: How to lead your company into the AI era," *Landing AI* (blog), December 13, 2018, <https://landing.ai/ai-transformation-playbook/>.
15. "PCL and AltaML partner to digitally disrupt construction," PCL Construction, accessed June 12, 2019, <https://www.pcl.com/news-and-media/news-releases/pages/pcl-and-altaml-partner-to-digitally-disrupt-construction.aspx>.
16. "Smart robot for your aquarium," *MOAI*, accessed June 12, 2019, <https://www.moaidevices.com/>.
17. Deloitte survey of more than 1,000 Canadian businesses (2019).
18. "Automating rail joint inspections with video analytics and AI," *International Railway Journal*, accessed May 31, 2019, https://www.railjournal.com/in_depth/automating-rail-joint-inspections-with-video-analytics-and-ai.
19. *Canada's AI imperative: Overcoming risks, building trust*, Deloitte, accessed June 15, 2019, <https://www2.deloitte.com/ca/en/pages/deloitte-analytics/articles/canadas-ai-imperative.html>.
20. Nick Harrison and Deborah O'Neill, "If your company isn't good at analytics, it's not ready for AI," *Harvard Business Review*, June 7, 2017, <https://hbr.org/2017/06/if-your-company-isnt-good-at-analytics-its-not-ready-for-ai>.
21. "How to get employees to stop worrying and love AI," *Harvard Business Review*, January 25, 2018, <https://hbr.org/2018/01/how-to-get-employees-to-stop-worrying-and-love-ai>.
22. *Canada's AI imperative: From predictions to prosperity*, Deloitte, accessed June 12, 2019, <https://www.canada175.ca/en/reports/ai-imperative>.
23. *Canada's AI imperative: Overcoming risks, building trust*, Deloitte, accessed June 15, 2019, <https://www2.deloitte.com/ca/en/pages/deloitte-analytics/articles/canadas-ai-imperative.html>.
24. *Canada's AI imperative: Public policy's critical moment*, Deloitte, accessed June 29, 2019, <https://www2.deloitte.com/ca/en/pages/deloitte-analytics/articles/public-policys-critical-moment.html>.

Canada's AI imperative

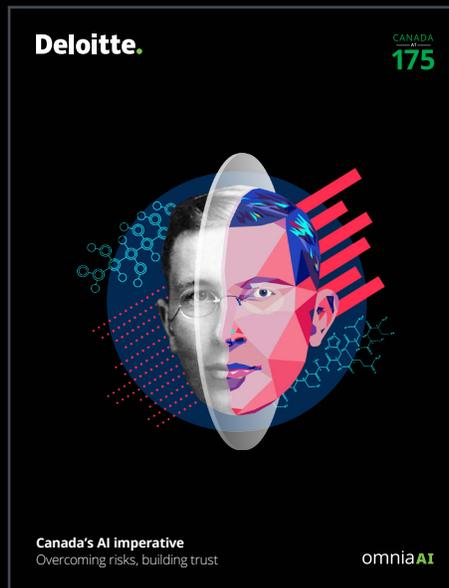
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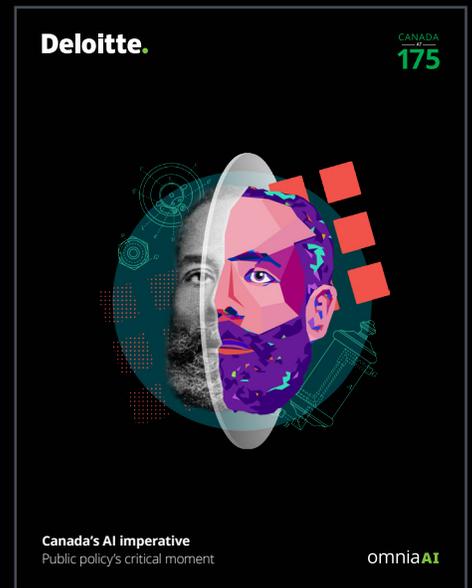
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