

Building a Digital-First Central Bank:

Digital Transformation at the Bank of Canada
and SEED AI's Methodology

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Preface

A few years after launching artificial intelligence (AI) initiatives, **persisting organizational issues** continue to prevent companies from reaping the expected rewards. As a result, as of late 2019, **only 8% of firms were engaging in core practices** that support **widespread adoption of AI¹**, and most had **only run ad hoc pilots**.

Digital transformations, including **AI adoption**, remain **necessary** for organizations to keep and reinforce their **competitive advantage**. However, executives and decision makers are faced with a challenge: the **lack of methodology** linked to digital transformation, especially **for AI adoption**. This makes it particularly **hard to decide how** and **where to start** to maximize impact and ROI while limiting risks.

This document presents **SEED AI's methodology** to help organizations in their **transformation towards AI adoption**. To better illustrate its impact, it presents a case-study of the **application** of this methodology at the **Bank of Canada**, with the results obtained.

The document is structured as follows: first, it discusses the **main challenges** faced by organizations on their journey **towards AI adoption**. Then, it presents **SEED AI's methodology** to address them at a high-level. Finally, it dives in **more depth on each step** of the methodology **and the results** of its application **at the Bank of Canada**.



The Bank of Canada is undertaking a Digital Transformation, in order to be Digital First in every aspect of our business. As part of this initiative, we are continually engaging with external partners, such as SEED AI and others, to pursue our transformation goals.



**Eric Santor, Advisor to the Governor on
Digitization, Bank of Canada**

The Bank of Canada at a Glance

The Bank of Canada is Canada's central bank, whose mandate is to promote the economic and financial welfare of Canada.

The opportunities brought by new technologies and tools, such as artificial intelligence, have led the Bank of Canada to embark on a transversal Digital Transformation to improve its service to Canadians.

For more information: <https://www.bankofcanada.ca>

SEED AI at a Glance

SEED AI is a data one-stop-shop. It is specialized in generating value with data and helping organizations solve business problems with artificial intelligence.

SEED AI offers services along the whole data value chain, from data collection, ETL and storage, all the way to business intelligence as well as building and maintaining custom artificial intelligence solutions.

SEED AI has worked across multiple sectors including financial services, insurance, healthcare, legaltech, heavy industries (e.g. mining), videogames, infrastructure, and renewable energy.

For more information: <https://www.seedai.ca>

AI Adoption Challenges - Human Aspects

While organizations face many technical **challenges to adopt AI**, the **toughest ones** are usually **human-centered** and **require a methodology** to handle them in an efficient way.



Business Translation

Translating business problems or needs into technical requirements

While artificial intelligence has attracted a lot of attention, there is still a prevailing **lack of adequate understanding of the technology by domain experts**, and **of the domain of expertise by data and IT experts**. This situation often **leads to misconceptions** around the practical applications of AI within organizations and a **suboptimal use of resources**.



Measuring Impact

Quantifying impact and ROI to optimize resource allocation

Organizations are still facing significant **issues** when trying to **scope AI projects** and **defining** their potential **return on investment**. This is often due to the **heterogeneity of use-cases** and **types of impact**, as well as the **transformational aspect** of AI projects **on existing processes**. These issues lead to **project prioritization** and **resource allocation mistakes**.



Cultural Inertia

Aligning internal teams and embracing change

AI projects **require** close **collaboration** between **stakeholders** with **different expertise**, business **priorities** and **innovation practices**. These differences often lead to **diverging incentives** and **misalignment** in the execution of AI projects. Moreover, **AI** applications can **require** significant **changes in processes** and **day-to-day activities** to bring their full added value to organizations. The **capacity to embrace change** culturally within organizations is an important **challenge** when **adopting artificial intelligence** and can **lead to a lack of adoption** of the technological solution, thus limiting the return on investment.

AI Adoption Challenges - Technical Aspects

The **human challenges** mentioned previously are usually the hardest to tackle. However, there are **often combined with technical challenges** that significantly **increase the complexity of AI projects**.



Data Maturity and Accessibility

Knowing where and how to access the relevant data

Artificial intelligence projects are entirely **dependent on data**. However, many organizations suffer from **low data maturity** and **issues accessing data sources** required for AI projects. This can lead to **lost opportunities** to create value due to the **lack of awareness of available data assets**, as well as **delay** or **additional costs to AI projects** to access the required data sources.



Legacy Systems

Working with technological debt

Organizations usually carry **technological debt** in the form of **legacy systems**. **Critical to operations** and core activities, these systems are **hard to change** but **contain valuable data** and are used in many processes. **Artificial intelligence applications** often **require** interacting with **legacy systems** (*e.g. to retrieve their data*). This can create difficult situations to avoid **building more technological debt** and **affecting the operations** of core systems.



Maintenance of AI Systems

Maintaining both infrastructure and models

AI systems require **two types of maintenance**. First, their **IT infrastructure** needs to be maintained, as is commonly done for other traditional systems. However, they also require their **models to be maintained**. With time and new data, the performance of **AI models can decay** or **develop damaging biases**. While organizations have become accustomed to maintaining traditional systems, **model maintenance and monitoring** is often a **new challenge** that **require its own expertise** to avoid costly mistakes.

SEED AI's Methodology - Fundamentals

All the **challenges** previously mentioned are **amplified** by the **lack of structure and methodology in AI**. This is due to the **novelty of this field** of expertise and **leads to over-budget projects** and **issues** in successfully **transitioning from proofs of concept to deployment**.

To help organizations in their journey towards AI adoption, SEED AI has built a **comprehensive methodology and toolkit**, as presented in this case study. It has 3 characteristics: **human-centric**, **impact-driven** and design to **reduce risks for decision makers**.



Human-centric

All stakeholders are essential for a successful AI transformation, from IT teams to end-users. They need to be educated and involved from the get-go to avoid the human challenges linked to AI adoption.



Impact-driven

AI and other related technologies are just tools, not end-goals. Digital projects must be driven by business or organizational impact, not technological tools.



Risk Management

AI is a young field expertise. Its lack of structure and methodology often leads to operational risks, lack of ROI and prioritizations issues.

SEED AI's Methodology at a Glance

The funnel below presents **SEED AI's methodology** at a **high level**. Each step is **detailed in the following pages**, as well as the impact of its **application** at the **Bank of Canada**.



Methodology in Action at the Bank of Canada



Training, Ideation Sessions and Call for Ideas

Scaling AI education for all and identifying impactful use-cases

To enable a successful adoption of artificial intelligence, it is important to demystify these technologies within organizations. This first step has 3 main goals:

- 1 Offer a **high-level understanding** of **data science** and **artificial intelligence**, including what these **technologies can and cannot do**. This is key to solve the challenges linked to business translations.
- 2 Use simple and **efficient ideation tools** to **empower domain experts** to **identify** concrete **use-cases** of artificial intelligence that are deployable and hold a **strong added value**.
- 3 **Collect ideas** created **by members** of the organization, who are the **most knowledgeable** about its **processes**, value creation **opportunities** and **cultural context**.

Training, Ideation and Call for Ideas at the Bank of Canada:

10%+

of the Bank's **members**
trained with **20+ speakers**

120+

ideas submitted in a **3-**
week call for ideas

20%+

participation rate of Bank
of Canada **members**

Methodology in Action at the Bank of Canada



Project Structuring

Transforming ideas into concrete projects

Successfully converting AI use-case ideas into **impactful projects** requires **clear scoping and planning**. Structuring workshops engages teams in **defining** the **resources needed** for **deployment**, the **cultural factors** to be considered and **measuring the ROI**.

This stage answers questions pertaining to mapping of **current versus desired processes, risks** to keep in mind and the **availability, integrity, and cleanliness** of the **datasets** in question.

During this stage, **dialogue** between **multiple stakeholders** can be **necessary** and some **previously unconsidered aspects** of the projects **can appear**. To facilitate this exercise and ensure a thorough structuring process, SEED AI has **built methodological tools** and **processes**.

This phase is essential to tackle issues linked to cultural inertia, impact measurement as well as technical aspects linked to deployment (*e.g. legacy systems to interact with*) to reduce risks.

Project Structuring at the Bank of Canada:

3

days of **workshops**

60

ideas structured into projects



Transfer of methodological **tools** for internal use

Methodology in Action at the Bank of Canada



Data Audit

Driving a data-driven organization and uncovering data-related challenges

Any **data science** or **artificial intelligence** project is fully **dependent on** the available **data**.

Before dedicating additional **resources** to a given project, it is essential to **rapidly check** the **data** to ensure its **quality, quantity, and accessibility**.

This step is **essential to reduce risks**. By requiring the extraction of a sample data sets from the target systems and collaboration with a domain expert to understand the data, it allows to **tackle both technical and human challenges**.

If the available **data is not good enough** to start a project, this stage **still holds significant value** for the organization. It empowers the organization to **assess its data collection and storage processes**, and **plan modifications** to optimize its operations as a data driven organization and culture.

Data Audits at the Bank of Canada:

13

data audits performed
on **various data types**
(text, tabular, times series,
etc.)

9

machine learning
projects green lit for
next steps

3

projects redirected
internally to **other**
digitization
initiatives

Methodology in Action at the Bank of Canada



Proof of Concept

De-risking projects and demonstrating impact through rapid feasibility checks

Algorithms are the **core** and the **most challenging part** of AI projects.

Proof of concepts allow to **assess** whether a future solution would meet end-users expectations and **generate impact**. They are **done in less than 3 weeks** to be lean and agile.

While prototyping, emphasis is put on integrating experts' knowledge into the model and **considering** the future **human interactions with the tool**. It is essential to **reduce risk** and increase **internal adoption** at later stages.

Successful proofs of concepts are pushed towards **deployment**.

Proofs of Concepts at the Bank of Canada:

8

proofs of concepts done
in 3 months

2

weeks on average per
proof of concept



Transfer of
methodological **tools** for
future internal use

Methodology in Action at the Bank of Canada



Deployment

Aligning end-users and technical experts to maximize adoption and impact

Once the potential of a solution is demonstrated through a proof of concept, its benefits for the organization must be unlocked by deploying the solution and ensure its adoption. Four key elements are required at this stage:



Defining the end process: new AI applications often alter existing processes. To ensure adoption and maximum impact, new processes need to be built with inputs from end-users and technical support teams.



Refining the model(s): model prototypes usually need to be generalized, optimized, and made robust before deployment. Interpretability, performance, and human intervention requirements are confirmed and ensured at this step.



Setting production requirements: optimal IT implementation approach may vary within an organization (*due to legacy systems, human in the loop requirements, existing processes, and security issues*). IT teams must be involved to build design it.



Knowledge transfer and maintenance: to ensure full adoption and sustainability, knowledge transfer to both end-users and technical support teams are essential.

Deployment at the Bank of Canada:

7

projects pushed to deployment in partnership with internal IT teams



custom **deployment approaches** for **security** and **operational requirements**



knowledge transfer to facilitate **maintenance** and **continuous improvement**

Impact at the Bank of Canada

In **8 months**, SEED AI's methodology applied at the Bank of Canada had the following impact:



Training, Ideation and Call for Ideas

10%+ of the Bank's **members trained**, with **120+ ideas identified** by **20%+** of Bank of Canada **members**



Project Structuring

60 ideas structured into projects in **3 workshops**



Data Audits

13 data audits done on **various data types** (*text, times series, etc.*) with **9 machine learning projects pushed forward**



Proofs of Concepts

8 proofs of concepts done in **2 weeks on average**



Deployment

7 projects pushed to **deployment**, with **custom approaches**, and **knowledge transfer** for **maintenance** and **improvements**

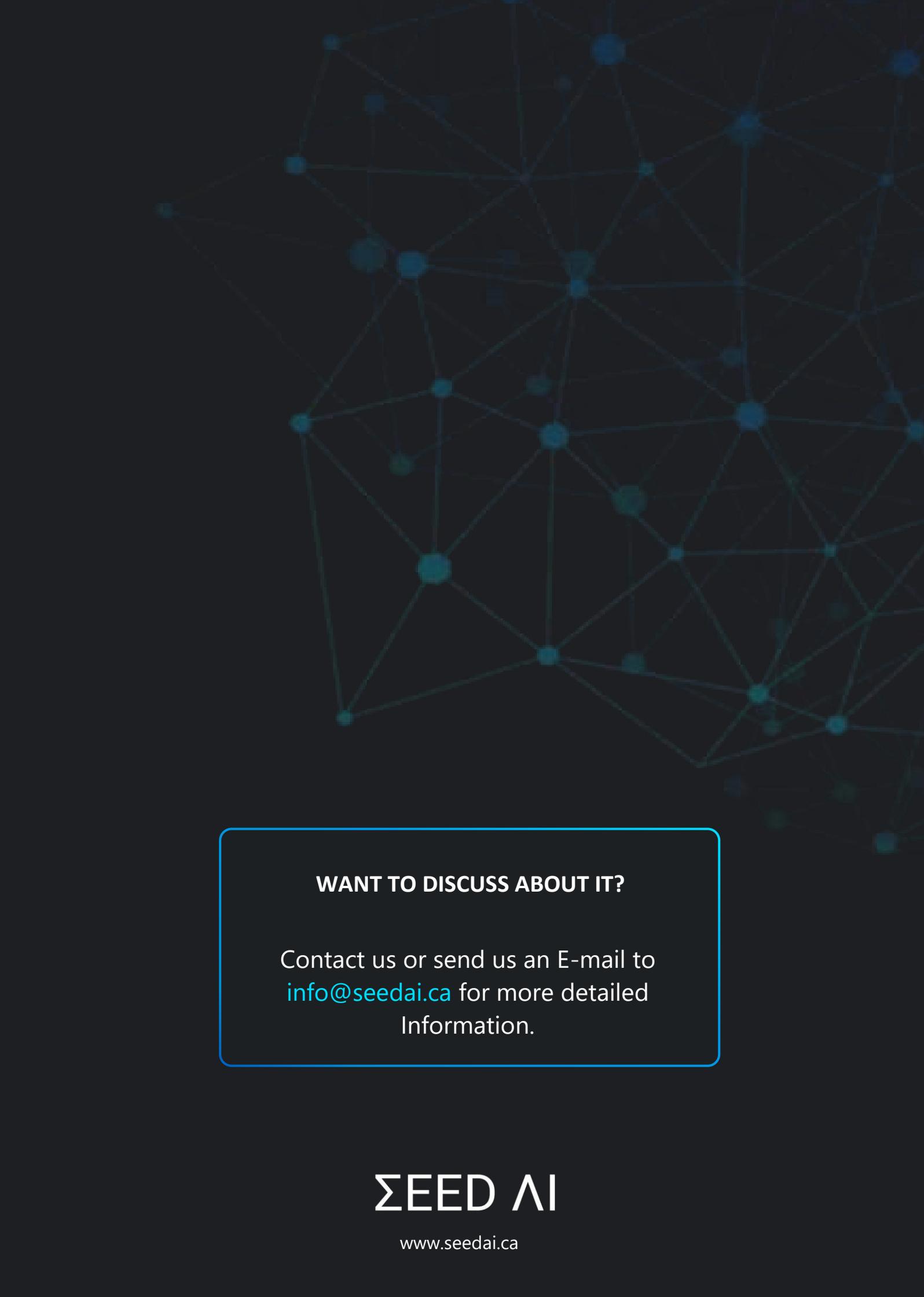
Next Steps for the Bank of Canada:



This methodology is designed to be **lean, agile**, and **iterative**. 40+ use-cases have been set aside for a second iteration. The implemented solutions can also be improved upon.



This first iteration has enabled the Bank advance its **digital transformation strategy** by helping it shape the **structure, composition** and **processes linked** to a future **Digital Transformation team**, that would merge AI projects with other digital initiatives such as business intelligence and RPA.



WANT TO DISCUSS ABOUT IT?

Contact us or send us an E-mail to
info@seedai.ca for more detailed
Information.

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