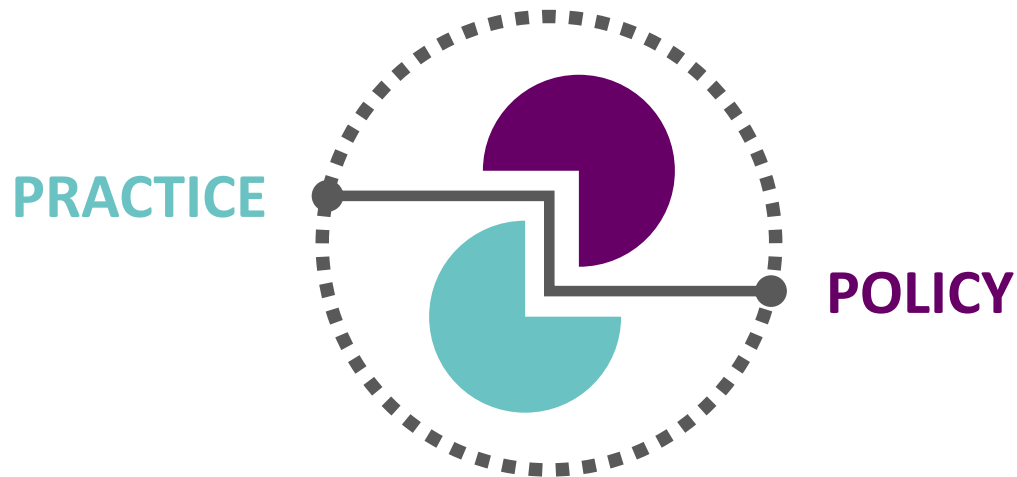




# Augmented Decision-making @ IRCC

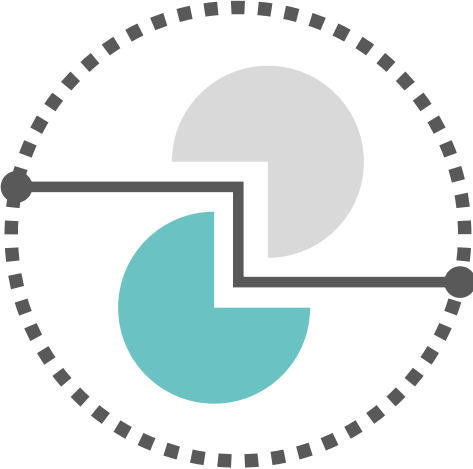


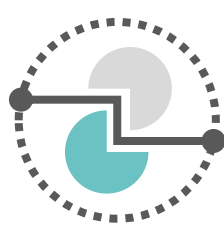
**Presentation to the Symposium on Algorithmic Government**

24 April 2019

Hubert Laferrière & Amanda McPherson

PRACTICE





## **Significant Volume Growth**

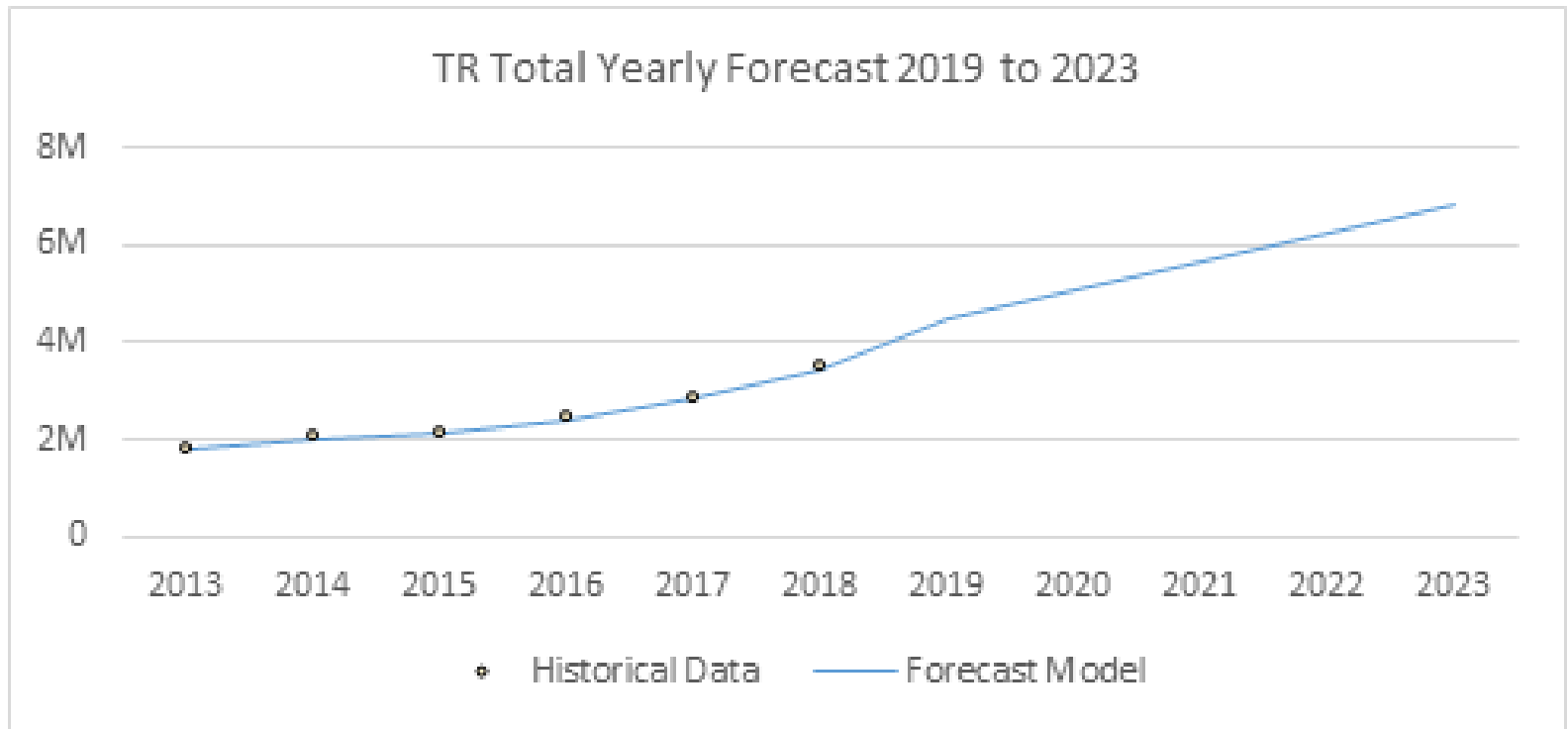
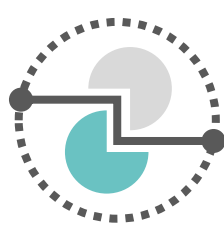
- » IRCC has been facing an ongoing and significant volume growth with temporary resident applications (visitors, students and workers), in particular from China and India.

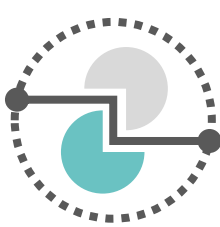
## **Emphasis on Client Service and Efficiency**

- » Minister's mandate letter is clear: reduce application processing times, improve service delivery to make it timelier and less complicated, and enhance system efficiency.

## **A Need for Innovation**

- » Since traditional means to deal with pressures do not suffice, IRCC has been developing its advanced analytics capacity including predictive analytics and machine learning.





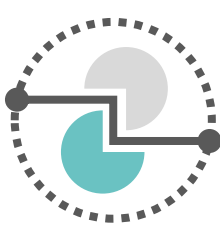
## Using Advanced Analytics & Machine Learning Technology

- » The goal is to automate a portion of the temporary residence (TR) business process, focusing on on-line applications (e-Apps) from China and India.
  - Model trained to recognize key factors at play in decision making on visitor applications.
  - The machine then automatically triages applications and “recommends” applications that should be approved at this step
  - With feedback data from non-compliant visitors, the machine is automatically adjusting the factors to reflect a changing environment.

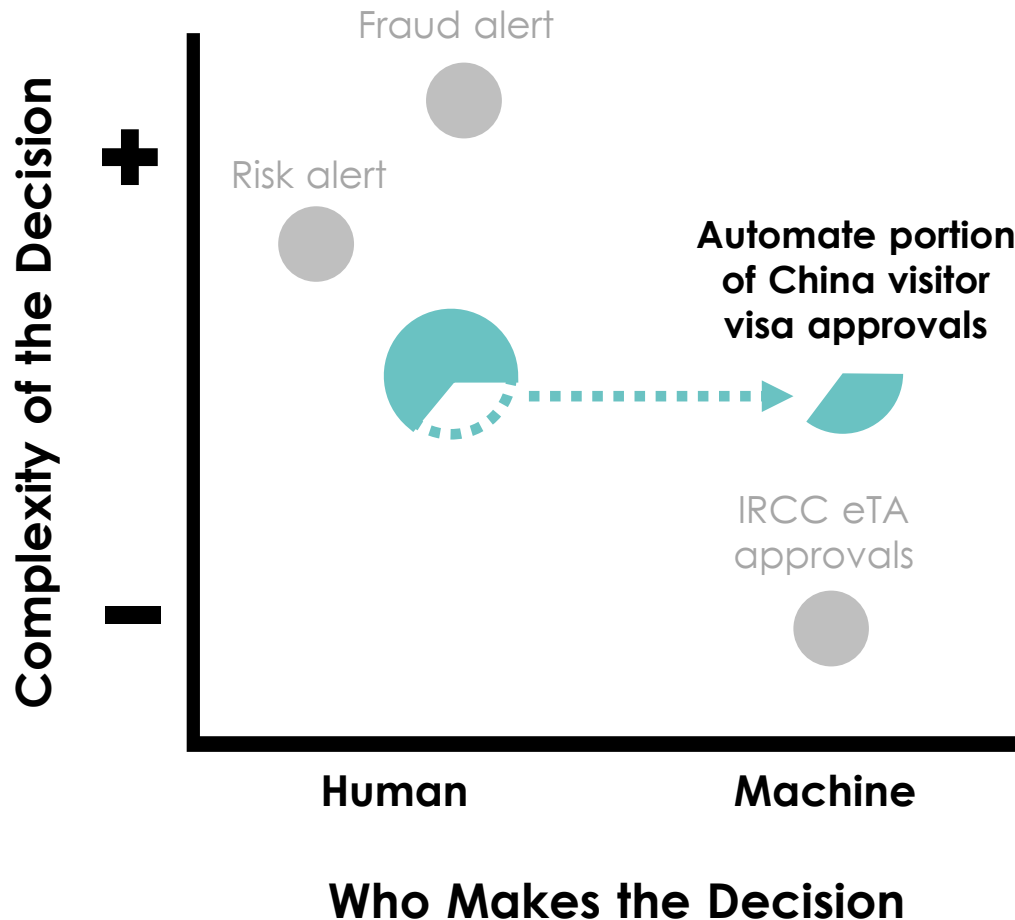
● **Pilot started in 2018: China in April and India in August.**

● **Benefits Realization Assessment completed in late Fall 2018 (China only).**

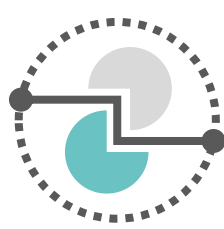
● **Transition into steady-state environment Fall 2019.**



# Approach to Support Decision Making

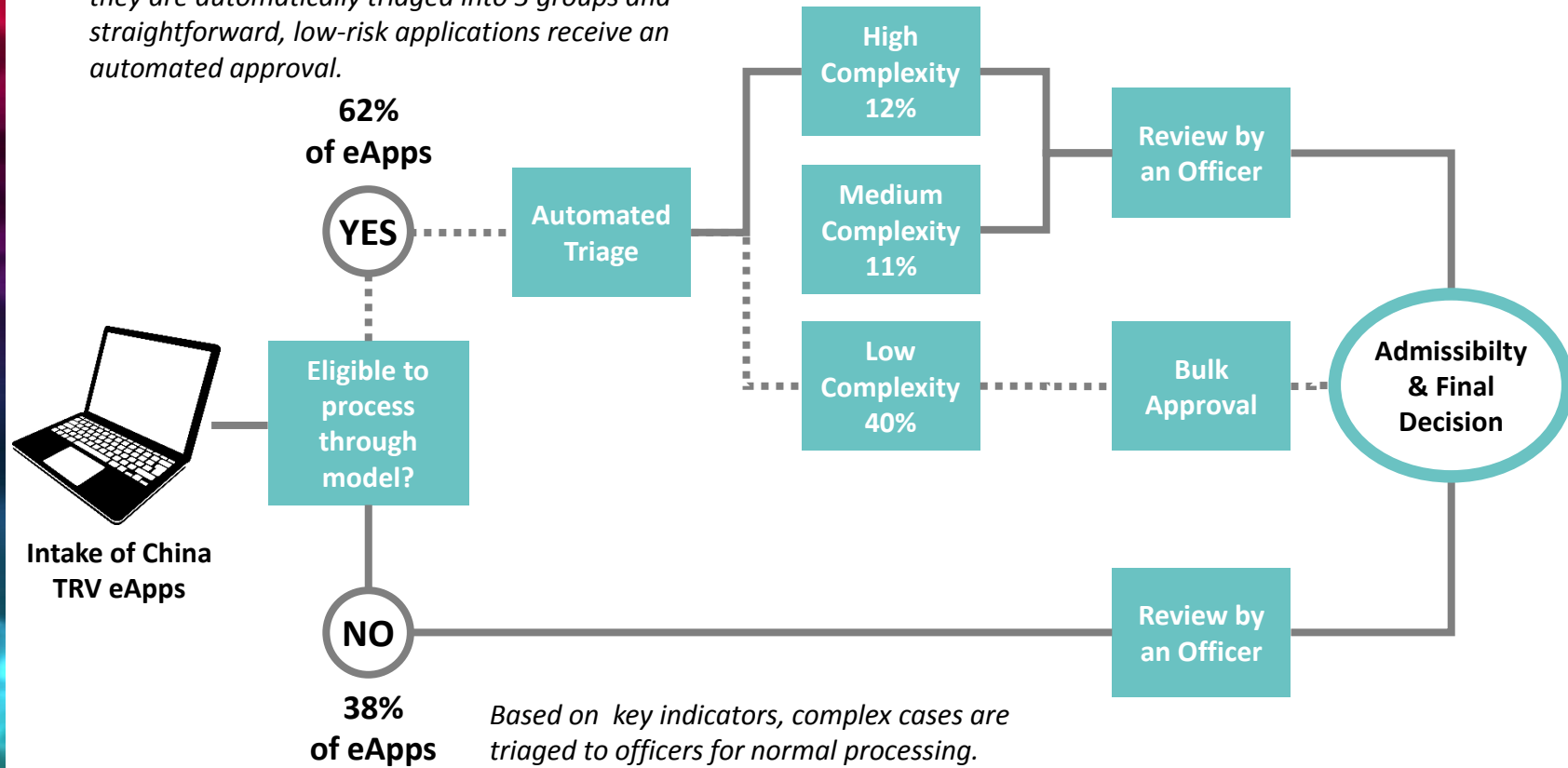


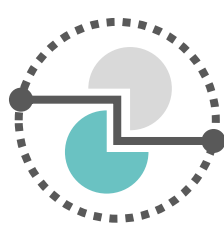
With the TR model, positive eligibility decisions are made automatically, based on a set of rules derived from thousands of past officer decisions. When an application meets certain criteria, it is approved for eligibility without officer review.



# China Pilot: Process Flow

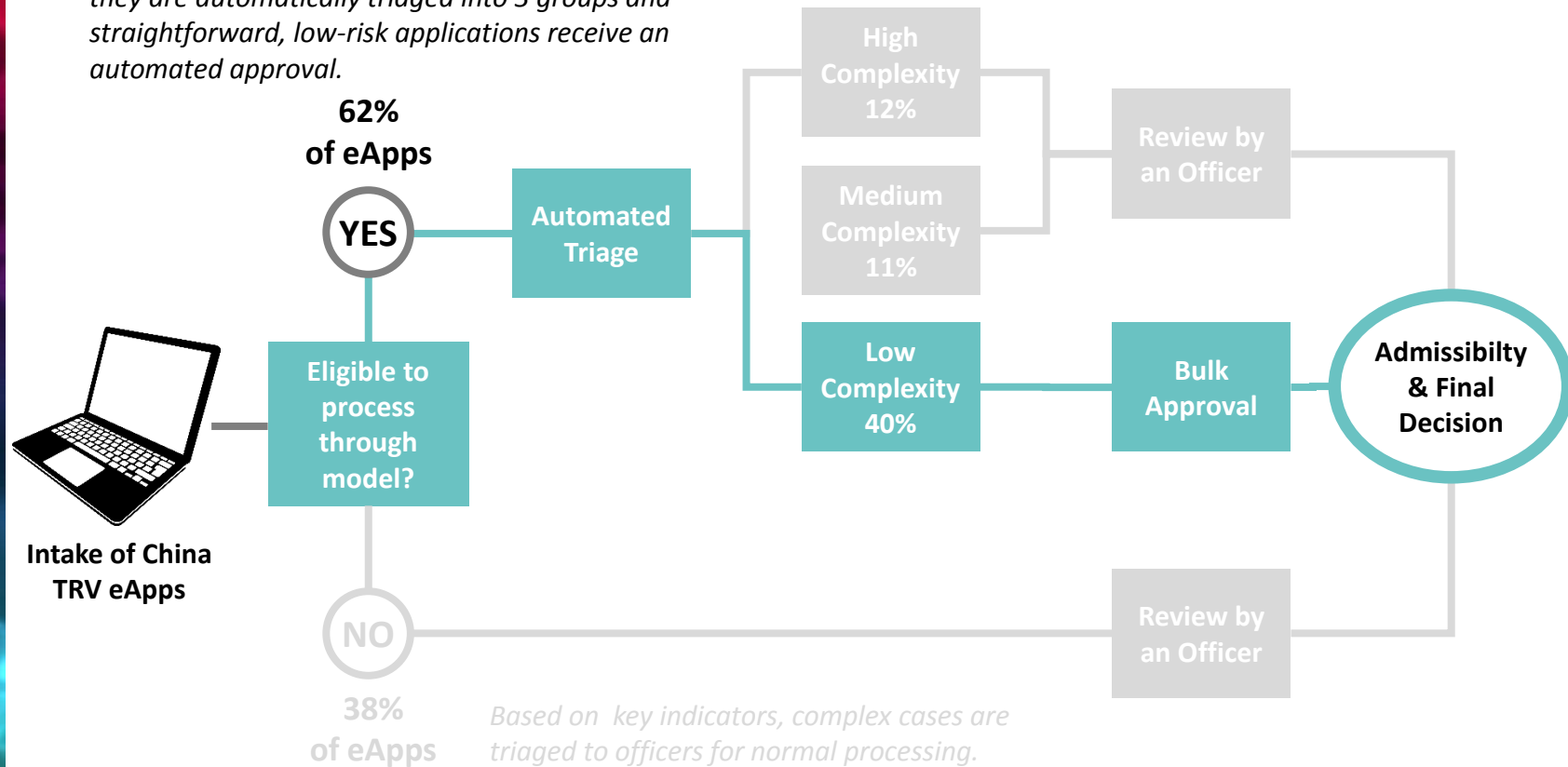
Remaining applications go through the model where they are automatically triaged into 3 groups and straightforward, low-risk applications receive an automated approval.





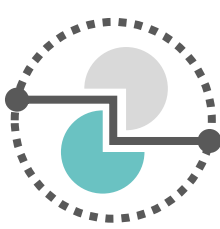
# China Pilot: Process Flow

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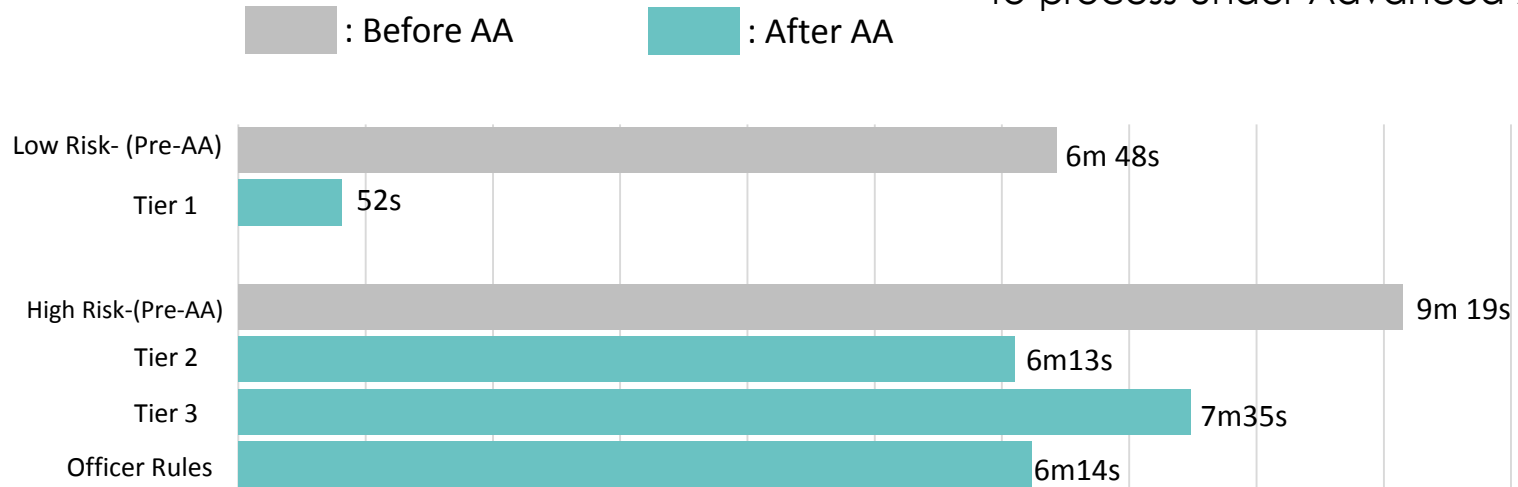
AA Models have yielded significant results in triaging applications and augmenting decision making, resulting in processing efficiencies and improved productivity; enhancing & strengthening program integrity while generating potential and substantial savings.





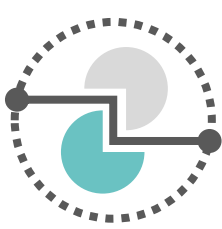
# China Pilot: Key Results

Tier 1 is **87% faster**  
to process under Advanced Analytics



**TIME SAVINGS = LOWER HR COSTS PER FILE = POTENTIALLY FASTER CLIENT SERVICE**

There is a tremendous potential to use AA to perform administrative and more simple tasks, and rely on a highly-skilled workforce to perform contextual reasoning, deep dives and complex fraud detection – tasks that are essential for **quality decision-making savings**.



# Accomplishments (...so far)

-  Legal & Policy
-  Ethics
-  Privacy
-  Communications
-  Data Governance & Management
-  Information Technology
-  Change Management
-  Build the Data Science Skills Set & Recruitment Strategy
-  Data Science & Third Party Review

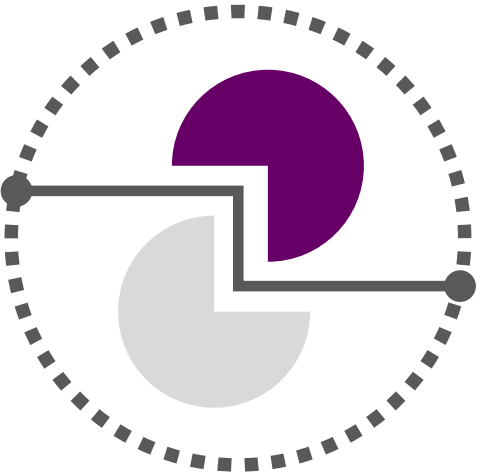
At design stage



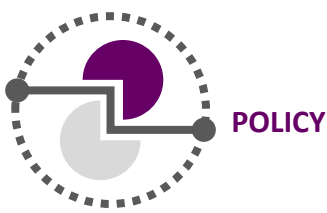
*2018 CIOB Community Award – Innovation*

*2018 Operations Sector Awards – Innovation*

- Embedding Key Resources
- Scrums



**POLICY**



- » The *Immigration and Refugee Protection Act* now provides broad authorities for the use and governance of electronic systems, including automated systems.

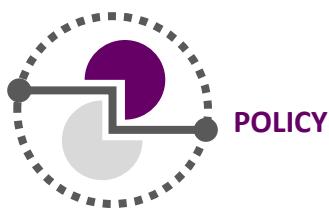
## ***Part 4.1 – Electronic Administration***

*Passed in 2015 and brought into force in 2017*

### **Key provisions include:**

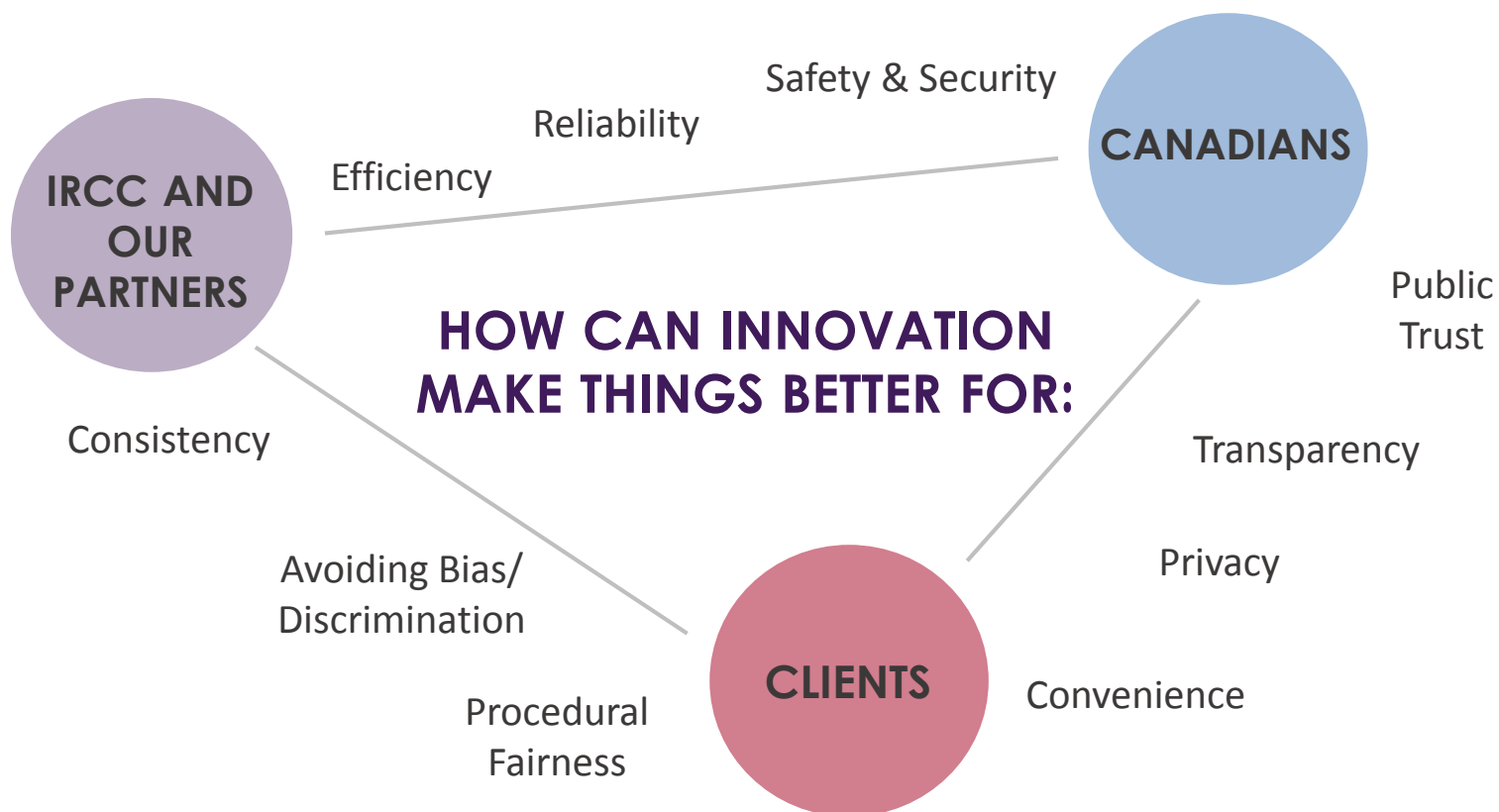
*186.1(5) An electronic system may be used by an officer to make a decision or determination or to proceed with an examination*

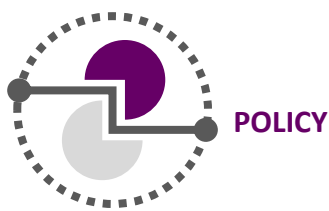
*186.3(2) The regulations may require an individual to make an application or submit documents electronically*



# Going Further

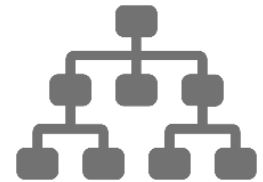
- » A strong legal foundation on its own is not enough to move forward with the use of automation and AI.
- » We need to make sure we're connecting the right people, asking the right questions, and taking the right steps.





# Working Differently

- » Automation and AI have the potential to fundamentally change how we operate
- » IRCC recently created a new Transformation and Digital Solutions Sector
- » Transformation will raise new considerations and challenges
- » Need to adapt to continue to deliver informed analysis and clear advice to government decision-makers



## **What are the implications for:**

*Our policy framework?*

*Our IT and data infrastructure?*

*Relationships with our security & delivery partners?*

*The role of our officers and our physical footprint?*



# Looking Outward

- » Successful use of automation and AI requires that we look beyond our organization, and even outside of the Government of Canada.
- » External engagement is necessary to:
  - reassure stakeholders and critics that we are using automation and AI responsibly; and
  - leverage the expertise of the academic community and other external experts.
- » IRCC has been engaging federal partners, stakeholders and academics regarding its use of electronic tools in order to:
  - more effectively respond to stakeholder concerns;
  - counter misconceptions; and
  - glean best practices.



## AUTOMATED DECISION SUPPORT Policy Playbook



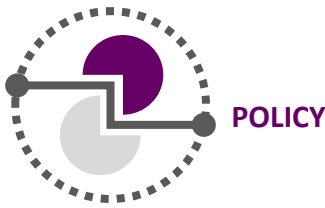
How to ensure responsible use of automation, advanced analytics and artificial intelligence in service of administrative decision-making

- 1 Preamble
- 2 Guiding Principles
- 3 The Automator's Handbook
- 4 Glossary of Key Terms

# A POLICY PLAYBOOK

- » Guiding Principles
- » A Handbook for Innovators





# Guiding Principles

Guiding principles will give IRCC a coherent basis for strategic choices about whether and how to make use of new tools and techniques.

## Overarching Goals

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- The use of new tools should deliver a clear **public benefit**
- **Humans**, not computer systems, **are responsible** for decisions

## Responsible Design

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- Ensure systems do not introduce **unintended bias** into decision-making
- Recognize the **limitations** of data-driven technologies
- Officers should be **informed**, not led to conclusions
- Humans and algorithmic systems play complementary roles; must **find right balance** to get the most out of each
- Adopt new **privacy-related best practices**



# Guiding Principles

## The Right Tools in the Right Circumstances

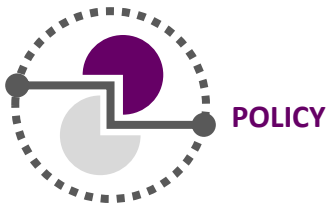
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- Systems should free people to focus on things that require their **expertise and judgment**
- Proceed carefully, step-by-step, **starting with the least impactful intervention**
- “**Black box**” algorithms should not be the sole determinant of final decisions on client applications

## Transparency and Explainability

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- Subject systems to appropriate **oversight**, to ensure they are fair and functioning as intended
- Always be able to provide a **meaningful explanation of decisions** made on client applications
- Balance transparency with the need to protect the **safety and security of Canadians**
- Clients to have **access to the same recourse** mechanisms



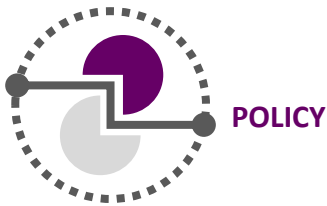
# The Automator's Handbook

A handbook is being developed to help guide innovators through a linear process when considering the development of a new automated decision system, equipping them to consider the right questions at the right times.

When deciding if automated decision-making is well suited to the problem at hand

- *What impact would our proposal have on clients?*
- *Do we have the data we need to make this work?*

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When setting out to design and build a new system

- *What can we do to guard against algorithmic bias?*
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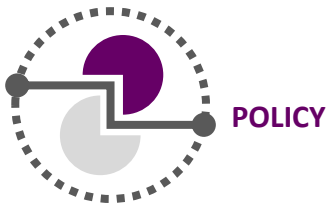
- *What can we do to guard against algorithmic bias?*
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**2**

**When preparing for system launch**

- *What is our approach to public transparency?*
- *Have employees received the training they need?*

**3**



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2

**Once an automated system is up and running**

- *What is the going process for quality assurance?*
- *Is our confidence threshold still appropriate?*

4

**When preparing for system launch**

- *What is our approach to public transparency?*
- *Have employees received the training they need?*

3



THANK YOU