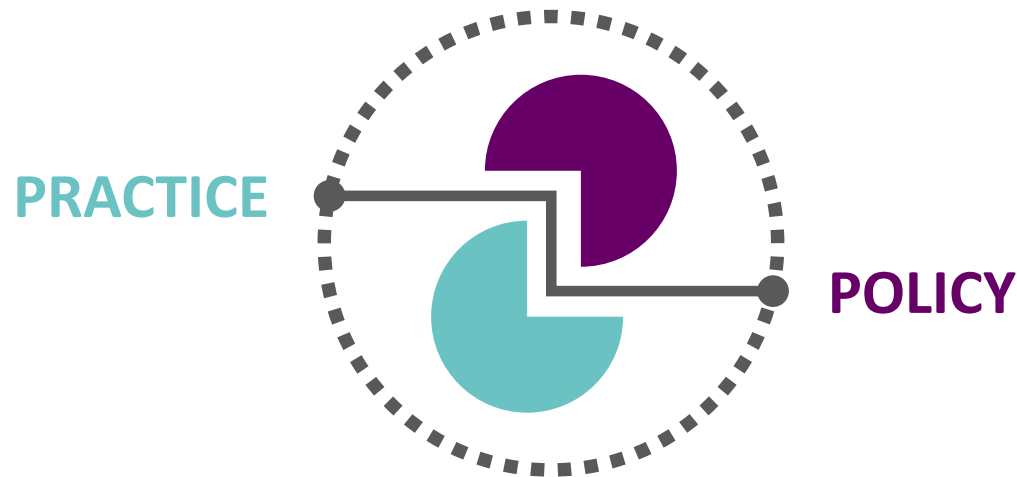




# Augmented Decision-making @ IRCC



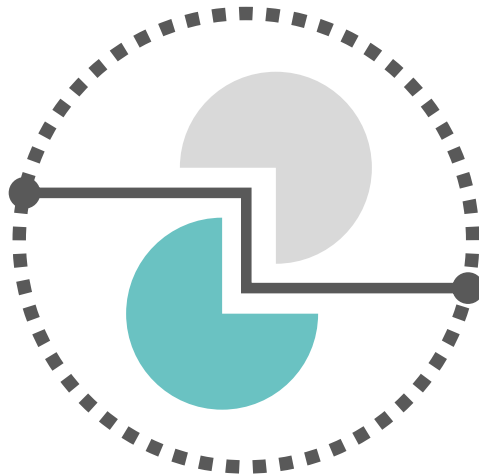
**Joint Councils Learning Event (PSSDC|PSCIOC) | The Pavilion at Assiniboine Park, Winnipeg**

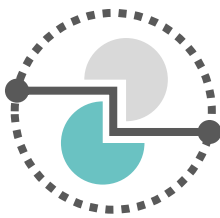
September 24, 2019

Hubert Laferrière

Director, A<sup>2</sup>SC, Advanced Analytics Solution Centre

PRACTICE





## **Significant Volume Growth**

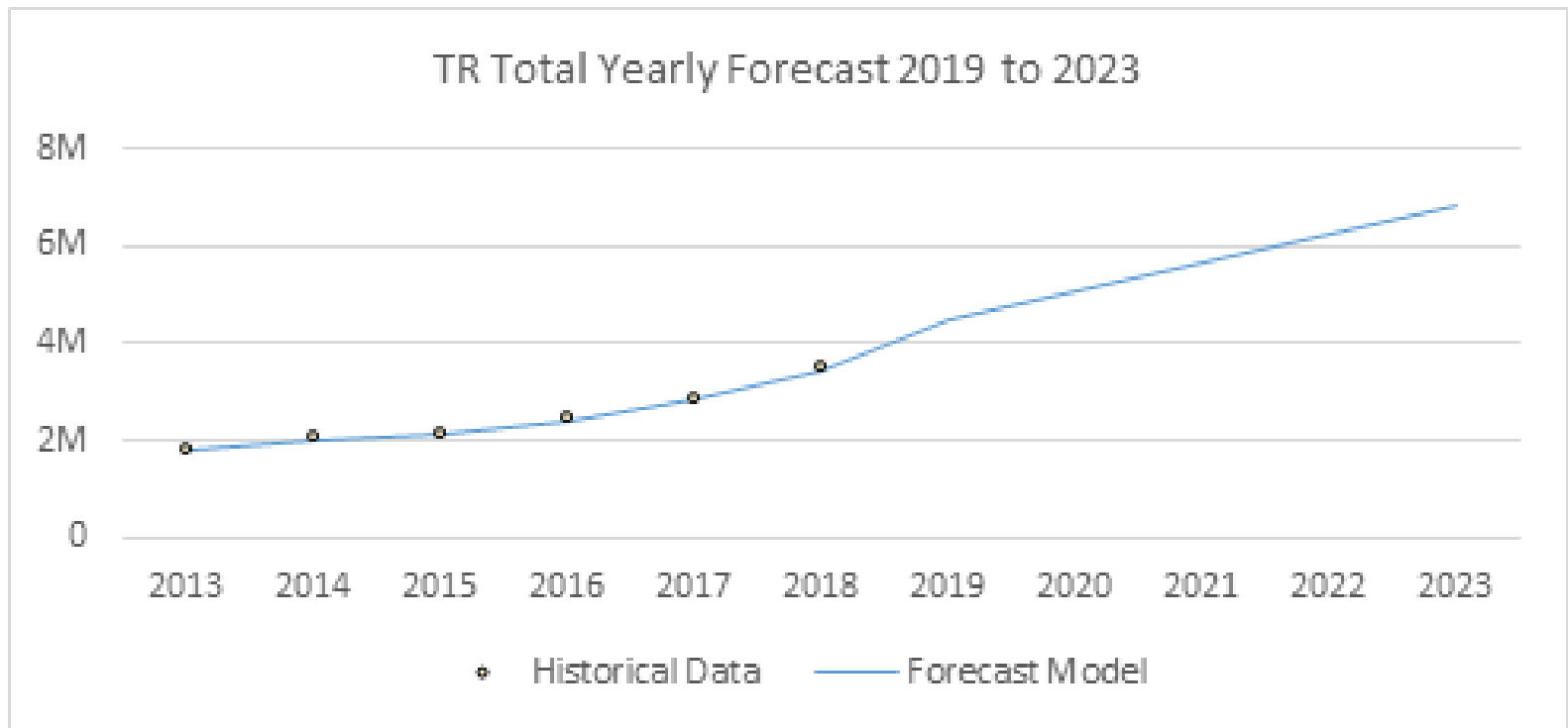
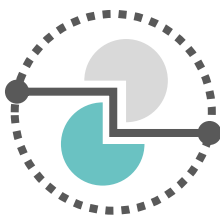
- » IRCC has been facing an ongoing and significant volume growth with temporary resident applications (visitors, students and workers), in particular from China and India.

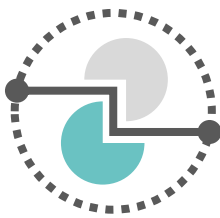
## **Emphasis on Client Service and Efficiency**

- » 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.





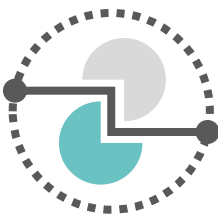
## Using Advanced Analytics & Machine Learning Technology

- » 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.

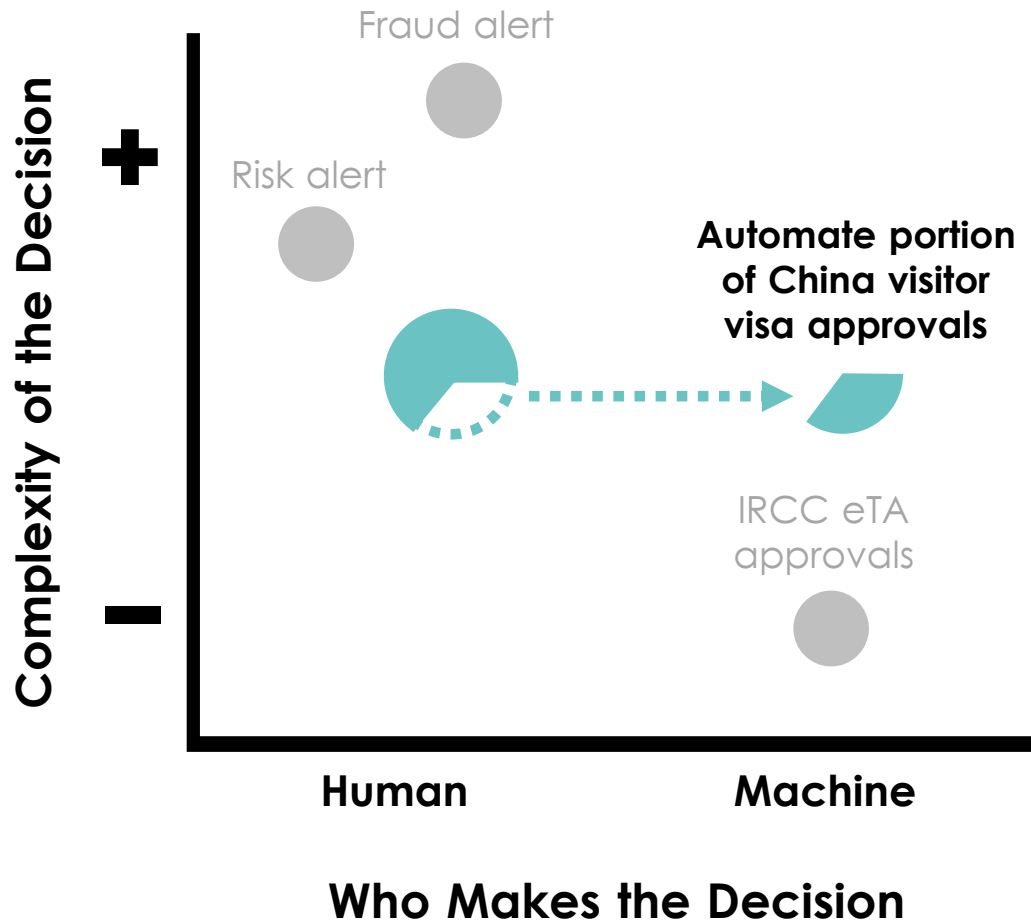
● **Pilot started in 2018: China in April and India in August.**

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

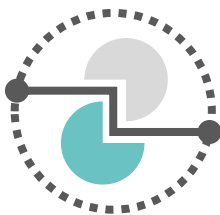
● **Transition into steady-state environment Fall 2019.**



# Approach to Support Decision Making

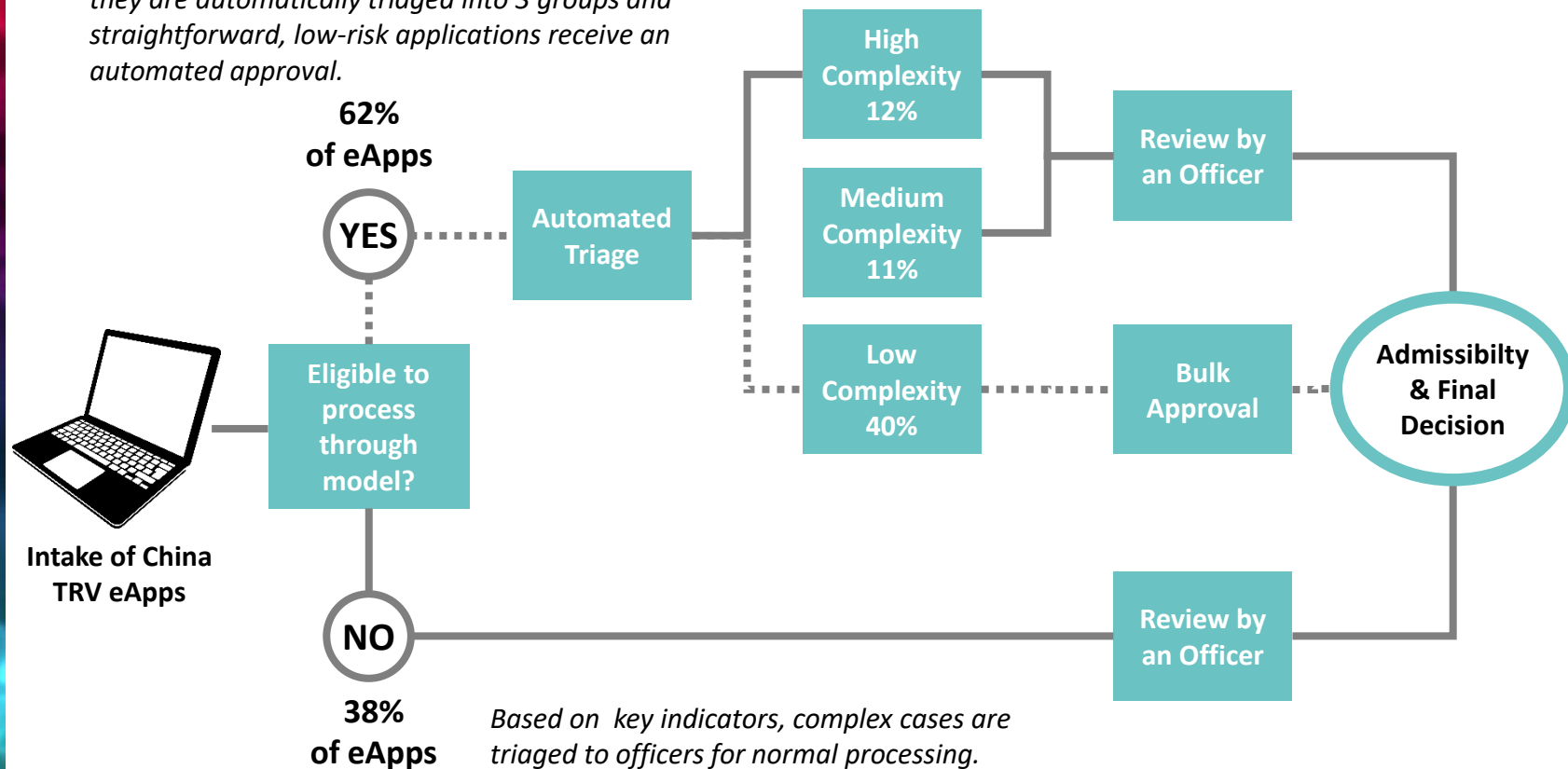


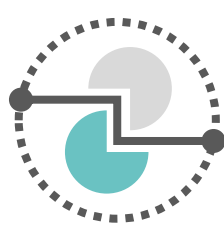
With the TR model, positive eligibility decisions are made automatically, based on a set of rules derived from thousands of past officer decisions. When an application meets certain criteria, it is approved for eligibility without officer review.



# China Pilot: Process Flow

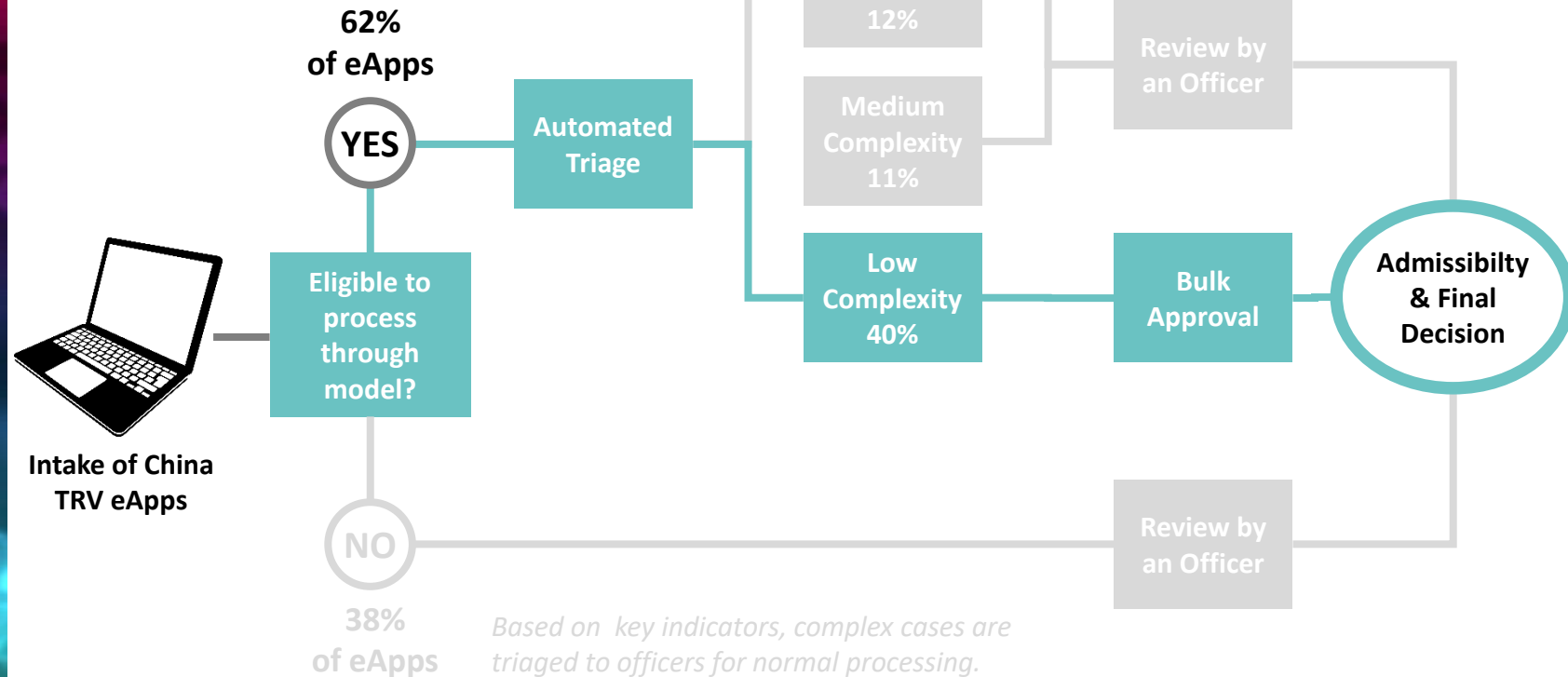
*Remaining applications go through the model where they are automatically triaged into 3 groups and straightforward, low-risk applications receive an automated approval.*





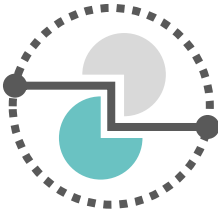
# China Pilot: Process Flow

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



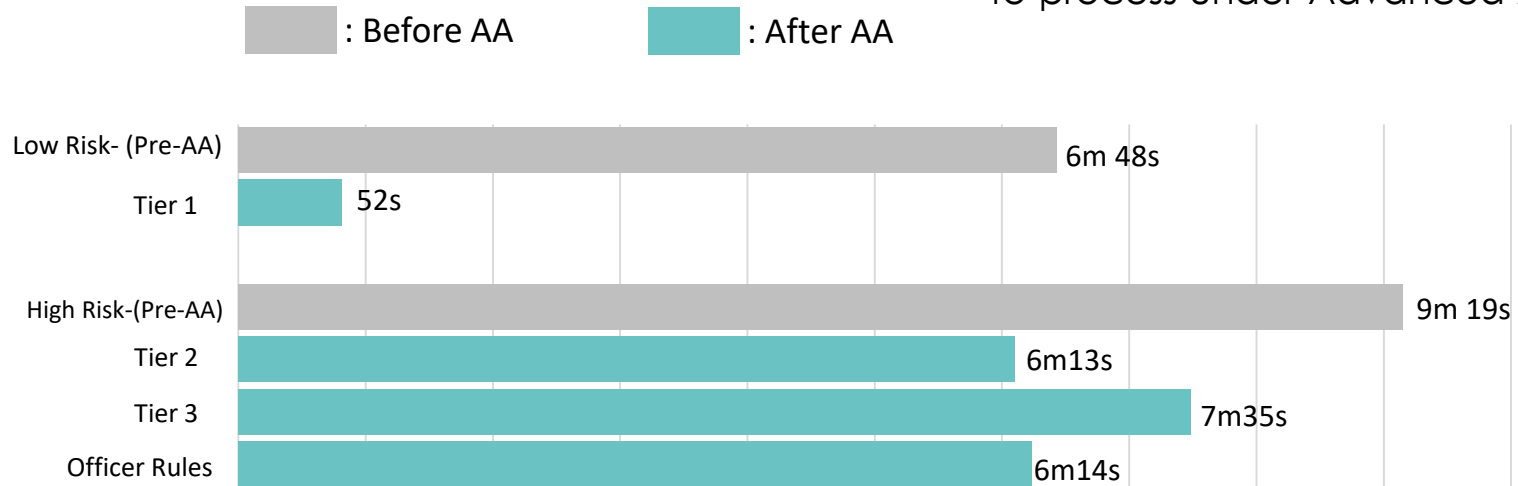
AA Models have yielded significant results in triaging applications and augmenting decision making, resulting in processing efficiencies and improved productivity; enhancing & strengthening program integrity while generating potential and substantial savings.





# 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

	<b>Legal &amp; Policy</b>	Opinions
	<b>Ethics</b>	Directives
	<b>Privacy</b>	PIA
	<b>Communications</b>	Presentations
	<b>Data Governance &amp; Management</b>	AI Catalyst
	<b>Information Technology</b>	Right environment
	<b>Change Management</b>	Plan
	<b>Build the Data Science Skills Set &amp; Recruitment Strategy</b>	Team
	<b>Data Science &amp; Third Party Review</b>	NRC
	<b>Cybersecurity</b>	Simulation



***2018 CIOB Community Award – Innovation***  
***2018 Operations Sector Awards – Innovation***

- Embedding Key Resources
- Scrums
- Agile and Open Analytics Methods)
- Creating alliance with academia.

SYMPOSIUM ON  
**Algorithmic  
Government**

Shaw Centre, Ottawa Ontario

April 23-24, 2019



# What Have We Learned So Far?

## **Not a Passing Phase**

- » Will be key to supporting Transformation
- » AA offers key to increasing operation effectiveness and efficiency

## **Modular Vs. Customized**

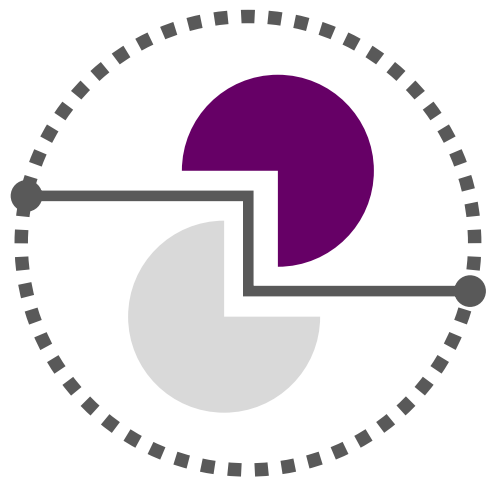
- » To maximize utility and efficiency solution need to be modular rather than customized for each situation

## **Link Directly to Operations**

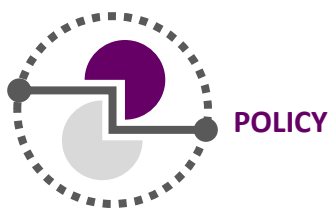
- » AA needs to work directly with the business to best understand the needs

## **More Than Technology – Key Issues & Challenges**

- » Automation and AI have the potential to fundamentally change how we operate
- » Transformation will raise new considerations and challenges
  - » Our policy and framework?
  - » Our IT and data infrastructure?
  - » Relationships with our security & delivery partners?
  - » Organizational readiness & operational stability?



**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:**

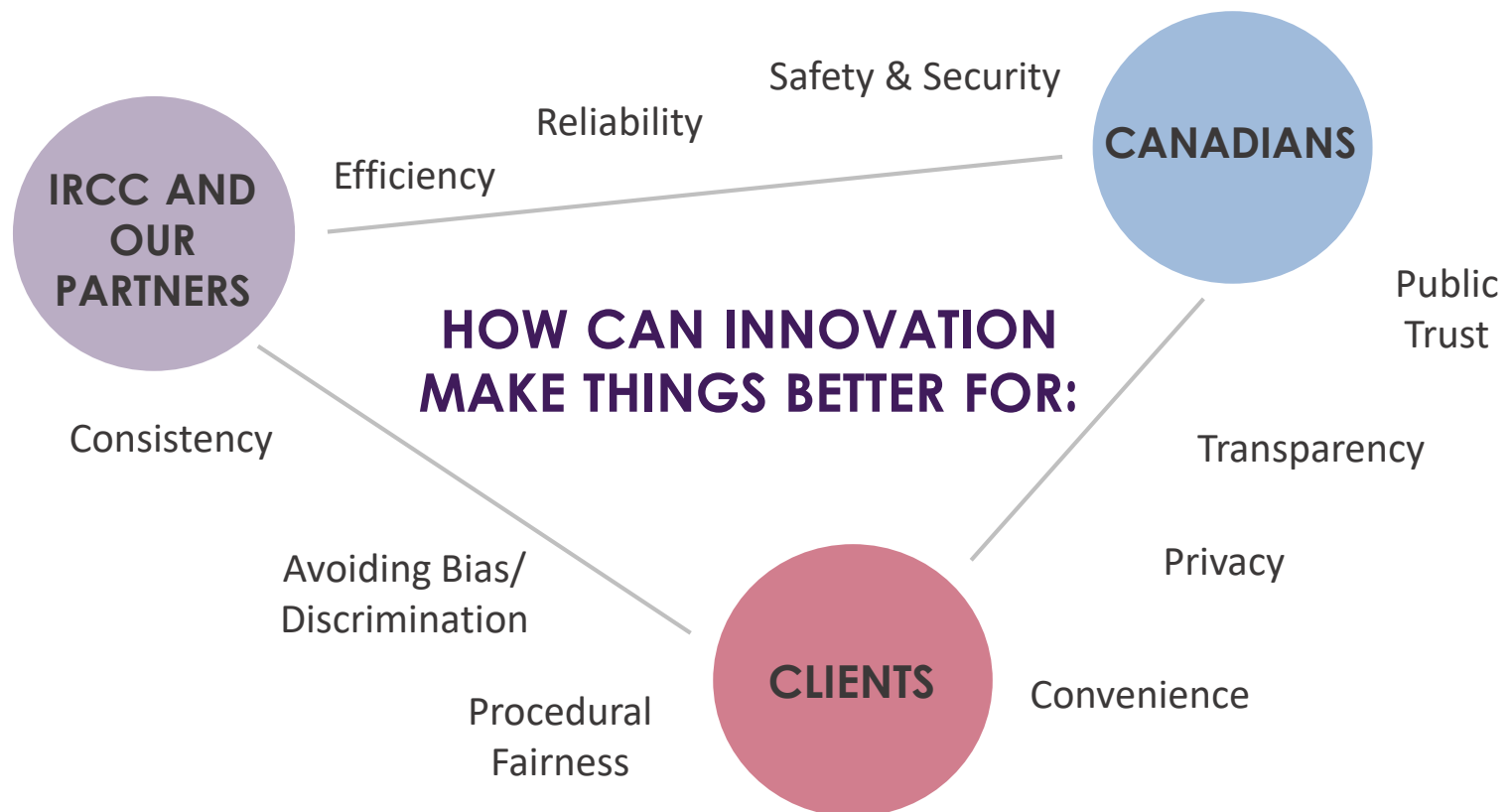
186.1(5) *An electronic system may be used by an officer to make a decision or determination or to proceed with an examination*

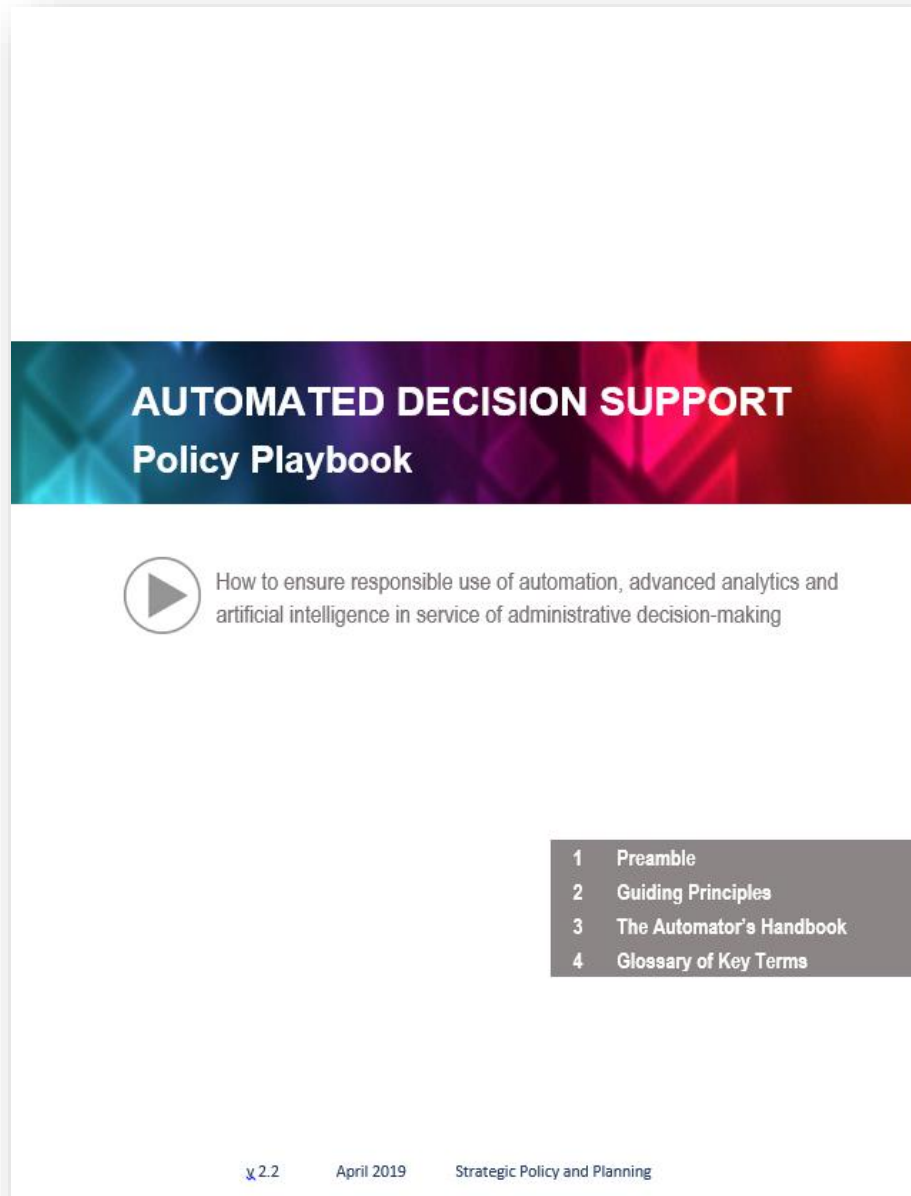
186.3(2) *The regulations may require an individual to make an application or submit documents electronically*



# 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.





# 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

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

## Responsible Design

- 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<sub>16</sub>
- 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?*

**1**

**When setting out to design and build a new system**

- *What can we do to guard against algorithmic bias?*
- *How will the system ensure procedural fairness?*

**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