Enhancing Regulatory Insights and Policy Analytics Through The Use of New and Emerging Technology

October 2019
Context
Operating in an age of disruption...

EXPLOSION IN AVAILABLE DATA
- Increasingly possible in an increasing number of industries

DISRUPTIVE TECHNOLOGY
- Rapid pace of emergence and adoption of new technologies

INCREASE IN COMPUTING POWER
- Exponential increases of computing power have enabled rapid advancement of AI

COMPANY GROWTH & SECTOR DISRUPTION
- Shorter circuits of dominance, shifts in leading sectors, rapid growth

LIMITED PREPAREDNESS FOR CHANGE
- Organizations are vulnerable to disruptions, primarily due to skills gaps

~42% of Canadian jobs are at high-risk of automation by 2040

The four most valuable companies in 2018 (Google, Amazon, Microsoft, Apple) were not in the top 12 in 2000

The average tenure of a company on the S&P is expected to fall from 20 years in 1990 to 14 years by 2026

The use of AI by companies has leapt 270% over four years (10% in 2015 vs. 37% in 2019)

The latest computer chips from Intel can run over 10 trillion calculations per second

While a majority of global leaders have a digital strategy, nearly half lack the expertise to execute it

Operating in an age of disruption...

The average tenure of a company on the S&P is expected to fall from 20 years in 1990 to 14 years by 2026

The four most valuable companies in 2018 (Google, Amazon, Microsoft, Apple) were not in the top 12 in 2000

The use of AI by companies has leapt 270% over four years (10% in 2015 vs. 37% in 2019)

The latest computer chips from Intel can run over 10 trillion calculations per second

While a majority of global leaders have a digital strategy, nearly half lack the expertise to execute it

~42% of Canadian jobs are at high-risk of automation by 2040
New and emerging technology in the legal field

**Blue J Legal**
Using AI to predict court case outcomes and find relevant cases

**Blawx**
Allows non-programmers to digitize legal knowledge and use AI to provide legal advice

**Thomson Reuters**
An AI powered legal assistant that will help you find court cases, provide legal advice and support data collection

**CanLII**
A repository of all federal, provincial, territorial legislation and regulations as well as a full database of court cases
AI can benefit regulators at all parts of the lifecycle

The projects address issues in the *Regulatory Review & Regulation Making* parts of the Regulatory lifecycle.
Benefits for Federal Regulators

**PRODUCTIVITY & EFFICIENCY**

*Developing* tangible solutions for enhanced productivity, efficiency and depth of analysis

**CAPACITY BUILDING**

*Helping* regulators understand disruptive technologies, how they are used in regulated industries and how they can be leveraged within the Government of Canada

**STRONGER NETWORKS**

*Enabling* Internal-External collaboration and access to leading AI experts, while matching the needs of regulators with AI experts

With *partners in the federal regulatory community*, the School is advancing demonstrator projects & offering tangible outputs that will benefit regulators while exploring disruptive technology and its impact.
Regulatory Projects
Semantic analysis of regulations

Project to empirically investigate four aspects of Canadian regulations by leveraging legal data science:

- **Prescriptively:** How binding are regulations
- **Flexibility:** How responsive are regulations to changing circumstances
- **Complexity:** How easily understandable are regulations
- **Age:** What is the average age of regulations?
Incorporation by Reference Search Tool

A tool built with 15 federal partners,* **compiles information** on regulations involving Incorporation by Reference (IBR)

**CURRENT**
- IBR identification and review is currently a *manual, time-consuming* process (4,000+ references in regulations)
- **Significant staff time** to find and record attributes of docs incorporated by reference (e.g., location, cost, language)
- Due to the manual workload, **continuous monitoring** is a major challenge and **risk of human error** is a factor

**PROPOSED**
- Improved speed and accuracy of IBR monitoring with the use of an intelligent document search platform
- **Reduction in amount of time** dedicated to monitoring and updating IBR counts and consolidation of information for consumption.

*BY USING AI, we can transform a 1300 hour per year process into a process that will take a few hours*
Regulatory Evaluation Platform (REP)

We are building two prototypes with 15 federal partners* **to accelerate more complex analysis and new insights** into regulations and impacts on stakeholders…

**CURRENT**

*Manual review* of regulations and acts

*No systematic tool* for compiling info on multiple jurisdictions, by sector/industry, to evaluate complexity, flexibility, conflict, and terminology

*Challenging* to measure cumulative burden of regulations especially across jurisdictions

**PROPOSED**

*Leading technology adapted to needs* of analysts and policy advisors

*Timely, less labour intensive analysis* to inform advice or decisions

*Ability to complete advanced analysis* to support regulatory modernization, measurement of regulatory burden and regulatory outcomes

…leading to a **deployable solution**
Rules as Code Discovery Project

Rules as Code has the potential to **transform** regulatory rule making and regulatory compliance

**GOAL:**

The project would introduce a process of **translating rules** (legislation, regulation and policy) into machine readable code so they can be **consumed and interpreted by computers**

If systems are able to understand the rules, we can **make government easier** for people and businesses

**BENEFITS:**

- **COMPLIANCE PROMOTION**
  
  Promote compliance by making rules easier to understand and by enabling regulated organisations to build business systems that draw on coded rules to automate compliance

- **AUTOMATED SCENARIOS**
  
  Allow policy makers and regulators to quickly and effectively model the outcome of proposed legislation or policy reforms using data and automated scenario testing

- **AUTOMATED ADMINISTRATIVE DECISION-MAKING**
  
  Enable automated or semi-automated administrative decision-making processes (e.g., application forms and processing of applications)

*Discovery Project* with Transport Canada to code a section of Marine Vessel Registration rules
Despite the potential of Rules as Code, there remain a number of challenges that will need to be addressed by the legal community before full scale adoption begins in Canada.

**CHALLENGES:**

Acts and Regulations are drafted in both official languages. How does creating Acts and Regulations in code apply in a jurisdiction where both languages are drafted at the same time and are both official?

Drafting conventions are well established. How do draft conventions need to evolve to support Rules as Code?

Many regulations incorporate by reference documents that are generated by standards development organizations which are written in non-standard language. How will we code documents incorporated by reference?
Pilot work includes leveraging ledger technology to issue, store and share information about government issued licenses, permits and other official documents as digital credentials.
Other Regulatory Demonstrator Projects

POTENTIAL REGULATORY INNOVATION PROJECTS

• Data Analytics for Regulatory Evaluation (Linking Administrative and Regulatory Data)
• Virtual Reality / Augmented Reality Inspector Training
• Regulatory Sandbox
• Internet of Things (IOT)
• AI for Regulatory Risk Assessment and Oversight
Questions?

Canada School of Public Service
Innovation and Policy Services Branch

Neil.Bouwer@canada.ca