Canada School of Public Service | École de la fonction publique du Canada

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

October 2019

Canada

Context

Operating in an age of disruption…

EXPLOSION IN AVAILABLE DATA
increasingly possible in an increasing number of industries

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

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

Including areas **not traditionally seen as at risk**, such as transportation and office work

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

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

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

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

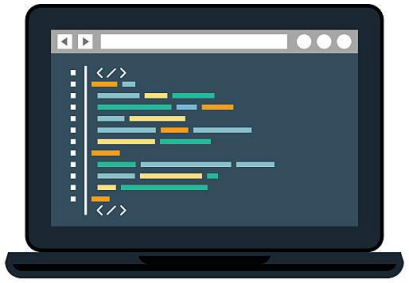
LIMITED PREPAREDNESS FOR CHANGE
organizations are vulnerable to disruptions, primarily due to skills gaps

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

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

REGULATORY REVIEW

Facilitating ***stock reviews*** in line with Cabinet Directive, including impact, complexity, flexibility, and jurisdictional coherence

REGULATION-MAKING

Informing ***regulatory scan*** and ***design*** (e.g. instrument choice) and ***due diligence*** on coherence, complexity, and flexibility

PROMOTING COMPLIANCE

Maintaining ***awareness*** of regulatory changes across departments and agencies via tools for regulators

VERIFYING COMPLIANCE

Identifying ***patterns in behaviour*** and ***risk*** relative to changing requirements and available resources

ENFORCEMENT & LEGAL RISK ASSESSMENT

Expediting ***analysis*** of legal risks by analyzing large amounts of case law and judicial information

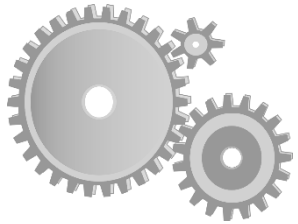
Benefits for Federal Regulators

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:**

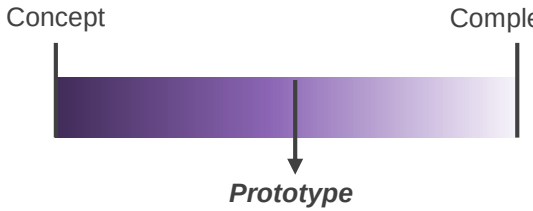
Prescriptively: How binding are regulations

Flexibility: How responsive are regulations to changing circumstances

Complexity: How easily understandable are regulations

Age: What is the average age of regulations?

Enabling Authority	Prescriptivity/Flexibility	Number of R
PUBLIC SERVICE SUPERANNUATION ACT,FINANCIAL ADMINISTRATIOI	0.30434783	25
CUSTOMS TARIFF	0.63593772	186
TERRITORIAL LANDS ACT	0.75686276	34
PUBLIC SERVICE EMPLOYMENT ACT	0.91346674	49
FINANCIAL ADMINISTRATION ACT	1.07710233	154
EXCISE ACT, 2001	1.13333333	13
AERONAUTICS ACT	1.1974783	176
AGRICULTURAL PRODUCTS MARKETING ACT	1.22516077	164
INSURANCE COMPANIES ACT	1.23921435	61
COPYRIGHT ACT	1.36031746	18
ROYAL CANADIAN MOUNTED POLICE ACT	1.47224084	12
SEX OFFENDER INFORMATION REGISTRATION ACT	1.5	13
NATIONAL DEFENCE ACT	1.51974407	12
EXCISE TAX ACT	1.54712919	53
COOPERATIVE CREDIT ASSOCIATIONS ACT	1.6797619	42
TRUST AND LOAN COMPANIES ACT	1.72273663	43
EXPORT AND IMPORT PERMITS ACT	1.72953216	65
CUSTOMS ACT	1.90279895	49
BANK ACT	2.13416896	85
CRIMINAL CODE	2.23689627	42
Average	2.50993875	2770
OCEANS ACT	2.58253968	17
CANADA NATIONAL PARKS ACT	2.73489641	28
INDIAN ACT	2.755693	26



Incorporation by Reference Search Tool

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

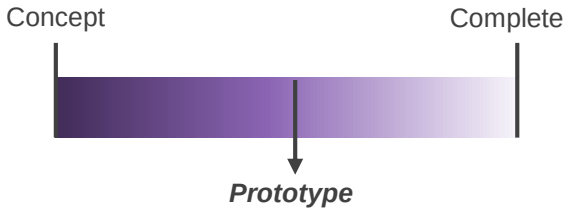
CURRENT

- 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

Rules as Code Discovery Project

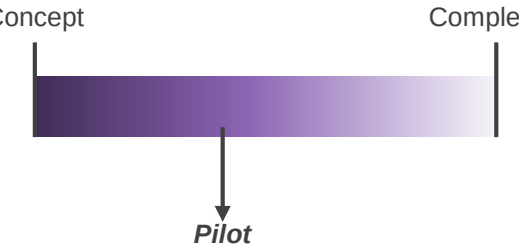
Despite the potential of Rules as Code, there remain a **number of challenges** that will need to be addressed by the legal community **before full scale adoption begins in Canada**

CHALLENGES:

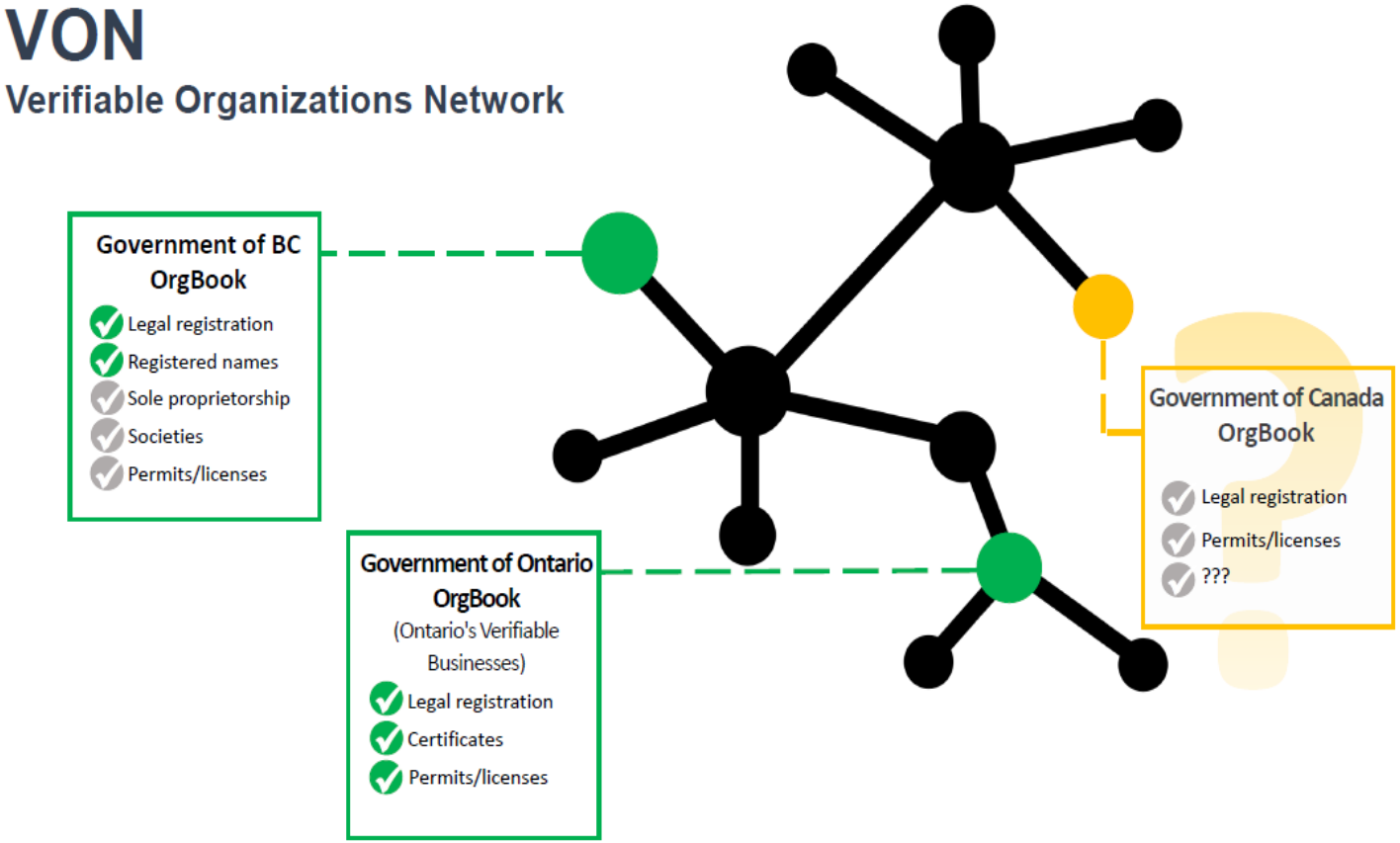
Acts and Regulations are drafted in both official languages. **How does creating Acts and Regulations in code apply in a jurisdiction where both languages are drafted at the same time and are both official?**

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?**



VON and OrgBook: Digital Identity



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?

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