Building a Data Economy - Economic Growth & Prosperity

Mukul Asthana, P.Eng., M.B.A. and Ryder LeBlanc, B. Sc.

The Data-Driven Economy

Canada is undergoing a digital transformation accelerated by several emerging technologies (AI, ML, quantum computing, etc.) which is ushering in a data-driven economy. To maximize the benefits of this new paradigm, data must be seen as an opportunity rather than a threat. Data supports the public, private, and third sectors by improving the delivery of existing services, creating entirely new products and services, and spurring technological innovation. These advances create jobs, strengthen the economy, and further societal goals like tackling climate change and improving health services. Transitioning to a data-driven economy requires data governance — the processes, roles, policies, standards, and metrics regarding data collection, storage, and use.

Gross Data Product: A Useful Metric

As Canada transitions to a data-driven economy it will be important to track our progress relative to other nations. One metric that can be useful for this is the Gross Data Product (G.D.P). This G.D.P. measures the value of data within a country and can be used to track digital competitiveness around the world.

Harvard Business has developed four metrics for measuring G.D.P.:

- **Accessibility**: Institutional openness to data flows as a way to assess whether the data generated in a country permits wider usability and accessibility by multiple AI researchers, innovators, and applications.
- **Volume**: Absolute amount of broadband consumed by a country, as a proxy for the raw data generated.
- **Usage**: Number of users active on the internet, as a proxy for the breadth of usage behaviors, needs and contexts.
- **Complexity**: Volume of broadband consumption per capita, as a proxy for the sophistication and complexity of digital activity.

Based on these criteria, Canada ranks 7th in the world overall. This indicates that Canada has done well with data so far and that there is an opportunity for us to collaborate and play a leading role among global partners to establish an international order for data governance. Countries with a high G.D.P. ensure their businesses can start up, grow, and be globally competitive in this new technological era. To position themselves as data leaders, many nations are taking ambitious steps to incorporate data into their governance structures.

United Kingdom: A Case Study in Driving Innovation

The UK is currently focused on developing data innovation over data regulations. This is clearly stated in its National Data Strategy as "data and data use are seen as opportunities to be embraced, rather than threats against which to be guarded". The core pillars influencing the data strategy are data foundations, skills, availability, and responsibility. To ensure the best use of data the UK believes that data must be standardized and fit for purpose, that its people must be able

to develop their data skills, that data should be shared and widely accessible, and that data use must be lawful, secure, fair, ethical, sustainable, and accountable.

The National Data Strategy has identified five priority areas of action:

- Setting the correct conditions to make data usable and accessible across the economy
- Developing a pro-growth data regime that fosters public trust without restricting access to data
- Radically transforming the use and sharing of data within government
- Ensuring the security and resilience of national data infrastructure
- Championing the international flow of data

## Estonia: A Case Study in e-Governance

Estonia is rethinking the very idea of government and digital infrastructure. Not only are they increasing broadband connectivity so that more people anywhere can access services on the go, but they are also defining standards so that the core sets of public tools and databases – 'the platforms'– can be reused by the public and private sectors to drive down costs and simplify services. This is in direct contrast to many existing forms of digital government, where departments digitize their services and functions independently and duplicate the efforts of other departments in gathering citizens' information.

These online platforms have allowed Estonia to offer public services faster and cheaper than ever before. Healthcare has been revolutionized by digitizing health records, prescriptions, and medical bills. One way this improves service quality is that paramedics responding to an emergency can query the patient's medical history and plan their treatment before they arrive. e-Estonia supports the private sector by making it easier to start a business. 98% of companies in Estonia have been established online, where registration times are a couple of hours instead of five days in person (e-Estonia, 2019a). Estonia's digital government even facilitates internet voting. In 2005, it became the first country in the world to hold nation-wide elections using this method, and currently 44% of Estonians use this service (e-Estonia, 2019b). These are depicted in Table 1.

Table 1: What the Ontario Government's Model Could Look Like
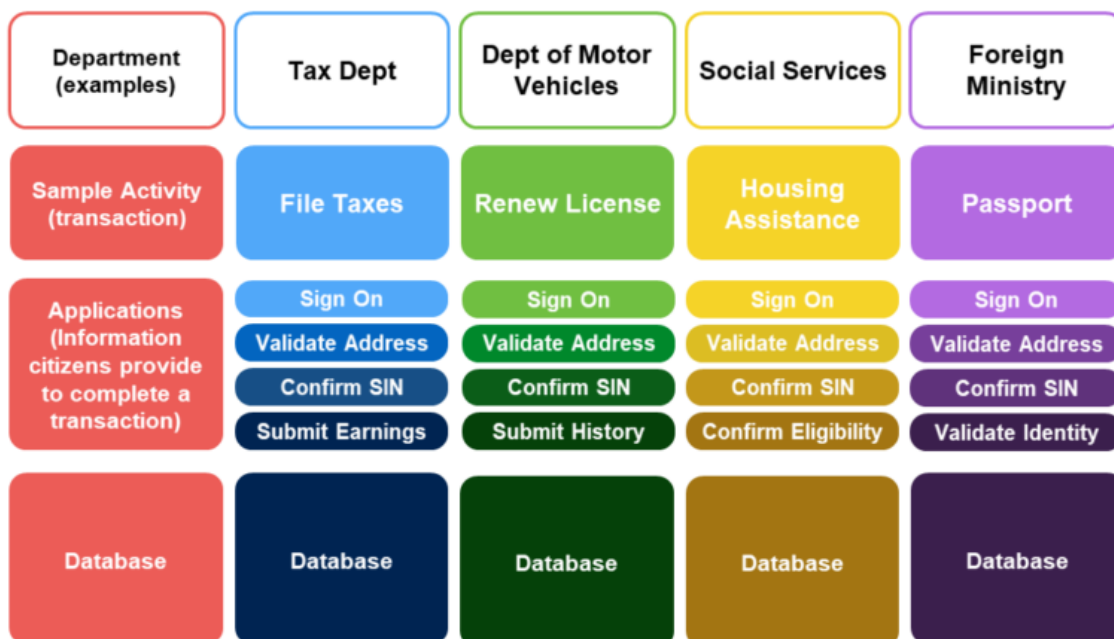
What government looks like today, digitally – Source: David Eaves
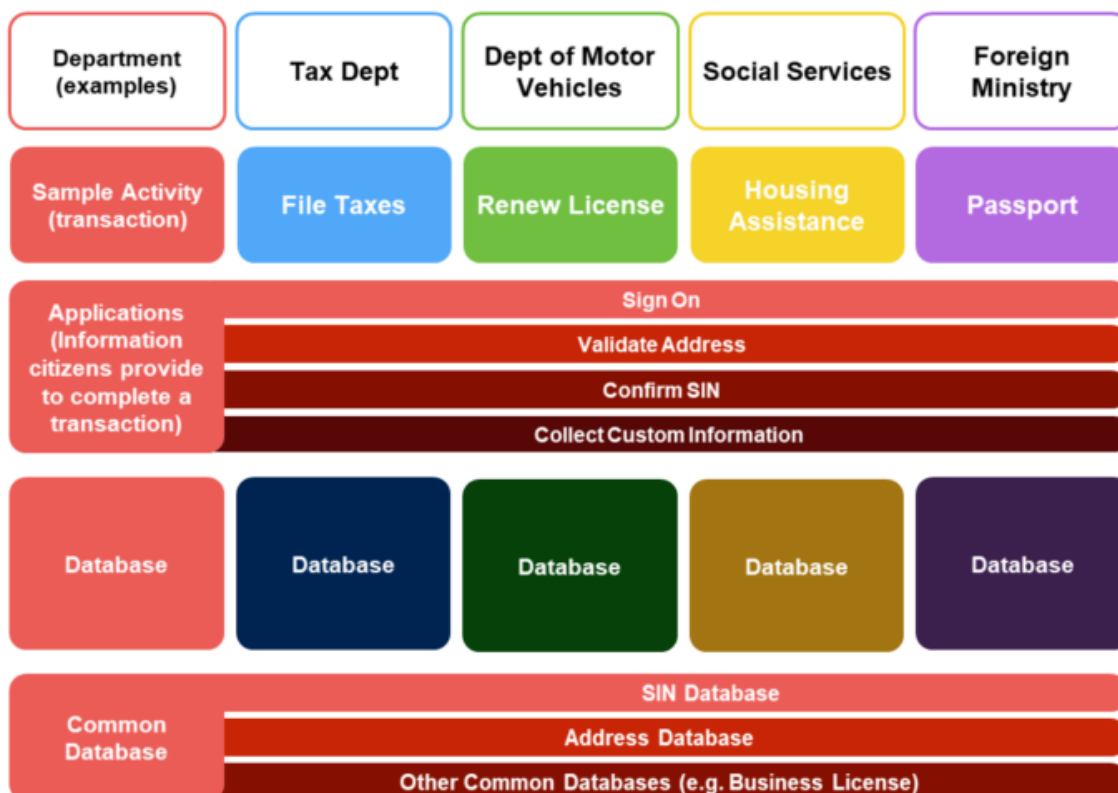
What government can look like using Estonia's model - Source: David Eaves

Singapore

The key competitive advantage of Singapore's data strategy is Virtual Singapore: a dynamic three-dimensional city model and collaborative data platform.

Virtual Singapore is transforming the country through:

- **Innovation;** a testbed for new ideas, technologies, and procedures
- **City planning;** an integrated platform for the development of analytical apps, useful for monitoring things like transport flows and pedestrian movements patterns. By leveraging the big data environment and aggregating information from both the public and private sector, the potential uses of virtual modelling for tackling livability issues are limitless
- **Research and development;** a rich data environment which allows researchers to develop new technologies
- **Improving government administration;** supports the creation of smart cities, the delivery of municipal services, and OneMap, a detailed national map of Singapore
- **Improving communities;** making geo-visualization, analytical tools, and 3D semantics-embedded information accessible to the public; providing people with a virtual yet realistic platform to connect and create awareness and services for their communities
- **Supporting businesses;** a wealth of data that can be used for business analytics, resource planning and management, and specialized services
- **Collaboration and decision making;** a virtual model that integrates various data sources including government agencies, 3D models, the Internet, and Internet of Things devices. The platform allows different agencies to share and review the plans and designs of various projects in one place

Data Governance from the Private Sector

Amazon, Google, Alibaba, and other data-driven behemoths are fostering economic growth by providing digital services to small and medium enterprises (SMEs). Alibaba in particular is focusing its efforts on digitizing and democratizing global trade by providing SMEs with services such as:

- Providing online marketplaces for trade
- Verifying merchant identities
- Handling payments
- Providing financing

Our governments should look to the innovation of these tech giants to understand how best to grow the economy by leveraging data.

Ontario's Data Strategy

Ontario's Digital and Data Strategy, as laid out by the provincial government in, sets a course for a data-driven economy that is compatible with Canadian values. This strategy includes various funding and initiatives, but more policies will undoubtedly be needed to meet the challenges ahead. As engineers we can sway public policy and a duty to society to exercise this for the public good. Now is the time to educate ourselves on these issues and prepare our recommendations for when policy makers turn to us for advice.

Works Cited

Chakravorti, B., Bhalla, A., & Chaturvedi, R. S. (2019). *Which Countries Are Leading the Data Economy?* Harvard Business Review. https://hbr.org/2019/01/which-countries-are-leading-the-data-economy

Eaves, D., & McGuire, B. (2019). *Lessons from Estonia on digital government*. Policy Options. https://policyoptions.irpp.org/magazines/february-2019/lessons-estonia-digital-government/

e-Estonia. (2019a, April 11). e-Business Register. https://e-estonia.com/solutions/business-and-finance/e-business-register/

e-Estonia. (2019b, July 24). i-Voting. https://e-estonia.com/solutions/e-governance/i-voting/

Government of Ontario. (2021). *Building a digital Ontario*. Ontario.Ca. https://www.ontario.ca/page/building-digital-ontario

National Research Foundation. (2021, February 20). *Virtual Singapore*. Nrf. https://www.nrf.gov.sg/programmes/virtual-singapore

Towson, J. (2019). *Hold on to your hat—Alibaba.com is building a massive new e-commerce platform (Part 1 of 2)*. KrASIA. https://kr-asia.com/hold-on-to-your-hat-alibaba-com-is-building-a-massive-new-e-commerce-platform-part-1-of-2

UK Government. (2020, December 9). *National Data Strategy*. GOV.UK. https://www.gov.uk/government/publications/uk-national-data-strategy/national-data-strategy