

SOUL on Top of the World

Canada Innovation Nation

John Weigelt Chief Technology Officer Microsoft Canada







Deloitte.

Services 🗸 Indus

Industries 🗸 Careers 🗸

Search

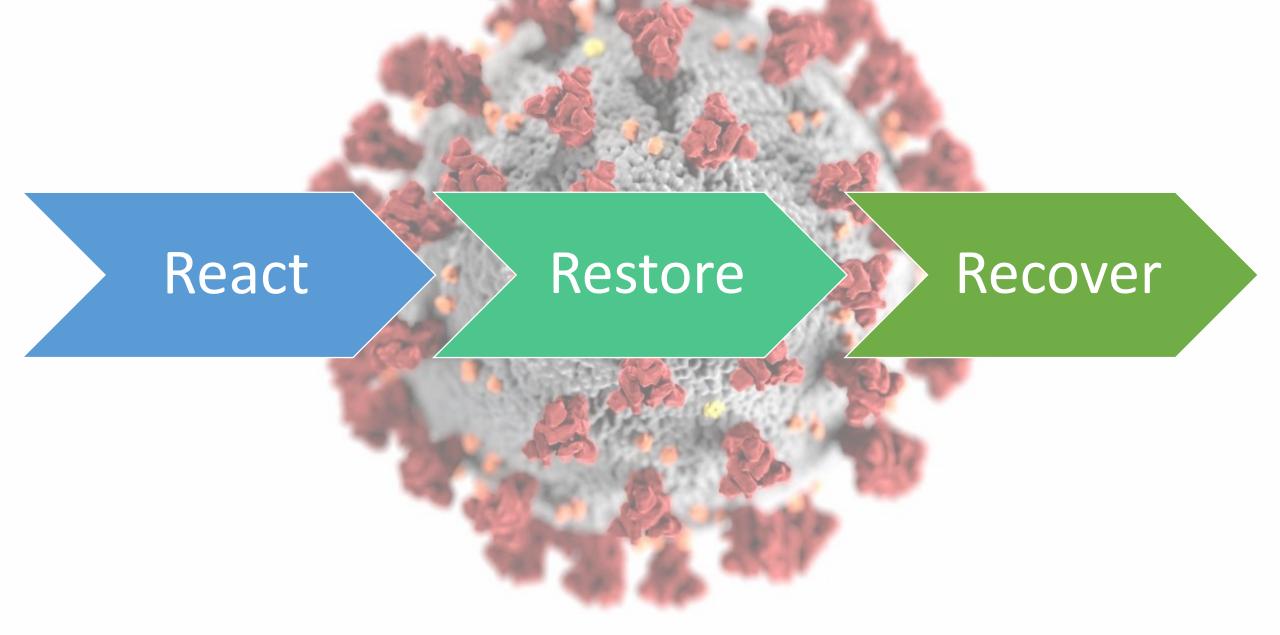


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Canada at 175

Deloitte's Canada at 175 program is a multi-year research initiative designed to spark vital discussion among Canada's governments, businesses, and citizens about Canada's future.

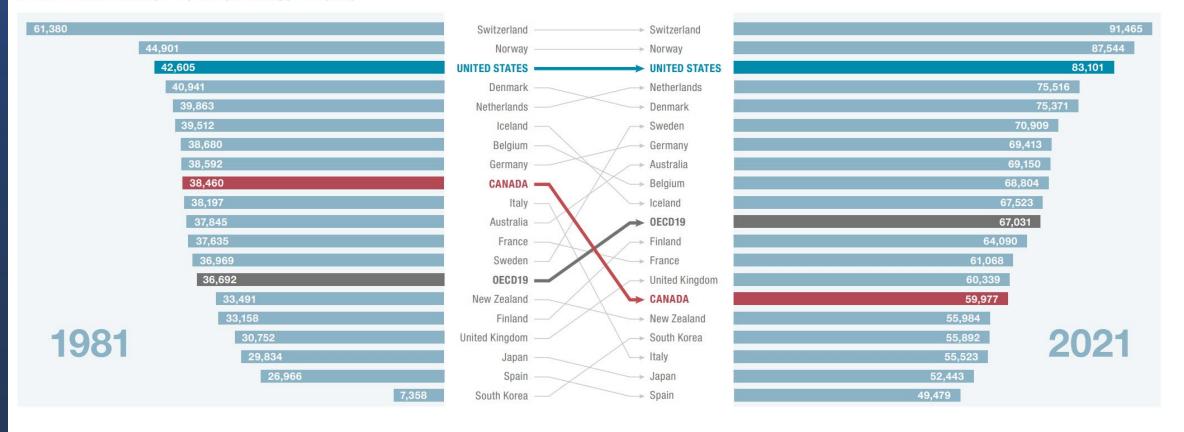


The Conference Board of Canada inFact Knowledge Areas Publications					Insights	Login ▼ Services ▼ AboutUs ▼	Create Ac	count		
Canada Becomes Relatively More Innovative										
Country + Provincial Rankings										
1 Switzerland	Α	5 Austria	В	9 Netherlands	С	13 Ireland	D			
2 United States	Α	6 Finland	В	10 Japan	С	14 Australia	D			
3 Sweden	Α	7 Germany	С	11 Canada	С	15 France	D			
4 Denmark	В	8 Norway	С	12 Belguim	С	16 United Kingdom	D			

Source: The Conference Board of Canada.

CHART 2 STANDARD OF LIVING IN 1981 AND 2021

In 2019 Canadian dollars per capita at purchasing power parity



Pressures

- Aging workforce / Retirements
- Poor productivity growth
- Low Innovation Investments
- Environmental Sustainability

Additional Pressures

- Industry refactoring
 - Retail, Hospitality, Entertainment, Services,
- Industry Echoes
 - Construction, Commercial Real Estate, Transportation, Supplychain, Manufacturing
- New Patterns of Work
- Post Lockdown Churn / Skills Shortage
- International Conflict
- Autarky
 - Increasing localization

Growing Opportunity

- Leadership
- Technology
- Cybersecurity
- Research
- Industry





Canada's Supercluster Initiative: \$2B investment to build industries of tomorrow

The Innovation Supercluster Initiative is the cornerstone of Canada's federal government innovation agendabuild collaborative partnerships, grow innovation and create new jobs.

- □ This program includes large anchor firms to start ups, from post-secondary research institutions to research and government partners.
- □ The development of supercluster will support the health of the Canadian economy by:
 - \circ advancing Canadian technological capabilities and advance business-led
 - o helping companies succeed in the global marketplace with new products, processes and services;
 - building a competitive advantage for their supercluster by positioning as a world-leading innovation hotbed that attracts cutting-edge research investment and talent.



DIGITAL TECHNOLOGY

British Columbia

Boost competitiveness in precision health, manufacturing and resource and environment technologies by advancing data collection, analysis and visualization.

PROTEIN INNOVATION COUNCIL

Alberta- Saskatchewan- Manitoba

Harness technologies to help Canada become the world leader in supplying plant-based proteins and related products.

ADVANCED MANUFACTURING

Southern Ontario

Drive collaboration between the tech & manufacturing sectors using technologies like Big Data, AI and the "internet of things" to scale production & improve efficiency

OCEAN

Atlantic

Maximize the potential and sustainable development of the ocean economy by investing in digital technologies for industries such fisheries, offshore oil and clean energy.

SCALE.AI

Quebec

Focus on defining a global supply chain platform leveraging artificial intelligence and data science particularly in retail, manufacturing and infrastructure services.





Social



Advanced Connectivity







irror object to mirror ror_mod.mirror_object Innovations Transforming rror_mod.use_z = False operation == "MIRROR_Y" Data Handling rror_mod.use_x = False

- Datasheets for Datasets
- Differential Privacy & other **Deidentification techniques**
- Synthetic data generation
- Confidential computing
- Data watermarking
- Big data, Little data
- Federated Learning
- Data Meshes

```
rror_mod.use_y = True
rror_mod.use_z = False
operation == "MIRROR_z"
rror_mod.use_x = False
rror_mod.use_y = False
rror_mod.use_z = True
election at the end -add
 ob.select= 1
```

urror_mod = modifier_ob.

```
ob.select=1
text.scene.objects.active
Selected" + str(modifie
rror ob.select = 0
bpy.context.selected_obj
ta.objects[one.name].sel
```

```
int("please select exactly
  OPERATOR CLASSES -----
```

pes.Operator): mirror to the selected ect.mirror_mirror_x" ontext): oxt.active_object is not

Artificial Intelligence

The Al technology is here

MONEYWATCH >

ChatGPT bot passes law school exam



WSJ

ChatGPT Wrote My AP English Essay—and I Passed

Our columnist went back to high school, this time bringing an AI chatbot to complete her assignments

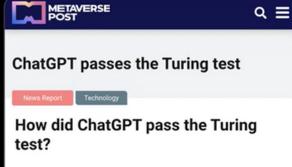
Global

TECH

ChatGPT passes exams for MBA courses and medical licences – and it's only getting started

CM BUSINESS

Real estate agents say they can't imagine working without ChatGPT now



ChatGPT made history by becoming the second chatbot to pass the Turing test. The Turing test is a test of a machine's ability to exhibit intelligent behavior, and it is considered to be a strong indicator of artificial intelligence.

A& NEWS

ChatGPT passes MBA exam given by a Wharton professor

The bot's performance on the test has "important implications for business school education," wrote Christian Terwiesch, a professor at the University of Pennsylvania's Wharton School.

Time to Reach 1 Million Users



41 Months



10 months

2.5 months

5 days

ChatGPT

chatGPT Speed of Adoption is unprecedented

HOW LONG IT TOOK TOP APPS TO HIT 100M MONTHLY USERS

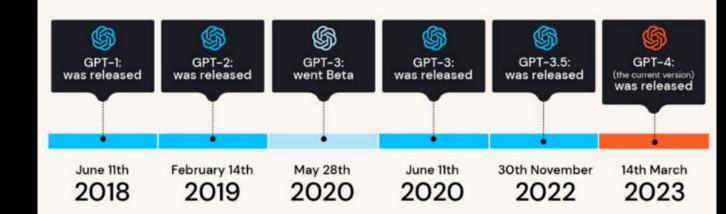


CHATGPT STATISTICS When was ChatGPT launched?

0

400 million

200 million



152,700 visitors

November 22

Change in ChatGPT website visitors since launch

visitors

December 22

January 23

February 23

Canada Lags in Trust in Al

Deloitte.	Services 🗸	Industries 🗸	Careers ~	Search	۹	⊕ CA-EN ✔	C
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Omnia Al				Al Services Products	Insights	Connect	with us

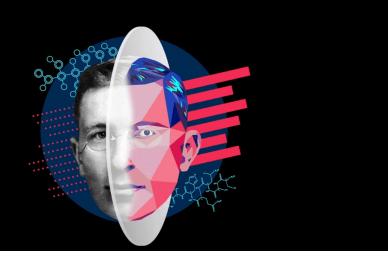
Canada's Al imperative: Overcoming risks, building trust

Al has the potential to be the catalyst for an era of unprecedented innovation, progress, and prosperity. Yet Canadians still do not truly understand Al, or see how its benefits outweigh the risks. We heard concerns about Al's impact on privacy, security, bias, consumer protection and more – and Canadians are looking to business and government leaders to provide answers and solutions to those questions. Left unaddressed, this lack of trust could have a serious impact on Canada's future prosperity.

This report outlines five key perceptions Canadians have about AI and examines the root causes of their distrust. While there's no question AI presents its fair share of risks, this report highlights that it is possible to develop AI that reflects Canadian values—and promotes prosperity for all.

Read Canada's Al imperative: Overcoming risks, building trust to learn more.

Download the report





Trust in Artificial Intelligence

Sugge<

Getting Specific on Al

Data	Math	Codifying	APIs	Packages	•••	Application	Function	Business

Data

- Context of collection
- Unrecognized Bias
- Synthetic data
- Temporal characteristics
- Streaming / static

Security/privacy

- Model Theft
- Model Corruption
- Faulty training (synthetic data)
- Adversarial perturbation

Training

- Supervised
- Semi-supervised
- Unsupervised

Models

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Locked

Trained

Evolving

Automation

- Human in the loop
- Human over the loop
- Human out of the loop

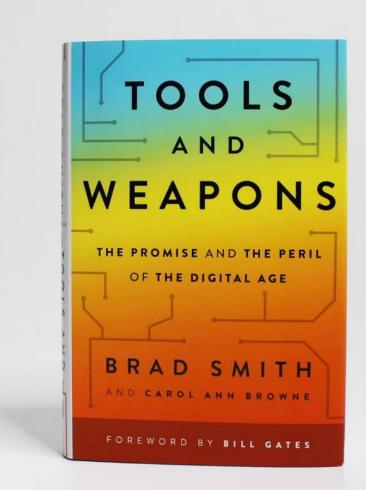
Types

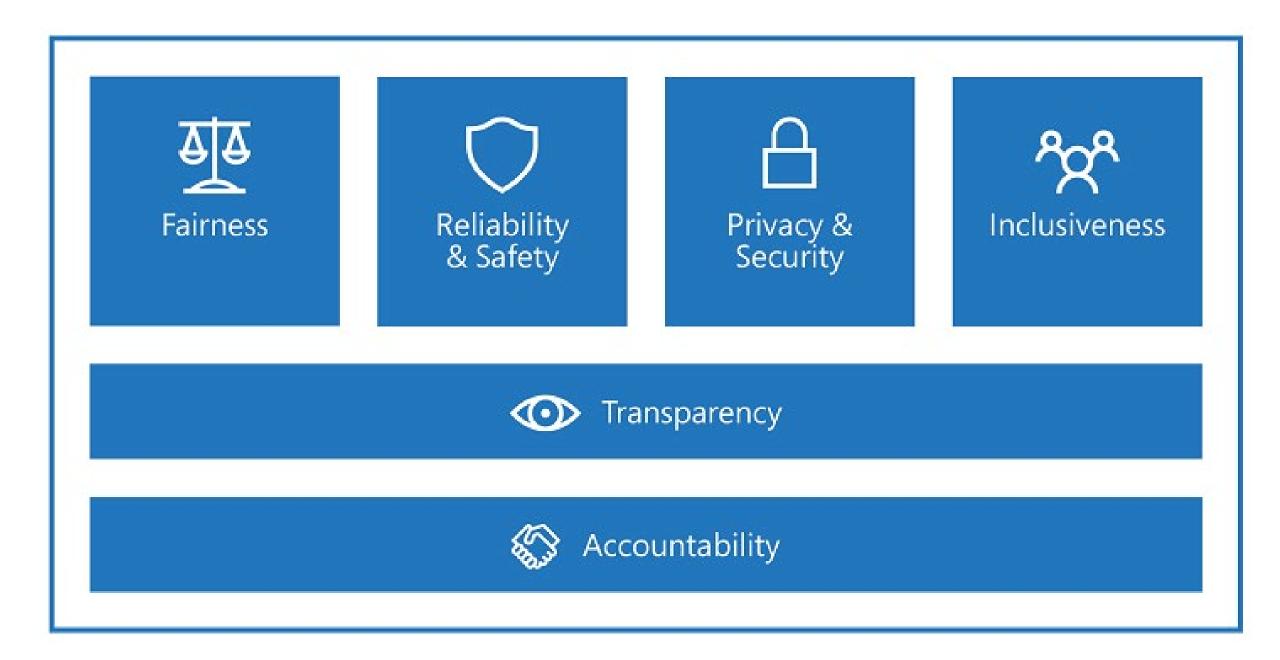
- Responsive
- Generative
- LLM
- Predictive

Why responsible AI?

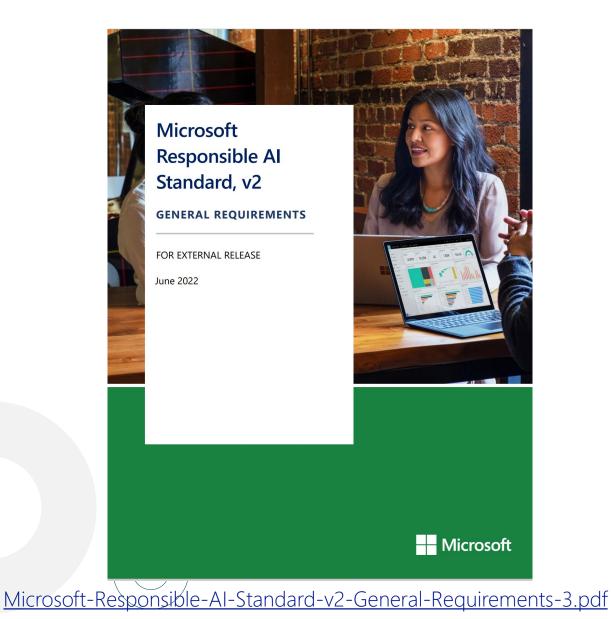
"The more powerful the tool, the greater the benefit or damage it can cause...Technology innovation is not going to slow down. The work to manage it needs to speed up."

Brad Smith President and Chief Legal Officer, Microsoft





Responsible AI Standard and Impact Assessment





Microsoft Responsible AI Impact Assessment Template

FOR EXTERNAL RELEASE

June 2022

The Responsible AI Impact Assessment Template is the product of a multi-year effort at Microsoft to define a process for assessing the impact an AI system may have on people, organizations, and society. We are releasing our Impact Assessment Template externally to share what we have learned, invite feedback from others, and contribute to the discussion about building better norms and practices around AI.

We invite your feedback on our approach: https://aka.ms/ResponsibleAlQuestions

-- Microsoft

Microsoft-RAI-Impact-Assessment-Template.pdf

🏹 Filter by title

General Data Protection Regulation (GDPR) Azure Software Licensing Terms Microsoft Developer Agreement

Terms of Use

Learn TV Code of Conduct

Terms of Learn Data Sharing

Learn /

Use cases for Azure OpenAl Service

Article • 01/31/2023 • 20 minutes to read • 3 contributors

What is a Transparency Note?

An AI system includes not only the technology, but also the people who will use it, the people who will be affected by it, and the environment in which it is deployed. Creating a system that is fit for its intended purpose requires an understanding of how the technology works, what its capabilities and limitations are, and how to achieve the best performance. Microsoft's Transparency Notes are intended to help you understand how our AI technology works, the choices system owners can make that influence system performance and behavior, and the importance of thinking about the whole system, including the technology, the people, and the environment. You can use Transparency Notes when developing or deploying your own system, or share them with the people who will use or be affected by your system.

Microsoft's Transparency Notes are part of a broader effort at Microsoft to put our AI Principles into practice. To find out more, see the Microsoft's AI principles 2.

The basics of Azure OpenAI

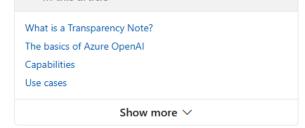
Introduction

Azure OpenAI provides customers with a fully managed AI service that lets developers and data scientists apply OpenAI's powerful language models including their GPT-3 and Codex series. GPT-3 models analyze and generate natural language, while Codex models analyze and generate code and plain text code commentary. These models use an autoregressive architecture meaning they use data from prior observations to predict the most probable next word. This process is then repeated by appending the newly generated content to the original text to produce the complete generated response. Because the response is conditioned on the input text, these models can be applied to a variety of tasks simply by changing the input text.

≡ In this article

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C Feedback



CIOSC 101:2019 (D7)

Automated decision systems using machine learning: Ethics by design and ethical use

35.020

WARNING

This document is not an official CIOSC Standard. It is distributed for review and comment. It is subject to change without notice and may not be referred to as a National Standard.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

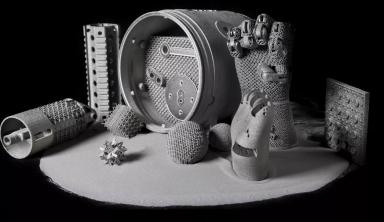




Additive Manufacturing

6.6



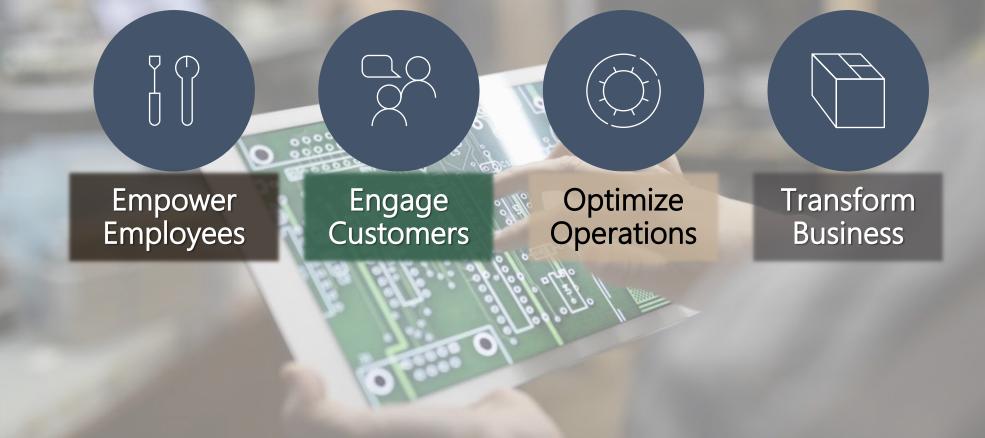


Oak Ridge National Laboratory

K

Quantum

Digital transformation







REVIEW POLICY

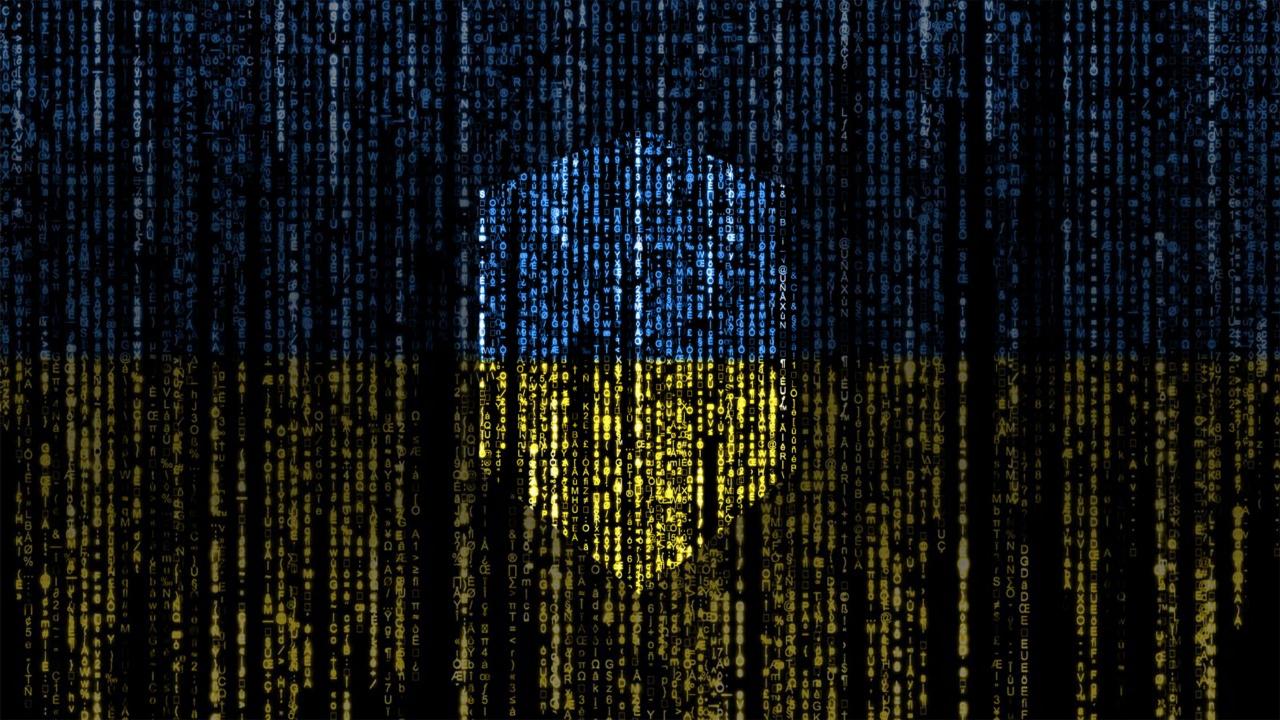
Review your cyber security policies and execute the basics based on the Zero Trust Framework

INCREASE SKILLS

We're committed to skill 250K student and professionals by 2025 aka.ms/cyberskills

ASK FOR HELP Ask for help Public

Sector Center of Expertise



Cooperation

The large hadron collider produces 30-50 PB/year*

*http://public.web.cern.ch/public/en/lhc/Computing-en.html (2017)

The Square Kilometer Array Observatory

- 16 terabits of data per second to central signal processors
- Store 710 petabytes of data per year,
- Two 'Science Data Processor' HPC systems expected to total at least 250 petaflops

SKA Observatory (SKAO): A guide to the soon-to-be largest radio telescope in the world | Space

OPEN AI GPT-3.5

- Trained with over 175B parameters
- The supercomputer developed for OpenAI is a single system with more than 285,000 CPU cores, 10,000 GPUs and 400 gigabits per second of network connectivity for each GPU server.
- Compared with other machines listed on the <u>TOP500 supercomputers</u> in the world, it ranks in the top five



Microsoft announces new supercomputer, lays out vision for future AI work - Source

Digital Research Alliance of Canada

- · 271,000 CPU cores
- · 10 petabytes of storage
- \cdot Jobs restricted to below 7 days
- Among its G7 peers Canada is last when one considers aggregate total compute power in Top500. Looking into compute power relative to gross domestic product (TFlops/GDP) Canada is second last within G7.



Skills

CONTRACTOR OF THE REPORT OF

Era of Copilots

Al as a real-time collaborator

...that generates content

... that sparks creativity

...that automates cognitive tasks

...that completes work

Productivity

We are here

Culture





TRANSPORT CANADA THE HUB

The discipline of digital service design is making great strides in centring public services around the diverse needs of clients. Citizens have high expectations about the quality of services they receive. That applies equally to regulatory oversight because inspectors are expected to engage end-clients with a service ethos in mind: an attitude of courtesy, empathy, and respect; the minimization of unnecessary burden; the creation of highly satisfying service experiences. The Hubgives Transport Canada the capabilities to instill that ethos, equip front-line staff, and implement a digital-service transformation strategy. The Hubmakes client-centred service design the first stop in the development process. not an after-thought.

The Hubisthat first stop for a crucial reason. Information technology projects often result in cost over-runs and a failure to live up to expectations. That can happen when developers do not fully understand the nature of the challenge early on. In this era of "agile" development where speed is the priority, new technology projects can fall into the build trap. In the rush to meet project milestones, corners can get cut where it counts the most making sure that the technology caters to real people and real-world circumstances in order to create worthwhile experiences. Projects that fall into this trap underwhelm and go under-used. Most need to be replaced long before their expected lifecycle is complete. The Hub has the capabilities to set technology projects on the right path and maintain that client focus.

This graphic illustrates The Hub's capabilities. It shows the jour ney of an internal-client striving to create better services for end-clients, all for the ultimate benefit of Canadians.

A BUSINESS PROBLEM **EXPLORATION**

Hub designers listen to internal dients and engage others across the organization. Issues are understood holistically and from multiple perspectives. Assumptions are scrutinized. New framinos result.

USER EXPERIENCE (UX) RESEARCH

ENTERPRISE

ARCHITECTURE

Technologyprojects fail when they fail to understand the diverse group of end-clients. Hub designers look up close at how services are provided. They determine end-client needs, wants, aptitudes, preferences, circumstances, expectations, mental models, demographic traits, and behavioural tendencies. Prototypes are put to the test with real clients before they are deployed. All of that user-experience research ensures that service designs are

rocted in evidence.

G SERVICE DESIGN AND **DEVELOPMENT**

Professional service design methods are used to generate innovative service designs and new ways of working. The process is highly collaborative. Experts, service providers, internal clients, end-clients, and other stakeholders can be brought together to ensure that the service experience is highly satisfying and promotes the public good. New sources of data are tapped to enhance the service experience.

The Hub role is to launch a new digital service project. Once the challenge has been fully explored and a design has been created, the project is handed off to a dedicated development process. The enterprise architecture and investment justification are scrutinized before proceeding to full implementation.

The temptotion is to rush to solutions instead of fully explore the nature of a challenge. That risk is highest when softwarevendors create buzz around their products without establishing suitability. The Hub is the first place a client will turn in order to properly understand the nature of the challenge and design appropriate, viable solutions.

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DIGITAL TOOL MAKERY

Fast-moving tiger teams come together on short notice to develop needed digital tools. Best-in-class tools are curated and adapted for developers. For example, modern software is modular. allowing code to be reused. The maker space is suited to codeothons and other rapid development events and experiments.

A project will often need to create new developertools and software components. Developers can meet at the Hub to collaborate and pool their skills to fulfill those needs. The fruits of that collaboration can then bere-used in future projects.



The Hub tracks state-of-the-art technologies and practices related to digital services. Internal clients are better able to see RESEARCH the art of the possible and select promising technologies from a menu of options. Proof-of-concept prototypes are developed to as tablish the viability offledgling technologies.

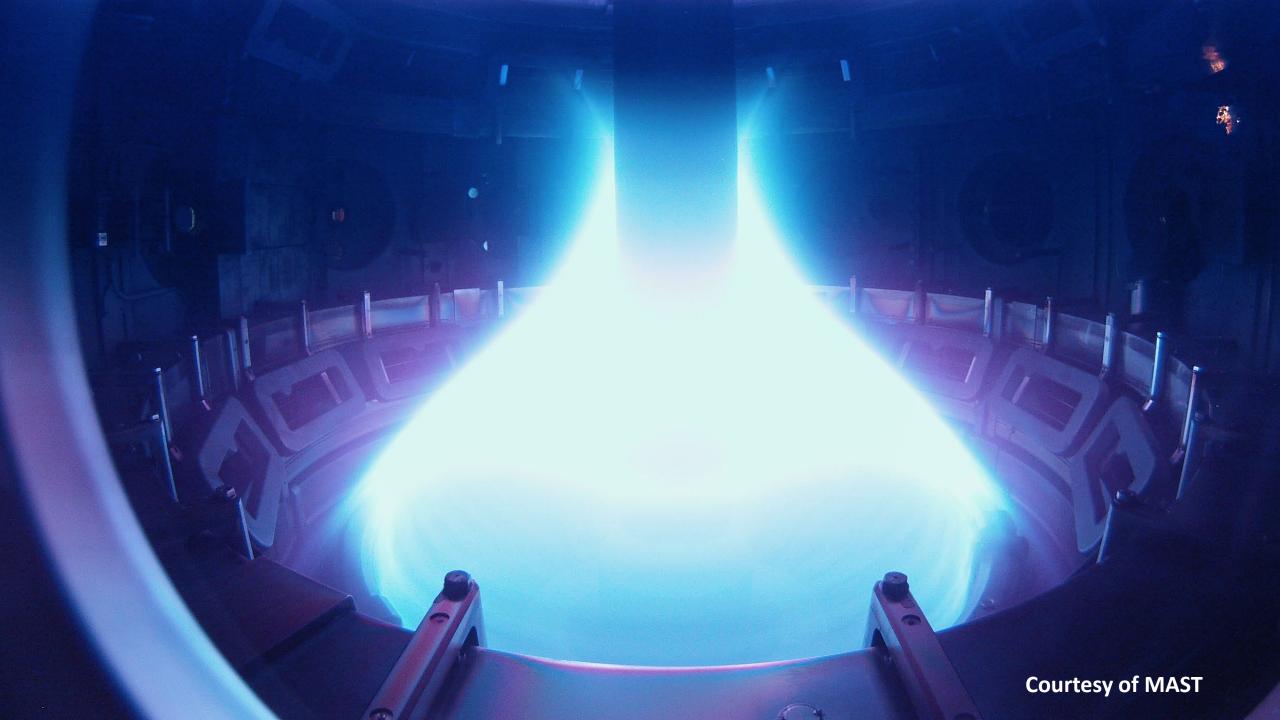


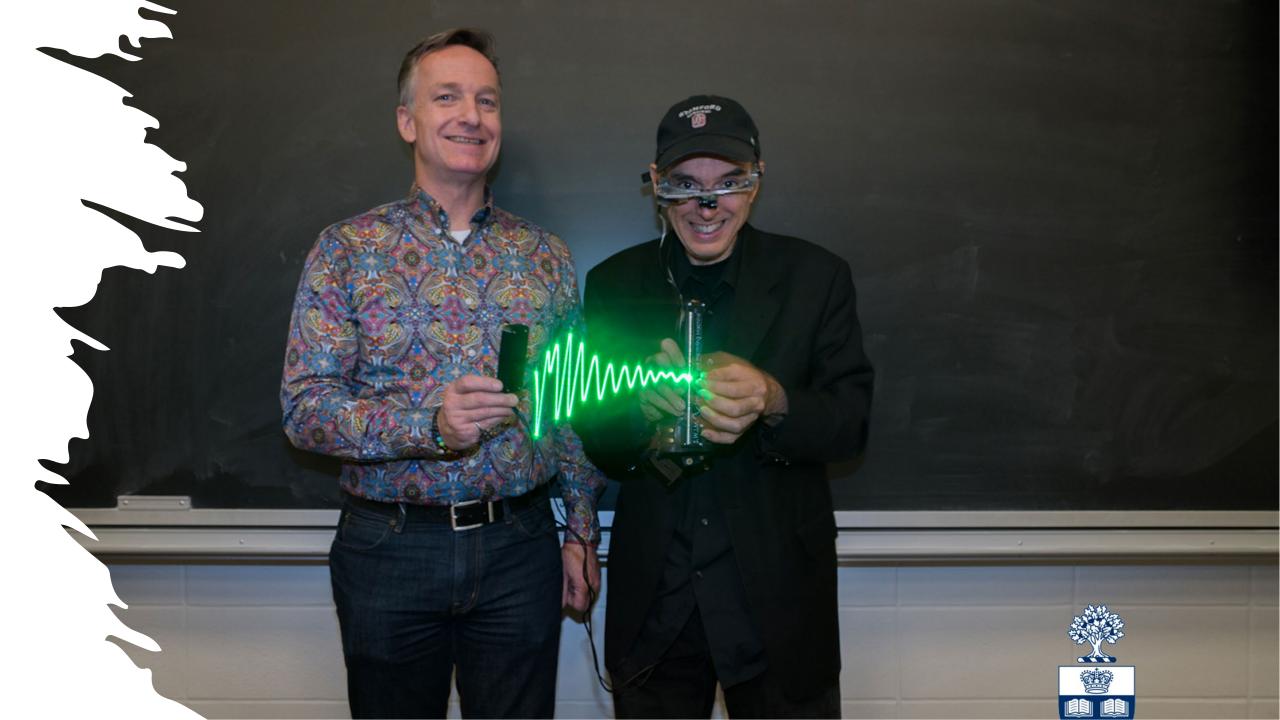
DIGITAL

LAB



Looking Ahead





Bioengineering





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