2022: A Look Forward

Alliance Members' Meeting

Jan 13, 2022

Digital Research Alliance of Canada | Alliance de recherche numérique du Canada

Land Acknowledgement

1. Provide Quality Service to all Researchers

2. Optimize organizational Structure and Enhance Capacity

3. Work Together for an Integrated DRI Landscape

4. Maximize public Investments to Accelerate Innovation

Office of the Prime Minister | Cabinet du Premier ministre

Ottawa, Canada K1A 0A2

“As Minister of Innovation, Science and Industry, you will lead efforts to create more jobs and achieve long-term economic and industrial transformation towards a low-carbon future, including through the strategic delivery of the Net Zero Accelerator Initiative. You will work to ensure that Canada is a world leader in clean technology, with a focus on critical minerals and the development of a sustainable battery innovation and industrial ecosystem, and position Canada to seize the opportunities of the digital economy, protecting rights and competitiveness and establishing a digital policy task force to help integrate efforts across government”.

December 16, 2021 to Minister Francois Champagne, Minister of Innovation, Science and Industry

Minister Champagne's Mandate Letter

- A strong Climate Action strategy – the Alliance is also are seeking to develop greener, more environmentally appropriate tactics to reduce emissions from our data centres
- (United Nations Declaration on the Rights of Indigenous Peoples) UNDRIP – our impending Indigenous Strategy embeds UNDRIP and OCAP as core principles in our engagement of First Nations, Inuit and Metis peoples within Canada's DRI strategy
- EDIA – the Alliance began with EDIA as a foundation for our funding calls and the formation of our organizational structure by seeking ways to addresses societal inequities. I have published in Policy Options and in numerous blogs, the Alliance's stance on these issues and advocacy for adopting an intersectional lens to our work
- More directly, the Minister is directed by the Prime Minister to establish a digital policy task force to integrate efforts across government and position Canada as a leader in the digital economy. The Alliance can help critically in this regard.

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https://pm.gc.ca/en/mandate-letters

Minister Champagne's Mandate Letter

- The Minister is directed to work with other Ministers in Public Safety, Foreign Affairs and National Defence to develop a National Cyber Security Action Plan. In partnership with CANARIE, the Board will approve a joint ecosystem plan in March, 2022 as per our Contribution Agreement
- Advance the Pan-Canadian Artificial Intelligence Strategy. The Board is already familiar with the leadership role we played in creating a Pan-Canadian approach to DRI for AI and Machine Learning
- Launch a National Quantum Strategy
- Add 1000 Canada Research Chairs (which will have cascading impacts to demand for DRI)
- Improve support for Black and Indigenous researchers by including specific equity targets for their research in federally-funded scientific research delivered through the granting councils

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Factors Influencing our Ecosystem

"Digital technology is changing our economy and our society—the way we access information, work, and connect with each other. Data is now a resource that companies use to be more productive and to develop better products and services, unleashing a digital revolution around the world".

- Canadian Data Governance Standardization Collaborative, 2019 (Government of Canada and Standards Council of Canada)

Legislative & Governmental Initiatives

European Open Science Cloud Commission, 2021

Australian Research Data Commons, 2021

Invest in Open Infrastructure, 2021

G7 Research Compact, 2021

Canadian Data Governance Standardization Roadmap resulting from Digital Charter Implementation Act, 2020

Canadian DRI Strategy, 2019

UNESCO Open Science Initiative, 2020

Future Scenario Planning

- Data analytics, Artificial Intelligence/Machine Learning
- “OPEN” Trends - Science, Infrastructure, Data…
- Self Service trends
- Diversifying business models: Cloud
- Purpose-driven innovation
- Omni-channel integration
- Cybersecurity

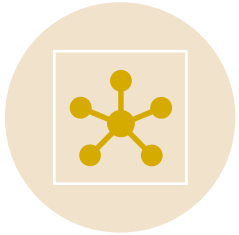
Data Analytics, AI/Machine Learning

- **Prescriptive Analytics:** This is the type of analytics that talks about an analysis based on the rules and recommendations in order to prescribe a certain analytical path for the organization.
- **Predictive Analytics:** Predictive analytics ensures that the path is predicted for the future course of action.
- **Diagnostic Analytics:** This is about looking into the past and determining why a certain thing happened. This type of analytics usually revolves around working on a dashboard.
- **Descriptive Analytics:** In descriptive analytics, you work based on the incoming data and for the mining of it you deploy analytics and come up with a description based on the data.

- Increasingly, machine learning and AI approaches are being applied to various forms of data analytics to set strategy & tactics
- Data Lakes & shared repositories
- The Alliance will require analytics dashboards placed on top of our data repositories & requiring advanced analytics to effectively support Canada's DRI ecosystem

The “Open” Trend

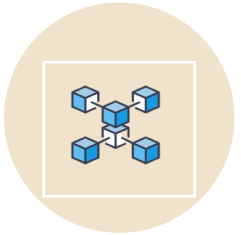
- The **Open Science** movement has emerged from the scientific community and has rapidly spread across nations, calling for the opening of the gates of knowledge.
- Investors, entrepreneurs, policy makers and citizens are joining this call. However, in the fragmented scientific and policy environment, a global understanding of the meaning, opportunities and challenges of Open Science is still missing.



INTEROPERABLE DATA MANAGEMENT FRAMEWORKS

OPEN (NON-PROPRIETARY) SOFTWARE

SHARED INFRASTRUCTURE

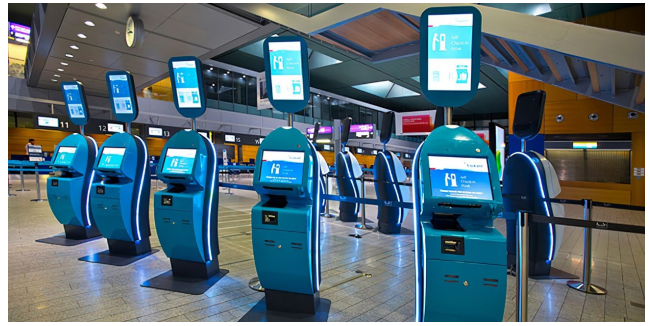


BLOCKCHAIN ADVANCEMENTS

GLOBAL PANDEMICS YET TO COME WILL PROPEL THIS NEED

Self-service

- Self-service trends are **rising significantly**, as technologies are playing a crucial role in keeping society functional during this pandemic. It may have a long-lasting impact in future
- This trend suggests researchers will <u>possibly</u> want to access DRI tools (e.g. *skilled researchers will want to spin-up their own HPC cluster in the cloud using Alliance issued tokens on commercial clouds*)
- Online Education & credentialing, RDM templates, Open Software tools, will likely structure the future of Alliance training and development in RS, RDM & ARC



Diversifying Business Models: Cloud

Advantages

- **1. Dynamic allocation & scalability of service**
  - Cloud allows for burst allocation without having to wait lengthy amounts of time with jobs in queue. Cloud allows for burst allocation without having to wait lengthy amounts of time with jobs in queue. When a user needs instant scalability, commercial cloud companies have the scale to enable it efficiently for both storage and computing, as cloud allows the ability to quickly scale and descale, using only what is needed for a specific job.
- **2. Potential cost savings**
  - Cloud enables to *only pay for what is used*. Having HPC infrastructure requires CapEx and OpEx, whereas paying for cloud services entails only OpEx costs. Furthermore, by using commercial cloud providers, i.e., there is the cost saving benefit of economies of scale. However, difficulty in estimating costs in advance could lead to budget overruns and unexpected costs (i.e., due to the complexity of cloud storage charges).
- **3. Agility in sharing**
  - Cloud could enable elasticity of use and sharing within the same platform, using open-source APIs within the cloud. As such, with central cloud usage, there could be less duplication of work.

Diversifying Business Models: Cloud

Considerations

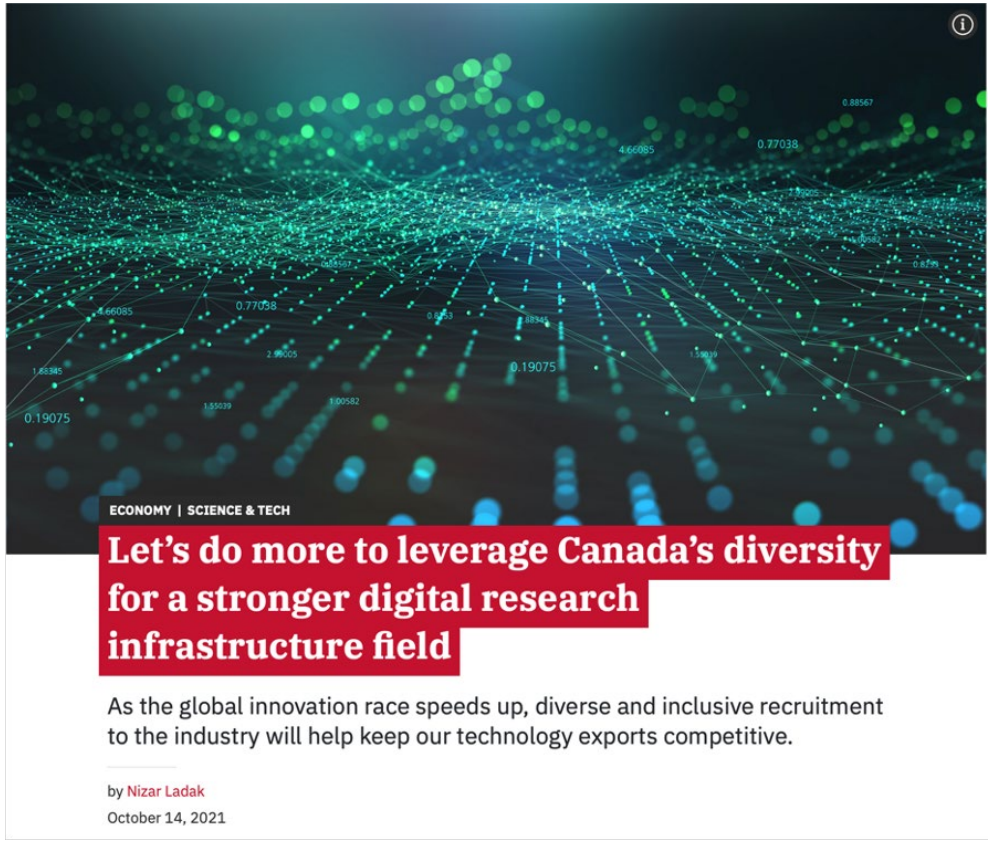
- **1.** Though cloud computing can cannibalize traditional ARC high performance computing, **there are various limitations of cloud that entail a continuation of the need for HPC as it is today.**
- **2.** Largescale interconnected problems are better for HPC. Primary space for HPC is areas to simulate physics or chemistry: modelling airflow, weather, hard science, with vast amounts of data, and many interacting parts
- **3.** Data management would be affected by the transition to cloud, specifically commercial cloud, as **data standards and security requirements would have to be embedded in the use of any cloud system** (*see Cybersecurity section*)
- **4.** Implications for research software include the differences in developing and using software for cloud
- **5.** Overall, **talent is a main implication for transitioning to the use of cloud**, as specific cloud support would be needed, for both public and private cloud use

Mental Health of Canada's Youth

- Depression and anxiety is increasing among our youth
- In 2019, the Kids Help Phone received 1.9M texts or calls.
- In 2020, it received 4 million.
- The kids help phone line receives 800 calls a day, 10 are active suicide rescues where the police are called for intervention.
- **Canada has the third highest youth suicide rate in the industrialized world**.
- Half of all of these calls are from Ontario, British Columbia and Alberta.

Purpose Driven Innovation

- The need for Equity, Diversity Inclusive and Accessible (EDIA) Frameworks to structure Alliance activities
- www.policyoptions.irpp.org
- Let's do more to leverage Canada's diversity in DRI…



Omni-Channel (off/online integration)

- An **omni-channel** experience refers to an integrated, well-structured, and consistent customer experience throughout all the possible channels that a customer engages with.
- While this may appear as a “retail sector” trend, it has implications for shaping expectations among researchers
- Researchers will come to expect that Software, Hardware and Data Management frameworks/considerations are seamlessly embedded in the tool sets they are provided…and will take for granted cybersecurity protections

Cybersecurity

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- **1. Standardized Policy**
  - **Common technical standards** that regulate technical procedures, tools and role-based access control
  - **Common operating agreements** that govern the interactions and responsibilities of all ecosystem participants

- **2. Talent**
  - **Increasing capacity in cybersecurity requires investing in cyber talent**(cyber security analysts, program/product managers, security architects, forensic analysts, threat hunters, etc.) through upskilling, hiring and retaining talent
  - 30% say **compensation/ incentive plans are not keeping pace** with the market
  - 27% identify a **lack of defined career paths** within cyber
  - 23% cite a **lack of learning and development opportunities**

- **3. Smart Cyber Technologies**
  - Smart cyber tech can learn and **recognize normal user behavior**, **develop baselines and detect outliers**, **identify malicious actions** that resemble previously seen events, and make predictions about previously unseen threats
  - In addition, smart cyber technologies **perform tasks in a highly consistent and repeatable way**, **eliminating human error and unnecessary manual labor**

Accelerating Discovery

From discovering insulin to fighting climate change to examining social inequity and beyond, Canada's researchers have collaboratively tackled some of humanity's biggest challenges. Today, research is increasingly urgent, complex and interconnected, and in response our researchers need better support for data management and better access to specialized software and advanced computing power.

We are accelerating discovery by transforming how digital research infrastructure is designed, managed, sustained and delivered to Canada's researchers and their global collaborators. Investing with vision, planning for the future, improving access to integrated digital research infrastructure and collaborating with a network of partners are all at the heart of what we do.

We both lead and serve, bringing a cohesive pan-Canadian vision for digital research infrastructure and a passion to collaboratively support our brilliant research community as they ask questions, gain understanding, accelerate discovery and transform how we live in our world.

Thank you

Alliance Membership

Enhanced membership program

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Membership: Benefits

- A seat at The Alliance inaugural table
- Attendance at AGMs
- Voting at AGMs (for Primary Members)
- Researcher Council nominations (for Primary Members)
- Opportunity to advise Board on strategic direction, policies and programs
- Opportunity to sit on advisory/ad-hoc committees
- Recognition on website and social media
- Early notification of funding opportunities
- Access to learning and development resources
- Network with other DRI-focused organizations
- Explore further opportunities to enhance Alliance services to members

Membership: Deepening our Connection

- Quarterly member meetings
- Introducing Monthly Member Connects: A learning and networking opportunity for members. A series where we will invite DRI thought leaders to connect with members and share advancements and resources
- Regular touch-points to build a valuable and personalized member experience
- Researcher spotlights: guest blogs, co-design of programming
- Expand relationships beyond primary contacts and throughout institutions
- Two-way Connections: Book a call to meet with our team
- Dedicated membership email: membership-adhesion@engagedri.ca

Data Champions

Pilot Project

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Data Champions Pilot Project

The Alliance launched a funding opportunity (January 4th, 2022) for the development of a Data Champions Pilot Project to promote a shift in data culture within the Canadian DRI ecosystem by promoting sound Research Data Management (RDM) practices.

As part of this Pilot Project, the Alliance will be gathering information to evaluate potential development of a scalable and sustainable Data Champions Program.

Objectives

- "Data Champions" are individuals/teams that aim to advance awareness, understanding, development, and adoption of RDM tools, best practices, and resources in Canada at their organization.
    - Funding (up to $50 000) to be used towards salaries/stipends to relieve "Data Champions" of salaried duties to focus on proposed activities.
- Outcomes of projects will be used to further the Alliance's RDM mandate by promoting sound RDM practices and contributing to a broader culture change in the conduct of digital research, and ultimately fostering excellence in Canadian research.

Timelines

Publish:	**January 4, 2022**
Info Session (English):	**January 13, 2022 at 11:00am EST**
Info Session (French):	**January 13, 2022 at 12:00pm EST**
Deadline to submit:	**February 3, 2022 at 5:00pm EST**
Adjudication Process:	**February 14-March 11, 2022**
Announce Award:	**Week of March 14, 2022**
First Disbursement:	**March 31, 2022**
Second Disbursement:	**March 2023**

Members Feedback on Strategic Plan Communications

As an Alliance Member, you and your organization will have access to a variety of communication resources and tools to help keep your community informed on the work of the Alliance and the benefits to Canada's diverse research communities. The Alliance will host a dedicated web presence explaining the Strategic Plan and related topics.

Alliance members play a key role in building awareness of our collective work in advancing research in Canada. Help us prioritize which communication tools will be most useful and practical to support your organization's communications about the work of the Alliance to your networks and communities.

- Poll questions
- Open question: Is there other content, tools, or engagement opportunities the Alliance can deliver that would help ensure our community, and YOUR communities, are informed about the new strategic plan?