NDRIO | NOIRN

New Digital Research Infrastructure Organization

Nouvelle organisation d'infrastructure de recherche numérique

Canadian DRI Needs Assessment: Preliminary Findings

Continuing the Conversation

About NDRIO

NDRIO Mandate

- NDRIO **works with other Digital Research Infrastructure (DRI) ecosystem partners and stakeholders** across Canada to ensure scholars and scientists **have the digital tools, support, services and infrastructure they need to support leading-edge research that enables Canada to compete on the world stage.**

- Our work **helps Canadian researchers, and ultimately** benefits Canadians and others around the world.
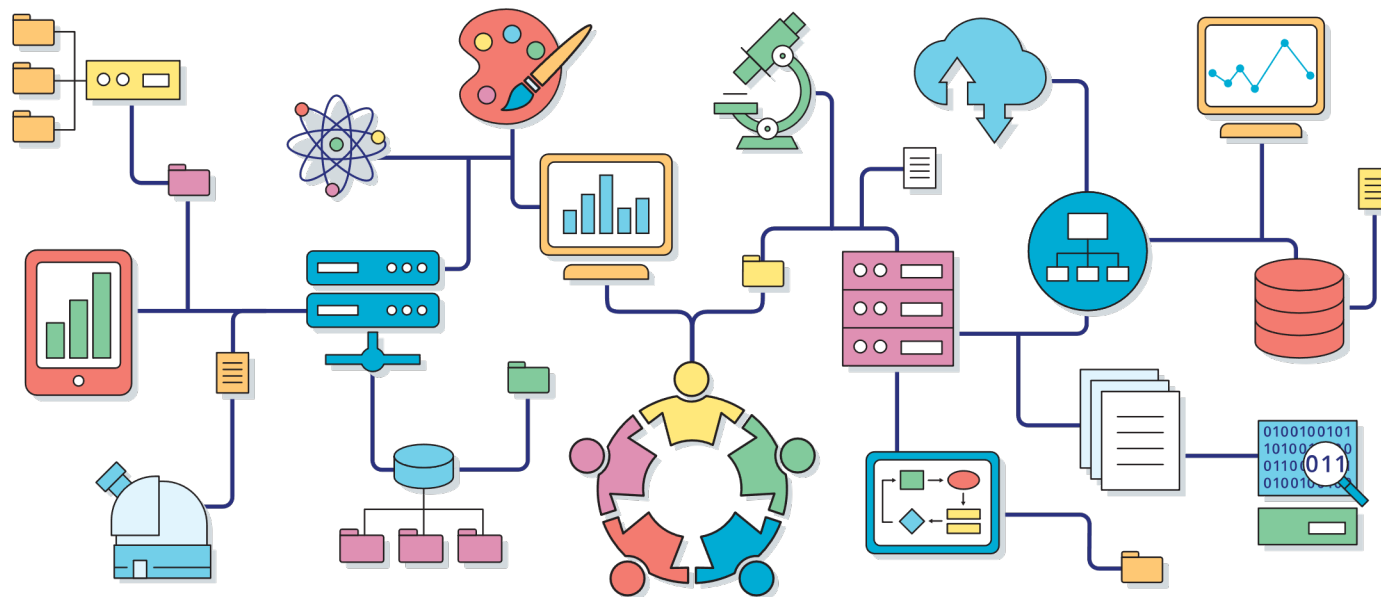
NDRIO Guiding Principles
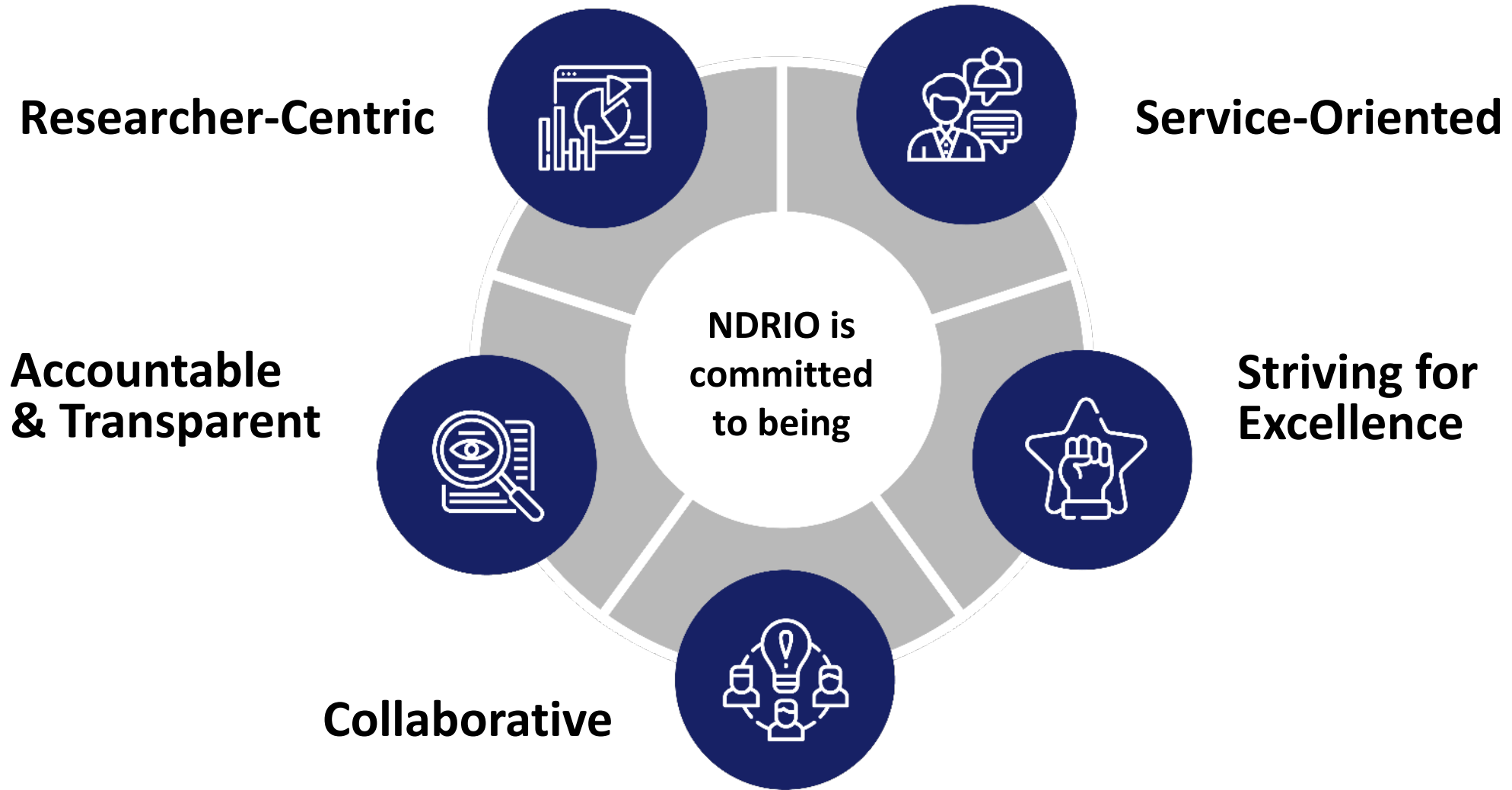
Needs Assessment Report → **National Service Delivery and Funding Model** → **DRI Strategic Plan 2022-2025**

LCDRI

Community Driven

Innovation, Science and Economic Development Canada

OCT 2020 - MAY 2021

Needs Assessment
- White Papers
- Survey
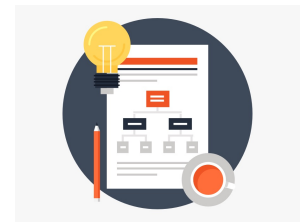- Current Documentation

Current State Assessment for ARC, RDM & RS

Town Halls
Work Groups
Website
Reports

FEB - JULY 2021

Environmental Scan

Technological Advancements Review

New Service Delivery and Funding Model

Informant Interviews
Town Halls
Work Groups
Website
Reports

Inaugural Call for Projects

MAY - SEP 2021

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New Digital Research Infrastructure Organization | Nouvelle organisation d'infrastructure de recherche numérique

Guiding Principles: Researcher Centric | Service-Oriented | Accountable & Transparent | Striving for Excellence | Collaborative

Needs Assessment Overview

Why did we conduct the Needs Assessment?

The Canadian DRI Needs Assessment allows us to understand the current needs and gaps in the national DRI landscape, including:
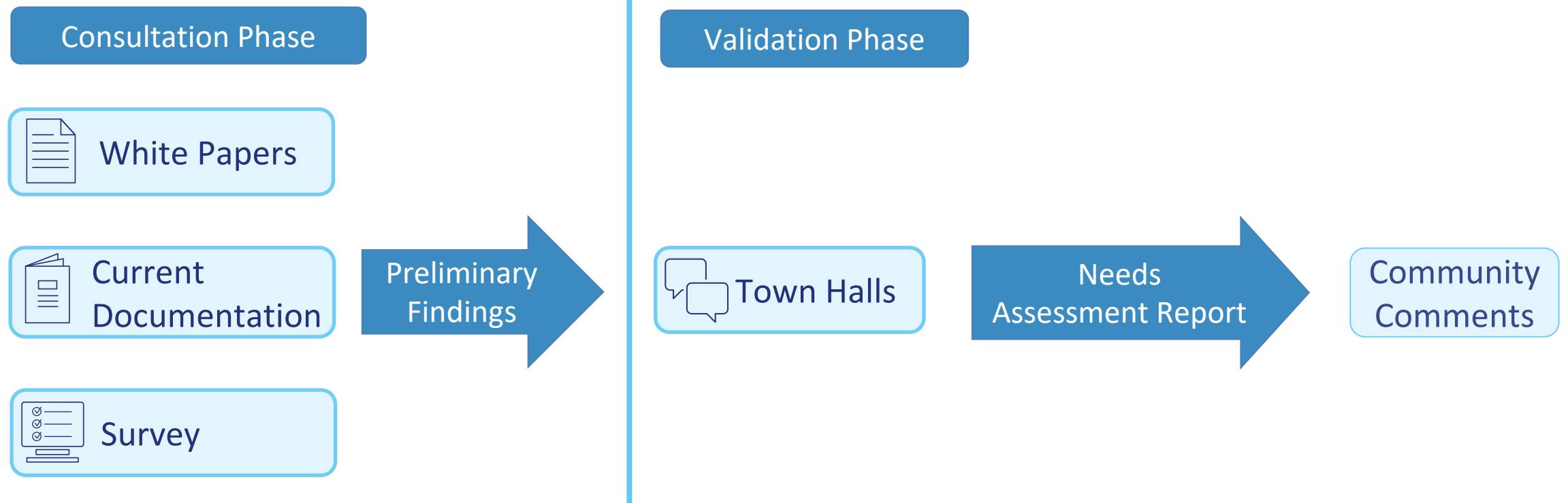
- Geographical distribution
- Spectrum
- Temporal duration
- Magnitude
- Existing capacities and resources

The Needs Assessment will also serve as a baseline against which to measure our future progress and inform future consultations.

How did we conduct the Needs Assessment?

Needs Assessment Process

Consultation Phase		Validation Phase
White Papers		
Current Documentation	Preliminary Findings →	Town Halls → Needs Assessment Report → Community Comments
Survey		

Who did we hear from?

105 White Papers
(Oct. 21 – Dec. 14, 2020)

19 Existing Documents
(Nov. 3 – Dec. 14, 2020)

350 unique authors from 112 organizations

Pan-Canadian Researcher Survey
(Feb. 5 – Mar. 1, 2021)

~1,400 respondents from across Canada

Who did we hear from?

Pan-Canadian Survey, February 2021

Ontario (573)
Québec (364)
British Columbia (172)
Alberta (94)
Manitoba (46)
Nova Scotia (43)
Saskatchewan (32)
Newfoundland and Labrador (24)
New Brunswick (15)
Prince Edward Island (7)

Medicine and Health Sciences
Arts, Social Sciences & Humanities
Mathematics, Statistics & Computer Science
Engineering
Astronomy, Physics & Earth Sciences
Agriculture & Environmental Sciences
Biological Sciences
Chemical Sciences
Information & Library Sciences
Other

Research Discipline

Methodology

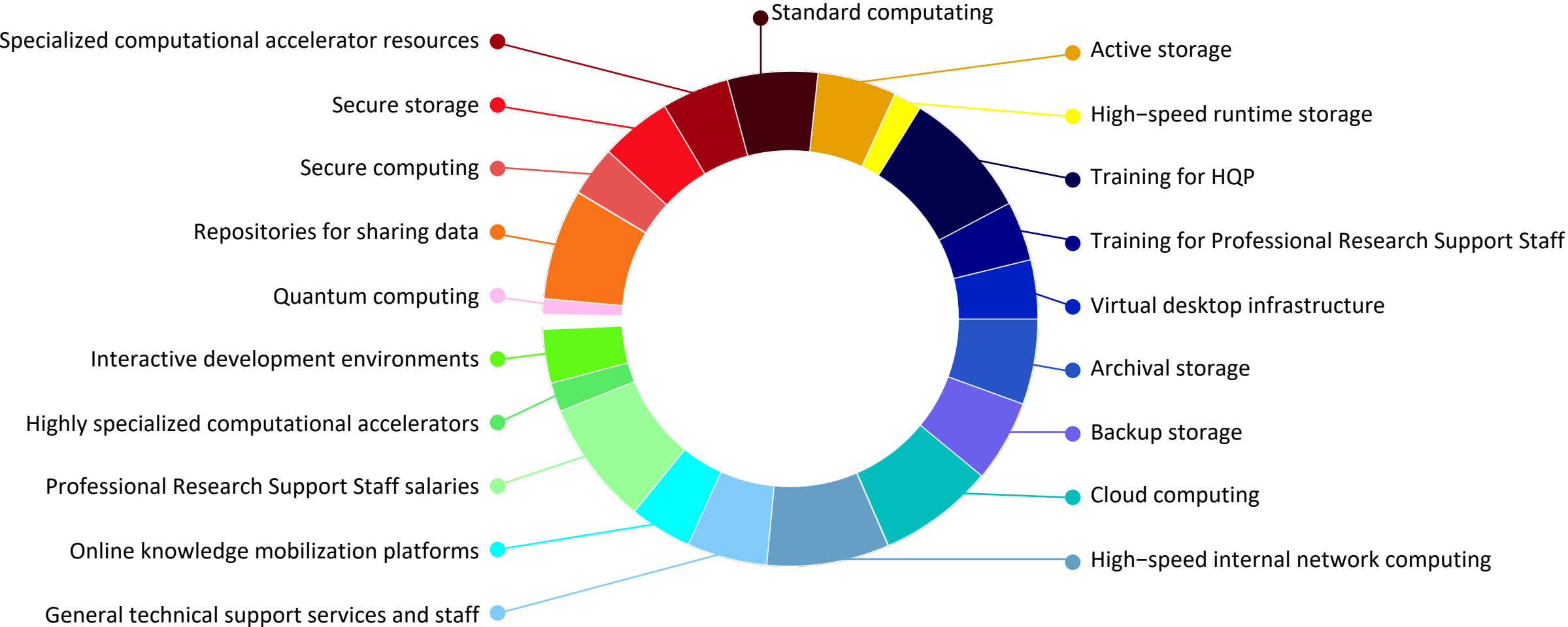# Ongoing Analysis

White Papers

- All 105 submissions were coded to organize and classify data, and identify categories and sub-categories for contextual analysis

- A Working Group synthesized and generated aggregated findings

Survey

- Descriptive statistics to capture the composition of respondents (institutional affiliation, geographic region, discipline)

- Commonalities and divergences based on respondents' profiles
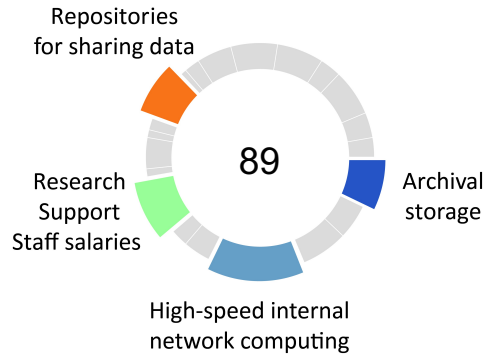
Initial Insights
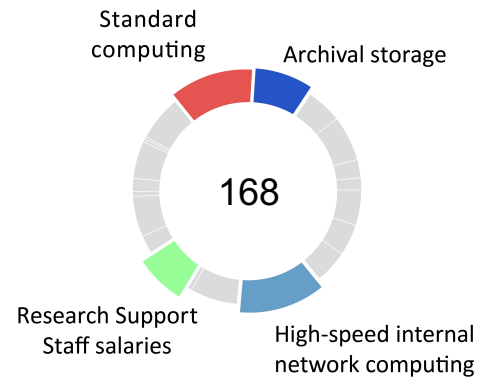
Complex DRI Landscape

Standard computating

Specialized computational accelerator resources

Secure storage

Secure computing

Repositories for sharing data

Quantum computing

Interactive development environments

Highly specialized computational accelerators

Professional Research Support Staff salaries

Online knowledge mobilization platforms

General technical support services and staff

Active storage

High–speed runtime storage

Training for HQP

Training for Professional Research Support Staff

Virtual desktop infrastructure

Archival storage

Backup storage

Cloud computing

High–speed internal network computing

What should NDRIO prioritize to meet your research needs?

Complex DRI Landscape
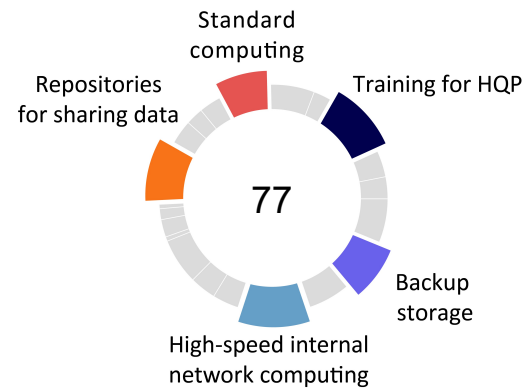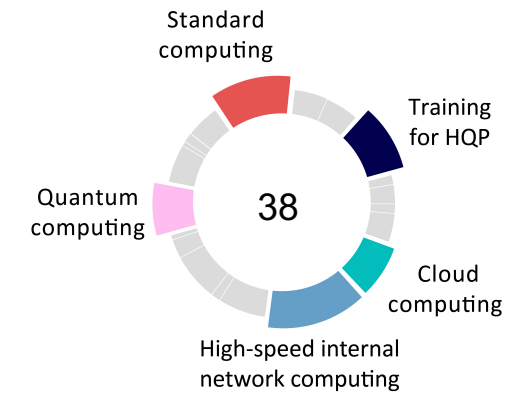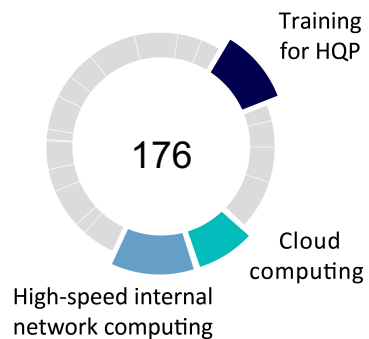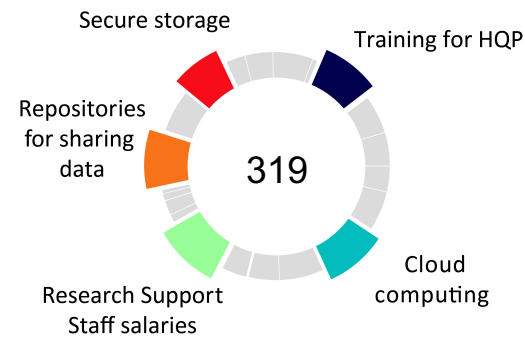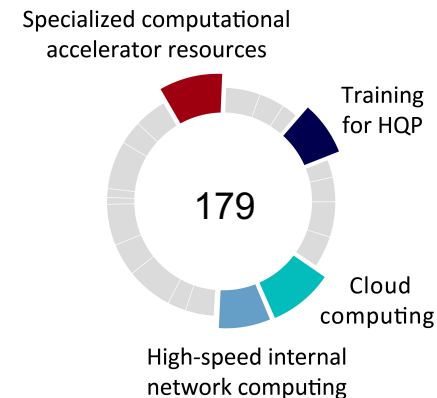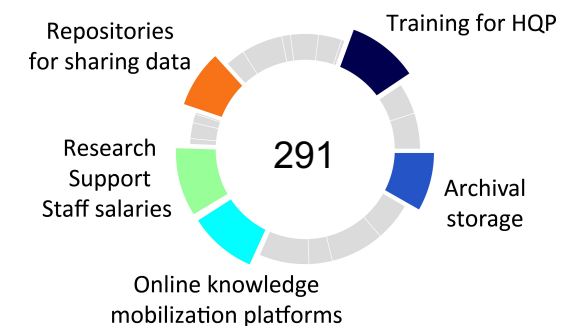
Diverse DRI Needs

Additional DRI Priorities Identified:

- Renewing investments in ARC
- Expanding cloud services, including commercial-cloud
- Providing data storage throughout the research lifecycle
- Fostering interoperability of data and tools
- Supporting software development
- Encouraging Open Science through tools, standards and policies
- Advancing Indigenous Data Sovereignty
- Extending support for sensitive data and improving cybersecurity

- Preparing current and future HQP through training and education
- Lowering barriers to access and collaboration
- Collaborating and aligning with stakeholders at various scales
- Embracing equity, diversity and inclusion
- Developing equitable and sustainable funding models

Virtual Town Halls

Virtual Town Halls: Discussion Opportunity

These events are an opportunity to:

- Review the Needs Assessment Preliminary Findings

- Discuss and provide further feedback on outstanding questions

- Continue to engage with Canada's research community

Virtual Town Halls: Discussion Opportunity

- 8 Virtual Town Halls will take place from May 4-7, 2021.
    - 4 English, 4 French
    - Each Virtual Town Hall will address a specific *theme.*

- After a short presentation on the findings, participants will discuss specific questions in a 30-minute breakout session.

- Breakout sessions will report their conclusions and recommendations back to the main room.

- The discussions and feedback from the Town Halls will be incorporated into the Needs Assessment Report, which will also be open for public comments.

Virtual Town Halls: Themes

Each Virtual Town Hall will address one of the following themes:

Awareness and Accessibility	Governance and Policy	Operations	Support
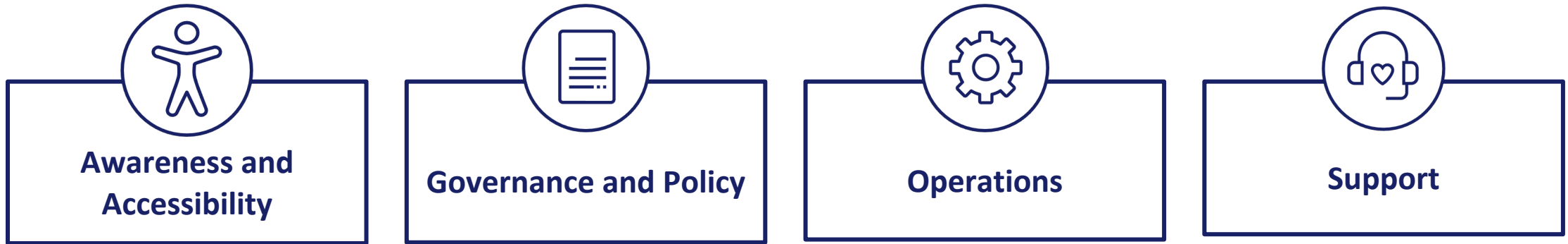
These themes relate to recurring topics presented in the White Papers, and:

- Are fundamental to NDRIO's organizational development and service delivery
- Address all DRI pillars: ARC, RDM, RS
- Focus on building consensus and collaboration

Awareness & Accessibility
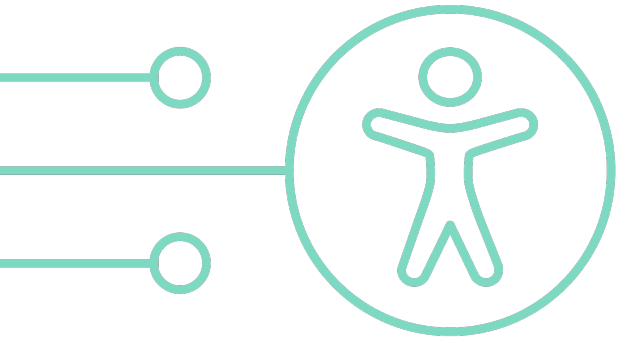
Awareness & Accessibility

Key Findings

- There is a lack of awareness of existing DRI available across all researcher career levels and disciplines.

- Resources and services are poorly described, resulting in **lack of clarity and confusion** among researchers.

- A **Canada-wide catalogue** of DRI services and resources could allow researchers to rapidly identify the right solution for their needs.

- Usage of national DRI components varies across disciplines, with those less aware relying more heavily on their own solutions, or institutional partners like research centres and libraries. This is **unsustainable** in the long term.

- Differences in institutional capacity are barriers to equitable access of research funding and support.
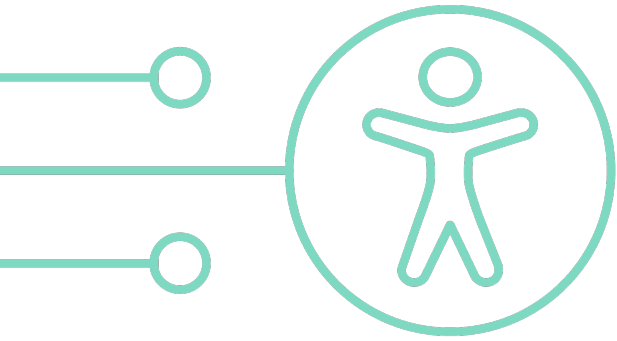
Awareness & Accessibility

Key Findings

- Researchers are unclear about **the eligibility of DRI expenses and matching requirements** across funding agencies.

- Current funding processes are cumbersome and time consuming. A pan-Canadian and simplified process through the use of Persistent Identifiers and more collaboration among stakeholders would reduce researchers' administrative burden and increase productivity.

- Bilingual support in all aspects of DRI is needed. Further implementation of French-language services and support should include interface design and training.

- **Increased accessibility and usability** could be achieved through collaborative platforms with low barriers and thoughtfully designed interfaces.

Key Questions

- What are the pathways you use to access DRI and support, and what are the points where NDRIO can intervene to improve discovery and adoption of services?

- What are the main bottlenecks you face when looking for, and requesting funding for, your DRI needs?

- In your discipline or community, what are the main channels to discover DRI resources?

Governance & Policy

Governance & Policy

Key Findings

- A national strategy for DRI must value and actively promote policies, processes and people necessary to establish and **maintain trusted relationships with Indigenous researchers and communities**. The space for collaboration and co-development must be prioritized to ensure Indigenous data sovereignty and community needs are created and continuously maintained.

- Locally, provincially and federally, data governance and associated data use **policies and practices that support DRI must facilitate efficient and effective research processes**, while being flexible to context and culture.

- **Differences in provincial and territorial policies and practices** make access, sharing and collaboration with sensitive data (e.g., PHI, PII) and proprietary information difficult.

- Third-party/organizational policies, lack of participant consent and monetary barriers are prohibitive. Particular attention to collection and use of race-based and other sensitive data requires dedicated analysis.
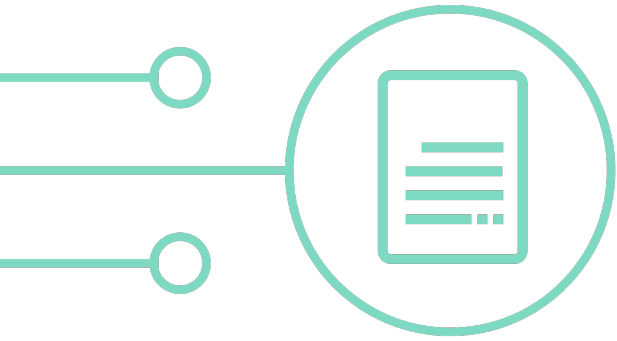
Governance & Policy

Key Findings

- **The protection of sensitive and private data** is essential in many disciplines. A pan-Canadian framework of policies, governance and DRI that ensures privacy through increased security and authentication practices across institutions would streamline computational pipelines and increase the efficiency of such workflows.

- **Open Science/Scholarship** should be valued, promoted, and facilitated, as appropriate. While not all data can or should be openly shared, appropriate mechanisms should be put in place to ensure this data can still be discoverable in a secure way.

- **Private sector collaboration** should be developed, while adhering to provincial and federal legislation and public/cultural values. Transparency is a necessary element to effective collaboration.

Key Questions

- What actions can the DRI community at large take towards building meaningful relationships with First Nations, Inuit, Métis, and other Indigenous communities?

- In the short term, can data governance policies, practices and procedures be re-aligned to facilitate, rather than inhibit, timely research? How? In the longer term, what are pan-Canadian steps to facilitate legislative/regulatory reform that will support researchers, while ensuring participant/personal data protection?

- What are the pain points in public-private collaborations for using DRI?

- What are models to support and encourage researchers to adhere to open scholarship mandates being set by publishers and funders?
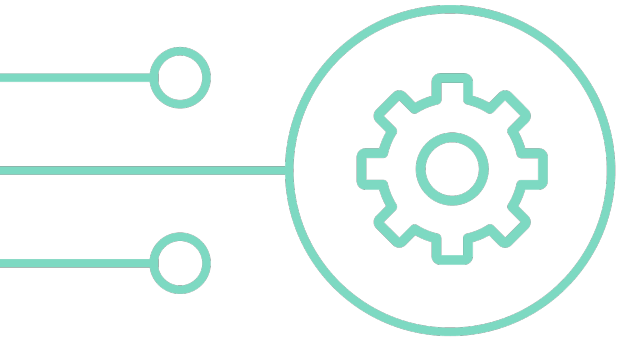
Operations
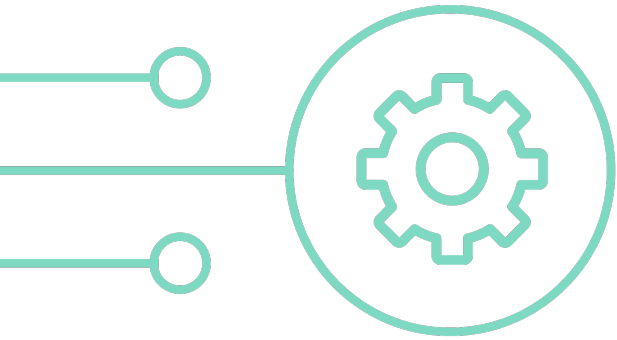
Operations
Key Findings

- An **integrated and cohesive** DRI environment should be advanced. For example, harmonizing processes with Tri-Agency funding decisions and policy requirements; clarifying communications through transparent systems and common access portals; simplifying identity management.

- Processes and allocations should reflect needs throughout the **full research lifecycle**, from grant proposal to preservation, and consider projects with different computational loads, time spans, and data governance models.

- Many researchers are seeking access to **commercial cloud** and favour hybrid models of access. However, engagement of commercial service providers must not harm shared academic efforts.

- Pan-Canadian DRI should support **international cooperation** through shared standards or policies for inter-operability.

Operations

Key Findings

- A pan-Canadian **convenor role** can bring together experts to collaboratively develop standards, best practices, and exchange ideas between researchers, practitioners, service providers, and policy makers.

- **Centralization, distribution and federation** need to be considered carefully. Consistency in processes and tools, and economies of scale, are key benefits to central models. However, support for researchers with unique needs and support from local HQP must be enhanced.

- The value of **accountability** must be promoted. The measurement of activity and successes using key performance metrics to support innovative governance are key to collective improvement (e.g., carbon emissions of compute resources).

Key Questions

- What are the preferred arenas for community engagement and collaboration (e.g., targeted working groups, online forums, online events, etc.)? Why do you value these arenas over others?

- What are key performance indicators to measure operational excellence?

- How can different stakeholders collaborate to improve accountability and transparency, and support equitable pan-Canadian DRI?
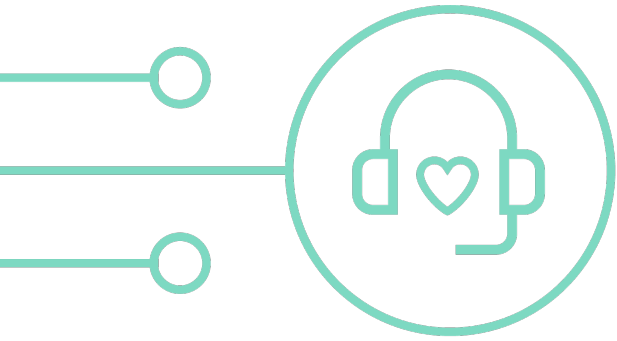
Support
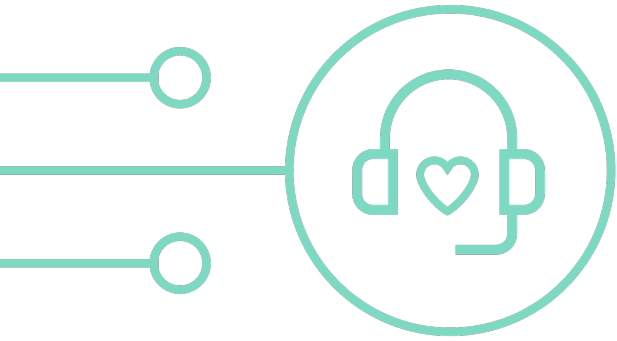
Support
Key Findings

- Attention must be placed on development and retention of national, regional and institutional HQP supporting DRI. **More human resources** (e.g., data curators, software developers, system administrators) are needed to support researchers with DRI.

- Increased **partnership and collaboration** with stakeholders across scales and research domains will encourage long-term **sustainability** of existing initiatives.

- Engaging local distributed HQP yields benefits via institutional knowledge and relationships. Access to **discipline-specific** expertise is critical in many circumstances. Expanding the range of **support teams** offering both technical and discipline-specific support would improve service delivery to researchers.

- More agile training is needed to bring graduate students and communities new to DRI up-to-speed.

Support

Key Findings

- Training is also **community-building** and this should feed into program design (e.g., cluster training by domain rather than by types of tools).

- **Renewing and expanding delivery of training and education** are central to supporting DRI.

  Emerging themes include:
  1. Research software support through training and local development teams
  2. Data curation to support the FAIR principles, and support with data repositories
  3. Cybersecurity and management of "sensitive" data
  4. More intermediate and advanced training on ARC, including the "responsible use of ARC" (e.g., data management)
  5. Going from "how-to" training to more exploratory formats to address ethical and epistemological issues

Key Questions

- What communities/stakeholders must be brought together through collaborative training to support researchers in your discipline?

- Would you be supportive of a national "Data Champions" style program? What HQP should such a program involve at the local level?

- Where and when support and training intersect a research project can greatly affect its success. What are opportunities for improvement to provide support at the points of need?

Next Steps

Next Steps

Needs Assessment Report

NDRIO will compile all findings into a draft Report for public comment by late summer 2021.

NDRIO Strategic Plan

The Report and other consultations will inform our 2022-2025 Strategic Plan.

Continued Collaboration

We want to hear from the researchers we serve. Please share your comments or questions to: research_recherche@EngageDRI.ca

Thank You