

From Andrew Rutenberg (PI of the RD), on behalf of the Research Directorate (RD) of ACENET

ACENET's Research Directorate (RD). The members of the RD are professors within ACENET member institutions, and the ACENET executive regularly attend our meetings. The RD serves to keep the organizational “eye on the ball” of serving (and expanding) the research community – we are ACENET’s “users group”. The RD meets monthly by Zoom to discuss initiatives and changes within ACENET. We also engage with other users, and have a representative on the ACENET board. Our focus enhances community appreciation, support, and use of ACENET resources (contributed systems, training, support, and engagement within the CC/NDRIO national federation). The RD is valued and “heard” by the ACENET board and executive, and we work to help ACENET thrive within a dynamic Canadian landscape.

One of the roles of the RD is strategic, and the national landscape and national resources are important to us. As such, we have invited both regional representatives of the NDRIO Research Council within our RD as either members or guests. We will continue and encourage this integration with NDRIO, and we hope that NDRIO fosters rich multi-level engagement with all regional consortia.

This white paper raises four points for NDRIO to consider (expanded below): the need for continuous consultation; the importance of undergraduate training; some challenges NDRIO will face; and praise of some of the things that work well for the current Canadian digital research infrastructure.

Continuous Consultation. Software, hardware, infrastructure, and training needs, as well as best-practice, are all constantly evolving. It is important that NDRIO engage in recurring cycles of consultation with the community. Canadian Digital Research Infrastructure will not be “solved” in one go; decisions and initiatives need to be iterative and inclusive. NDRIO’s door should *always* be open to community input. We recommend multiple consultation styles or approaches:

1. **Focus groups** with stakeholders from various communities determined by region, discipline, level of expertise, or area of interest. Both in-person and online events will help to reach broad audiences, since in-person events can provide more depth and opportunity for informal interaction while online events can be more inclusive and affordable in both time and money.
2. **Semi-annual open-ended town halls** over Zoom would open up engagement with the broader community. It is easy to let meetings and town halls become presentations, rather than facilitating input from DRI users. We suggest that listening should be the goal of town-hall events. Pre-circulate information from NDRIO, so that most of the time

in town-hall events can be spent in discussion. [Compute Canada had a town-hall at the annual Canadian HPCS conference – but this was largely talking to rather than listening to users – and it had a limited reach outside of HPCS attendees.]

3. **Engage with regional consortia at many levels.** Sustained and bidirectional communication between management of NDRIO and of regional consortia is paramount to collaboration and success. Close integration of employees from regional consortia at different levels and career stages within NDRIO working groups can leverage their expertise. We recommend explicit and regular liaising with researchers who are also engaged with regional consortia. This could take place at an annual meeting, or through formal representation from the regional consortia within NDRIO.
4. While pleased that NDRIO requested feedback through whitepapers, we note that the call was announced after the start of term, during a global pandemic, and with a tight deadline. We encourage NDRIO to have an **annual or standing call for policy papers**.

Undergraduate Training. Undergraduates become the next generation of researchers, both inside academia and in industry, where their experiences and training can help them make strong career choices and succeed more rapidly. Despite that, ARC training is not ubiquitous across universities and departments – and summer research experiences are still underfunded across the tricouncil. NDRIO should fund, partner, and cajole to change that.

1. Undergraduate training bootcamps in basic programming skills, language switching (e.g. between C, Python, R, and Matlab), and “Software carpentry” should be available nationally both synchronously and asynchronously.
2. While undergraduate training in ARC is crucial for primarily undergraduate institutions, it is important for every undergraduate – and so is important at all universities. In particular, equitable access to training will foster equitable access to research and professional opportunities and so will support national EDI initiatives.
3. Undergraduate training opportunities should be available regardless of discipline and should be tailored to different undergraduate audiences. For instance, a linguistics student working with large corpora will need different training than a physicist or engineer. The training could be organized by broad area of interest or background knowledge. Offering workshops that advertise “no experience needed” will help attract students from various backgrounds.
4. Reaching out to K12 (e.g. with access to individuals or classes, and training) will pay further dividends by broadening the pipeline to undergraduate, graduate, and business opportunities.
5. NSERC has USRA summer opportunities, CIHR has summer studentships, and SSHERC has explore grants. MITACS has Globalink. Nevertheless, there is significant unmet need, and opportunity. NDRIO should develop its own internship program, perhaps in

partnership with the tricouncil and MITACS, linked with NDRIO training and resources, and aimed at compute-intensive research.

6. While most attention is placed on research hardware, software, and storage needs, Canadian research would be greatly enhanced by stronger training and recruitment. These suggestions would facilitate more people-power within the NDRIO research ecosystem.

Some Challenges for NDRIO. While there will be a great number of challenges for NDRIO, here are some we emphasize:

1. Communicating effectively with people who are already saturated will be a continual challenge. Sending out the email, or posting to the webpage is not enough. Being thoughtful about deadlines, and working continually to increase engagement will be crucial. Our suggestions about “continuous consultation” above should help.
2. Clearly communicating about what resources are available, and how to use them, is particularly important for new and potential users. This will require constant outreach.
3. Ensuring enough Research Support staff are available to support researchers (and to do that outreach) will be a challenge, as needs will continually change.
4. Supporting the Regional Consortia both politically, financially, and practically will be important and challenging. The best hardware is useless without users, training, and support. As a national umbrella organization, NDRIO must foster the entire ecosystem.
5. Promoting EDI nationally, regionally, topically, internally and externally will be important. ARC continues to have significant challenges with EDI; NDRIO can help us effect change through hiring, training, leadership, and opportunities. EDI is also a useful lens to consider how effective NDRIO is. If EDI is not improving in all respects, it points to missed opportunities and gaps that should be addressed.

What is Working Well. Notwithstanding our suggestions for improvement, the existing DRI ecosystem in Canada – as developed by CFI, Compute Canada, and the regional consortia (now Westgrid, Compute Ontario, Calcul Quebec, and ACENET) – represents tremendous value that should be largely preserved. Here are some things we would particularly like to support.

1. Research consultants (RC) distributed across many university campuses. They are key towards access, training, outreach, and engagement. In particular, collaborations with research groups should be encouraged. Professional training and development of RC is key to their continued success and retention.
2. Training initiatives across Canada. Promoting access nationally (from all consortia) and providing more asynchronous and remote training will be important.
3. We echo Ross Dickson’s submission in <https://engagedri.ca/white-paper-submissions>.