

# BACKGROUND

## Leadership Council on Digital Research Infrastructure (LCDRI)

### SUMMARY

In Budget 2018, the LCDRI is asking the federal government for:

- **an investment in data management of \$55M over 5 years to support a national body that would coordinate and facilitate key data management services and infrastructure across Canada; and,**
  - **a signal that the federal government is committed to ensuring that researchers have access to the ARC that they need by stabilizing Canada's ARC environment through a sustained and predictable investment of \$79M to \$123M annually, beginning to be phased in no later than 2019.**
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- Digital research infrastructure (DRI) is reshaping the practice of research, allowing us to tap the potential for unprecedented breakthrough across all academic disciplines.
  - To ensure that Canadian researchers can exploit and realize the opportunities that these new technologies and data offer, they must have access to a strong, agile, and sustainable DRI ecosystem that delivers both infrastructure and services through its five core components: network, advanced research computing (ARC), data management, advanced research software, and storage.
  - To support researchers, the DRI ecosystem must reflect the differentiated service delivery models required by each of its core components. It must also, through effective coordination and governance structures, be integrated and interoperable across its core components and amongst its three delivery layers: national, regional/provincial, and local.
  - In November 2016, the federal Minister of Science funded LCDRI to work through a community-based process to develop a position paper in each of the following areas: data management, ARC, and the future coordination of the national layer of Canada's DRI ecosystem.
  - Working Groups were struck to write each of these three papers and the position papers have all been submitted to the department of Innovation, Science and Economic Development (ISED) for the Minister's review.

## **Why is DRI important?**

Just as digital technologies are fundamentally reshaping our world and changing the way that we do business, communicate with one another, and solve problems in our day to day lives, it is having a transformative impact on research. First, new technologies such as ARC (computing that goes far beyond the capacity of the desktop computer) and advanced research software are allowing researchers to work faster, smarter, and more collaboratively. For instance, calculations that used to take three months, can now take less than three hours and experimental approaches such as crash tests and emergency flight maneuvers that were too costly, dangerous, or impossible to undertake can now be simulated.

Second, digital technologies are creating vast amounts of data at an explosive rate – data that can be harnessed for solving some of the most complex questions and challenges facing humankind. However, if this data is not managed properly and researchers are not supported in their use of it, we can find ourselves data rich, but information poor, losing all of the promise and potential that these data offer.

We are just at the cusp of understanding what these new technologies will mean to our research community, but the growth lines are clearly demonstrating that having access to these powerful research technologies and supports will be critical to Canada's future – just as access to the web and a desktop computer now are. The research projects of many of Canada's top researchers, such as Art MacDonald, our most recent Nobel prize winner, are already dependent on digital research infrastructure (DRI). In addition to allowing us to tap the potential for unprecedented breakthrough across all academic disciplines, it is essential to Canada's ability to remain globally competitive and part of critical international research collaborations. It is also a foundational element for ensuring that Canada continues to have the young talent and technology that it needs to participate fully in today's knowledge economy.

## **What is needed to ensure that Canadian researchers have access to the DRI that they need?**

To realize the promise of these new digital technologies and data, Canadian researchers require access to a strong, agile, and sustainable DRI ecosystem. This ecosystem must provide well-integrated infrastructure and services that are coordinated across a diffuse delivery environment with institutions, regional/provincial/national/international organizations, and discipline-specific communities all having a role – this is an ecosystem and it takes a team to make it successful. Lastly, all five core components of the ecosystem must be recognized and funded.

## **What has the LCDRI done to support the development of a framework to address these needs?**

In recognition of the critical role that DRI will play in Canada's future, a year ago, the Minister of Science funded the LCDRI, to run a community-based process to develop

three key position papers on data management, ARC, and the future coordination of the national layer of the DRI ecosystem. All three papers provide a summary of the current challenges in each area and outline a vision, goals, principles, and options for future federal action to ensure the successful development of all three within the national layer.

### **What is the LCDRI ask of government?**

Having now had an opportunity to complete a deeper dive to understand fully the key issues affecting the national layer of Canada's DRI ecosystem, the LCDRI has presented a number of investment options to government in the areas of data management and ARC. Specifically, it has put forward a proposal for an investment in data management of \$55M over 5 years to support a national body that would coordinate and facilitate key data management activities across Canada to ensure that researchers are able to find, access, and reuse current and historic data efficiently and effectively.

LCDRI is also requesting that, in budget 2018, the federal government signal its commitment to ensuring that researchers have access to the ARC that they need to participate fully in today's digitally-intensive world by funding expected user growth, and by stabilizing Canada's ARC environment through a sustained and predictable investment of \$79M to \$123M annually, beginning to be phased in no later than 2019.

Lastly, the LCDRI provided three options for future coordination of the national layer of the DRI ecosystem in Canada and stressed the importance of respecting the differentiated service delivery models required by each of its core components. It also emphasized the importance of ensuring that, through effective coordination and governance structures, the DRI ecosystem is integrated and interoperable across its core components and amongst its three delivery layers: national, regional/provincial, and local.