A Response to Industry Canada's discussion paper noted below:

February 2014

Research Data Canada (RDC) welcomes the opportunity to comment on some of the questions raised in in ***Seizing Canada's Moment Moving Forward in Science, Technology and Innovation.***

Research Data Canada:

Research Data Canada is a collaborative effort to address the challenges and issues surrounding the access and preservation of data arising from Canadian research on the part of some 34 organizations. This multi-disciplinary group of universities, institutes, libraries, granting agencies, and individual researchers has a shared recognition of the pressing need to deal with Canadian data management issues from a national perspective. (For a complete list of the organizations active in RDC see Appendix A. Research Data Canada has completed an inventory of elements of data infrastructure currently available in Canada and has highlighted gaps. The Policy Committee of RDC has developed a schedule of policies that need to be in place to ensure effective stewardship of Canadian research data. The Education and Training Committee is identifying, amassing, and developing resources to train data professionals and researchers in effective management of data. The Standards and Interoperability Committee of RDC is hard at work compiling a set of standards based on international best practices.

RDC is also an active member of the Digital Infrastructure Leadership Council and has had the opportunity to discuss the S&T Consultation document with other Council members in the context of the recent Digital Infrastructure Summit 2014 held in Ottawa http://digitalleadership.ca/ . We are aware many of our sister organizations will also be making comment. RDC will confine our comments to those questions that directly touch our work.

- ***What actions could be taken, by the government or others, to enhance the mobilization of knowledge and technology from government laboratories and universities, colleges and polytechnics to the private sector?***

Canada currently lacks a systematic approach to the collection, curation, preservation, and the provision of access to data resulting from publicly funded research. Currently, there is no requirement for researchers to have data management plans as part of their research funding proposals although in the recent consultation paper ***Capitalizing on Big Data: Toward a Policy Framework for Advancing Digital Scholarship in Canada***, the Tri-Councils and CFI have proposed that Data Management Plans become a requirement for research funding in Canada. RDC is on record as supporting this proposal.

Data Management Plans are a critical but not sufficient step to making the products of publicly funded research openly accessible to other researchers and the private sector. For Data Management Plans to have real application, a comprehensive infrastructure for data management and access is required. It should be noted that a key component of that infrastructure is a cohort of well-trained data professionals who can work with researchers from the conception of the research project to ensure that data is collected in a manner that provides for its long-term curation and for ease of discovery so that the private sector and others can discover data and gain access to them over many years.

It is important to note that research data is not simply a product of research; research data is also a foundation for further research and development by both researchers and entrepreneurs. The original creators of research data may have little idea of potential commercial value in their data which is why data protection and discoverability are critical. Equally the potential commercial value may only be realized some considerable number of years after the creation of the data.

Research Data Canada stands ready to assist Industry Canada should it wish to explore how a robust data management system in Canada could contribute to economic growth and to assist in outlining what would be required to operate such a system.

- ***How can Canada continue to develop, attract and retain the world's top research talent at our businesses, research institutions, colleges and polytechnics, and universities?***

In an opinion piece for the Globe and Mail on January 28th, 2014, in response to the Federal Government's stated intention of doubling the number of international students recruited to Canada, Gilles Patry, President of CFI said:

…there is no perception of a Canadian education advantage compared to others." In part, it is a question of marketing; what will we sell to these exceptional international students, as well as their parents, in the face of intense competition from other countries?
When it comes to high-quality graduate students especially, having a great product to sell is often more crucial than the sales pitch. Canada's number one product is, without a doubt, the world-class research environment we have to offer, with its outstanding professors and its exceptional research facilities where these highly driven, discerning and sophisticated minds will have the best chance of realizing their post-graduate ambitions.

Research Data Canada would entirely concur with Dr. Patry. World leading equipment such as microscopes, synchrotrons, and gene sequencers is critical, but also important is more foundational

infrastructure, such as high-speed networks, high-performance computation, and data management systems, in attracting and retaining the world's top research talent.

Canada has been a world leader in research networks for two decades. In the recent past Canada has developed significant capacity in computation. Canada continues to lack a comprehensive system for data management.

To be sure, articles in prestigious peer-reviewed journals remain the currency of academic life. But increasingly those journals are reviewing the data behind those articles and there is a growing world-wide movement to recognize citation of peer reviewed data along-side the citation of peer-reviewed articles as a substantive measure of academic impact. The best research talent will require access to the appropriate infrastructure including the services of data professionals in order to be recognized for their work. Absent access to such infrastructure, the best research talent will relocate to where such infrastructure is robust and easily accessed because reputation and career success is completely dependent on such access.

- ***How might Canada build upon its success as a world leader in discovery-driven research?***

Making the data from publicly funded discovery-driven research accessible to entrepreneurs and researchers is one key method of how Canada might build upon its success in discovery driven research. Data is the primary product of almost all discovery research. Making that product available as a resource for further discovery and to inform the development of new products and services by the private sector will extend the reach of Canada's success beyond the traditional environment of peer reviewed journals to world leading economic activity. Again the infrastructure for data management must be in place to make such access possible.

- ***Is the Government of Canada's suite of programs appropriately designed to best support research excellence?***

The Government of Canada has an excellent suite of programs that truly drive research excellence. The programs of the Tri-Councils, CFI, and Genome Canada have enabled Canadian research to achieve an international reputation quite out of proportion with Canada's relative size as a country. The programs most certainly should be sustained.

The drive for research excellence has, however, inhibited the development of foundation infrastructure for research. It is hard for proposals for generic computing or research data infrastructure to compete with proposals for breakthrough research in cancer. CFI has made several attempts to recognize the difference: in 2006 with the National Platforms Fund and in announcing a program for cyber-infrastructure for 2014. It is clear that foundational infrastructure – network, compute, and data management that must always be in place to support all manner of diverse research – cannot optimally be supported through a sporadic competition model. Foundational infrastructure must have regular, predictable funding to enable optimal planning, cost-effective deployment, and confidence on the part of the wider research community that such foundational infrastructure will be available. RDC urges the Government of Canada to sustain its current funding programs for research, but we also urge the Government to consider an alternate method of funding for the foundational infrastructure that must be in place if research excellence is to be sustained.

Research Data Canada would also like to call the Government of Canada's attention to the work of the Research Data Alliance (RDA). www.rd-alliance.org RDA has been formed to build research data infrastructure and interoperability at an international level. RDA is funded by the Research Data Alliance Colloquium – a network of international funding agencies including the Australian National Data Service, the European Union, and the NSF and NIST in the United States. Canada was invited to be a founding country prior to the formal launch of RDA, and it has a standing invitation to join. Canada should be actively engaged with international efforts to build research data infrastructure and data interoperability. The entire global community is grappling with many of the same issues. Canadians can learn from our peers and also be active contributors to the development of emerging standards and practices under the auspices of the Research Data Alliance (RDA). The Government of Canada should join in the work of the Research Data Alliance Colloquium (RDAC) to fully enable Canadians to build research data interoperability through engagement with RDA. This affiliation will kick start our domestic efforts to build infrastructure for data management with the benefit of experience from other jurisdictions.

Conclusion:

Research Data Canada is grateful for the opportunity to comment on the consultation paper and commits to full engagement in any on-going discussion. As noted earlier, RDC stands ready to assist the Government of Canada in defining and implementing a national infrastructure for data.

Appendix A: ORGANIZATIONS WITH STAFF ACTIVELY ENGAGED IN THE WORK OF RDC

1. Canada Foundation for Innovation
2. Canadian Association of Research Ethics Boards (CAREB)
3. Canadian Index of Well-Being
4. Canadian Polar Data Network
5. Canadian Research Knowledge Network (CRKN)
6. Canadian Space Agency
7. CANARIE
8. CARL
9. CASRAI
10. CIHR
11. Compute Canada
12. CUCCIO
13. Department of Energy (US)
14. Digital Curation Centre (UK)
15. Environment Canada
16. McGill University
17. National Research Council
18. National Snow and Ice Data Centre (US)
19. NSERC
20. Ocean Networks Canada
21. OCUL – Scholar's Portal
22. Ontario Institute for Cancer Research
23. Queen's University
24. St. Mary's University
25. SSHRC
26. Statistics Canada
27. Tesera Systems Inc.
28. Treasury Board Secretariat
29. University of Alberta
30. University of Manitoba
31. University of Prince Edward Island
32. University of Toronto
33. University of Victoria
34. University of Waterloo