



Canadian Digital Information Strategy

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FOREWORD

This document is the Consultation Version of the Canadian Digital Information Strategy.

We would welcome your comments on the Canadian Digital Information Strategy by **Nov 23, 2007**. Your feedback will be used to finalize the strategy.

To guide your response, we would ask you to consider the following questions:

1. Do you agree with the overall vision, scope and challenges outlined in the strategy?
2. Are the objectives and actions in Part II the right ones? Which do you view as the most important or pressing?
3. What do you consider to be the critical next steps to advance the strategy? What role can you or your community play?

We assume that submissions to this consultation are not made in confidence unless specified otherwise. We may reproduce and publish the submissions in whole or in part in any form and use, adapt or develop any proposals put forward without seeking permission or providing acknowledgement of the party making the proposal.

We hope that you will take time to read, consider, share and discuss with others, and comment on this strategy, and we thank you in advance for your input.

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EXECUTIVE SUMMARY

Digital information and networked technologies are key drivers of economic growth and social well-being in the 21st century. It is clear that the nations that nurture their digital information assets and infrastructure will prosper; those that do not will fall behind. Canada must act quickly and decisively. We must ensure that the needs of all Canadians—private citizens, scientists, creators, industry, students, workers—are met. We must also make certain that the fundamental values of our nation, such as bilingualism, multiculturalism, inclusiveness, and equity are reflected in the digital realm. This can only be accomplished with a coordinated strategic approach that involves all of those engaged in the creation, preservation and dissemination of digital information.

In 2005, Library and Archives Canada (LAC) initiated a dialogue reflecting the range of interests in the digital field, with the goal of framing a Canadian Digital Information Strategy (CDIS). Through a series of meetings, LAC consulted with over 200 stakeholder organizations from a variety of sectors: publishing and media producers, creators, rights bodies, academics, provincial and federal officials, and memory institutions. The consultations culminated in a National Summit at which broad consensus on the elements of a national strategy emerged, which in turn led to the development of this document by a committee whose members are named in Appendix III. The vision proposed is:

Canada's digital information assets are created, managed and preserved to ensure that a significant Canadian digital presence and record is available to present and future generations, and that Canada's position in a global digital information economy is enhanced.

The Strategy puts forward three broad opportunities for achieving this vision:

1. **Strengthening content** so that, over time, Canada's information assets and accumulated knowledge will be in digital form.
2. **Ensuring preservation** so that Canadians will have ongoing access to their country's digital knowledge and information assets, and future generations will have evidence of our intellectual and creative accomplishments.
3. **Maximizing access and use** so that Canadians will have optimal access to Canadian digital information important to their learning, businesses and work, leisure activities, and cultural identity; and Canadian content will be showcased to the world.

For each of these, there are a number of specific objectives, each of which has proposed actions. The objectives address the following:

Toward strengthening digital content:

- mass digitization on a national scale
- a conducive digital production environment
- improved digital production practices
- diversity in digital content production

Toward ensuring digital preservation:

- selection and capture of digital content for long-term retention
- distributed digital preservation repository network
- preservation-related research
- new workplace skills
- increased public awareness of digital preservation issues

Toward maximizing digital access:

- mechanisms for democratic, ubiquitous and equitable access
- seamless access and global visibility
- more open access to public sector information and data
- effective communication and management of copyright
- increased user research

The goals of the Strategy cannot be undertaken by any single organization; rather, an inclusive, coordinated and distributed approach involving stakeholders from all sectors of the information environment is required. The information community sees growing urgency in the need to deal with digital issues, and has expressed a new willingness to work collaboratively within a common framework so that Canada is ensured a leadership role in the global digital knowledge economy.

Digital information and networked technologies are key drivers of economic growth and social well-being in the 21st century.



PART I: INTRODUCTION AND BACKGROUND

Introduction

The types and sources of Canadian digital information are wide-ranging. Equally diverse are the users for whom such information has value. Industry, business, healthcare, government, the arts, education, scholarship, the justice system, individual Canadians in the course of their daily lives—every sector of society both produces and consumes digital information. Increasingly, in this era of MySpace, Flickr, YouTube, wikis, blogs, and Google Earth mash-ups, the lines between information creator and consumer are blurring.

On the production end, digital is ubiquitous. As of 2003, over 90% of information output was digital¹ and the volume of information is estimated to be increasing at a rate of 30% per year.² A recent Australian report noted that the “growth of digital information and the need to store, manage and preserve access is an issue of truly global proportions.”³

On the consumption end, Canadians are

online. We turn to the Internet as our resource of first choice for information, to obtain services and to access culture.⁴ Expectations are high: web generation users want the information they seek to be online, instantly available, and preferably free.⁵ And they want to interact with it, modify it, build personal collections, and adapt information resources to their own purposes. The challenge for users is to extract meaning from a world of information excess.

Roles have shifted, introducing new ambiguities and gaps in the chain of responsibilities.

In addition to information creators/producers and information consumers, there are those tasked with managing and keeping information available for users over time. In the past, this role has often been the responsibility of ‘memory institutions’ such

¹ Lyman, Peter and Hal R. Varian. *How much information? 2003* <http://www2.sims.berkeley.edu/research/projects/how-much-info-2003/>

² *Ibid.*

³ Collections Council of Australia. *Summit on Digital Collections: Working Papers*. August, 2006. <http://collectionscouncil.com.au/summit+2006+-+digital+collections.aspx>

⁴ *Canadian Internet Project (2004)* <http://www.cipic.ca/en/results.htm>; Media Awareness Network, *Young Canadians in a Wired World* <http://www.media-awareness.ca/english/research/YCWW/index.cfm>

⁵ See presentation by Mike D’Abramo, Youthography, at <http://www.collectionscanada.gc.ca/cdis/012033-601-e.html>

as libraries, archives, museums, and data centres. However, in the digital environment, the three roles are not as distinct: producers are consumers, consumers are producers, and information managers may be producers, consumers, or memory institutions. Roles have shifted, introducing

new ambiguities and gaps in the chain of responsibilities. To compound this situation, the standards, processes and technologies for managing digital information over time are still emerging and will continue to evolve, challenging our human, technical and financial resource capacities.

Why a strategy?

To date, Canada has lacked a ‘master plan’ to guide its scientific, cultural, and education communities, businesses, and civil society in the production, use, sharing and preservation of its vast and growing body of digital information. While Canadian organizations and individuals invest substantially in the creation of digital content, it has become apparent through the consultation process and background research that the management of digital information in Canada is fragmented and inadequate. Our investment in digital content creation is not accompanied by a coherent national strategy for its access and preservation.

As the roles of information creators and consumers blur, we need to recognize that the social aspects of the web are growing in prevalence. Digital content will be more and more in the form of conversations between people, using many different media types. Access to and preservation of these conversations will enable broad engagement and will provide a window on our current society in the years to come.

As a nation, we do not yet have the capacity to assure long-term access to our digital resources. Indeed, *all* digital information is at risk. Yet digital preservation is not a high profile issue, despite some recognition that the early decades of the digital era may prove to be the “digital dark age”⁶—the least

permanently documented period of recent history. To increase our capacity to preserve digital information, we need a framework to strengthen, coordinate and better communicate our collective efforts.



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In addition, we continue to overlook opportunities for collaborative innovation and new knowledge creation because digital access is not yet possible to many of Canada’s information assets.

Canadian organizations involved in the production, stewardship, coordination, and funding for digital content and infrastructure recognize the growing urgency here. The issues, and indeed many of the recommended actions in this Strategy, are not new; many of the same ideas are found

⁶ For example, see “Coming Soon: A Digital Dark Age?” CBS News, January 21, 2003. <http://www.cbsnews.com/stories/2003/01/21/tech/main537308.shtml>

in shelved reports from as far back as 1997.⁷ Yet, both the risks and opportunities are growing, and we must accelerate our activities to address the significant financial, organizational, technical and legal challenges of the digital information environment.

Our investment in digital creation is not accompanied by a coherent national strategy for its access and preservation.

Other nations are investing substantially in this area. In the United States, the Library of Congress administers a National Digital Information Infrastructure and Preservation Program (NDIIPP). The National Archives and Records Administration (NARA) is building a sophisticated electronic records infrastructure for United States Government records. There are national institutional archives of particular scientific datasets such as the NASA National Space Science Data Center, and federated collaborative archives such as the National Geospatial Digital Archive (NGDA). There are also a number of major public-private partnerships underway (including with Google, Yahoo! and Microsoft) to mass digitize the published collections of a number of major American and European research libraries.

In Europe, the European Union's *i2010* initiative aims at "re-invigorating the contribution of information and communication technologies (ICT) to economic growth", and includes programs to address digitization, to make resources accessible over networks, and to preserve and archive digital resources. Many countries—among them Germany, United Kingdom, Netherlands, the Scandinavian countries, Australia, New Zealand, and China—have articulated some form of strategy and are putting robust programs and organizational approaches in place.⁸

Digital information and networked technologies are recognized worldwide as key drivers of economic growth and social well-being in the 21st Century. Canada cannot afford to be left behind. A digital information strategy is crucial to a strong Canadian presence, participation, and ability to compete in a global information market.

Furthermore, we must ensure that the needs of all Canadians—citizens, scientists, students, creators, workers—are met. A Canadian digital information strategy is essential if we are to reflect in the digital realm the fundamental values of our nation, such as bilingualism, multiculturalism, inclusiveness, and equity.

Strategy development process

Library and Archives Canada (LAC) is mandated by the *Library and Archives of Canada Act*, enacted in 2004, to be "an enduring and accessible repository of

Canadian documentary heritage and Government of Canada information, and to facilitate cooperation among the communities involved in the acquisition,

⁷ For example, see *Towards a Learning Nation: The Digital Contribution. Recommendations Proposed by the Federal Task Force on Digitization*, December 1997. <http://www.collectionscanada.gc.ca/8/3/r3-407-e.html>

⁸ See Appendices 1 and 2.

Situation in Canada," Library and Archives Canada, <http://www.collectionscanada.gc.ca/cdis/012033-700-e.html>

preservation and diffusion of knowledge.” In October 2005, LAC recognized that the most common and pressing challenge amongst stakeholders in the information sector is our collective transition to digital. To this end, LAC commissioned two reports: “*Toward a Canadian Digital Information Strategy: Mapping the Current Situation in Canada*”⁹ and an international scan entitled “*Toward a Canadian Digital Information Strategy: A Review of Relevant International Initiatives*.”¹⁰

LAC then joined with more than 50 groups in an initial exploration of Canada’s digital information issues. At this meeting, stakeholders urged LAC to take the lead in organizing a more inclusive and sustained dialogue reflecting the range of interests in the digital field, with the goal to frame a Canadian Digital Information Strategy (CDIS).¹¹

Further consultation was undertaken through a series of four thematic meetings in early 2006, held in four cities across Canada. The CDIS consultations looked at: (1) digitization on a national scale, (2)

optimization of born digital production, (3) building a preservation infrastructure, and (4) fostering access and use within a rights framework.¹² A ‘study day’ to look at research and education needs drew participants from information studies faculties from across the country. Over 200 stakeholder organizations joined the discussion, with participation from publishing and media producers, creators, rights bodies, academics, provincial and federal officials, and memory institutions.

The consultations culminated in a National Summit¹³ held in December 2006 in Montebello, Québec. At this meeting, a broad consensus on the elements of this national Strategy emerged. This Strategy document was then developed by a national committee, whose members are named in Appendix III.

What is ‘digital information’?

Digital information is created everywhere, stored everywhere, and consumed everywhere. Almost all Canadians now create digital content of one type or another as part of their daily lives, and there are as many types of digital information as there are reasons for creating it.

Most traditional media types are now available in digital formats, such as books, journals, and newspapers; government publications, documents and records; audio recordings; manuscripts, archival collections and their finding aids; genealogy resources; film, video, and broadcast content; photographs; maps and atlases; statutes,

⁹ McDonald, John and Kathleen Shearer, “Toward a Canadian Digital Information Strategy: Mapping the Current

¹⁰ John McDonald. “Toward a Canadian Digital Information Strategy: A Review of Relevant International Initiatives,” Library and Archives Canada, <http://www.collectionscanada.gc.ca/cdis/012033-800-e.html>

¹¹ Toward a Canadian Digital Information Strategy: Initial Exploratory Meeting, October 17-18, 2005, <http://www.collectionscanada.gc.ca/cdis/012033-602-e.html>

¹² Toward a Canadian Digital Information Strategy: Thematic Meetings, <http://www.collectionscanada.gc.ca/cdis/012033-600-e.html>

¹³ Toward a Canadian Digital Information Strategy: National Summit., <http://www.collectionscanada.gc.ca/cdis/012033-601-e.html>

regulations and case law; theses and dissertations; reference works; educational resources and learning objects; museum/gallery exhibitions and works of art. In the sciences, information and data appear in the form of tables of data,¹⁴ maps, charts, remotely-sensed imagery, simulations, algorithms, models and software. Most of these forms of content have been significantly transformed, and continue to evolve, in the shift to digital.

To this diverse body of digital information is added a range of new forms of online-only content such as email, websites, web databases, blogs, wikis, webmaps, multiplayer online games, data portals, and user-created web profiles, photographs, and videos. Often this material is more ephemeral, more participative, more fluid, and inherently web-based.

Digital information is created everywhere, stored everywhere, and consumed everywhere.

The Canadian Digital Information Strategy defines digital information very broadly. Like the New Zealand Digital Content Strategy, the Strategy Development Committee (see Appendix III) has considered digital information to include all “digital material that is created, used, shared, accessed and preserved in a digital format.”¹⁵ Information can be conceptualized as existing along a value chain with raw data at one end and packaged content, such as videos or scholarly articles in peer-reviewed journals, at the other end. In this Strategy, the term ‘digital information’ includes all forms of digital material that fall along this value chain.



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¹⁴ Scientific data are “numerical quantities or other factual attributes generated by scientists and derived during the research process (through observations, experiments, calculations, and analysis).” Distinctions are made between raw data and derived, refined, synthesized, or processed data. (CODATA Task Force on Archiving Scientific Data. <http://www.nrf.ac.za/codata/>)

¹⁵ “Creating Digital New Zealand: The Draft New Zealand Digital Content Strategy”: Discussion Document. November 2006, p.8.

The scope of the Strategy

There are many ways of categorizing content and, as distinctions blur, none is wholly satisfactory. Nevertheless, the work to develop the scope of this Strategy identified four reasonably indicative, although sometimes overlapping, sources of digital information:

1. Public domain and civil society
2. Academic and research community
3. Government and public sector
4. Business and corporate world

Source	Typical motivations	Target audiences	Key characteristics
Public domain and civil society	<ul style="list-style-type: none"> ▪ Personal and local needs and wants ▪ Creativity ▪ Reputation ▪ Profit 	<ul style="list-style-type: none"> ▪ Family and community ▪ Public ▪ Education sector 	<ul style="list-style-type: none"> ▪ Formal and informal ▪ Commercial and open ▪ Cultural significance is key
Academic and research Community	<ul style="list-style-type: none"> ▪ Education ▪ Research ▪ Discovery ▪ Knowledge and technology transfer 	<ul style="list-style-type: none"> ▪ Peers and academia ▪ Industry ▪ Public 	<ul style="list-style-type: none"> ▪ Raw data to formal content ▪ Trend toward rapid dissemination of research outputs and open access ▪ Trend toward integrating content across all stages of knowledge creation and use ▪ Scientific relevance and access to both recent and longitudinal data are key
Government and public sector	<ul style="list-style-type: none"> ▪ Policy mandates ▪ Services to citizens ▪ Accountability ▪ Communication 	<ul style="list-style-type: none"> ▪ Public service and legislators ▪ Citizenry ▪ Industry 	<ul style="list-style-type: none"> ▪ Published content, raw data, corporate records ▪ Authority and validity are key
Business and corporate world	<ul style="list-style-type: none"> ▪ Efficiency ▪ Profit ▪ Market share ▪ Communication ▪ Accountability 	<ul style="list-style-type: none"> ▪ Owners and insiders ▪ Suppliers, partners and consumers 	<ul style="list-style-type: none"> ▪ Private (corporate records) ▪ Transaction orientation ▪ Commercial value is key

Although digital information is defined very broadly, the scope of the Strategy does not include all categories of digital information. The Strategy targets information and discourse of cultural, scientific, and unique value for Canada and Canadians, with the focus being on the first three sources cited in the table above, as well as commercial content industries.

In general, aside from public reporting such as annual reports and financial statements and the small percentage of records that have enduring archival value, corporate administrative records and transactional data do not enter the information flow in our society. Thus, corporate business records do not fall within the scope of the Strategy, nor does private consumer information such as data related to telephony, banking or commercial transactions. As well, personal records and

non-aggregated data including those gathered by governments, such as tax, health, and employment records are examples of information that would fall outside the scope of this Strategy.¹⁶

¹⁶ Digital initiatives in such areas are in play. For example, Canada Health Infoway is an independent not-for-profit corporation whose members are Canada's 14 federal, provincial and territorial Deputy Ministers of Health. With a federal investment of \$1.6B to date, its goal is to have interoperable Electronic Health Records in place for 50% of Canadians by 2009.



PART II: THE PROPOSED STRATEGY

A framework for action

Vision

Canada's digital information assets are created, managed and preserved to ensure that a significant Canadian digital presence and record is available to present and future generations, and that Canada's position in a global digital information economy is enhanced.

Key assumptions

Several key assumptions have guided and informed the discussions that led to articulation of this Strategy:

- **The time is now** – All digital information is at risk and there is significant urgency to implement the Strategy in a timely manner. If we delay, many of the digital assets currently being created will surely be lost, as will economic opportunities arising from improved information asset management.
- **Change is constant** – Digital technologies will continue to change rapidly, requiring a Strategy that can evolve, together with a sustained effort to act upon it.
- **Stakeholders are supportive and engaged** – Overcoming digital information challenges requires collaborative effort and investment within and across jurisdictions and sectors. There is support for an inclusive and distributed strategy to achieve the vision—one that is respectful of jurisdictions, that builds on existing capabilities and ongoing initiatives, and that supports smart partnerships and synergies.
- **Interoperability and open access strategies are key** – The management and flow of information is advanced by widespread adherence to open international standards that foster interoperability, by adoption and sharing of emerging best practices, and by reducing barriers to access.
- **Information access and use supports Canada's societal goals** – In society, equitable information access fosters equal opportunity for learning, creative and commercial enterprise.

- **Information access and use supports Canada’s economic goals** – An information-rich society is vital to Canada’s competitiveness in knowledge-based industries and to the country’s economic growth.
- **Investments must be strategic, leveraged and rewarded** – There are costly dimensions to the challenges of digital information. The Strategy aims to inform and encourage strategic investment by Canadian governments and the private sector.
- **The model must be distributed** – The Strategy advances a networked model, building on strengths and building strength, across the country.
- **Canada can be a world leader** – We have the leadership and collaborative capacity to coalesce our resources, our technological capabilities and our efforts in order to achieve the vision.

Three challenges we see

The Canadian Digital Information Strategy addresses itself to three significant challenges and frames them as opportunities for our future as a highly developed information society:

1. To strengthen content
2. To ensure preservation
3. To maximize access and use.

Three outcomes we seek

Three long-term outcomes are expected from the actions proposed in this Strategy:

1. Canada’s information assets and accumulated knowledge are in digital form.
2. Canadians have ongoing access to their country’s digital knowledge and information assets, and future generations will have evidence of contemporary intellectual, scientific and creative accomplishments.
3. Canadians have optimal access to Canadian digital information important to their learning, business and work, leisure activities, and cultural identity.

Challenge 1 – Strengthening content

Long-term outcome: Canada’s information assets and accumulated knowledge are in digital form.

While there are few national borders in the digital world, a strong digital presence is vital to Canada's economic growth and its participation, contribution, and ability to compete in the global knowledge-based economy. The Internet is now a leading resource for learning, research, business, services, and recreational activities. Canadian content should be visible there, reflecting and contributing our expertise and creativity to an increasingly online world. To position our content globally, and better exploit it domestically, we must address issues and gaps in digital conversion, digital

production, and digital information management.

The Strategy envisions a rich and coherent body of Canadian digital content that reflects the Canadian experience and meets the needs of an increasingly online body of Canadian users. Strengthening Canadian digital content will require a conscious and collaborative effort from all sectors to convert analogue content held in repositories across the country, together with a similar effort to strengthen the creation of enduring high-quality ‘born digital’ information.

Goals

- To realize the systematic development and management of a vast body of high-quality Canadian cultural, scientific and government digital information for dissemination, access and use.
- To promote the development of strong digital content industries in Canada.

1. Strengthening content - Objectives

1.1. Digitize Canada's textual, image, audio and audio-visual heritage on a mass national scale.

Digitization converts content that exists in print or analogue form to digital formats, and usually results in the content being made available online. This broadens its accessibility and responds to a new reality: if information is not online, it is not visible; and, to a growing portion of the population, particularly the 'Net generation', that means it simply does not exist.

Our approach has been project-based, and many of the resulting resources fall short on completeness, public profile, and end-user focus.

In Canada, we already have several key ingredients for a successful digitization effort: keen and committed institutions at all levels; some government support; and considerable production experience, some of it collaborative. But other key ingredients are missing. We have arrived at our current state of digitization in an ad hoc fashion with short-term funding that is often focused on selective interpretive content. We have done so without the benefit of minimal standards to ensure product reliability, interoperability and longevity; and without tools, best practices, and

guidance to ensure efficiency and effectiveness. Our approach has been project-based, and many of the resulting resources fall short on completeness, public profile, and end-user focus. After about ten years of effort, Canadian pre-digital content has only been converted in a patchwork of online exhibitions and partial collections, and the latter are often in databases that lack interoperability. Canada does not have a comprehensive national collection of any particular type of digitized material, nor is there overall coherence in the corpus of all Canadian material that has been digitized so far.

Although there has been significant private sector investment in the conversion of legal, news, and business information, when compared to many other countries, our public and private investment in digitization appears to be lagging.¹⁷ As a result, the sum of digital



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¹⁷ For example, the UK government allocated 30M Euros (\$43.1M CDN) to digitization in 2006 (\$.71 per person). This figure does not include additional investment from Google and Microsoft in digitization of Oxford University and British Library collections. While the Canadian government expended \$26.8 (\$.80 per person) on Canadian Content Online programs that include some content digitization, the Canadian programs do not focus on digitization but on "online engagement of Canadians with collections". The Canadian expenditure on conversion specifically is actually significantly lower than that figure, and thus lower than in the UK.

resources that we make accessible to our own citizens and to the world is comparatively weak.

Digitization is usually undertaken with the goal to make information more accessible, but sometimes it can also serve a preservation purpose. In the case of some analogue material, such as nitrate film, conversion should be undertaken before the film has deteriorated beyond salvage. Older audio and video recordings, some of which carry unique content such as folklore or oral histories, are becoming inaccessible because of format obsolescence or material degradation.

The ability to preserve digitized content ties in closely to the adoption of sound digitization practices that will allow the resulting digital works to remain accessible over time. Digital preservation requires a commitment to high-quality processes during digitization (e.g. standard formats, stable URLs) and to sustaining the digitized resource indefinitely in a trusted repository. Funders such as Canadian Culture Online (CCO) require that access to digitized resources be maintained for a minimum of five years. But, there has been little consideration of what will, or should, happen to the resources in the long-term.

The CDIS consultations suggested that Canada's national approach should be built upon provincial strategies, which in turn would take into account regional and local needs and priorities. This approach can be coupled with collaborative approaches across government jurisdictions and across private-public sectors. There was consensus among participants that we

must dramatically ramp up the scale and scope of our digital conversion. It was also made clear that, in order that digitization not be limited to pre-20th Century material, there must be cooperation between digitizers and rights holders, and that Canada should develop a licencing regime that will favour digitization of 'orphan works' (published works for which rights holders cannot be identified or located).

A collaborative national vision must lead to an increased—and increasingly coordinated—effort. That effort must be strategically funded from both private and public sources, and underpinned by common standards and sound guidance based on best practices. While standards tend to be more complex and costly to apply than projects (and their funders) anticipate, the good news is that among digitization projects worldwide, there is increasing consensus and consolidation on the use of certain file formats, metadata standards, and interoperability protocols. Many high quality guidance documents have been generated that could be adapted and adopted for Canada.

*Highlighting progress: **AlouetteCanada** (<http://www.alouettecanada.ca/>) is an open collaboration initiated in 2006 by Canadian research libraries and their partners to encourage open digitization, develop tools to enable Canadian cultural and heritage organizations to provide more standardized access to their digitized content, and provide a central portal that will harvest the metadata of dispersed collections, thereby enhancing their accessibility. **The Canada Project**, recently conceived by Open Text Corporation, Library and Archives Canada, and University of Waterloo, is a private-public-academic partnership which, in collaboration with AlouetteCanada and others, aims to realize full-scale digital conversion of Canada's published heritage.*

Digitization has matured. More than ten years' worth of international research, investment and practice has been accrued to address its challenges. Costs have come down; technologies have evolved; best practices have emerged; economies of scale have become evident; and international models exist. This maturation makes it an opportune

time for Canada to define an ambitious program of digitization as other countries and groups of countries are in the process of doing. Experience has proven that our analogue content has rich value within the Canadian and global networked information environment, and we must act decisively and collectively to make it available.

Actions

- 1.1.1. Undertake a five to ten year national digitization project to convert Canada's cultural, scientific and government heritage according to an ambitious set of conversion targets and appropriate national standards.
- 1.1.2. Advance the development and implementation of comprehensive provincial digitization strategies as part of the national project.
- 1.1.3. Develop national collaborative approaches for digitization that support free and open access to digitized content that derives from the Canadian public domain.
- 1.1.4. Obtain a new digital copyright regime that will enable digitization of orphan works by not-for-profit institutions without a motive of gain.
- 1.1.5. Promote and develop private-public partnerships to maximize digitization efforts.

1.2. Provide a conducive environment for the growth of Canadian digital content production.

Formal content producers, such as publishers and record companies, began the transition to digital production practices over 30 years ago, and it would be unusual to find a publisher today that is not using digital production practices. The commercial sector has moved rapidly to add online finding tools, digital delivery options, and to address pricing and format expectations of online consumers. Producers are finding new business models: providing free online excerpts or complete PDFs as a way of increasing hardcopy sales; licensing online collections at bundled pricing; and marketing microcontent (individual articles or songs) in addition

Highlighting progress: [Lulu.com](http://lulu.com) is an example of self-publishing Web commerce founded by Canadian Robert Young (Red Hat) that provides Internet applications that enable publishing and repackaging of many types of digital content, including documents, music and audio files, and digital images. Anyone can use lulu.com to publish and market their content over the Internet.

to more packaged content (journal subscriptions or CD albums) under a range of online payment options. A few creators directly offer users a choice to download for free or to purchase, sometimes with variable pricing schemes (e.g. [Sheeba www.sheeba.ca/store](http://www.sheeba.ca/store)). In the academic publishing world, the 'author-pays'

model¹⁸ enables free access for users while allowing the producer to retain a revenue stream.

Despite progress by some, the transition to disseminating digital products is posing a significant challenge for others. In the digital environment it is easy for users to share content; and the demand for open and no-cost content along with free services is part of the Internet culture. Anyone can now publish directly to the Internet, and new approaches to marketing self-publications have even recently emerged.

The Strategy aims to create an environment in which both small and large, traditional and new media producers thrive.

At the CDIS consultations, participants from traditional publishing sectors expressed concerns about protecting revenues and ensuring that creators' rights would not be compromised in an online distribution environment. Businesses need sustainable ways of generating revenue and many creators seek to earn a livelihood from the content they create. Furthermore, many Canadian publishers will need assistance to transition their services. A

study commissioned by the Association of Canadian Publishers concludes that “without additional resources, most [Canadian book publishers] will find it difficult to ramp up their skills and their corporate capacity to adapt to a rapidly changing environment and new ways of doing business.”¹⁹

Commercial entities also expressed interest in increasing their use of open standards and technologies for production as a way of controlling high systems costs and potentially achieving greater visibility for their products in the networked information environment. Academic presses and other small publishers clearly see the merit in cooperative development of tools and infrastructure to support online publishing, such as those being developed by the Synergies Project.

The Strategy aims to create an environment in which both small and large, traditional and new media producers thrive.

*Highlighting progress: The **Synergies Project** is building a national platform with a wide range of tools to support the creation, distribution, access and archiving of digital journal articles in the Social Sciences and Humanities in Canada. A five-university consortium, Synergies will provide a fully accessible, searchable, decentralized and inclusive national database of structured primary and secondary social sciences and humanities texts.*

¹⁸ 'Author-pays' is a business model in which “publication is paid for by the author, the author's institution, or the research programme.” It is one model being used for open access journals, as it is an alternative to the 'subscriber-pays' or 'user-pays' model in which journal production costs are supported by institutional and reader subscriptions. (Wellcome Trust. Costs and business models in scientific research publishing, 2004).

¹⁹ The Impact of Digitization on the Book Industry: <http://www.omdc.on.ca/AssetFactory.aspx?did=5897>

Actions

- 1.2.1. Encourage the development of digital production and delivery, and the exploration of new business models, among industries engaged in content production.
- 1.2.2. Encourage communities of practice to develop standards-based and interoperable production practices, processes, infrastructure and tools for digital content production.

1.3. Improve digital content production practices in order to serve national objectives in terms of management, long-term preservation, access and use, and rights protection.

Unlike the analogue environment, the digital information lifecycle stages of creation, use, and preservation are highly inter-dependent. Critical information about a digital resource, such as its format, the context in which it is created, and its copyright and use information are ideally identified at the time of creation so that the resource can be managed, used, and preserved appropriately in the future.

Managing the stages of the digital information lifecycle is possible through a variety of increasingly widely accepted standards and best practices. Unfortunately, in the Canadian context, we are yet to see the comprehensive application of digital information lifecycle management. For example, digital resources are often created without long-term permanence in mind.²⁰ Creators and publishers do not always

take the measures required to ensure the long-term historical value of their digital works. Furthermore, because of their failure to adopt standards and best practices, creators may inadvertently produce digital works that will not be adaptable to rapid technological change and will therefore not endure.

The Strategy seeks to improve the capacity of Canadian content creators to produce high-quality, sustainable digital material. There are significant risks associated with using proprietary standards and technologies, which are very vulnerable to obsolescence; therefore, the adoption of open standards should be encouraged. The use of persistent identifiers, which point users to the authoritative and permanent version of the resource, should also be encouraged. As well, sound practice would be to assign preservation, descriptive and rights metadata at the time of creation. The broad implementation of these types of practices will enable the greatest possible usability, longevity, and portability of Canadian digital content.

Of particular concern is research data, a resource of growing importance for

Highlighting progress: The **Canadian Culture Online** program requires the digital creation projects it funds to comply with its Technical Standards and Guidelines, which are based on widely-accepted standards developed by such organizations as the World Wide Web Consortium (W3C) and the International Organization for Standardization (ISO).

²⁰ (McDonald, John and Kathleen Shearer, 2006)

Canada's knowledge economy. Participants at the CDIS consultations echoed many of the issues outlined in the 2005 report of the National

Highlighting progress: In the Government of Canada, an ADM-level Recordkeeping Task Force has been convened to modernize the management of records and information, and address five key recordkeeping challenges: the need for a recordkeeping regulatory regime; building recordkeeping capacity; enabling e-record and publication sustainability; legacy record solutions; and monitoring recordkeeping. Within the framework of a Recordkeeping Regulatory Regime, best practice tools, directives and documentation standards will complement a comprehensive strategy for sustainable e-recordkeeping, and leverage an environment for digital publication licensing and management.

Consultation on Access to Scientific Research Data (NCASRD Final Report, 2005). Research data must be created using open standards so that they are available, understood and reusable in the future.

Government information and data are valuable national resources that must be created and managed appropriately. Government published and unpublished information (publications and records) are central to an effective and accountable Canadian public administration. Digital records are vital to efficient decision making; to enable the Government of Canada's public service to act in a transparent manner; and to ensure that evidence of the Government's actions are preserved for the benefit and knowledge of current and future generations.

In the digital era, where government employees have the power to create and destroy information at their desktops, the appropriate creation, management and preservation of records is not guaranteed. The fragility of digital information; the absence of technological frameworks to organize and retrieve digital information at levels that meet acceptable recordkeeping, legal, and public accessibility requirements; and the uneven application of metadata, records capture systems, and directives on the creation of records—all of these factors challenge the realization of modern, efficient and competitive government at federal, provincial and municipal levels.

In all sectors, creators need access to tools that will assist them in adopting technologies, standards and practices that will facilitate information management and permanence. Some tools already exist, but these are generally domain specific. There is a need to increase the sharing of best practices within and among communities. Canadian funding agencies that invest in the creation of digital resources are well positioned to influence the adoption of technologies, standards and practices to facilitate sound information management and long-term preservation over the lifecycle of the resource. Similarly, individual organizations can develop internal policies and insist on adoption by their constituents.

Actions

- 1.3.1. Foster the adoption of recognized, open standards, and the development and sharing of best practice guidance and of standards-based tools, within communities of content creators.
- 1.3.2. Build requirements for sound practices into Canadian funding programs that support the production of new digital content. Such practices include: digital information and data management plans; data quality control plans; standards-based metadata; timely online publication of research outcomes; and deposit of data and research outcomes with appropriate repositories.
- 1.3.3. Foster approaches across academic research environments to reward researchers for sound practices (see 1.3.2).
- 1.3.4. Provide instruction in academic programs in digital information and data lifecycle management, including preservation, metadata, ethics, copyright and licensing, privacy and security.
- 1.3.5. Ensure effective implementation of a system for persistent identification of digital resources.
- 1.3.6. Encourage digital content production practices that facilitate conversion to alternative formats when required (see 3.1.4).
- 1.3.7. Develop technical capacity among digital content producers for automated transmission to Trusted Digital Repositories (see 2.2).
- 1.3.8. Develop and implement comprehensive e-records strategies that address policy, regulatory instruments, standards, and systems for government information production and management.

1.4. Encourage diversity in digital content production.

Canada's population has a unique cultural, ethnic and linguistic makeup. Diversity is a fundamental characteristic of Canada and this should be reflected in our nation's digital presence. The Strategy seeks to support Canada's public policy objectives of bilingualism, multiculturalism, inclusiveness of persons with disabilities and respect for Aboriginal peoples' knowledge and heritage.

There are some initiatives underway that support this objective. For example, Multicultural Canada showcases the achievements of Canada's diverse communities, and the Cree Culture Website is a growing site dedicated to Cree culture available in Cree, English and French. Our Voices is a website that provides access to audio material on the history and culture of the First Nations people of Canada, and the Chinese-Canadian Genealogy website provides resources for people who would like to explore Chinese-Canadian history and genealogy. Project Naming is a collaboration between Library and Archives Canada and Inuit youth and elders to identify Inuit portrayed in LAC photographic collections, and the Kitikmeot Place Name Atlas records traditional Inuktitut and Inuinnaqtun place names of the region, including their pronunciation, meanings and associated oral traditions, and placing them on the map. With such projects, Canada strengthens the digital voice of its cultural communities to reflect our geographic, linguistic and cultural diversity. But much more is possible.

Participants in the CDIS consultations stressed the need to foster bilingual content, French-language content, and content in Aboriginal languages on a much more massive scale. In particular, special attention is needed to build digital production capacity among Aboriginal peoples, which in turn will encourage their participation in the knowledge economy and their engagement in preserving and promoting their cultures, languages and identities. For French-language content, the work of the Bibliothèque et Archives nationales du Québec (BAnQ) to strengthen the digitization network in Québec and to contribute to the development of a network of national French-language digital libraries²¹ advances this objective.

Also, as an inclusive society we must facilitate the production of digital content into alternative formats, so that persons with print disabilities can access it. We need to foster adherence to accessibility standards in publishing production in order to increase the percentage of materials available to those who cannot read conventional print. The Initiative for Equitable Library Access will coordinate activities designed to develop and cost the implementation of a nation-wide strategy to provide equitable library service to Canadians with print disabilities. Activities include the development of a trusted clearinghouse of publishers' electronic files to support the production of alternative formats.

²¹ See Le réseau francophone des bibliothèques nationales numériques
<http://communiqués.gouv.qc.ca/gouvqc/communiqués/GPQF/Mars2006/23/c5276.html>

Actions

- 1.4.1. Target support for digital content production by, and for, diverse communities including Aboriginal, linguistic, cultural, and print disabled communities.
- 1.4.2. Investigate and implement international standards, best practices and technological solutions that will enable digital content creation, preservation, access and use by diverse communities.
- 1.4.3. Provide tools and services, including technology solutions where necessary, that enable communities to create, preserve, access and use their own digital content.

Challenge 2 – Ensuring preservation

Long-term outcome: Canadians have ongoing access to their country’s digital knowledge and information assets, and future generations will have evidence of contemporary intellectual, scientific and creative accomplishments.

Canada has been generating digital information for decades and the volume and value of this content is incalculable. However, the production of digital information is not matched by coherent strategies for its preservation.

The fragility of digital content is caused by a variety of factors, including technology dependence, rapid technology and format obsolescence, material degradation, and inadequate technical processes and standards. Indeed, the technical approaches to ensuring the viability of digital information over time remain fluid, costly, and are often more research-based than production-ready. Yet, the challenges are not exclusively or even primarily technical; many are organizational. Preservation of digital information requires the development of appropriate policy, the implementation of sound practices, access to human and financial resources, and an active commitment of government and organizations over the long-term.

Technically and organizationally, digital preservation requires vigilance, foresight and capacity. Given these complex factors, many feel that much of the digital information being created today will be lost forever.

The challenges of managing this growing body of digital information are immense and require a collaborative effort. We have yet to establish the physical and organizational infrastructure needed to support comprehensive digital preservation strategies in Canada. We need to assign accountability; to foster widespread adoption of standards, policies, practices, procedures, and technologies that enable the implementation of strategies; to build institutional capacity; and to ensure there are trained people in place to accomplish the task.

We need to act quickly and decisively if we are going to succeed in preserving access to our nation’s digital output.

Technically and organizationally, digital preservation requires vigilance, foresight and capacity.

Goal

- To develop a robust national capacity to preserve digital content of enduring cultural and scientific value to Canada and Canadians.

2. Ensuring preservation - Objectives

2.1 Conduct a national appraisal of digital information priorities for long-term retention and preservation, and accelerate capture accordingly.

The goal of digital preservation is to ensure ongoing access to digital objects. But it is simply impossible to preserve everything. The *Expanding Digital Universe*, a forecast of worldwide information growth through 2010, reports that “in 2007 the amount of information created will surpass, for the first time, the storage capacity available” and the gap between production and storage space will continue to grow.²² We are confronted with the need to choose what will be preserved and what will not. This cannot be done without a reasoned framework of selective capture and curation.²³

In Canada, we currently collect and preserve only a small fraction of the digital content that is produced. No specific digital content type is being preserved in a comprehensive way.²⁴

Some measures have been taken. Since 1997, Library and Archives Canada has been collecting digital documents in a selective manner with particular focus on federal government publications. As of January 1, 2007, the *Library and Archives Canada Act (2004)* was extended to include the legal deposit of electronic publications and maps, and this will be applied in a phased approach. Sections 12 and 13 govern the efficient disposition, transfer and preservation of government and ministerial records of archival or

historical value. However, the e-recordkeeping practices in departments and agencies are uneven (records creation, capture, and preservation practices are not implemented consistently), so the acquisition of the digital record of evidence of the Government of Canada’s activities remains incomplete.

Of the provinces that also have legal deposit (Québec, Manitoba and Newfoundland and Labrador), only Québec is now including electronic publications, starting with its government e-publications. Provincial and territorial legislation governs the collection and disposition of their governments’ records, but electronic record-keeping is uneven.

Highlighting progress: LAC is developing a **Government of Canada Web Archive**. It has twice harvested the Government of Canada (.gc) domain. This archive is currently available to onsite users in LAC reading rooms. LAC has also conducted a test crawl of provincial governments’ domains and hopes to collaborate with provinces on this. It is considering conducting a first crawl of the entire Canadian Web (.ca and Canadian .com and .org), as many other countries have done with their respective Web domains.

Some large collections of digital information exist in Government of Canada databases, such as those maintained by Statistics Canada, Fisheries and Oceans Canada, Natural

²² IDC The Expanding Digital Universe: An IDC White Paper. March 2007.

http://www.emc.com/about/destination/digital_universe/pdf/Expanding_Digital_Universe_IDC_WhitePaper_022507.pdf

²³ According to the UK Digital Curation Centre, “digital curation”, broadly interpreted, is about maintaining and adding value to a trusted body of digital information for current and future use. <http://www.dcc.ac.uk/about/what/>

²⁴ (McDonald, John and Kathleen Shearer, 2006)

Resources Canada, and Environment Canada. Some reports and plans have been prepared pertaining to the long-term preservation of these valuable data sets²⁵ but these are not universal, nor fully implemented.

In Québec, the Érudit Consortium maintains a central repository that is designed to house a variety of digital content types such as articles, books, working papers, etc. Other Canadian academic libraries have set up repositories to collect the research output generated at their institutions. Other libraries (public and private sector) also collect digital material, but not in any formal, consistent or comprehensive way. All of these efforts remain nascent—uneven in scope, institutional support, and uptake by faculty and users.

The Strategy seeks to develop a national formalized framework for digital capture and preservation. At the CDIS consultations, stakeholders felt there was a need to clarify preservation roles amongst various stakeholder agencies. Some of the key types of content for which responsibility must be strengthened include: public sector



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content, university-generated content, community and business content, user-created content, raw scientific data, and digital broadcast content. Some noted that existing gaps in the capture and preservation of digital government information are unacceptable given the public investment in its creation and its enduring value.

The challenge of digital preservation is well beyond the capacity of any single organization. Canada needs an organizational accountability framework with governance mechanisms and a well-articulated, rational selection criteria model.

²⁵ GeoConnections is the Government of Canada agency mandated to deliver the Canadian Geospatial Data Infrastructure (CGDI). GeoConnections conducted a study on Archiving, Management and Preservation of Geospatial Data (2005) which provided analysis of the issues and a list of technological preservation solutions and proposed institutional and national actions. Phase II fo the GeoConnections Program includes archiving as an information management strategy.

Actions

- 2.1.1 Define and establish, on a national basis, roles and responsibilities for digital information capture and long-term preservation by broad category/type of information.
- 2.1.2 Study the need for redundancy and/or dark archives, and to what type of information this need applies.
- 2.1.3 Implement legal deposit at national and, if applicable, provincial levels for specific types of published digital content.
- 2.1.4 Implement a national approach to web archiving.
- 2.1.5 Determine roles and develop approaches to selectively capture and preserve: informal content such as blogs, podcasts, online music, and user-created videos and photography; scientific and research data; and digital broadcast content.

2.2 Develop a distributed network of Trusted Digital Repositories (TDRs) with responsibility to capture, manage, preserve and provide access to Canada's digital information assets, covering:

- **cultural heritage content of all types**
- **scientific data and research**
- **government information.**

A fundamental component of the digital preservation infrastructure is the 'Trusted Digital Repository' (TDR).²⁶ The concept of the TDR was introduced in a report issued by the Research Libraries Group and OCLC in 2002 and is defined as a repository "whose mission is to provide reliable, long-term access to

managed digital resources to its designated community, now and in the future." A TDR is much more than a software platform; it provides a policy, process, standards, and technology framework for digital preservation. Such repositories take on the vital role of constant technical vigilance and conduct the necessary interventions, such as format migration when format obsolescence occurs, to ensure that content is not lost.

*Highlighting progress: **Canada's Scientific Infostructure (Csi)** is a national program that aims will provide universal, seamless and permanent access to scientific content for Canadians. Spearheaded by CISTI, the program will be accomplished through strategic partnerships with the information community. So far, CISTI is maintaining a repository of over 7 million journal articles in science, technology and medicine and there are plans to add other publication types, digital objects and links to scientific data.*

²⁶ Research Libraries Group. (2002). *Trusted digital repositories: Attributes and responsibilities*. An RLG-OCLC Report. Available at: <<http://www.rlg.org/longterm/repositories.pdf>>. For more details on TDRs, you may wish to read this report.

In Canada, digital preservation services that currently exist “do not provide the full range of management activities required to ensure the long-term preservation of digital objects.”²⁷

Repositories exist across the country in many different domains. Library and Archives Canada, the Canada Institute for Scientific and Technical Information, the Érudit Consortium, many of the larger academic libraries, and other organizations all have repositories in place to collect and preserve Canada’s digital content. But few, if any, of these repositories have achieved the status of a Trusted Digital Repository.

Furthermore, existing repositories tend to be limited to text-based material; few ingest digital scientific or research data.

At the CDIS consultations, consensus emerged on the need to establish a network of preservation repositories in Canada. A highly collaborative effort amongst stakeholders will be needed to

map out the desired model; to determine the number, structure, and participating institutions; and to identify roles and responsibilities. The network should be interoperable and distributed, and involve a wide range of institutions that are capable of ingesting, managing, preserving, and providing access to a prescribed set of content.

It is unrealistic to expect that Canada’s existing repositories will be able to fulfill all of the requirements of a TDR immediately. Thus, the aim is to build toward the capacity of a Trusted Digital Repository at a number of key individual repositories.

Actions

- 2.2.1 Explore and recommend network models appropriate for each sector (cultural heritage, science and research, and government).
- 2.2.2 Create TDRs and data archives on a national scale.
- 2.2.3 Develop funding mechanisms to begin to build distributed institutional and technological TDR capacity across Canada with federal and provincial seed funding.
- 2.2.4 Develop common services as required so that duplications of effort and costs are minimized.
- 2.2.5 Support standardized TDR development through the promotion of common attributes and open standards; provision of guidance and training; and development and sharing of open source tools.
- 2.2.6 Build the requirement to archive to a digital repository, and support the costs of that process, into funding programs that produce digital content (see also 1.2.2).
- 2.2.7 Establish a national TDR certification process to enable digital content depositors, rights holders, and users to recognize trustworthy digital repositories.

²⁷ McDonald, John and Kathleen Shearer, *Toward a Canadian Digital Information Strategy: Mapping the Current Situation in Canada*. January 2006, p. 44.

2.3 Foster Canadian R&D that advances the goals of better managing, sustaining and providing access to digital information, and contribute research outcomes to the global effort.

Numerous research and development challenges remain in the field of digital preservation. Research into technologies, organizational models, standards and practices, and interoperability will be needed on an ongoing basis as digital content evolves, becomes more complex, and grows in volume. Effective R&D will enable the technical foresight and constant vigilance required to manage and preserve digital information.

Substantial international research is being undertaken in the field of digital preservation. The EU, US, UK and other countries have large funding programs to address digital preservation issues. In Canada, the InterPARES Project (International Research on Permanent Authentic Records in Electronic Systems), centred at the University of British Columbia, has been contributing to international research in the area of preservation and authenticity of digital information. In addition, smaller digital preservation projects are being undertaken by other organizations in Canada.

Despite existing Canadian projects, the participants at the CDIS consultations agreed that there is a need to build R&D capacity in the area of digital preservation in Canada and to bridge the gap between research and the application of knowledge. They suggested that this gap could best be addressed by engaging in more applied research in digital preservation through demonstrator and test bed projects similar to those being funded through

the National Digital Information Infrastructure Program (NDIIP) in the US.

An opportunity also exists to improve the uptake of research outcomes through better monitoring of research efforts and more sharing of results and data. CDIS stakeholders felt that Canada should also increase its participation in international research efforts, building its expertise and capacity at home through more



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collaboration with other countries looking to address the same issues through research.

Canada needs a more coordinated approach to digital preservation research. Priorities must be identified by discussion and collaboration, and the eligibility of digital preservation research and demonstration projects under existing funding programs, as well as the adequacy of such funding, must be examined.

Actions

- 2.3.1 Identify existing strengths and gaps in preservation research in Canada and internationally with a view to developing a collaborative Canadian digital preservation research agenda, including a planned set of digital preservation test bed projects.
- 2.3.2 Increase funding available to digital preservation research, and increase the dissemination of research results in both official languages.

2.4 Develop new workplace skills capacity for digital information management and preservation.

Digital information management and preservation are new challenges that demand new knowledge and competencies for the people involved. Skills such as those taught at the UK's Digital Preservation Training Programme are needed. The course of study includes modules on topics such as preservation approaches, metadata, formats, initiatives and tools, records management, costs and risk management, and access and legal considerations.

In Canada, training and education capacities for digital management and preservation are in the developmental stages and are targeted primarily at libraries and archives. Library, information, archival and museum studies programs across Canada have started to incorporate courses into their curricula that touch on the challenges of digital preservation.²⁸ Some community colleges address digital information but the courses are few and not well coordinated. Professional associations

such as ARMA Canada and the Association of Canadian Archivists offer training but these are often restricted to specific, short workshops offered at conferences or as special events.

Highlighting Progress: The School of Library, Archival, and Information Studies at the University of British Columbia offers a course on the Preservation of Digital Records. The course explores issues concerning the management, authenticity, and preservation of digital archival records.

The Strategy seeks to improve the human resource capacity in the area of digital preservation. Digital preservation training should form part of the professional training for conservators, archivists and librarians. But the training should also extend to content creators, publishers, academic researchers and business information managers.

²⁸ (McDonald, John and Kathleen Shearer, 2006)

Actions

- 2.4.1 Develop new competencies and positions such as ‘digital curators’ who would have stewardship responsibility for digital information, whether in an institutional setting or as part of research teams.
- 2.4.2 Develop training and degree programs that will build the skills necessary for digital information curation.

2.5 Raise the public and political profile of digital preservation issues.

The issues of digital preservation are likely to touch all Canadians in the coming years. The fragility of digital information and the rapid obsolescence of digital media threaten treasured personal and family collections of digital music, DVDs, and photographs.

But few Canadians are fully aware of the extent of the problem. Efforts must be made to raise the profile of digital preservation needs and challenges within creator communities, with government officials, with funding bodies, and with the public at large. The communication effort should emphasize the high risk and impact of loss, and should clarify the strategies and practices required to prevent loss. High profile champions will be needed, along with compelling examples of loss or risk of loss.

Just as individuals want to protect their investment in content that is meaningful to them, we believe that Canadians see

value in protecting digital content that is meaningful and important to their society, economy or research. It is a matter of bringing the issue to their attention.

Public, institutional, and creator support for a preservation strategy for digital information is critical. This can only be accomplished through a long-term and comprehensive program of workshops, professional development, community building, technical support, and innovative projects that capture the public imagination.

Digital preservation has had media coverage in other countries and should be the focus of an advocacy strategy to increase public and decision-maker awareness in Canada. Whether one organization or a coalition of organizations (similar to the UK’s [Digital Preservation Coalition](#)) should take this on merits discussion among existing stakeholder groups.

Actions

- 2.5.1 Develop a Canadian advocacy strategy for digital preservation issues.

Challenge 3 – Maximizing access and use

Long-term outcome: *Canadians have optimal access to Canadian digital information important to their learning, businesses and work, leisure activities, and cultural identity; and Canadian content is showcased to the world.*

Sustaining access to digital information over time is the goal of digital preservation, but it is the *use of information by people* that is the overarching rationale for preservation efforts—just as it is why the information is created in the first place. This Strategy seeks to foster the widespread availability and diverse use of Canadian digital information resources. We need to be sure that we are exploiting the opportunities provided by Canada’s high levels of connectivity and Internet use to society’s greatest advantage.

In this era of powerful search engines, wireless Internet connectivity, online communities, and handheld devices, access to a vast wealth of information is easier than ever before. Some might argue that the user is well and sufficiently served. But it is increasingly evident that users don’t just want to find information, they want to use and reuse it, interact with it and with other users about it, manipulate it, comment on it,

repackage it to meet their unique needs, and rework it to create new content. This is the ethos of Web 2.0²⁹—the second generation of the web characterized by services, collaboration and sharing.

This Strategy aims to foster information use and reuse to serve a wide range of purposes and contexts and a wide range of users, access methods, and devices. It seeks ways for Canada to resolve the tension between, on the one hand, maximizing access to information so that it can be used and reused freely for education, scholarship, entertainment, or creative purpose within our society; and on the other hand, supporting the right of creators to exert control over the use of, and to derive remuneration from, their works.

²⁹ See <http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html> or http://en.wikipedia.org/wiki/Web_2

Goals

- To foster optimal³⁰ access to Canada's digital information assets to everyone, everywhere, and via all devices.
- To promote access and use of Canadian information within a global information environment.

3. Maximizing access and use - Objectives

3.1. Foster democratic, ubiquitous, and equitable³¹ digital information access within our society.

A range of legislation and policy mechanisms exist to ensure that Canadian citizens have as level a playing field as possible for economic and social opportunity. These include the *Charter of Rights and Freedoms*, universal public education, universal health care, the public broadcast system and the public library system. These mechanisms must also extend to the digital environment. Factors such as income, language, age, geographic location, and physical ability should have as little impact as possible on citizens' ability to participate in and benefit from the shift to a digital information environment.

Access to broadband services is becoming increasingly important as content becomes more complex and sophisticated. Canada is a world leader in this area.³² According to the Organization for Economic Co-operation and Development (OECD), just over 23% of Canadian households have

broadband access to the Internet.³³ This translates into a Canadian broadband penetration of about 76% of active Internet users (compared to the US rate of 69.4%, as of March 2006).³⁴

Highlighting progress: The [Atwater Digital Literacy Project](#), an initiative of the Atwater Library and Computer Centre (Montréal), gets kids and community groups using creative web technologies (blogging, audio, video, digital photos) to help them express themselves, find new ways to talk about things important to them, and to help them build their own communities.

Yet significant numbers of households and organizations still do not have access to broadband, either because they are unable to afford it, or because there is no access in their community. Not all classrooms and libraries have access to broadband, although a target connectivity threshold seems to have been reached and the federal government is pulling back from programs such as SchoolNet,

³⁰ By 'optimal' access we mean, for commercial digital content, that it is available but intellectual property rules and fees may apply in its dissemination and use, and for public domain content that it is available freely.

³¹ 'Democratic' access means information is broadly available to everyone; 'ubiquitous' access means that information is available everywhere and via all devices; and 'equitable' access means that it is available in a form that makes it usable to everyone.

³² In its December 2006 Report, the OECD stated "Canada continues to lead the G7 group of industrialized countries in broadband penetration."

³³ OECD Broadband Statistics to December 2006. See

www.oecd.org/document/7/0,2340,en_2649_37441_38446855_1_1_1_37441,00.html

³⁴ See <http://www.websiteoptimization.com/bw/0604/>



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LibraryNet and the Community Access Program. We need to continue efforts to improve and maintain broadband or wireless penetration for all Canadians, including affordable plans so that wireless devices such as cellphones and Blackberries can be used for unlimited access and downloading of Internet content.

The digital environment offers new opportunities to improve equitable information access.

Large capacity research networks are also needed in order to support e-science/e-research methods such as high performance computing. The continued development of Canada's advanced Internet network for research purposes through CANARIE is critical.

The term 'digital divide', initially framed as a connectivity and affordability issue, now also encompasses information literacy. Information literacy is defined as "the ability to know when there is a need for information, to be able to identify, locate, evaluate, and effectively use that information for the issue or problem at hand".³⁵ Technical and information literacy skills are relatively low in some segments of society,

including low-income Canadians, new Canadians, Aboriginal Canadians, and older Canadians. For example, a small but growing number of seniors embrace the Internet (5.8% of 55-64 age group; and 1.9% of 65+ as of 2004³⁶). For these segments of society, rapid advances in information and communications technologies can be intimidating. We need targeted training programs that address demographic groups' differing usability requirements.

Canadians with print disabilities—those who are unable to read standard print due to a visual, perceptual or physical disability—require information in alternative formats such as braille, audio, or electronic text and need access to assistive technologies. Less than 5% of published works are available in a format that is accessible to those with print disabilities. It is critical that publishers provide digital information in a format that is usable on assistive technology and/or which facilitates its transformation into alternative formats.³⁷ The promotion of universal design and ensuring the interoperability of assistive technologies with mainstream technologies are also important.

For the traditional research materials

Highlighting progress: The Canadian Research Knowledge Network (CRKN) is a partnership of Canadian universities dedicated to expanding digital content for the academic research enterprise in Canada. On behalf of its over 70 academic members, CRKN undertakes large-scale content acquisition and licensing in order to build knowledge infrastructure and research capacity in Canada's universities.

³⁵ See the National Forum on Information Literacy in the US at <http://www.infolit.org/>

³⁶ See <http://www.pwgsc.gc.ca/onlineconsultation/text/statistics-e.html#Demographics>

³⁷ Canadian Library Association. *Opening the Book: A Strategy for a National Network for Equitable Library Service for Canadians with Print Disabilities*. 2005.

such as online databases and journals, there are ways to increase 'free-to-me' access—the appearance to the user that there is no cost to their use of the information resource. Substantial public sector investment from institutions, provincial governments, and the [Canada Foundation for Innovation](#) has been made to license content to consortia of academic or public libraries. Opportunities to expand this approach are by no means exhausted. Each time the scope of a licence is expanded (e.g. from institutional to provincial), there is broadened public benefit, reduced per-use costs to be borne, and, at the same time, increased producer revenues. New Zealand and Iceland have expanded their National Site Licences to include all citizens, rather than just the academic community.³⁸

The digital environment offers new opportunities to improve equitable information access. This can be accomplished through the expansion of access programs available through public institutions such as libraries, schools, and other community centres, or by supporting Canadian publishers in their efforts to make content accessible at source or through alternative format producers. The Strategy seeks ways to maximize all Canadians' access to digital content.

The term "digital divide," initially framed as a connectivity and affordability issue, now also encompasses information literacy.

Actions

- 3.1.1. Address gaps in geographic broadband or wireless coverage in order to facilitate digital information access.
- 3.1.2. Ensure that Canada's network capacity is sufficient to serve distributed preservation and high rates of popular use of high bandwidth content.
- 3.1.3. Implement affordable data download plans to encourage widespread mobile access to the Internet.
- 3.1.4. Provide mechanisms through which Canadians engaged in learning, non-profit community-based activities, or private study can access a broad body of available digital content without direct cost to the individual. Mechanisms include free Internet access points through libraries and other community centres, and national and provincial consortial licensing of selected commercial information resources through libraries.
- 3.1.5. Develop mechanisms that will enable Canadians with print disabilities to access information in alternative formats and to use adaptive technologies for broad scale information accessibility.
- 3.1.6. Increase delivery of information literacy programs within educational systems, libraries, and community groups.

³⁸ See EPIC- Electronic Purchasing in Collaboration at: <http://epic.org.nz/nl/faq.html#allNZ> and The Icelandic National Consortium at: <http://www.hvar.is>

3.2 Enhance visibility of and seamless³⁹ access to Canadian information within the global digital information environment.

Users are brought together with the content they seek through powerful global search engines, specialized retrieval and aggregation services, and links from other websites.

Currently, aggregated access to existing Canadian digital content is not optimal. Digital content providers have typically created neat silos of their own content but have not maximized the Web exposure of this content. Also, the availability of digital content varies significantly depending on the type of content or producer (i.e. commercial, government, etc.); the type of access model employed (subscription-based, pay per view/download, free access, etc.); and the content management system in use.⁴⁰

Digitized content is a good case in point. Most cultural heritage digitization projects are web-accessible, but their Web profile is low. While it is possible to make database content visible to search engines, much database content remains accessible only to a user who arrives at the home website, finds the database, and inputs a search query. Private sector digitized collections may be behind firewalls and accessible only to the company itself, but this is potential for much broader use. At present, no comprehensive meta-search is available, even from the major search engines.

In Canada, in the cultural, education and research sectors, there are a number of

specialized aggregation services and portals for different types of information resources, such as: AMICUS (Canadian library holdings), Archives Canada (archival collection holdings), Artefacts Canada (museum holdings), Images Canada, Theses Canada, Culture.ca, Virtual Museum of Canada, and the CARL Institutional Repositories Harvester, the IDRC Open Repository (IDRC-funded research results), TaPOR (Text Analysis Portal for Research), Geogratias Portal (geospatial data), SAFORAH (forest observation research), the Ice Service Data Archive (ice data), Érudit (scholarly research), and so on.

These national portals and access tools are valuable, but do not provide comprehensive coverage of the digital information available in Canada. Gaps exist in scope, coverage, functionality, or public profile. They are on a range of platforms and use divergent metadata standards and controlled vocabularies;

Highlighting Progress: A good example of both seamlessness and private sector benefit from public information is the **Canadian Ice Service Data Archive**. It provides online current and historical data specifically to serve marine and sea-based industries. Data are digitized into charts that can be fed directly into navigation systems and GPS.

some are focused linguistically in either English or French; and they are not federated. Canada needs to assess the position and scope of Canadian aggregation services in the global

³⁹ By 'seamless' we mean that the user can link through to the desired content readily without encountering obstacles or undue barriers to that process.

⁴⁰ McDonald, John and Kathleen Shearer, *Toward a Canadian Digital Information Strategy: Mapping the Current Situation in Canada*. January 2006, p. 40.

network environment to determine whether more or different Canadian information aggregation services will benefit users' ability to find and use Canada's digital information assets. We also need to nurture classification and information retrieval systems that facilitate multilingual access, as single language focus of content, metadata, or the user interface inhibits access to digital content for those who seek a more complete set of search results.

The emerging vision of Web 3.0⁴¹ suggests that in the future there will be increased use and benefit derived from exploiting and federating metadata describing information resources. Many anticipate that unstructured information such as the full-text indexing of contemporary search engines will give way to, or be augmented by, greater use of structured information, allowing more intelligent computing by search services. This suggests that memory institutions should continue their long-standing commitment to encourage and provide metadata services for Canada's key information resources.

The theory of the Long Tail⁴² asserts that even very obscure, old or specialized material will get used if it is made available on the Internet. Improving the mechanisms through which content (whether commercial or free) is discovered by its market, and optimizing content for exposure through those mechanisms, will lead to higher rates of use of the content and, potentially, to new revenues for rights holders. At the National Summit, it was underscored that the further development of national aggregation services would be an important step in improving access to Canadian content.



Library and Archives Canada #PA-128007

⁴¹ See http://www.readwriteweb.com/archives/web_30_when_web_sites_become_web_services.php or http://en.wikipedia.org/wiki/Web_3

⁴² See <http://www.wired.com/wired/archive/12.10/tail.html>

Actions

- 3.2.1 Consider the need for new models to aggregate and provide access to digital content, taking into account diverse user communities, new developments in technology, and the increasingly participative and 'intelligent' web environment.
- 3.2.2 Develop a strong role for the TDR network (see 2.2) as an interoperable access gateway to Canadian digital information.
- 3.2.3 Encourage development of specialized aggregation services and advanced research and knowledge discovery tools (e.g. for text and data mining).
- 3.2.4 Pursue means to optimize Canadian content for indexing by major search engines and specialized aggregation services.

3.3 Provide timely and open online access to Canada's public information and publicly-funded research information and data.

Governments produce a wide range of information, much of it in digital format. This information constitutes an important national asset. A 2006 OECD report on public sector information (PSI) details the important economic and social benefits that arise from providing the broadest possible access to this information. These include: direct commercial benefit to the private sector based on public sector information reuse; indirect economic potential by improving decision-making and production; preserving public information in collective memory and for future generations; and improving and supporting cultural and educational experience.⁴³ Along with these benefits, governments have a social obligation to provide access to the information they create. Although additional costs are associated with making information available to the public that must be borne by governments, the benefits have been shown to far outweigh the costs. It follows that governments should look for ways to make their information publicly accessible,

available free of charge, and with limited or no restriction on use.

In Canada, the various levels of government are major producers of digital information, including both cultural and scientific content such as geospatial and environmental data. There are a number of laws and policies that govern information produced by governments. Federally, the *Access to Information Act*, which intends to ensure a right of access to government

Highlighting progress: ODESI, the Ontario Data Documentation, Extraction Service Infrastructure Initiative, is a new infrastructure project, which enable discovery, access and integration of social science data from a variety of databases. The project will employ a distributed data access model, where servers that host data from a variety of organizations will be accessed via the Scholar's Portal.

information by the public, applies to all federal government departments and most government agencies with the exception of the commercial Crown corporations, Parliament and the Courts.

⁴³ OECD Working Party on the Information Economy, Digital Broadband Sector Content: Public Sector Information and Content (2006) <http://www.ifap.ru/library/book066.pdf>

The federal government has a Policy on the Management of Government Information. The policy states that government information is “a valuable asset that the Government of Canada must manage as a public trust on behalf of Canadians.” It seeks to “manage information to facilitate equality of access and promote public trust, optimize information sharing and re-use, and reduce duplication, in accordance with legal and policy obligations.” Equivalent legislation and policies exist in the provinces and territories.

One of the major mechanisms currently in place to provide access to federal government documents is the Depository Services Program (DSP). The DSP provides access to an electronic library of Canadian federal government publications to a network of more than 800 libraries in Canada and to another 150 institutions around the world.

Crown copyright has been the traditional mechanism used to guard against inappropriate or erroneous use of government information. In Canada it has also been used as a means to license commercial reuse of government information. The United States places its information in the public domain and has introduced a Federal Research Public Access Act, which would require agencies with research budgets of more than \$100 million to enact policy to ensure that articles generated through research funded by that agency are made available online within six months of publication. The United Kingdom has streamlined and clarified permitted uses and costs for online information through its “Click-Use” licences, while the

European Union has recently adopted a position to allow unrestricted commercial and non-commercial re-use of its information, with certain conditions in some cases.

Highlighting progress: The **Canadian Institutes for Health Research (CIHR)**, Canada's major federal funding agency for health research, has released a new [policy](#) on access to research outputs. The aim of the policy is to ensure that the results of research are available “to the widest possible audience, and at the earliest possible opportunity”. The policy covers peer-reviewed journal publications, research materials, and research data and requires that grant recipients make every effort to ensure that their peer-reviewed research articles are freely available within six months of publication.

Public funding also underwrites much of the academic research in Canada. Indeed, the Canadian government invests over a billion dollars each year⁴⁴ in support of research through the three academic funding agencies.

Highlighting Progress: Some major government information producers such as Statistics Canada have recently dropped certain fee charges, and the **National Research Council Press** offers fifteen of its research journals free of charge to Canadians through support from the Depository Services Program. Other Canadian government access initiatives include **Geogratis**, a portal provided by the Earth Sciences Sector (ESS) of Natural Resources Canada (NRCan), which provides access to geospatial data free of charge over the Internet.

Yet the results of government-funded research are not always freely available to the Canadian public or Canadian researchers. Research outputs come in many forms: data, journal articles, monographs, and other types of content, all of which should be as accessible as possible. Today, researchers create and

⁴⁴ The combined funding budgets of the NSERC, CIHR and SSHRC for 2007 represent over 1 billion dollars.

Strategies are required to advance the goal of maximizing access and use of government information in Canada, while acknowledging that public sector information is not all the same.

use data sets of unprecedented size and complexity. In 2006, the National Consultation of Access to Scientific and Research Data (NCASRD) called for urgent action on improving access to research data, stating that “Much of the data on which our knowledge is being built today is hard to access by other Canadian research communities, and is often not ideally structured to be as useful or as open as possible, even within the discipline for which it is being constructed.” Having documented the types of practices needed, the report states, “Increased access will accelerate these changes, creating a new world of research and a whole new world. When these databases are combined within and between disciplines and countries, fundamental leaps in knowledge can occur that transform our understanding of life, the world and the universe.”⁴⁵

Public reporting of the outcomes of research, usually accomplished through published journal articles, is an important part of the research process. Like academic granting councils worldwide, Canadian funding agencies are considering how best to improve access to the research results they fund.

In a 2005 article, Dr. Arthur Carty, Canada’s National Science Advisor calls for a culture of sharing. “An open-access philosophy is critical to the system’s success: if research findings and knowledge are to be built upon and used by other scientists, then this knowledge must be widely available on the web, not just stored in published journals that are often expensive and not universally available.”⁴⁶

Stakeholders at the CDIS consultations felt that Canada could improve the accessibility of both government-produced and government-sponsored digital information and data at both federal and provincial levels. This includes a more open interpretation of Crown copyright and the implementation of policy and program measures that ensure that the results of publicly-funded research are made publicly available.

Strategies are required to advance the goal of maximizing access and use of government information in Canada, while acknowledging that public sector information is not all the same. For example, a valid distinction can be drawn between the open access

Highlighting progress: **GeoBase** is a national initiative (federal / provincial / territorial) to ensure the provision of, and access to, quality base geospatial data covering Canada in the short and long term. The initiative has developed a unique licence called the **Geobase Unrestricted Use Licence Agreement** which grants users a non-exclusive, fully paid, royalty-free right and licence to exercise all intellectual property rights to the data made available through the GeoBase website.

⁴⁵ Strong, David F. and Peter B. Leach National Consultation on Access to Scientific Research Data, Final Report. January 31, 2005. pg. 1. Available at: http://ncasrd-cnadr.scitech.gc.ca/NCASRDReport_e.pdf

⁴⁶ Arthur Carty. “A global information system needs a culture of sharing.” November 2005. Available at: http://www.universityaffairs.ca/issues/2005/november/opinion_01.html

appropriate for government publications and the on-demand access required by law to internal government records, where restrictions on the latter may be founded upon privacy or security concerns. There are also significant costs associated with making government information available to the public—costs related to production, translation to meet Official Languages

requirements, accessibility standards, and maintaining information's authoritativeness and currency over time. Yet, for Canadian citizens and society to obtain maximal benefit from the information governments generate, those governments must provide as open access as possible to publicly-owned and publicly-funded information at no cost.

Actions

- 3.3.1 Review policy and licensing practices for Crown copyright with the view to facilitate access, use and re-use of public sector information and content; to unify licensing policy across the public sector; and to remove cost recovery-based barriers to access.
- 3.3.2 Strengthen online dissemination of government information through an expanded digital Depository Services Program.
- 3.3.3 Develop and implement consistent open access policies for research funding agencies and governments to ensure that Canadians have access to publicly funded data and information.
- 3.3.4 Develop funding models that cover the cost of publication and data dissemination to ensure that open access benefits both users and rights holders.
- 3.3.5 Implement tools and policies that support on-demand translation of unilingual information and that support conversion to alternative formats for those with print disabilities.

3.4 Effectively communicate, manage and protect a balanced digital copyright regime.

The direction and application of copyright law in the digital age is a matter of debate worldwide. Canada is no different: the discussion around existing Canadian statutes and jurisprudence has led to a consensus that some aspects of the law need to be reformed, but there is no consensus on the proposed changes. The debate tends to be polarized, with creators and copyright owners arguing that the law must ensure that rights holders retain the right to determine access and use in

the digital realm, while user groups advocate for a more flexible copyright regime that will permit new methods of use without express authorization.

The Canadian Digital Information Strategy is not focused on resolving the tensions between open access and commercial interests on the Internet, nor on copyright reform. Rather, CDIS seeks ways to advance the goal of fostering widespread access and diverse information use within a

philosophical framework of respect for intellectual property rights, as enshrined in copyright legislation.

At the National Summit, a number of stakeholders expressed concerns about the impact of measures that limit legitimate uses of digital material, such as those uses exercised based on fair dealing⁴⁷. For example, technological protection measures can limit the number of times a work can be copied, even if the purchaser is making legitimate copies, or can make it technically impossible for those using assistive technology to read the material; or licences can dictate restrictive terms and conditions on access and use. These types of measures are particularly worrisome for libraries because they inhibit the activities required for long-term preservation, such as making multiple copies and migrating formats.

Some content providers are moving away from technological measures. For example, in response to consumer demand, Apple iTunes recently announced it will offer DRM-free (without digital rights management⁴⁸) music that will be interoperable with its competitors' audio devices. Perhaps one of the keys to ensure vibrant and sustainable content industries in Canada, while fostering greater access and use of content, will be found with new economic models rather than by exercising greater control (See Section 1.2).

In Canada, copyright does not need to be asserted with a copyright statement;

the *Copyright Act's* provisions provide acceptable purposes of use and only the rights holder can give permission for a use that is proscribed by the law. The digital environment presents new opportunities relating to the terms of use. A variety of mechanisms — such as licences, web permission forms, and pre-approved uses, with and without notice — have emerged that assist rights holders to indicate to users permitted uses beyond those provided in the legislation.

The Canadian Digital Information Strategy is not focused on resolving the tensions between open access and commercial interests on the Internet, nor on copyright reform.

These mechanisms reflect a diversity of interests amongst content provider communities. There are already numerous direct producer-consumer and producer-information manager licencing arrangements, and many websites provide terms and conditions statements about the use for their content. While many licences aim to restrict use and limit redistribution, Creative Commons licences allow producers who want to expand use of their content to express that they permit users to copy, make adaptations, or share works, with or without attribution. Such models and templates are a positive step in encouraging rights

⁴⁷ The Canadian Intellectual Property Right Office defines fair dealing as the “use or reproduction of a work for private study, research, criticism, review or news reporting”. See http://strategis.ic.gc.ca/sc_mrksv/cipo/cp/faq_cp-e.html#18

⁴⁸ The Canadian Internet Policy and Public Interest Clinic defines Digital Rights Management as “technologies designed to automatically manage rights in relation to information”. See: http://www.cippic.ca/en/faqs-resources/digital-rights-management/#faq_what-is-drm

holders to consider their options and to document legitimate licencing terms in plain language.

For many digital content users, the vagaries of Copyright law, when combined with inconsistencies in available rights information and uninformed assertions and interpretations of rights, lead to uncertainty and confusion. Is downloading music illegal except for sites where I pay for it? If I download

from a site based in Russia, whose laws apply? Can I use an online World War II image in my own mash-up? Where does the public domain start and end?

Clearly, there is room for user education. The Strategy aims to clarify the issues surrounding rights for both users and creators; and to encourage the development and adoption of tools that enable the greatest possible use of content within a balanced legal framework.

Actions

- 3.4.1 Foster public understanding of copyright, fair dealing, the public domain and the variety of licencing models available in the information marketplace.
- 3.4.2 Develop tools to support rights research and permission requests for the use of copyrighted material.
- 3.4.3 Develop tools to assist rights holders in understanding and evaluating options available to exercise their intellectual property rights.
- 3.4.4 Contribute to international development efforts on rights metadata and to adoption in Canada of standardized metadata for recording information on copyright status, rights holders, and terms and conditions for use; and promote solutions that attach the metadata to the digital object, while enabling all legally permitted uses of that object.
- 3.4.5 Promote easy licencing of in-copyright digital content where appropriate with tools such as web permission forms, micro-payment mechanisms, and pre-approved permissions.

3.5 Increase the funding and dissemination of digital information user research

Online users are often characterized as expecting to find everything they seek easily, immediately, and preferably free-of-charge on the Internet. They are increasingly participative, interacting with Internet content to refine, repurpose or reshape it.

Several sources of data exist on Internet

connectivity and patterns of use, and various forms of evidence have helped us understand that the Internet is now a first and often only source for information seekers.⁴⁹ Internet user behaviour has been studied globally, but less well documented are user needs in specific contexts and sectors.

⁴⁹ Statistics Canada, *Canadian Internet Use* (2005) <http://www.statcan.ca/Daily/English/060815/d060815b.htm>; Canadian Internet Project (2004) <http://www.cipic.ca/en/results.htm>; Media Awareness Network, *Young Canadians in a Wired World* <http://www.media-awareness.ca/english/research/YCWW/index.cfm>

For a national digitization effort, we need data on user needs and preferences for different kinds of retrospective information in order to set priorities for digital conversion and to evaluate success. Identifiable user groups — students, academic researchers, general public, genealogists, and so on — can have highly divergent requirements.

Where preservation is concerned, we need to better understand public perceptions of digital information value, and what kind of public access is appropriate for web information that has been archived.

We need data to assess the impact of digital information on individuals, on organizations, and in society. Collaborative effort may be needed to define methods to assess the use and value of digital information in Canadian society, and then to carry out such assessments.

E-learning represents an important application of digital content but it

suffers from many of the same problems (such as lack of interoperability, lack of quality control, and digital rights issues) that this Strategy looks to address. E-learning stakeholders recognize the need to work together and are taking the first steps to build a strategy for e-learning in Canada. It would be to the advantage of content producers/managers and the education community to work together on shared and interoperable tools, standards and best practices in order to develop a critical mass of Canadian digital content in English and French for K-12 education. Such a collaborative endeavour could start with user needs research on the education market.

The objective is to ensure that those engaged in digital information production, management, and provision of access take full account of the information needs and access behaviours of their user communities. These needs clearly differ between the casual web-browsing citizen and a highly specialized researcher participating in a globally distributed scientific research project.

Actions

- 3.5.1 Identify existing strengths and gaps in user research in Canada and internationally with a view to developing a Canadian research agenda in this area.



PART III: MAKING THE STRATEGY WORK

Toward implementation

In its present form, the Strategy is a call to action. It provides a broad based, stakeholder-informed view of the key areas in which concerted action is needed, and furnishes direction about what specific actions to take in each area. As one committee member puts it, the draft Strategy is 'a hymn book from which we can all begin to sing'.

This version of the Canadian Digital Information Strategy is issued for public comment and we hope that it will act as a springboard for discussion and debate. We recognize that the current document is missing some important detail regarding its many recommended actions—elements such as leadership, partners, costs, and

funding sources. We have chosen to wait to address these implementation aspects until we have verified that stakeholders support the vision, goals, and key actions of the Strategy, and have confirmed that it is both valuable and viable.

Work on the Strategy must therefore continue. As you review this draft, we ask you to consider how to advance its implementation and to suggest concrete follow-up steps that will ensure that the Strategy is acted upon. The final version of the Canadian Digital Information Strategy, to be published within six months, will be informed by reaction to this draft and by the feedback we receive, and will add some key approaches toward its implementation.



PART IV: CONCLUSION

The goal of the Canadian Digital Information Strategy is to enable more of Canada's rich cultural heritage, its scientific information and research data, and the body of information emanating from its governments—all of which are fast becoming digital—to be managed, available, known, and used, now and into the future, for societal and economic benefit.

The shift to the digital realm is the most significant change to information production and dissemination since the advent of the printing press in the 15th Century. Given the scale of the transformation, it is inevitable that a range of challenges would arise and that they would take some time and some concerted effort to sort out. This Strategy addresses three major challenges: to strengthen production, to ensure preservation, and to maximize access and use.

Those involved with the development of this Strategy believe that if we apply a combination of will, clarity of vision, collaborative effort across sectors and jurisdictions, and investment from both private and public sectors, we can make Canada the most information rich and information literate country in the world. If we are successful in identifying, valuing and

preserving our digital information assets, we can use these assets to educate our youth, to foster a common cultural identity and pride in our accomplishments, and to create new knowledge and new products that advance our economy. If we provide ubiquitous and democratic information access for all Canadians, we will support our common goal to live in an inclusive and progressive society.

Increasingly, information *is* digital. The volume of born-digital content is already enormous will continue to grow in scale and complexity. National borders do not exist in the digital world and Canadian content creators must compete in a truly amorphous global market. The challenge of ensuring that there is and continues to be an abundance of Canadian digital content is achievable, but our success will be determined in large measure by how well we choose to collaborate across sectors and jurisdictions, and how often we find ways to learn from each other and adapt consistent models and approaches that contribute to a strong national digital information environment. The effort will benefit from diverse input. And ultimately, all Canadians will benefit from being able to exploit an information-rich environment to contribute to our culture, society and economy.

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- The Learning Federation (Australia and New Zealand)
<http://www.thelearningfederation.edu.au/tlf2/>
- PANDORA – Australia's Web Archive
<http://pandora.nla.gov.au/apps/PandasDelivery/WebObjects/PandasDelivery.woa>
- Designing and Implementing Record Keeping Systems (DIRKS)
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- An Approach to the Preservation of Digital Records
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France

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<http://www.bnf.fr/pages/europeana/europeana.htm>
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-

- Ithèque
<http://www.ithèque.net/>
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Germany

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 - Open Access
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- NESTOR - Network of Expertise in Long-Term Storage of Digital Resources
<http://www.langzeitarchivierung.de/index.php?newlang=eng>
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Korea

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Norway

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<http://www.kulturnett.no/>
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Sweden

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<http://www.dpconline.org/graphics/>
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<http://www.rcuk.ac.uk/research/outputs/access/default.htm>
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<http://www.gla.ac.uk/espida/about.shtml>
- Investing in Value: a Perspective on Digital Preservation
<http://www.dlib.org/dlib/april06/mckinney/04mckinney.html>
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www.opsi.gov.uk/click-use/
- Digital Preservation Strategy Framework for the British Library
<http://www.bl.uk/about/collectioncare/hbookframework.html>
- DPC Handbook of Digital Preservation
<http://www.dpconline.org/graphics/handbook/index.html>
- SHERPA - Securing a Hybrid Environment for Research Preservation and Access
www.sherpa.ac.uk/
- AHDS – Arts and Humanities Data Services
<http://ahds.ac.uk/>
- Preservation Eprints Services
<http://preserv.eprints.org/about.shtml>
- The National Archives UK – Electronic Records Management
<http://www.nationalarchives.gov.uk/electronicrecords/default.htm>
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<http://www.nationalarchives.gov.uk/pronom/>

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<http://www.ndad.ulcc.ac.uk/>
- CAMiLEON: Creative Archiving at Michigan & Leeds: Emulating the Old on the New
<http://www.si.umich.edu/CAMiLEON/about/aboutcam.html>
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<http://www.ucl.ac.uk/life/lifeproject/>

United States

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- Global Digital Format Registry
<http://hul.harvard.edu/gdfr/>
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<http://www.crl.edu/content.asp?l1=13&l2=58&l3=162&l4=91>
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Multinational organizations

European Union

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- European Union eContent*Plus*
http://europa.eu.int/information_society/activities/econtentplus/index_en.htm
- Minerva Europe
<http://www.minervaeurope.org/>
- Good Practices Handbook (Digitization)
http://www.minervaeurope.org/structure/workinggroups/goodpract/document/bestpracticehandbook1_2.pdf
- Planets - Digital Preservation Research and Technology
<http://www.planets-project.eu/>
- CASPAR - Cultural, Artistic and Scientific knowledge for Preservation, Access and Retrieval
<http://www.casparpreserves.eu/>
- Dynamic Action Plan for the EU co-ordination of digitisation of cultural and scientific content
<http://www.minervaeurope.org/publications/dap.htm>
- EU Commission on the Re-Use of Commission Information
http://europa.eu.int/information_society/policy/psi/index_en.htm

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http://ec.europa.eu/information_society/eeurope/i2010/index_en.htm
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www.erpanet.org
- European Commission on Preservation and Access – GRIP Gateway for Resources and Information on Preservation and Access
<http://www.knaw.nl/ecpa/grip/>
- Preservation Towards Storage and Access: Standardized practices for audio-visual content in Europe
www.prestospace.org/index.en.html
- BRICKS - Building Resources for Integrated Cultural Knowledge Services
<http://www.brickcommunity.org/prj>
- DELOS Network of Excellence on Digital Libraries
<http://www.delos.info/>
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UNESCO

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http://portal.unesco.org/ci/en/ev.php-URL_ID=1538&URL_DO=DO_TOPIC&URL_SECTION=201.html
- IFPI:06 Digital Music Report
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WSIS

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International Internet Preservation Consortium (IIPC)

- International Internet Preservation Consortium <http://netpreserve.org/about/index.php>

InterPARES Project

- InterPARES 1 Project http://www.interpares.org/ip1/ip1_index.cfm
- InterPARES 2 Project http://www.interpares.org/ip2/ip2_index.cfm

Creative Commons

- Creative Commons Website <http://creativecommons.org/>

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