



LAC Forum with University Partners II: Disruptive Technologies in Memory Institutions and Academia

Summary Report

March 13, 2019
395 Wellington Street, Alfred Pellán Room
Ottawa, Ontario



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Table of Content

- Introduction 3
- Keynote Address: Digital Competencies and Digital Literacy in a Disrupted World 3
- Panel I: Big Data, AI, Data Mining and Related Technologies 4
- Panel II: How University Libraries are Experiencing Digital Transformation 5
- Open Discussion among Audience Members 7
- Presentation on Training Needs Analysis for Federal Employees 8
- Panel III: Impacts of Disruptive Technologies on Business Processes and Operations 8
- Conclusion 10

Introduction

Library and Archives Canada (LAC) held its second Forum with University Partners, which brought together more than 200 participants, including public servants, academics, librarians, and other information management professionals, to discuss the impact of “disruptive” technologies on their respective professions, and to explore common challenges and opportunities that might exist between and across these professions. Specific panel discussions included Big Data, AI, Data Mining and Related Technologies; How University Libraries Are Experiencing Digital Transformation; and Impacts of Disruptive Technologies on Business Processes and Operations. The event also featured a keynote address from Wendy Duff (Dean, Faculty of Information, University of Toronto) on Digital Competencies and Digital Literacy in a Disrupted World; the signing of an official Memorandum of Understanding between LAC and Carleton University; an open discussion among audience members on the challenges presented by digital transformation in their own workplaces; and a presentation by Sandra Toze on Training Needs Analysis for Federal Employees. Opening remarks were provided by Guy Berthiaume (Librarian and Archivist of Canada, LAC) while closing remarks were provided by Linda Savoie (Corporate Secretary, LAC).

Below are some highlights from the event.

(General [information about the Forum](#), including agenda and abstracts.)

Keynote Address: Digital Competencies and Digital Literacy in a Disrupted World

Wendy Duff began her keynote address, subtitled “The Future is a Foreign Country,” by noting that the nature and scope of “disruption” has evolved over time. In the past, the actions or behaviour of an individual or small group of people may have been considered disruptive, but their overall impact was relatively confined and could be managed on this basis. Today, disruption often takes the form of major institutional changes prompted by rapid advancements in technology that can prove difficult, if not impossible, to anticipate and address. The manufacturing sector has already experienced several of these changes, with automation and the need for advanced technical knowledge dramatically reshaping its traditional workforce, and there is no reason to think “knowledge jobs” will be spared a similar fate. This reality has led to greater emphasis being placed on interdisciplinary skills development in information management programs. While the future needs of the information management sector can be difficult to predict, students equipped with skills and knowledge in programming, statistics, database creation and management, data analytics, community engagement and advocacy, and ethics will be better positioned to navigate an evolving job market. Such a cross-disciplinary focus may not guarantee students a job in the information management sector, but it will ensure that they are not left feeling like strangers in a “foreign future.”

In responding to questions from the audience, Duff reiterated the need for interdisciplinary skills development and coordination between disciplines. She highlighted information management educators working closely with their colleagues in engineering, computer science, and statistics as positive examples to follow. Duff also reiterated the difficulty of anticipating future changes in the job market, indicating she could not say which jobs in particular might be at risk (while, acknowledging that there is a general need for more librarians in rural areas). On the topic of misinformation, Duff noted that forgeries have always existed and that archivists are specifically trained to detect them. University librarians have a role to play in educating undergraduate students about where to find credible sources and how to use them, but it is less clear how the public at large can be taught about this important topic. There are limits to what university libraries can do in this area.

Panel I: Big Data, AI, Data Mining and Related Technologies

A common theme in the first panel concerned many people lack sufficient knowledge of how advanced computer learning works. This can lead to hidden biases in the technology and perpetuate inequality between different user groups. At the same time, the technology remains valuable in its ability to help people navigate, understand, and document an increasingly complex world, so the real challenge is finding the right balance between trust and skepticism regarding the technology's potential versus its actual use.

Speaking first, Mike Smit (Associate Professor, School of Information Management, Dalhousie University) raised these concerns in the context of a visual-sharing culture. As Smit noted, visual forms of communication have gained prominence in social media, displacing the previous priority of textual forms of communication, and even limiting the space for text-based input and metadata fields. This poses distinct problems for access to and preservation of visual records, but it is an overall challenge that can be partially addressed through the use of artificial intelligence (AI) and machine learning. Unfortunately, the technology itself is not infallible or entirely self-reliant, so there will be a continuing need for people to participate in this work, ensuring that records are representative of society as a whole and free of any hidden biases. Importantly, AI does not excuse the need for human attention or involvement; it simply changes the nature of their participation.

André Vellino (Cross Appointed Professor, School of Information Studies and School of Electrical Engineering and Computer Science, University of Ottawa) raised a similar set of questions in his presentation. He drew on the example of HAL from the film *2001: A Space Odyssey* to illustrate his main concern: machines are limited by the instructions people provide them, opening up the possibility for hidden biases and oversights to affect their performance. An AI program will adapt its behaviour and evolve its thinking as programmed, but without human understanding of how these processes occur, trust in AI will remain a problem. Some of this skepticism is warranted because AI is ultimately vulnerable to the biases and omissions of its creators. However, too much skepticism can also be problematic, preventing the full realization of AI's positive potential and leading people to dismiss what computers already "get right." Programmers can begin to address some of these concerns by building ethics into AI, but until people fully understand how AI works, they should entertain its use with a healthy degree of skepticism.

In their presentation, Marie-Jean Meurs (Professor, Département d'informatique, Université du Québec à Montréal [UQAM]) and Hugo Cyr (Dean, Faculté de science politique et de droit, UQÀM) focused on the need for a more egalitarian approach to how data is calculated, distributed, and used. While newer technologies increase the number of works available to the general public, the same technologies often mask issues of inequality. This can be seen in the relationship between users and technology companies, between smaller technology companies and larger ones, and between technology companies located in developing countries versus developed countries. The privatization of both public and personal data, and the reality of uneven laws, standards, and norms internationally, are particularly problematic and seen by Meurs and Cyr as a new form of colonialism. To address these inequalities, greater cross-border regulation of technology companies is needed. It is also essential that programmers prioritize people and place them at the centre of AI—a goal that can be aided by greater public investments in addressing social, economic, and political forms of inequality.



Speakers from the Panel I with the Librarian and Archivist of Canada: Mike Smit, André Vellino, the moderator Johanna Smith, Marie-Jean Meurs, Guy Berthiaume and Hugo Cyr.

Following their presentations, the panelists responded to questions from the audience on inequality in the cultural and linguistic fields and the use of “big data” to track the movement of people across political borders. Regarding the first question, it was acknowledged that English forms a “linguistic base” for AI and that there is a real need to preserve cultural diversity in this context. However, it was also noted that translation applications remain a tool in need human input and that some progress has already been made in improving these technologies (e.g., Google Translate) and making them more representative of different cultures and languages. Regarding the second question, it was noted that AI excels at population-level types of analysis, but that it is less reliable at individual-level types of analysis. It was reiterated at several points throughout the discussion that AI remains a technology in progress, necessitating the need for continued human input and a critical approach in its valuation and use. Ultimately, people are responsible for the decisions of AI, and this should underscore the need for caution in both the development and use of AI.

Panel II: How University Libraries are Experiencing Digital Transformation

The second panel focused on the challenges and opportunities created by digital disruption in university libraries. Some of these challenges include the transition from born-analog to born-digital materials, the need to incorporate complete lifecycle considerations into digital asset management systems (DAMs), leveraging the value of existing services and programs while providing resources for new digital capacities and technologies, and better communicating the value of university libraries to their key user groups. On the last point, a particular challenge is the view among some students that they are not properly equipped to take full advantage of the digital tools and services provided by the school. Opportunities include situating the library at the centre of the university experience, building bridges between different disciplines and professions, expanding access to open resources, bringing local experiences into contact with global experiences, and providing new products and new forms of knowledge to users. As the examples from this panel demonstrate, many university libraries are already on their way to successfully navigating these challenges and taking advantage of these opportunities.



Speakers from the Panel II with the Librarian and Archivist of Canada: Jonathan Bengtson, Martha Whitehead, Guylaine Beaudry, Guy Berthiaume and the moderator Wayne Jones.

Speaking directly to the Concordia University's experience, Guylaine Beaudry (University Librarian, Concordia University) described how the university library came to develop its new digital strategy. The strategy is the result of an extensive (and ongoing) consultation process, which involved a successful speaker series and a survey of 2,000 students on their digital experiences at the university. Among other things, this consultation process revealed that a majority of students feel they have not been properly prepared to take full advantage of the digital tools and services provided by the school. The survey also revealed the need to make greater use of existing technologies, such as YouTube and course recordings, in order to better connect with students. Building on the work of the consultation process, the new digital strategy is premised on 24 distinct personality profiles, which will allow the university library to better understand and address the needs of different user groups, including faculty members, support staff, and students. Specific aims of the digital strategy include advancing a new user-centric approach, prioritizing the needs and interests of users over other considerations, consolidating and simplifying existing platforms (from three to one), improving digital literacy among users and instituting a new "digital culture," and better responding to changing market needs. The university library plans to succeed where others have failed by "harness[ing] the energy of disruption" and channeling it into concrete actions—a point reflected in the amount of time, energy, and resources that have already been invested into the university library's new digital strategy and the initial outputs of this strategy.

In his presentation, Jonathan Bengtson (University Librarian, University of Victoria) advocated for the adoption of "digital scholarship" (as opposed to "digital humanities") as a general and inclusive term that would better capture the opportunity for greater interdisciplinary connections created by digital disruption. He noted that university libraries still have not fully adapted to this paradigm shift, creating a sense of existential crisis in some areas. Specifically, the norms of traditional research work are being actively challenged and this has necessitated the need for convergence between library and research platforms. Moving forward, it is important that university libraries provide a foundation for the entire lifecycle of a research project, including the use of "sustainability" as a baseline for digital preservation. Key personnel in this new context include metadata librarians and "decoupled" librarians, who are able to work across traditional disciplines and provide content to diverse user groups. This shift will involve building more direct links between the university library and individual faculties, and it will require the

creation of new physical and digital spaces to bring this work together. Investments in digital curation, metadata, other digital-leaning areas of operation, and training for library staff and researchers are needed to support this transformation.

Martha Whitehead (University Librarian, Queen's University) began her presentation by noting society now finds itself in a "post-digital" world where "already being digital" is the new norm. However, she also noted that this transformation can never be fully realized because "change is the new constant." Instead, the focus should be placed on ever-evolving products and services that situate information resources at their centre. Part of this change in perspective can be seen in the transition from born-analog to born-digital materials, which has created new possibilities for publishing content, collecting it, making it accessible, and preserving it over the long term. These new forms of content and the new ways of interacting with them do not always resemble analog organizational structures. This has led to the need for new ways of thinking about these otherwise traditional library functions in the digital context. At the same time, these technologies are able to bridge local and global experiences, and they are able to bring new experiences to users through augmented reality—pushing university libraries (and other memory institutions) into yet newer directions. None of this represents a radical departure from the traditional mandate and functions of university libraries, but it has changed *how* this work is done and it will continue to do so for the immediate future.

During the question and answer period, it was asked how these new technologies might affect people's interpretation and use of information, and what might be the possible consequences of this. The reply was that these technologies allow for different ways of knowing and experiencing the world to coexist, and that this is both a strength and weakness of the technology. However, it will always be part of a university library's mandate to align these understanding and experiences with the standards of academic practice and the expectations of faculty members, students, and the academic community more broadly. In responding to a question about resistance, the importance of robust and ongoing consultation was emphasized. It was also mentioned that broad institutional changes require time and patience to implement—factors that may span the mandates of several different institutional leaders and champions. Finally, speaking to the advantages of scale created by digital technologies, the potential of repository networks and interoperability between different platforms to bridge individual collections was highlighted. This potential has already led to several successful joint initiatives, including the National Heritage Digitization Strategy in Canada, the World Digital Library, and the Bibliotheca Alexandrina, and it is hoped that further successes lie ahead in this area.

Open Discussion among Audience Members

To open the afternoon portion of the event, audience members were invited to speak about their own experiences with digital disruption in the workplace. It was noted that some technologies endure while others eventually disappear, but that AI is likely to remain essential in some capacity over the long term. For this reason, it is necessary to have "clean" data, which includes proper training for the people who are ultimately responsible for the collection, presentation and use, and preservation of this data. Some important considerations in this context include who owns the data, who created it, who curated it, and who can use it. Participants also discussed the importance of collaboration and horizontality within and between organizations. This does not mean traditional tools and processes must be abandoned, but they should be adapted and redeployed to meet the unique challenges and opportunities presented by digital disruption. In many cases, this will involve breaking out of traditional works silos and workflows and either retraining existing staff to acquire new digital competencies or hiring new staff who already have these competencies.

The discussion closed with a return to the university library context, reemphasizing that digital scholarship is larger than just the humanities and that this will require university libraries to reconceptualize how information resources are collected, presented, used, and preserved. In this context, libraries should move away from a text-based presentation of these resources and take full advantage of the new, dynamic presentation opportunities afforded by digital technology. It is ultimately the content, not the "container" in which it is presented, that matters. Accordingly, these containers should be adapted to best meet the needs and interests of different user groups. Part of this

challenge concerns how tenure and other institutional structures shape the development and use of research products, meaning traditional practices may continue to exist alongside more digitally agile practices for the foreseeable future. Institutional buy-in remains important as university libraries (and other institutions) navigate this moment of digital disruption.

Presentation on Training Needs Analysis for Federal Employees

Sandra Toze (Assistant Professor and Director of the School of Information Management, Dalhousie University) spoke about the results of a recent survey on digital needs in the public sector and offered some more general comments on this topic. She began by noting a shift in basic training courses, from placing an emphasis on database management in the past to now focusing on data management as a lifecycle process. This reflects new expectations concerning digital literacy and skills in the public sector and elsewhere. The survey sought to discover what digital skills are currently in the workforce, what competencies are currently being taught, how these different skills are being put into practice, and what skills will be required in the future. From this survey, 30 different digital disciplines were identified, each requiring a range of competencies—some deep and specialized, others more general and crossing several of these disciplines. The survey also revealed that chief information officers in the public service share an interest in showcasing digital initiatives and that they recognize some lessons can be drawn from the private sector, but that “doing digital” does require some different thinking in the public context.

The feasibility of being “agile” and the acceptability of “failing fast” with public funds are two key private sector concepts that do not necessarily translate well into the public sector. Importantly, while new tools and technologies can create excitement, it is not always clear how to channel this excitement into accountable and sustainable opportunities. This point is reflected in the many legacy systems that are still being used, and the fact that paper remains a mainstay in government. These institutional and cultural barriers to change should not be overlooked. Moving forward, thought should be put into identifying what specific digital skills are needed and how best to transmit these skills. As a final observation, Toze said online courses may not be the best delivery mechanism for skills diffusion and that traditional, in-person training sessions retain some advantages.

Panel III: Impacts of Disruptive Technologies on Business Processes and Operations

The third and final panel discussion dealt with the subject of long-term preservation and access. It was argued that systems built from off-the-shelf solutions might provide more flexibility and prove more sustainable over time than systems built from scratch in-house. A particular benefit for public institutions in this context is the fact that no public resources would be spent on the development of a proprietary system that may not be compatible with other systems or adaptable to changes in technology over time. These potential limitations stem from the unique nature of digital content, which—unlike its analog counterpart—is dynamic and constantly evolving in terms of format and functionality. The dynamic nature of digital content, the need to migrate obsolete formats and perform regular format checks on all content, and the unparalleled growth of digital content in terms of volume, all present unique challenges for long-term preservation. System designers should also consider the need to actively monitor advancements in technology, the benefits of networked or “federated” approaches, and the successful removal of superfluous digital content.

In building LAC’s DAMs, Sylvain Bélanger (Director General, Digital Operations and Preservation, LAC) explained that the institution has sought assistance and technological solutions from external third-party public and private partners. This approach, which departs from the traditional practice of relying on in-house expertise and technology, provides LAC with more flexibility and adaptability as it navigates what remains an evolving area of its business operations. To this effect, LAC is currently working with Preservica on the development of a long-term digital preservation platform. There remain many unanswered questions and challenges in this area, but the work being done stands out for its overriding focus on posterity and the recognition that an effective DAMs has acquisition, discovery, access, and preservation features built into it. Some of these features, namely those related to acquisition and preservation, were given less prominence in earlier digital repository systems.

Umar Qasim (Digital Preservation Officer, University of Alberta, and Portage Preservation Expert Group) spoke about the Portage Network being developed by the Canadian Association of Research Libraries. He began by noting that a number of complex considerations apply to the long-term preservation of digital content. This contrasts to the situation of analog works, which do not require the same degree of intervening technologies to ensure their long-term survival. The exponential growth of digital content and the constant development of new formats and technologies are only two of the many unique challenges in this context. In some cases, a digital work may actually have a shorter shelf life than an analog work, absent the aid of any intervening technologies. Another unique challenge for digital content is the fact that “siloeed” or standalone repositories are seldom sustainable over the long term—a point that has acquisition, discovery, access, preservation, and resource implications. To address these challenges, digital preservation strategies should extend beyond one lifecycle and be based on a common understanding of the overall challenge. The Portage Network represents one such solution with its three components: repository services, preservation services, and planning and monitoring. The project aims to build a common understanding of basic preservation requirements, focus on partnerships, present a unified message, and articulate core competencies. Based on these objectives, it is hoped that a national digital research culture can be developed.

Discussing the University of Toronto’s experience with long-term preservation and access models, Steve Marks (Digital Preservation Librarian, University of Toronto Libraries) described three distinct yet overlapping “waves” in the development of digital repositories. The first generation of digital repositories were purpose-built around specific requirements for journals and open access. They were seen as “resting places” for the university’s research output, but they were not optimized for long-term preservation or an array of different formats. The siloeed nature of these repositories presented another challenge: there was no single point of access for everything. The second generation of digital repositories sought to rectify these problems, and while they succeeded in many respects, the ever-increasing volume of content continued to pose a distinct challenge. This led to the development of the third generation of digital repositories, which focuses on discovery, access, and integrity (in addition to acquisition and preservation). Importantly, these systems are not just seen as repositories, but instead are treated as essential focal points in the overall (and ongoing) creation, collection, preservation, and dissemination of digital content. While the general movement has been towards this generation of digital repositories, Marks added that first- and second-generation digital repositories still exist and serve important functions, but that this also means their limitations remain a challenge.



Speakers from the Panel III with the Librarian and Archivist of Canada: Omar Qasim, Sylvain Bélanger, Sandra Toze, Guy Berthiaume, the moderator Leslie Weir and Steve Marks.

Questions during this panel touched on the intake of third-party publications and the disposal of digital content. Regarding the first question, it was noted that working directly with publishers, including self-publishers, is arguably the most efficient and practical approach to take in new content. This can be done by building deposit mechanisms directly into external publishing platforms, and by communicating the importance of depositing copies for long-term preservation and access (including where Legal Deposit requirements apply). Regarding the second question, a number of factors and considerations were mentioned. This included providing disposition dates upon deposit, separating items with different retention periods, accounting for redundancy, and pushing obsolete formats forward. Redundancy is an especially complicated factor because it is seen as both a positive built-in control feature, but also a potential source of excess and unnecessary information if not properly managed over time. However, on the central question on how to ensure the removal of unwanted content, the challenge of knowing when something has actually been destroyed was reiterated.

Conclusion

LAC's second Forum with University Partners brought together public servants, academics, librarians, and other information management professionals to discuss the impact of "disruptive" technologies on their respective professions, and to explore common challenges and opportunities that might exist between and across these professions. While most of the discussion focused on the experiences of university libraries, the lessons learned can be extended to include other institutions. Importantly, the opportunities and challenges presented by digital disruption are not unique to a particular context but affect all aspect of society. A general level of interest and openness to change is needed to navigate these pressures successfully. Part of this will involve abandoning older programs, services, platforms, and paradigms in favour of newer ones. It will also involve adapting the old to fit the new and vice versa, recognizing that the "digital turn" has no clear endpoint and that it is just as tied to the future as it is to the present and the past. What ultimately matters is how *people* manage these transitions, and herein lies one of the key takeaways from the entire discussion: humans should remain located at the centre of technology. This, more than anything else, will help to guide the future direction of technology and its use in positive ways.

LAC is thankful to everyone who participated in the event and contributed to its success, and LAC looks forward to continuing this discussion (and others) in future forums with its university partners.



Speakers, moderators and LAC's team for the second Forum with university partners: Wayne Jones, Sylvain Bélanger, Martha Whitehead, Johanna Smith, Mike Smit, Guylaine Beaudry, André Vellino, Steve Marks, Guy Berthiaume, Jonathan Bengtson, Leslie Weir, Hugo Cyr, Linda Savoie, Marie-Jean Meurs, Zeïneb Gharbi and Pascale Robichaud.