

National Strategy for Digital Records: Comparing the Approaches of Canada and China

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Abstract: This paper compares and contrasts the Canadian and Chinese national strategies for digital records, with the intention to generate best practices and/or lessons learned that are instructive and applicable to a wider archival community, irrespective of the existence of certain political and administrative differences.

Keyword: digital records; digital records management; national strategy; Canada; China;

1. Introduction

Canada and China are two countries differing in political and administrative structures, which, inevitably, impacts on their archival systems. Although the Canadian archival system, as represented by the Library and Archives of Canada, has a longer history of dealing with digital records, the Chinese archival system has been making great strides in recognizing digital records as official records and in managing them as such. Operating in similar or even same technological environments, their paths cross in establishing a national strategy for managing, preserving, and making available the memories of human actions in the digital world. This paper compares the Canadian and Chinese national strategies for digital records, as a component study of the research project entitled Information Management Crisis in the Government of Canada: A Grounded Theory Study (hereafter the IM Crisis in GC project).¹ It aims at revealing instructive and applicable good practices and/or lessons learned through illustrating differences and similarities, and it hopes to promote discussions not only on specific strategies but also collaborations among international records communities, irrespective of the existence of certain political and administrative differences.

2. Meaning of the Term National

As a federalism country, Canada has two orders of government: federal and provincial/territory. The Canadian federal government is also frequently addressed as the national government, or the Government of Canada (GC), due to its constitution derived authorities for areas such as national security, foreign affairs, and telecommunications that typically impact the country as a whole.² Complementarily, the provincial/territory governments have exclusive authorities, also granted by the Canadian Constitutions, over such matters as records management and archival administration. This structure, however, does not prohibit cooperation between the two orders of government or, with respect to this

¹ The project is conducted by the author of this paper in pursuing her PhD degree at the School of Library, Archival and Information Studies at the University of British Columbia, Canada, under the supervision of Dr. Luciana Duranti. A component study in the context of this project refers to a study directed by the technique of theoretical sampling of the grounded theory research methodology. Such a study is both independent of and interrelated to the overall project.

² Canada. Constitution Acts, 1867 to 1982. Accessed July 19, 2012. <http://laws-lois.justice.gc.ca/eng/Const>.

paper, within a community that is county-wide. The Library and Archives of Canada Act mandates the Library and Archives of Canada (LAC) to not only “serve as the continuing memory of the government of Canada and its institutions” but also “facilitate in Canada cooperation among the communities involved in the acquisition, preservation and diffusion of knowledge”.³ Therefore, the term “national” in the Canadian national strategy is interpretable of as either related to the federal government or to the entire county. When it is related to the former, the strategy refers to the management of digital records of the federal government and when it is related to the latter, the strategy refers to LAC’s role of providing both professional and financial support to the Canadian records community throughout the country. The Canadian national strategy is thus limited in scope and cooperation-driven by methodology.

Comparatively, the term “national” in the Chinese national strategy denotes a literal meaning of the term as “relating to, or belonging to a nation as an organized whole”.⁴ The Archives Act of the People’s Republic of China establishes not just one institution at the national level as the Library and Archives of Canada Act does, but a system consisting of a series of institutions for the entire county.⁵ These institutions are networked by administrative and professional relationships and encompass archives of government, enterprises, social organizations, and private citizens. This means that, corresponding to China’s administrative structure that establishes government organizations at national, provincial, municipal, county, township, and village level, archival administrations and archival institutions or at least archival positions are set up at all levels. Vertically, each of these levels receives directions from and responds to the upper levels. Horizontally, the archives administrations provide professional guidance to government agencies at the same level regarding their archives management, and archival institutions acquire archives from agencies at the same level and enterprises within the same administrative district. Accompanying these independent establishments are archival programs internally set up in the various kinds of organizations (e.g., ministries, state-owned enterprises), which are also

³ Canada. Library and Archives Canada Act. S.C. 2004, c. 11. Accessed July 19, 2012.<http://laws-lois.justice.gc.ca/eng/acts/L-7.7/FullText.html>.

⁴ American Heritage Dictionary. <http://ahdictionary.com>.

⁵ China. Archives Act of the People’s Republic of China, 1987, revised 1996. http://www.law-lib.com/law/law_view.asp?id=285.

networked both vertically and horizontally. In addition, the Chinese archival system reserves places for particular types of archives such as scientific-technological archives and audio-video archives.⁶ At the center of this system is the highest level of archival administration, the State Archives Administration, whose policies, directives, and standards are required to be compliant with by each and every component of the system. This top-control, cross-connected structure characterizes the Chinese archival system as a true national, highly centralized one, which impacted, inevitably, the development of the Chinese national strategy for digital records.

3. Status of Digital Records and Their Management

Digital records, previously called machine-readable, computerized, or electronic records, started to exist in the Government of Canada in the 1950s when mainframe computers were used for massive data processing. As the Canadian federal archival legislation typically address records as irrespective of physical format, digital records, by definition, have never been excluded from the scope of archival administration, or, specifically, LAC's legislated mandate. As a distinctive and increasingly dominate group, however, digital records in GC have largely remained invisible in both its policies and programs. When at the current stage, they were previously part of records management (RM) and now of information management (IM), and when under the control of LAC, they are part of documentary heritage or digital information.

GC's performance evaluation addresses IM as a whole,⁷ i.e., without distinguishing the various components identified in its Policy on Information Management.⁸ It is therefore, consequently, difficult to discern the performance of the management of digital records in a direct manner. The GC IM performance has unfortunately been overwhelmingly unsatisfactory to its own standards since 2006, the year that the evaluation separated IM from IT (information technology) and assessed it independently. By logic reasoning, the poor performance of IM includes that of RM and digital records management

⁶ State Archives Administration of China. http://www.saac.gov.cn/xxgk/node_142.htm.

⁷ Treasury Board of Canada Secretariat. Management Accountability Framework (MAF) Methodology. <http://www.tbs-sct.gc.ca/maf-crg/index-eng.asp>. MAF started in 2003 and is continued to be used today.

⁸ Treasury Board of Canada Secretariat. Policy on Information Management 2007. <http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?section=text&id=12742>.

(DRM), although the term RM or DRM (full or short) has never appeared anywhere in the evaluation reports. A more direct revelation of the unsatisfactory performance of RM came, in an indirect manner, from the assessments on GC departments' performance under the Canadian federal Access to Information Act, conducted by the Office of Information Commissioner of Canada. As discovered by the IM Crisis in GC project, although labeled as "Information Management Crisis",⁹ the issue is a sole RM and DRM matter. What the crisis truly means is the difficulty of finding responsive *records*, including digital ones. This unsatisfactory performance inevitably affects the selection of records for shaping the part of the nation's documentary heritage. The combined effect of the graving RM situation in GC institutions and the almost stagnant transferring of digital records to LAC called for the Canadian strategy.

Digital records in China exist similarly in terms of their formats and the dramatically increased quantity. For the past two decades, the county has been keen on taking up with information technologies and has made great strides towards that direction. The challenges and opportunities brought by digital records were recognized by the Chinese archival academia in the early 1990s,¹⁰ and since then, many research projects have been carried out. In records producing organizations, however, digital records are only complement of paper records. Paper records remain to be the official version yet digital ones are also transferred into archival custody for technological convenience. Obviously, this "two-tracks system" has problems because no exact correspondence between the two tracks can be established, causing many digital records – typically operational ones – failed to be recognized thus not transferred, yet at the same time, those transferred are of little usage due to the impossibility of generating corresponding paper records. As found out by the survey on acquisition and management of digital records by provincial archival institutions, over a half of these surveyed institutions had acquired digital records, yet frequently found them in poor quality and hardly access ready.¹¹ Apart from the complex issue of identifying digital

⁹ Office of Information Commissioner of Canada. A Dire Diagnosis for Access to Information in Canada. http://www.oic-ci.gc.ca/eng/med-roo-sal-med_spe-dis_2009_4.aspx.

¹⁰ The hallmark of this recognition and the first systematic study on the subject of digital records is the dissertation by Huiling Feng in 1996, entitled *Possessing New Memories – Research on Electronic Records Management*.

¹¹ Yuenan Liu et al. Analysis of the Acquisition and Management of Digital Records by Primary and Secondary Provincial Archival Institutions in China", *Archives Bulletin*, 4 (2010): 7-12.

records in all kinds of technological environments, there are plain drawbacks with which the system also finds difficult to cope. This includes the managerial and resource burdens it causes, which is only exacerbated by the high rate of records acquisition maintained by the Chinese archival system. Facing the DRM challenges, the Chinese archival academia and the lower level archival administrations have reacted with a sense of urgency and more remarkably, enthusiasm, as they view the advent of digital records an unprecedented opportunity for both the archival discipline and profession. Although also moving towards the direction of digital records, the State Archival Administration, the national leader in archives management, remains to be comparatively passive as demonstrated by the policies and regulations it has so far issued.¹² The Chinese strategy was born in this context.

4. The Strategies

The Canadian strategy, as characterized as aiming at improving the unsatisfactory IM/RM performance and enhancing LAC's role of facilitating the national advancement of documentary heritage, is representative of two sets of documents: the first including the Policy on Information Management 2007, the Directive on Information Management Roles and Responsibilities 2007, and the Directive on Recordkeeping 2009, all issued by the Treasury Board of Canada, and the second including a series of research papers and a final report produced in developing the Canadian Digital Information Strategy during 2005 to 2010, all published by LAC.¹³ Although including Strengthening Content as one of the three challenges it intends to address, the Canadian Digital Information Strategy focuses indeed on preservation and access. Strategically, it advocates comprehensiveness and cooperation as it states that "a vision on a national scale require(s) an inclusive, coordinated, distributed and sustained approach involving stakeholders from all sectors of the information environment"¹⁴. Accompanying this advocacy is the claim that in the digital environment, "the roles of information creators and consumers blur" and the responsibilities of the

¹² State Archives Administration of China. Policies and Regulations.
http://www.saac.gov.cn/xxgk/node_141.htm.

¹³ Library Archives Canada. Canadian Digital Information Strategy.
<http://www.collectionscanada.gc.ca/cdis/index-e.html>.

¹⁴ Library Archives Canada. Canadian Digital Information Strategy (CDIS): Final Report of consultations with stakeholder communities 2005 to 2008.
http://www.imdev.gov.ab.ca/secure/resourceroom/pdf/CDIS_FinalReport_eng_REVISIED_Final.pdf, 6.

traditional “memory institutions” such as libraries, archives, museums and data centers have shifted, introducing “new ambiguities and gaps in the chain of responsibilities”¹⁵. The Strategy thus addresses the challenges it identifies in a general manner and does not distinguish the numerous kinds of information the term “digital information” encompasses. Among all the recommendations made, only one was found specific to digital records.¹⁶

The Policy on Information Management identifies records management as one expert service among all the services the IM discipline encompasses; however, RM professionals are blended into the “IM functional specialist” in the Directive on Information Management Roles and Responsibilities.¹⁷ The IM Crisis in GC project found out that, because all policy requirements address IM and IM functional specialists as a whole, the exercise of discerning relevance to records and/or RM when consulting them become constant and exhausting, and frequently, yield no results. Compounding the situation are two other factors, one being the confusing conceptual framework and the other being the IM work structure in GC institutions. Collectively outlined by the Treasury Board policy instruments and LAC guidance, the IM conceptual framework proved to be unable to guide the necessary distinguishing of the various IM components and to be ineffective of identifying official records from transitory ones. The IM work structure in GC institutions relies on, ultimately, individual employees, as they are required to apply “GC and departmental information management policy, standards, procedures, directives, guidelines, tools and best practices”.¹⁸ The IM functional specialists only exist to provide support and the support is provided only when requested. The approach of treating IM as one single discipline, the inadequate conceptual framework, and the reliance on individual employees to perform the actual IM/RM work jointly caused the insurmountable difficulties the GC institutions had experience in attempting to execute the GC policy requirements. This situation contributes, directly, to the labeled IM yet indeed RM crisis.

¹⁵ Ibid. 6-7.

¹⁶ Which states that “For government information production and management, develop and implement comprehensive e-records strategies that address policy, regulatory instruments, standards and systems”, 22.

¹⁷ Treasury Board of Canada Secretariat. Directive on Information Management Roles and Responsibilities. <http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=12754§ion=text>,

¹⁸ Treasury Board of Canada Secretariat. Policy on Information Management, 6.3.1.

The Directive on Recordkeeping (RKD) is the newest component of the GC's strategy toward the RM crisis, yet records and RM disappear completely in it – even though the term “record” appears conspicuously in the title. The RKD is indeed about “information resources of business value”, defined as “published and unpublished materials, regardless of medium or form, that are created or acquired because they enable and document decision-making in support of programs, services and ongoing operations, and support departmental reporting, performance and accountability requirements”.¹⁹ It defines also, “For the purpose of this directive”, records as “information created, received, and maintained by an organization or person for business purposes, legal obligations, or both, regardless of medium or form”,²⁰ without, however, any reasoning on why the term is not even used once in the text of the RKD, and if so, why defines still the term. For its entire course, the IM Crisis in GC project cannot find the differences between the two definitions even though all data sources collected regarding the Treasury Board and the Library and Archives of Canada were coded one by one and line by line. As a formally issued GC-wide policy, the RKD requires compliance by departments subject to it by 2014, and the identification of “information resources of business value” constitutes the first task of the compliance. At this stage, whether this strategy will prove to be the right one to solve the lingering problem remains to be seen, yet it is difficult to be confident that a replacement of term is in fact the solution.

Unlike the Canadian strategy, which was born out of government mandate, the Chinese strategy is primarily a product of a research project entitled Research on Theories and Systems of a National Strategy for Electronic Records Management, led by the Renmin University of China and conducted during 2006 to 2007. Supported by a series of research projects conducted in 2005 and 2007 focusing on the risks and mechanisms regarding electronic records management, the project produced its reports Strengthening the Scientific Management of Electronic Records of Our Country, outlining the significance and urgency of a national strategy. The report was subsequently submitted to the central government, which endorsed the proposed notion of a national strategy. Specific instructions were given

¹⁹ Treasury Board of Canada Secretariat. Directive on Recordkeeping. <http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?section=text&id=16552>.

²⁰ Ibid.

by the Prime Minister, which requested relevant government agencies to consult the report and to act upon it. In 2009, as the step that starts the national strategy, the central government issued an interim policy on electronic records management, establishing an electronic records management steering committee at the national level and regulating on “unified management” and “lifecycle management”.²¹

Recognizing the existing development of electronic records management as mostly built at the lower levels of the Chinese archival system or within individual ministries/sectors, the Chinese strategy emphasizes a top-down approach that features centralization and coordination. The intention of the top-down approach is twofold: first, to leverage the existing developments and second, to correct the previous common phenomenon of reinventing the wheels. The lack of centralization and coordination in the past had caused considerable waste of resources and at the same time, yielded only piecemeal solutions. However, to design a centralized and coordinated strategy with the scale of the entire country is an unprecedentedly complex undertaking, which the strategy acknowledges. At the current stage, the strategy has developed a theoretical model and an overall framework. The theoretical model justifies the necessity of a national strategy and specifies its features, e.g., the degree of maturity. The overall framework includes, as its components, policies and mechanism, systems of standards, legal and regulatory requirements, and model projects, all considered as forming the starting point of a long and evolving journey.²²

5. Conclusions

In the course of developing its strategy, China studied the digital records management experiences of a number of developed countries, among which is Canada. The Chinese strategy appreciated the Canadian approach of centralizing all types of digital information needed by the government’s operation and echoed strongly the notion of records

²¹ Central Office of the Communist Party of China. Interim Method on Electronic Records Management. 2009.

²² Huiling Feng and Yuenan Liu. National Strategy for Electronic Records Management. Renmin University Press. Beijing, China, 2011.

as information resources.²³ It maintains, however, at least at its current stage, an explicit focus on records and does not blend them into information or replace them with information resources of business value. This appears to be the most salient difference between the two strategies. It needs to be stressed that, this is NOT a simple matter of term choice. As discovered by the IM Crisis in GC project, blending records into information has impacted profoundly the strategic directions and the accompanying action plans for digital records management. The research findings rendered as well the “blurring” view possessed by the Canadian Digital Information Strategy highly questionable. The study signals to the Chinese archival community the need of further studies and deeper contemplation.

Outstanding differences exist with other aspects as well, and the relationship between the strategy and academic input is one of them. The main force behind the Chinese strategy was the Chinese archival community, specifically, a research team consisting of archival scholars, practitioners, and students. It is difficult, if not impossible, to find traces of academic influence (including research findings by university research teams) in Treasury Board policies and the Library and Archives Canada guidelines. Maybe a correlation, the Government of Canada employs in-house or on-job training for equipping its IM specialists, yet the Chinese strategy advocates firmly records management education at university, graduate study level, and only emphasizes training for continuous development. Although different in training approach, both strategies recognize the shortage of qualified IM/RM personnel, in particular the insufficient understanding of technologies. This similarity turned out to be the only one that was found by the comparison.

Following its strong tradition of setting up positions dedicated to records and archival work, the Chinese strategy is also fundamentally different from the Canadian model of information management roles and responsibilities. As the Chinese strategy for digital records is still in its infant, there are no proofs for its success or failure. Yet, the Chinese model of managing paper records with dedicated personnel has proven effective. It is maybe time for the Government of Canada to ask, why, with a solid, well-conceived governance and accountability structure in place and with these many years’ effort for improvement, the

²³ Linqing Ma. “Analysis of the Government of Canada Strategy for Electronic Records Management”, *Archival Studies*, 1 (2011): 15-21.

IM/RM performance remains yet unsatisfactory; and whether the approach of relying on individual employees to carry out IM/RM actual work is in fact one of the root causes. It may also be the time for the Government of Canada to consider whether the Chinese experience should be looked at, which apparently has never appeared on its radar of searching for best practices.

The other difference worth noting lies with the two strategies' perceptions over their IM/RM knowledge. The Chinese one explicitly acknowledges the still weak accumulation of theoretical foundations for digital records in China and has set directions for improvement. The Canadian one claims typically a "leader role", leading both nationally and internationally.²⁴ It is difficult, however, as experienced by the IM Crisis in GC project, to interpret its self-contradicting conceptual framework and to bridge the apparently huge gap between the claimed IM/RM leader and the poor IM/RM performance. This comparison concludes that the area of theoretical foundation is one area that both countries need to improve.

The last point this comparative study hopes to make is the role of the national archives. The different roles of the Library and Archives Canada and the State Archives Administration of China had played in the two national strategies is clear by the current comparison, yet the full range of their functions requires further, more detailed studies. This is relevant to the theoretical ideas of the Canadian lifecycle management and the Chinese "entire course governance", and is tightly related to the above conclusion on theoretical foundation building. It is believed that more comparative studies like this should benefit the records community worldwide.

²⁴ See, for example, Library Archives Canada, Records and Information Life Cycle Management. <http://www.collectionscanada.gc.ca/government/products-services/007002-2012-e.html>, which states that LAC is "a National Centre of Excellence in Information Management"; also, in Library Archives Canada, Canadian Digital Information Strategy (CDIS): Final Report, 13: "We have the leadership and collaborative capacity to coalesce our resources, our technological capabilities and our efforts in order to achieve the vision (of being a world leader)".

National strategy for digital records: the story of China

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Summary

Digital records have gained great momentum in China, and become the major form of records in many sectors. China has made great strides in recognizing records in digital formats as official records and also managing and preserving them as such. However, since the authenticity, integrity and accessibility of electronic records are not fully guaranteed, the effectiveness and efficiency of Chinese e-Government, perhaps the whole e-society, are seriously challenged. In this context, the research team of Renmin University of China proposed to the central government the National Strategy for Digital Records in 2008. In Dec, 2009, the joint conference mechanism was established at the level of central ministries, which is recognized as the first step of the national strategy implementation, aiming to coordinate relevant regulators on digital recordkeeping and preservation. In 2011, the first 5-year national plan of digital records was issued, which is carried out by the joint conference and its executive office.

Introduction

This paper reports on one of the research findings of the project “Annual reports on the cutting edge development of electronic records management and preservation” (Project Number:10XNI019), supported by China’s Fundamental Research Funds for Central Universities and the Research Funds of the Renmin University of China (RUC). The project is designed to gain a systematic perspective of the field of electronic records management (ERM) and preservation (ERP) both domestically and internationally through regularly tracing and analyzing the theoretical and practical advancements in ERM and ERP. By doing so, it aims to distill a set of principles applicable to ERM and ERP initiatives around the world, and at the same time, provide directions and guidance for further developing requirements for local situations.

Since the 1990s, information technology (IT) application has gained its domination in the policy of the economic and social development in China (World Bank, 2007). Organizations and agencies are now experiencing a rapid transition from the paper-based working environment to an electronic one. Consequently digital records have gained a considerably rapid increase and become the major form of records in many fields. Chinese archival system has been making great strides in recognizing records in digital formats as official records and in managing and preserving them as such. However, the effectiveness and efficiency of Chinese e-Government, and maybe the whole e-society have been challenged as the authenticity, integrity and accessibility of electronic records are in dangerous status (Feng, 2009a). A joint conference mechanism at the level of central departments was established in Dec, 2009 to solve the

divergence and multiplicity of relevant regulators to ERM and ERP, which was regarded as the first step of the national strategy for digital records in China.

In this paper, the author discusses why the national strategy for digital records is needed in the given circumstance of China, what the characteristic of Chinese strategy should be from the perspective of design, how it is going and what the next steps should be.

Background of national strategy

There are two alignments of recordkeeping and archival preservation in China. One could be called “professional” or “explicit”, which depends on the archival organizations with professional staffs including records managers in records creating organizations and archivists in archival preservation institutions. In this system, the State Archives Administration of China (SAAC) is the public authority responsible for the administration of recordkeeping and archival preservation throughout the nation. The other could be described as “embedded” or “implicit”, which depends on the records creating sectors. Some activities of records management or even preservation are unconsciously undertaken during the business process. However, what they care about is mainly the business mission. In paper environment, these two alignments operate in two parallel ways and their orbits seldom intersect except filing and transfer. The archival professionals can hardly influence the records creation, let alone intervene, what they can do is only follow the paces of business activities and accept their documentary products.

The task of managing and preserving records in digital form in China is firstly put forward by the pioneers of business sectors in the process of IT application. In 1992, the National Computer Aided Design (CAD) Application Engineering was initiated by the State Council and involved 11 ministries and commissions among which the former State Science and Technology Commission (SSTC) played the leading role. It set up the goals of “doubly throw”, which were to throw drawing board and to throw drawing depot. To throw drawing board means digital design records will replace paper drawings at the creating stage. To throw drawing depot means digital recordkeeping and preservation will take the place of paper records management and preservation. (*ONCAE, 1998*) The latter are the territory of archival profession. In 1996, the “Leading Group on Electronic Records Filing and Management” and “Research Group on Electronic Records Filing and Management” were established by SAAC, and their first job is to deal with CAD records management. With the joint endeavor of SAAC, the former SSTC and other governmental departments, three series of national standards related to CAD records creation and recordkeeping were published in succession with the support of 35 pilot projects, they are “*Management of CAD documents*”(GB/T17825.1~10-1999), the “*Requirements for optical disk storage, filing and archival management of CAD electronic records*”(GB/T17678.1~2-1999), and “*Conformance testing for optical disc storage, filing of CAD electronic records*” (GB/T17679-1999). The second result of the two groups on electronic records filing and management is the most influential national standard “*Standard of electronic*

records filing and management” (GB/T18894-2002) covering all kinds of electronic records on the basis of pilot office automation systems (OA), which generate administration records, similar to electronic documents management system (EDMS) with workflow management in western countries, of the Secretariat of the State Council, Shanghai municipal government, Hangzhou municipal government, Yunnan provincial government and Guangdong provincial governments (Qiu, 1999). A number of local archival authorities including 13 provincial archives issued similar regulations with the reference to GB/T 18894-2002 (Zhou, 2012). Besides standards, another achievement of the groups was the first ERM teaching material “*Introduction of electronic records filing and management*” (SAAC, 1999). In 2000, the first digital archives project was initiated by Shenzhen Municipal Archives, supported by SAAC, aiming to seek the solutions of transfer and preservation of digital records (Li, 2003) .

The theoretical research field made synchronous development as practical advancement. Professor Huiling Feng, the leader of the electronic records research team of School of Information Resource Management, RUC, completed her landmark doctoral dissertation “Owning new memory: electronic records management” in 1997, many views, points and statements of this paper are widely spread and got frequently cited. She respectively directed the first national research projects concerning electronic recordkeeping sponsored by National Planning Office of Philosophy and Social Science (NPOPSS) in 1996 and by National Science Fund Foundation of China (NSFC) in 1999. Many other scholars began their exploration from this period too. The first research findings focused on the new attributes and new methods of the new types of records. The domestic researchers did reach some conclusions similar to international colleagues, such as the requirements should be integrated with the business activities and business systems. (Feng, 2001)

The situation of ERM and ERP was at a standstill soon afterwards. The regulation publishing slowed down. From 2003 to 2008 no more national standards were issued, SAAC only formulated 2 industry standards with regard to recordkeeping of official email, i.e. “*Rules for filing and management of electronic official email*” (DA/T32-2005) and technical requirements of optical disks used by archival institutions, i.e. “*Specifications for technical requirements, care and handling of optical disc for electronic records filing*” (DA/T38-2008), together with a regulation dealing with certain administration records delivered by the systems under the unified configuration of General Office of the State Council (SAAC, 2003). The vital standards of recordkeeping metadata and electronic records management system (ERMS) suffered troubled birth. The archival profession was not confident that the digital records could be kept and preserved in digital form. All the standards and regulations stated that the electronic records with long-term value should have hard copies, even after the Electronic Signature Law came into force in April 2005. Dual-capture and dual-preservation are universal, which become the biggest barrier of the methods change in digital world and also add to the daily work pressures of records managers and archivists.

Researchers did further survey of the reality and continuous study of the methods change. For example, they introduced the perspective and approaches of risk management to analyzing the risk factors of ERM and ERP. A list of over 100 detailed risk factors throughout the lifecycle of electronic records was provided (Feng, 2008). Nevertheless, the practice stumbled and the refined management did not prevail. This distinctive contrast puzzled the researchers. At the third forum of information resource management in May 2006, professor Huiling Feng first put forward the concept of “national strategy for electronic records”, she argued that national strategy for electronic records should be constructed in order to wholly promote the national controllability of these unique information resources, because methods changes could not take effect without structural reform and thinking renovation, and the latter needed the top down design and multiple-department cooperation (Feng, 2006). Her proposal gained wide acceptance among the participants from the administrative departments, local units and university scientific research units (Pei, 2006). And the research team in RUC led by Professor Feng went much further. The research report titled *A Report on Enhancing Scientific Management of Electronic Records for China* was forwarded to the Chinese Premier Minister Jiabao Wen in 2008. The report recommends establishing national strategies to deal with challenges of digital records, including designate a single authority for overall planning, centralised administration and complete process control of electronic records; issue Records Act of the People’s Republic of China; integrate electronic records strategy into the national strategy; establish and implement overall standards frameworks for ERMS and trusted digital repository (TDR) applications; and build national digital archives, etc. (Feng, 2009b)

Premier Minister Wen made comments on the Report and urged relevant central government departments to study the Report on July 26, 2008 (SIRM, 2009). This is the first time in China that senior central government departments have paid attention to digital records. Since then, discussions have been ongoing between central government departments and scholars across disciplinary fields and across sectors. *Interim Regulation on Electronic Records Management* was issued by the General Office of the State Council on December 8th 2009, which proposed national requirements for digital records management and preservation. A joint conference mechanism involving 9 central departments was also established to solve the divergence and inconsistency of relevant regulators, signifying that the national strategy of electronic records has began its practical journey rather than a theoretical design.

Design of national strategy

National Strategy for digital records is the goal orientated, overall planning and basic institutional arrangements on the overarching, fundamental, long-term problems from the national strategic perspective. Based on the literature survey (An, 2009), most countries didn’t use the term of “national strategy” concerned with electronic records problems or actions. Nevertheless, quite a number of countries and regions have formed the virtual “national strategy”. Since 1990s, given the decentralized management problems, many countries hold the same view to strengthen the overall planning, policy guidance, standards

specification and technical research at the national or federal level in the form of initiatives, strategic initiatives, and policy framework etc. By doing so a supervisory mechanism and regulation system are gradually coming into being in which the national archives play the role of a leader, and successively roll out some significant measures reflecting the state will and interests. For example, the United States initiated a critical project as “Electronic Records Archives” which has finished its development phase and got ready to use by the central government (NARA, 2008). By joining several government bodies which are responsible for one particular aspect of information management together, the U.K. established the National Archives, thus legitimizing and broadening its function of electronic records (TNA, 2012).

Different countries may have different emphasis on the approach of digital records management and preservation. How does a country under its unique situations design, promote, execute, evaluate and improve its national strategy for digital records? A conceptual model of national ERM and ERP strategy as shown in fig 1 and fig 2 was constructed by the research team of RUC to serve as an analysis framework. It is a multi-dimensional system, consisting of three parts: objective, scope and content. Objective is the soul of strategy, determining the basic position and direction of national strategy. Scope describes the coverage of the strategy, and sets the strategy’s boundary. It consists of three domains in which the hierarchy domain clarifies that the strategy covers central, local and organizational level; the business domain clarifies that the strategy influences every industry that could create and use electronic records; and the process domain clarifies that the strategy covers the whole life cycle of electronic records from creating, keeping to preservation. Content means the main themes of national strategy, illustrating the specific approach to achieve the strategic goal. It mainly covers the following three dimensions: stage, path and element. There are three strategic stages including planning, implementation and strategic evaluation, revealing the complete life cycle process of the strategy. The strategic paths contain policy, mechanism and pilots, revealing the key ways to promote the strategy. The strategic elements include responsibility, budget, knowledge, technology, methods and market, revealing the main resources needed in the process of implementing the national strategy.

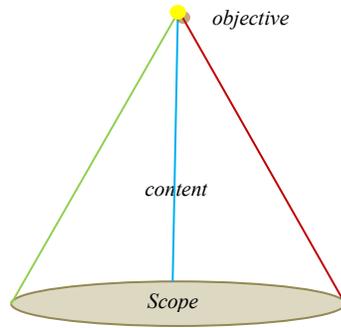


Fig 1 Sketch framework of the national strategy for digital records

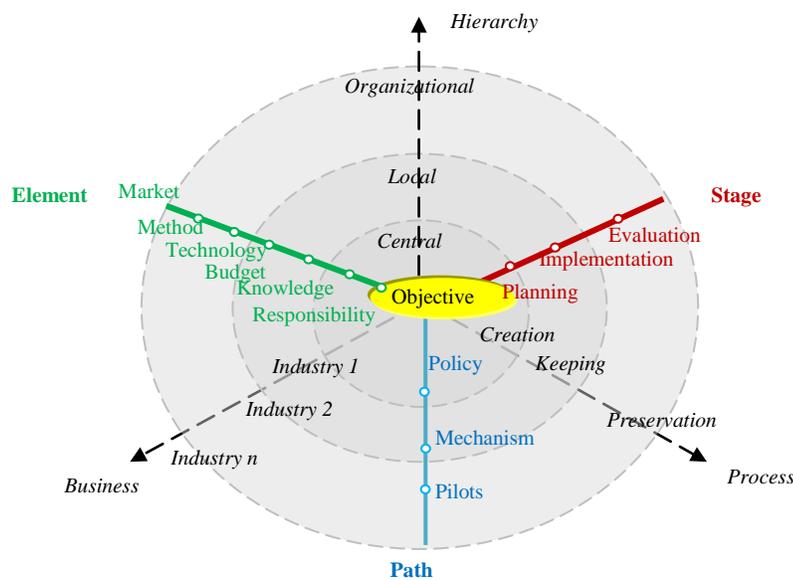


Fig 2 Detailed framework of the national strategy for digital records

By analyzing the domestic conditions and global experiences according to the framework, basic features of Chinese national strategy for digital records should consist of the following aspects:

- Nationwide. China is a centralized country. The national strategy should cover both the central and local level, which is very different from those federate countries. It requires that both the overall strategy and the specific measures should be implemented in the records creating and archives management organizations of all levels and types throughout the country. Local pilot practices should be supported, supervised and extended by the central authorities.
- Coordination. Almost all of the former policies, regulations and projects were lead by the stereotyped passive thinking of “just following the business”, which made the actions serve the current, partial and departmental purpose and resulted in misunderstanding, time-consuming labor and contradictions. For example, in dual-capture system, the records managers have to ask the decision-maker to provide hand signature on the hard copy he or she has already approved via the network, because the current laws

made different provisions towards the question if and electronic records could serve as legal evidence. Separate administration is the systematical reason of disjointed transaction of records creating, recordkeeping and records preservation. A re-organized and creative mechanism should be established and provide the basic power for real implementation of the national strategy for electronic records. (Liu, 2009)

- Policy-guiding. Policies play a critical role in every country or region, yet they have great influences particularly in China depending on its administrative system and power. The records managers and archivists have the tradition to look for the administrative support when in trouble. Suitable and harmonizing policies including laws, regulations and standards should be the key part of our national strategy.
- Comprehensive methods. Electronic records management and preservation could only be gradually improved through a variety of means, such as policy, legislation, standard, technology, scientific research and market. The archival profession should change introspective tradition and strengthen the cooperation with other parties, including business sectors, IT service provider, universities and research institutions, etc.

Current development

The most important measure of Chinese national strategy for digital records is that a multi-players coordination mechanism has been established which can promote coordinated actions to solve mutual problems. In the end of 2009, “National electronic records administration joint inter-ministry conference” came into being. Several representative ministries participated in this conference including General Office of the State Council, MIIT, SAAC, Administration for the Protection of State Secretes and National Standards Institute etc. According to *Interim Regulation on Electronic Records Management (2009)*, the conference has the responsibility to develop overall plans and coordinate the national governance regarding digital records management and preservation. The executive office of national electronic records administration joint conference has been set up. The first 5-year national plan was issued in 2011 and was carried out by the conference and its executive office. The research team of RUC undertook the research of this 5 year national plan and provided the draft by the way of literature review, questionnaire survey towards 30 provincial archives, 16 sub-provincial archives, 2 public company groups and experts comments for over ten times.

The first 5 year national plan set up the goals as follows: to guarantee the authenticity, integrity security and usability of electronic records, to improve the effectiveness and efficiency of e-government and e-business, and to pass down the digital memory of the society. 7 main tasks were proposed for ERM and ERP including mechanism improvement, legislation, standardization, ERM and TDR implementation, system certification, training and research. Several achievements have been gained through the following measures:

- Several local governments have established and are establishing a coordinate mechanism following the central experience. A national coordinate network is coming into shape.
- A set of basic and imperative regulations, standards and guidance are under development. Drafts for Chinese ISO 15489-1 and ISO 23081-1 were completed in 2008, and finally issued in 2010. In 2009 SAAC published “*Metadata Standard for Administration Electronic Records*” (DA/T46-2009) which specified both recordkeeping and preservation metadata with regard to administration electronic records. Jiangxi Provincial Archives also developed local metadata standards on audio and video records. Drafts of *General functional requirements for electronic records management system*, similar to DoD 5015.2-std, Moreq2, and ICA Req, together with *General metadata sets for digital records* have been completed, and ready to be issued this year.
- The first national pilot projects have been started from the beginning of this year. Up to May, 2012, more than 10 organizations have got the opportunity to conduct national pilot projects, which includes central government agencies, public enterprises and local archives. Not only the typical administration records but also operational records, e.g. customs records, land management records, design drawings, will be managed in these pilots.

Conclusion

Electronic records management and preservation in China involves multiple players and multiple leaderships along the whole lifecycle of records. The dissociated responsibilities on records creation and archival custody results in conflictions and also overlapping on records management measures, which is getting worse along with the administration reform and spread of IT applications. The promoters of national strategy for digital records in China should take advantages of the strong points of the centralized archival administrative system, gather the expertise, capital, research resources all over the country, and focus on the preliminary and key problems of digital recordkeeping and preservation, such as the standards development, software compliance, and implementation of ERMS, metadata schema, and TDR, etc.

Although China is taking the first step of the national strategy for digital records, there is still a long and hard road ahead of this big country. The research team suggests to:

- Optimize the archival administration network, promote the multi-institution cooperation, and extend the functions of archival departments. The establishment of mechanism of “national electronic records administration joint inter-ministry conference” is good news for coordination. At the same time there does exist a dangerous probability that archival profession would lose some of their power in electronic era.
- Build up access rules to ERMS and TDR market. With the incoming development of the standard of ERMS functional requirements specification, the quality of the systems can get baseline guarantee by testing the off-the-shelf software to examine if they can got compliance with the standard. (Liu, 2010). RUC has just set up a laboratory to explore and conduct software compliance testing.

- Develop the rules of system project planning and audit, and assure the quality of digital recordkeeping system and preservation projects and the efficient usage of public budget. This measure is of extreme essence in case of pilot programs.
- Improve the cooperation. There is large scope to facilitate the relationships and information sharing between archival administration departments and the society of industries, within the fields of digital information preservation, between different levels of archival authorities and different types of archival institutions.

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National Strategy for Digital Records: The Story of Canada

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Summary

In the digital environment in Canada, there is a growing recognition that cross-sector, multi-disciplinary approaches are required to address a set of shared issues concerning the preservation of digital information. Obviously, digital records form an indispensable and irreplaceable part of digital information. Allying with other key stakeholders involved in digital information management, LAC issued a report on Canadian Digital Information Strategy (CDIS) in 2010, which aims to strengthen Canada's ability on digital information management on 3 aspects, i.e. strengthening content, ensuring preservation, and maximizing access and use. LAC's transformation to modernization and TDR development are the initiatives which enrich the design of national strategy and also put forward its implementation.

1. Background

Digital information and networked technologies are key drivers of economic growth and social well-being in the 21st century. In today's information economy, nations who actively nurture their digital information assets and infrastructure will prosper; those who do not will fall behind. In order to strengthen Canada's presence, participation and ability to compete in a global information market, and to reflect the fundamental values of Canada in the digital realm, including bilingualism, multiculturalism, inclusiveness and equality, Canada has been taking measures to manage its digital information strategically.

Among the ubiquitous digital information environment, digital records form an indispensable and irreplaceable part of the operation of any organization. They serve as not only one type of information resources, thus requiring to be managed as corporate assets, but also evidence of decision-making and actions taken, the availability of which lays the foundation for transparency and accountability. In this new digital era, where employees have the power to create and destroy information at their desktops, appropriate creation, management and preservation of records are not guaranteed.

There is a growing recognition that cross-sector, multi-disciplinary approaches are required to address a set of shared issues concerning the preservation of digital information. The digital

preservation issues are national in scope, and therefore a national strategy, involving all concerned groups and organizations should be developed.

2. Design of national strategy

Canadian Digital Information Strategy

In line with its mandate to preserve the country's documentary heritage and to support those involved in preserving digital information and making it available, Library and Archives Canada (LAC) has assumed a lead role in establishing the groundwork for the development of a national strategy for digital information. In undertaking this role, LAC recognizes that a truly national digital information strategy could not be undertaken by any single organization or government, instead it should be an inclusive, coordinated, distributed and sustained approach involving key Canadian organizations from all sectors responsible for the management of digital information.

LAC and other key stakeholders engage in the strategy development process, which is as followings:

In September 2005, LAC commissioned two reports to explore these issues pertaining transition to digital: "*Toward a Canadian Digital Information Strategy: Mapping the Current Situation in Canada*"^[1] and an international scan entitled "*Toward a Canadian Digital Information Strategy: A Review of Relevant International Initiatives*."^[2] Results of two reports showed that:

- Canada is weak in the scale of results and unremarkable when compared to other G8 and EU countries;
- Canada is not contributing substantially to global digital information research and development;
- There were no existing mechanisms to address digital information issues at the national, multi-sectoral level.

In October 2005, LAC hosted a discussion among more than 50 groups in an initial exploration of Canada's digital information issues. At this meeting, it was determined that the next step towards achieving a common understanding of 2 to 3 elements for a national strategy was to gather collaborative input from key stakeholders.

In Spring 2006, four collaborative meetings took place across Canada during April and May. Participation included digital information creators, producers, publishers, research communities, memory institutions (libraries, archives, and museums), rights bodies, universities and other educational institutions. Each session focused a topic that was key for a national strategy. The

four topics are *Digitization on a National Scale, Optimizing Digital Production, Building a Digital Preservation Infrastructure, Fostering Access and Use within a Rights Framework*.

Through a series of meetings, LAC consulted with over 200 stakeholder organizations: publishing and media producers, creators, rights bodies, academics, provincial and federal officials, and memory institutions. The consultations culminated in a National Summit in 2006 at which broad consensus on the elements of a national digital information strategy emerged. Responsibility was conferred on LAC by Summit stakeholders to prepare a draft strategy for public consultation. The draft version was published for commentary in October 2007. The final report titled “Canadian Digital Information Strategy (CDIS): Final Report of consultations with stakeholder communities 2005 to 2008” incorporating feedback was published in 2010.

The CDIS aims to fulfill the following 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.

The Strategy identifies three key challenges to be addressed in pursuit of this vision. The three challenges are *Strengthening Content, Ensuring Preservation, and Maximizing Access and Use*. Each challenge, in turn is linked to a set of goals, objectives and actions leading to desired outcomes in each challenge area.

LAC modernization

Modernization represents the transformation of LAC from an institution that gave priority to the acquisition and preservation of analogue materials (in print, film, videotape, vinyl records and other non-digital formats) while providing limited access to these collections, to an institution that promotes open access to Canada's documentary heritage for all^[3]. At the heart of the modernization process is the implementation of a strategic approach aimed at building a collection that is wholly representative of Canadian society. To that end, modernization is based on five key principles:

- LAC is collaborating with other institutions that share complementary mandates;
- LAC is redefining the selection process to ensure that its holdings evolve in line with its priorities and its expected long-term resourcing;
- LAC is improving access to the content of its holdings, particularly through digital technologies;
- LAC is preserving both digital and analogue documentary heritage; and

- LAC is building its capacity to manage and carry out its mandate.

To further these ends, LAC has embarked upon a comprehensive set of Modernization Innovation Initiatives (MII), twelve in all, which focus on the core activities of human resources, information management, appraisal, resource discovery, holdings management, digital preservation, and stakeholder engagement.

LAC also reengineered its core business to three pillars, which are acquisition, preservation and resource discovery.

Acquisition

Acquisition is largely about finding the most meaningful documentary heritage in a world of abundant information. The purpose is to institute a systematic approach to the professional justification of the acquisition of documentary heritage. At the same time, the intent is to open the door to new approaches and new relationships with memory organizations at provincial, regional and local levels in order to ensure that the acquisition of documentary heritage is made by the most appropriate institution.

Preservation

Preservation resources are limited and LAC is concerned about its capacity to sustain its documentary heritage for future generations. In LAC's modernization initiative, preservation has a lead role in promoting the institution's uniquely legislated mandate. It informs acquisition decisions to ensure that LAC acquires only the documentary heritage it can effectively preserve, and makes it possible for Canadians to access and make use of their heritage.

Resource Discovery

The components of resource discovery includes: LAC's collection; descriptions; tools for exposing metadata; services to the public; and, engagement of clients. LAC is steward of only a fraction of Canada's continuing memory and, as such, it must work within broader national and international networks. LAC and other institutions have complementary mandates to provide access to Canada's documentary heritage. LAC will develop, in consultation with partners and stakeholders, an overarching national strategy for acquiring and making available the national documentary heritage in a way that is more focused, distributed and collaborative.

There are four guiding principles to assist in LAC's acquisition, preservation and resource discovery process, which are *Significance, Sufficiency, Sustainability, and Society*.

- **Significance:** the documentary heritage material that best represents the development of Canadian society and its identities, cultures, values, and experiences, which is captured for past, present, and future generations of Canadians, and for others interested in Canada.
- **Sufficiency:** LAC's capacity to fulfill its mandate in collecting Canada's documentary heritage in adequate quality and quantity to meet the objectives of the institution and Canadian society.
- **Sustainability:** align LAC's acquisition activities with the institution's capacity to preserve and make accessible documentary heritage over time.
- **Society:** emphasize the broad social context within which LAC exercises its documentary heritage mandate.

Key stakeholders

Modernization recognizes that Library and Archives Canada (LAC) cannot have a monopoly in relation to Canada's national heritage due to the massive volume of information available and the many new ways that documentary heritage is generated. The conception and implement of the national strategy for digital records requires a new model, in which LAC shares many of its responsibilities with a wide range of stakeholders, including:

- creators, producers, publishers
- research communities
- memory institutions (libraries, archives, museums)
- rights bodies
- universities and other educational institutions

LAC and other institutions will benefit by collaborating to appraise, acquire, preserve, describe and enable access to the most representative documentary heritage produced by Canadian society.

The roles that LAC can potentially play in the national strategy of digital records management are: Foundation Building, Collaboration, Program, and Transfer.

- **Foundation Building** involves the creation of relationships with LAC's designated communities, offering and receiving guidance, advice, support, and consultation in both formal and informal approaches.
- **Collaboration** refers to the joint activities or transactions involving LAC and other parties with compatible objectives who agree to combine inputs (financial or in-kind) to share in defined risks and benefits for the purposes of acquiring Canadian documentary heritage material.

- Program refers that a collection development process that is designed in response to a shared, ongoing, or strategic need or opportunity that is championed by upper management, and accessible to multiple participants/applicants (rather than a single partner).
- Transfer means when LAC has specific legal obligations emanating from the LAC Act regarding Legal Deposit publications, archival government records, and ministerial records.

Initiatives

In the implementation of the national strategy, consensus emerged on the need to establish a network of preservation repositories in Canada. 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.

LAC is putting the elements in place to serve as a TDR which 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.”^[4] LAC TDR is based on the OAIS reference model; it can provide a set of trusted services that provide reliable and persistent access to, along with reliable storage and long-term preservation of the digital collections at LAC.

The high-level design of LAC TDR to preserve records is as followings:

Channels

The transfer of digital information assets into the LAC TDR will take place via a number of ingest channels. The transfer channel employed is partly determined by the content, these are brought into LAC collections through OAI harvest. Government electronic records at the moment must be transferred via a specialized transfer application that is installed into the client’s EDRMS system.

Metadata capture

The more structured forms of ingest enable the capture of extensive metadata – for example, both the web upload form for electronic publications and the electronic records transfer application allow for the capture of extensive metadata from the creator of the digital asset.

Technical validation

Regardless of the form of ingest, all digital assets have to pass through a technical validation process before they can be stored in the LAC TDR ingest zone.

Content validation

The first collection-specific action is to verify that a digital asset properly belongs in the LAC permanent collections. For archival records this means validating the content of the asset under the terms of a Records Disposition Authority, or RDA. The RDA terms and conditions are then cross-walked onto the file classification plan of the governmental agency. The file codes for archival files are then compiled into an XML-based list that is loaded into LAC TDR. LAC TDR systems compare the file code associated with a given SIP against the list of file codes for archival documents. If the file code is listed as archival, the system requests confirmation of this decision by a collection management archivist. If the file code is not included in the list, it is classified as an exception and routed to the collection management archivist for validation or exclusion.

Assumption of legal custody

Once all of the SIPs for a given transfer of electronic records have had their content validated in this manner LAC then takes legal custody of the archival records. This stage is important for any records transfer as the agency which has legal custody of records is the agency which must respond to any request for information under an ATI request.

Transfer of descriptive metadata to MIKAN

Once the transferred records have been validated as archival, LAC TDR staff and systems process and describe the records in order to make them available to LAC clients. The first step in this process is to verify the access rights of the metadata of an individual archival record (in this context, an archival record = metadata + digital object (e.g. a spreadsheet or wordprocessor file). The metadata must be reviewed by a staff member to determine whether it can be exposed to the public through MIKAN, the LAC descriptive metadata management system for archival records.

Item-based access to digital assets

Digital objects must be reviewed by access rights staff and are reviewed either item-by-item or file-by-file, in response to access requests from the public. The transfer of descriptive metadata from LAC TDR to MIKAN has been entirely automated at the lower levels of archival description, namely the file and item levels. With the transfer of descriptive metadata into MIKAN, LAC clients, including records creators and the general public, can discover the digital assets as they would discover traditional paper records or records in other media.

Access rights managed by LAC TDR

Access rights to these records are controlled in LAC TDR, which is why the access rights statement appears when the user clicks on the permanent ID, rather than being written into the descriptive record that appears in MIKAN.

3. Key features of national strategy

Establishment of national strategy for digital information

Canada undertakes a strategy on the national level for digital information (including digital records), which is unique among the countries undergoing the similar digital information preservation challenges^[5]. The key stakeholders in Canada involved in digital information creation, management and preservation recognize that many of the challenges are shared across multiple and diverse sectors of society, the resolution should focus attention on the need to foster closer cooperation among the stakeholders. They also recognize that the establishment of Canadian digital information initiatives in a strategic context would accelerate Canada's efforts to position itself on the world stage. Furthermore, the needs of all Canadians—citizens, scientists, students, creators and workers should be met, and the fundamental values of Canada, including bilingualism, multiculturalism, inclusiveness and equality, should also be reflected in the digital realm, which requires a national strategic framework.

LAC assumes a lead role in the national strategy

In the conception and implement of national strategy for digital records, LAC assumes a lead role. According to the report of LAC's study on the current situation of digital information/ records management in Canada, i.e. "Toward a Canadian Digital Information Strategy: Mapping the Current Situation in Canada", despite the many technological and legislative hurdles, libraries and archives are the organizations most actively involved in the preservation of digital information. And, it is the library and archives communities that are raising the alarm about the urgent need for action in regards the preservation of digital information^[6]. As a national library and archives, LAC has the legislative mandate, "to preserve for future generations the documentary heritage... (and) to provide professional, technical and financial support to those involved in the preservation and promotion of the documentary heritage and in providing access to it" (Section 8(1).i). Thus, LAC steps forward to offer leadership in the development of consistent and effective approaches to the preservation of digital information regardless of the sector in which it is generated.

Enabling a lifecycle approach to managing digital records

In the digital environment, the lines between information creator, information consumer, and information manager are blurring: 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. Under this circumstance, digital preservation requires a shift in organizational thinking towards a lifecycle approach to managing content, which should include Strengthening Content, Ensuring Preservation, Maximizing Access and Use. 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. Preservation in the digital environment requires management throughout the lifecycle of the digital object, demanding a cooperative approach from all actors: producer, consumer, and archive. There is a need for an accountability framework to ensure that roles and responsibilities for digital information preservation are clearly assigned.

4. Conclusion

The National Strategy provides a broad-based, stakeholder-informed view of the areas of digital information creation, management and access which need concerted action from across all information sectors.

LAC's own priorities, which as follows, reflect the growing demand for preservation of both new digital documentation and continuing analogue collections:

- Increasing digital capacities to store and access materials;
- Implementing a whole-collection approach to preservation decisions;
- Sharing efforts in a stronger preservation community.

To address these priorities, LAC will undertake initiatives that engage institutions with complementary mandates and provide practical applications of the guiding principles and key roles in the context of preservation.

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