

The Digital Preservation of Culture: Exploring a Strategy for Sustainability

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Abstract

While there is a proliferation of digital media in all formats—from videos and images to blogs and wikis—the belief is that what resides on the Internet is “safe”. The startling fact is, however, that all of this information in digital format is in danger of being lost into digital oblivion. The much heralded “Information Highway”, beckoning before us is crumbling in the rearview mirror.

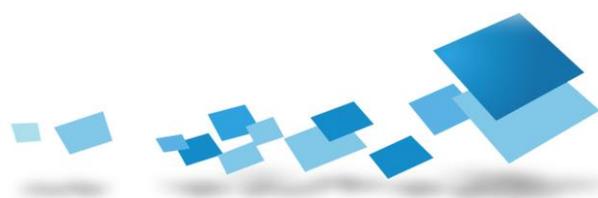
Preserving all of the digital content that we create is a daunting, if not impossible, task. Due to the nature of technology-driven content, preserving digital materials brings new challenges with pressing immediacy. What resources and technologies are required to guarantee future access and preservation into perpetuity? Who are the key stakeholders and where do their interests lie? How can digital preservation be sustained to make it economically viable into the future?

This paper seeks to ask the hard questions. It proposes pragmatic solutions that are based on a sustained approach to digital preservation. This includes examining the cultural, technological, operational, legal, and economic issues that impact long-term digital preservation.



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Introduction

Despite the global recession, we are experiencing a revolution in digital technology. Emerging Internet-based tools have given us the ability to create, transmit, and distribute digital content quickly, cheaply, and more easily than ever before. As a result, the volume of digital content is increasing at an exponential rate. And with each new generation of technology, it becomes more complex and elusive.

While there is a proliferation of digital media in all formats—from videos and images to blogs and wikis—the belief is that what resides on the Internet is “safe”. The startling fact is, however, that all of this information in digital format (content that is “born digital”) is in danger of being lost into digital oblivion. The much heralded “Information Highway”, beckoning before us is crumbling in the rearview mirror.

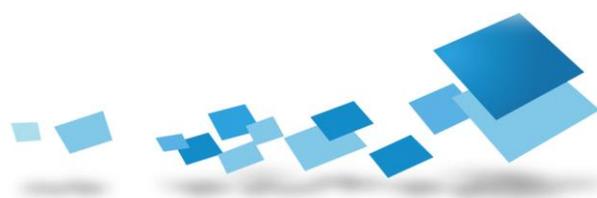
Preserving all of the digital content that we create is a daunting, if not impossible, task. Massive amounts of digital information that once existed are already irretrievable. The famed Domesday Book, documenting England in the 1080s, has already outlived the digital copy made in the 1980s and is now unusable. Given that our current unchecked growth of digital media is unsustainable, proactive efforts must be made now to ensure the preservation of our digital memory.

The traditional practices for preserving analog materials are not sufficient for digital objects. Archiving digital content is much more complex than storing a file and forgetting about it. Attics and basements where organizations consigned paper files for decades do not exist in the e-world. Due to the nature of technology-driven content, preserving digital materials brings new challenges with pressing immediacy. What resources and technologies are required to guarantee future access and preservation into perpetuity? Who are the key stakeholders and where do their interests lie? How can digital preservation be sustained to make it economically viable into the future?

This paper seeks to ask the hard questions. It proposes pragmatic solutions that are based on a sustained approach to digital preservation.

By definition, *sustained digital preservation* requires that preservation-related activities are financially, organizationally, and culturally sound. The approach casts a net that reaches beyond government-focused and culturally-based mandates to address the cultural, technological, operational, legal, and economic issues that impact long-term digital preservation¹. It is an approach that is rooted in the rapidly evolving international standards for maintaining authentic digital records and managing records in a modern administrative environment.

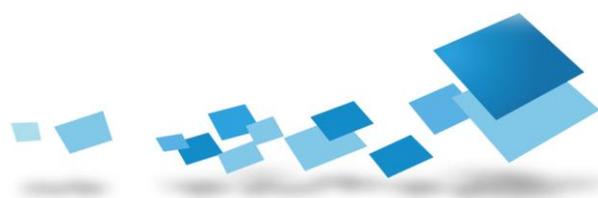
¹ Bradley, Kevin. *Defining Digital Sustainability*. Library Trends - Volume 56, Number 1, Summer 2007



The potential exists to mobilize our intellectual capital, ensuring that the research, databases, and creative expressions of our society are appropriately available to all. It is on just such a foundation that innovation and creativity can thrive, stimulated by the insights of others and taken to new levels.

Sustainable digital preservation now underlies the basic social fabric. Records of decisions and actions have relevance and impact long into the future as legal issues, constitutional precedents, borders and boundaries, sovereignty, and rights of individuals, groups, and organizations rely on the foundation of reliable recordkeeping. These records, in all sectors and within families, are increasingly digital. Preservation requires choices and the allocation of time and effort if we are to avoid collective amnesia. The issue is urgent.

We now communicate easily and almost instantaneously across vast distances in complex ways. But can we still communicate across time? The information and records we create, our recorded memory, have been termed “the gift of one generation to another”. What will our legacy be?



To Preserve or Not to Preserve

"What's past is prologue" William Shakespeare, The Tempest

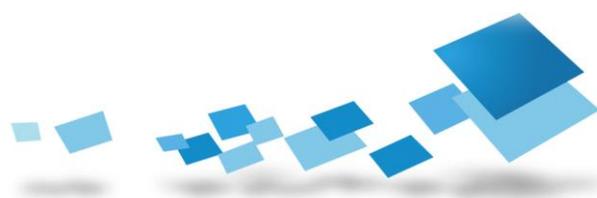
Information preservation is a continuing and critical activity in human history, culture, and the development of civilization. Society is based on our ability to learn from those who have gone before and to build on their knowledge and experience. As Shakespeare's quote so succinctly states, our past facilitates our understanding of and our approach to the future. Over the centuries, our inherited knowledge has been abbreviated by wars and natural disasters with the burning of the great Library of Alexandria, the Lisbon earthquake, and countless other losses. Humankind is the poorer for it. The digital age enables us to share and link information in ways we are still imagining. But it rests on a foundation of ever-changing hardware and software. A proactive effort is required to sustain the content.

Early information capture goes back many years; indeed as far back as 17,000 years when we consider the Lascaux Caves. The discovery of the caves in 1940 ushered in a new era in of knowledge in prehistoric art and human origin. Today, the caves continue to educate and inspire, but they do so virtually. Visitors are not allowed to physically tour the caves; instead the caves are beautifully rendered in a digital experience available online at www.lascaux.culture.fr. This Web site demonstrates the promise of technology to sustain and preserve our most treasured artifacts for continuing access, regardless of geographic location, education, or socio-economic background.

The concept of digital preservation is widely discussed by librarians, archivists, historians, computer scientists, and even engineers. Broadly defined, digital preservation is the set of processes and activities that ensure continued access to information and all kinds of records in digital format. While this does include the preservation of materials resulting from digital reformatting, it focuses primarily on information that is "born-digital" and has no analog counterpart.

Preservation as a cultural process

Preservation is a matter of conscious choice. In the digital world, it can no longer be left to chance or the dedication of a file clerk. Everyone is his/her own archivist. For all of us, pressed by the imperatives of today's demands, dealing with yesterday's record is a task of low priority easily postponed to a "quiet" day, or more likely, never. In many governments and modern organizations, information and records are being formally re-conceptualized as vital assets: assets that all managers must manage as effectively as they manage budgets, space, and staff. They are being held accountable and auditors are realizing that their ability to perform their function rests upon the integrity of the record. Auditors seldom audit what was done; they audit what has been documented. Similarly the legal defense against allegations draws upon the integrity of the record. The techniques of e-discovery enable a thorough search of all electronic records, revealing gaps, mismanagement of recordkeeping, and all the trivia of emails. In



the e-world, accountability has taken on new force and meaning, reconfirming the necessity of effective recordkeeping.

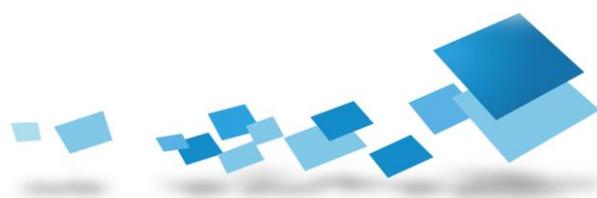
As a society, we also need to learn the skills of the archivist: in appraising and selecting what has value for the long term while actively discarding the routine that has fulfilled its purpose. Vital emails are submerged in the chaff of the trivial, and the final version of that great report is lost amongst the edits and versions. You, as both creator and consumer, are best placed to identify what has continuing value and what does not. But it requires a decision; decisions that once made can be built into the software and enable the system to assume much of this responsibility. But the choices and the decisions must be made before the system is overwhelmed and some arbitrary approach imposed by the system administrators.

With social media, selection becomes even more difficult. As the cost of mass storage comes down, it is possible to download and retain all of Facebook® and YouTube™. But is it necessary or desirable? We need a discussion in our societies regarding what we want to keep and what we will allow to disappear. Societies need to make choices suited to their standards and values at a given time. The Library of Congress has recently announced that it will retain all of Twitter™. But any message, even a “tweet”, derives its meaning from the context of the moment. After a few days, do we remember the context of that brilliant tweet; and will others a few years from now even understand it?

The Privacy Commissioner of Canada, Jennifer Stoddart, has taken the lead internationally in studying the privacy impacts of the policies and programs of various social media sites. Facebook has modified its approach based on her advice. Young people place a great deal of information about themselves, their friends, and their families online. It is new, fun, and engaging in its exuberance. But should we keep it all? A decade from now a search by a prospective employer or a security check will come across this information. Youthful indiscretions are often best left forgotten. Society must remember, but it must also be allowed to forget. Choices must be made.

It could be argued that in order to obtain comprehensive records, saving everything minimizes the risk of losing digital artifacts. When we examine the current state of the Internet, this is impossible. Most of the content on the Web, what is called the “Deep Web”, is not available to the public. The Deep Web refers to content that is not indexed by standard search engines due to privacy issues and limitations in crawler technology. The surface or public Web is made up of 21 billion pages—less than one percent of what is currently online. Future researchers and lawyers may very well be interested in this depth of information as a source, but at the moment due to privacy, legal, and technology issues, the Deep Web remains vastly unexplored. If we are unable to access all of it, we will not be able to save all of it.

Key stakeholders of digital preservation, the governments and institutions involved, need to develop evaluation guidelines for digital collections. Bit-level preservation selection should be a process that begins when digital objects are added to a trusted repository. Upon ingestion or even creation, we need to



determine which digital objects should be preserved, which method to use, and for how long.

What constitutes value in today's digital world? Is a video as valuable as a research paper? The question is a difficult one, and the answers depend on preservation objectives, financial support or funding, legal issues, and the overall impact of the digital object on culture or education. We can no longer leave it to later generations to collect digital objects created today. For the stakeholders involved, they must assume an active role as curators of collections to develop the guidelines and make the hard decisions.

Preservation as a technological process

Once the choice is made to preserve content, preservation becomes a technological process.

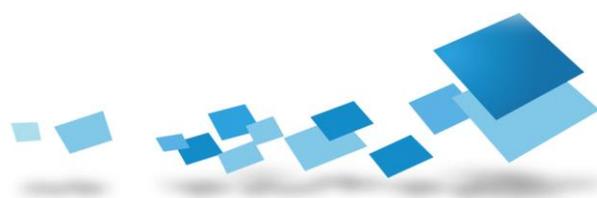
Content that is born digital must be digitally preserved. At its most fundamental level, digital preservation is concerned with preserving the bit stream—the ones and zeros that constitute a digital object.

Preserving digital objects (also referred to as digital content and digital media in this paper) involves procedures that are very different to the preservation of analog materials. Sources such as manuscripts, posters, prints, maps, book, journals, and letters are “captured” and recorded onto physical media for access. The digital world transforms traditional preservation activities from protecting the physical integrity of the object to specifying the creation and maintenance of the object, while guaranteeing authenticity and access.

The preservation of the order of the bit stream is essential for long-term access to digital objects. To ensure future preservation of digital information, we must be able to verify that information is authentic and access it as a reliable record. There must be a way for users to find information and view it, or render it, in its original format. This is not always possible, however, because the environments that digital objects are created in are changeable. Preservation is a challenge because digital creations are built on technologies that are constantly evolving. The bit stream is not fixed; it must be rendered each time it is consumed. Long-term preservation, then, is dependent upon the technologies that enable us to access content—technologies that are often made obsolete by upgrades or new releases.

The complicated nature of digital media necessitates a layered approach to digital preservation. A number of approaches are currently at different stages in research and development: migration, emulation, refreshing, persistent object preservation, technology preservation, and so on. Although there is no definitive solution or strategy for preservation, there is a similitude in the underlying components required, which includes the following:

- A trusted repository: the infrastructure required to store and distribute digital content, best networked with other trusted repositories on different power grids in case of disaster



- Specialized services for the management of digital objects or assets, including digital asset management, metadata creation, and content lifecycle management
- Additional services that support processes such as migration or emulation
- The interface that provides access to digital assets, based on user permissions

These functional layers can be offered as separate yet interoperable services that can be combined in various ways to support different forms of preservation activities—from bit preservation to migration to new formats. With the emergence of new technologies and outsourcing applications to the “Cloud”, other preservation structures are also possible. In the private sector, business solutions are increasingly being outsourced from multiple service providers. This holds promise for the field of digital preservation in the potential adoption of an outsourced approach, where various components are delivered as separate on-demand services distributed across multiple organizations for greater efficiency and economies of scale.

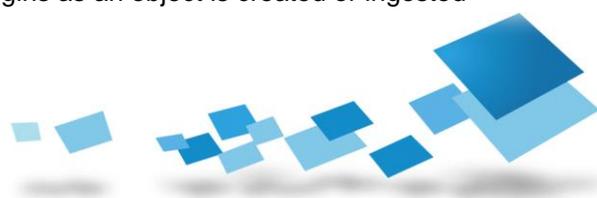
The [National Archives and Records Administration \(NARA\)](#) in the United States supports a similar infrastructure in their *Persistent Archives and Electronic Records Management* project. The proposed system effectively combines elements from supercomputer centers, digital libraries, and distributed environments. While potentially more cost effective and efficient, an important consideration for this decentralized approach is the requirement for diverse systems to interoperate seamlessly with distributed services and any number of repositories.

A trusted repository

Digital or bit preservation requires a secure and stable technical infrastructure based on a trusted repository, or a network of repositories. According to a working definition of sustainable preservation, long-term value is created as digital objects are stored, protected, managed, rendered, and accessed for reuse. A trusted digital repository delivers each of these services to a community of users, while maintaining the integrity and the authenticity of the original source material in an online environment.

Digital asset management

The goal of digital preservation is to move beyond maintenance to the provision of universal, transparent, and continued access to digital assets, regardless of device or interface. For preservation to be sustainable, a trusted repository must also provide the mechanisms required to acquire, manage, and disseminate digital objects. This set of activities includes the ingestion of digital files in the appropriate format along with the ability to add metadata to files to preserve them as technology evolves. The practice of preserving the content and its accessibility is called Digital Asset Management (DAM). DAM describes the process of ingestion, management, and distribution of digital objects. In adopting this process, the process of preservation begins as an object is created or ingested



into the trusted repository and should continue throughout its lifetime of production and distribution.

For more information about DAM, refer to Chapter 10 of [Managing Content in the Cloud](#).

Content lifecycle management

Perpetuating access to digital materials over the long term involves careful DAM practices throughout the lifecycle of content. When a new digital resource is acquired, it is simultaneously ingested by the digital repository's system. While the resource is being prepared for circulation, it should also be prepared for long-term retention.

Content Lifecycle Management (CLM) helps organizations manage all types of content from initial creation through to final disposition. The same practices can be applied to digital content for preservation purposes. Records management is a subset of CLM and describes the process of identifying, classifying, storing, preserving and destroying records. Within a trusted preservation repository, RM-like policies and procedures around content will determine how long files should be retained and which files should be preserved in perpetuity.

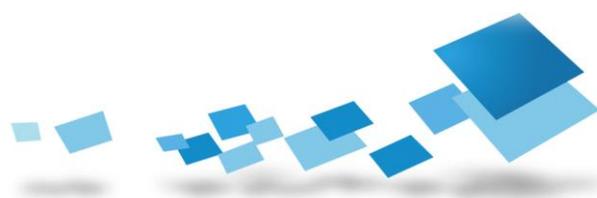
More information about CLM is available in Chapter 5 of [Managing Content in the Cloud](#).

Metadata

Metadata is one of the most important factors in sustaining long-term access to digital content. Metadata is data about data that allows users to find, access, and render digital media. The metadata associated with digital objects determines how users can access content and in what context.

Metadata includes descriptive information about the file itself and enables users to locate content according to the internal structure of the object. To maximize access, authenticity, and reuse of a digital object, metadata should include all references to the object such as annotations, glosses, quotations, cross references, and hyperlinks. How a search engine selects, organizes, and presents information, for example, can invariably distort context. When we consider how to best preserve a Web-based research paper with all links intact, the overwhelming challenges of digital preservation become clear.

Metadata is provided when digital objects are ingested into a trusted repository. For this reason, a common standard metadata framework, used by both the producer and the repository, is ideal. Like cataloging, the manual application of metadata is a labor-intensive and costly endeavor. Standards are currently being developed and used in preservation to automate and facilitate metadata creation, including METS and PREMIS, as used by the [Library of Congress](#) in the US and [Planets](#) in Europe.



Metadata is described in detail in Chapters 4 and 10 of [Managing Content in the Cloud](#).

The development of standards

We have explored how metadata standards can support the streamlined submission of digital objects into a repository. The more standard a digital object is, the easier it is for the digital repository to ingest it, manage it over time, and render the object in its original form. Most repositories in libraries and archives assume responsibility for preservation only if the objects are in certain file formats accompanied by specific metadata.

In a greater context, the development of standards promises to benefit many aspects of preservation. Much work has already been completed in standard development. In 2002, the Open Archival Information System ([OAIS](#)) reference model provided details for a repository structure that was mindful of the impact of new technologies, with support for evolving media, data formats, and user communities.

Additional initiatives, including Australia's [National Library](#), the University of Michigan's [OAlster project](#), and the [Budapest Open Archive Initiative](#) have experimented with preservation standards as proofs-of-concept. The Digital Repository Audit Method Based on Risk Assessment (DRAMBORA), developed jointly by the [Digital Curation Centre](#) (DCC) and [Digital Preservation Europe](#) (DPE) in 2007, characterizes preservation as a risk management activity and provides an audit methodology. An International Standards Organization (ISO) working group has been set up to move forward on standardizing this methodology.

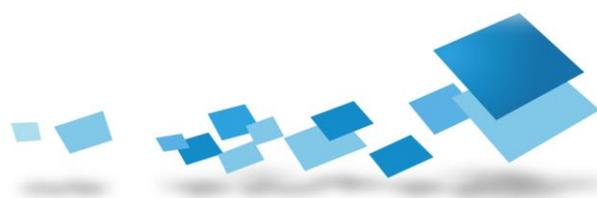
While many of these standards have been accepted and even applied in some instances, much work remains to establish standards across a range of digital objects that require preservation.

Preservation as an operational process

The preservation of digital materials requires continual maintenance and management. Digital objects cannot be left unattended to survive into perpetuity. Even after they are saved, digital objects remain continually at risk. Software upgrades happen frequently, and files require duplication, auditing, migration, and maintenance according to recognized standards and best practices. To guarantee the preservation of long-term access to digital objects, preservation activities need to be adequately resourced with skilled professionals and a set of operating policies around technical, operational, and administrative requirements.

Operational policies and information governance

Information governance as it relates to preservation relies on a set of documented policies and procedures established around structure and staffing of a preservation system. Before considering a preservation strategy, it is crucial for



organizations involved to articulate a long-term information governance strategy. The strategy must include every stakeholder who is charged with or impacted by the efficacy of the program.

Governance structures will ensure that those involved have their responsibilities clearly defined while addressing required technology aspects, including what programs, standards, formats, and access permissions to follow. These governance structures ensure that access to content is secure and reliable. A preservation system will need to protect its digital objects against security breaches and natural disasters. Backup and data protection, disaster preparedness, financial viability, and security are essential for effective preservation.

Information governance is described in Chapter 3 of [Managing Content in the Cloud](#).

Preservation as a legal process

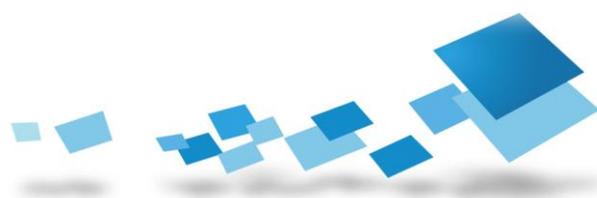
Preservation as a legal process involves protecting copyright and ensuring both the authenticity of content and the security of services around this content.

The management of rights and access controls for digital objects is an increasingly grey area, impacted by the exponential growth of digital content and free and open access to content on the Internet.

Intellectual property is central to publishing, entertainment, and media business models. These companies must ensure that they have the legal rights to use media and the tools required to protect information from inappropriate use, duplication, and distribution. Legal issues arise with the automated collection of digitally-based information for preservation. A good example of this is the [Google Books](#) project, which, in its efforts to give the public access to the largest online corpus of human knowledge, went so far as to digitize first and ask permission later. As a result, a number of publishers asked to have their works removed from the project after they had already been digitized.

Today's publishers of digital content, including writers, artists, and musicians, rarely sell their products; instead they license access to them on a pay-per-use or subscription basis. On the Internet, copyright protection is easy to circumvent for anyone familiar enough with pirating techniques, and infringement occurs on a regular basis. To prevent this, preservation should include strategies for technical protection such as Digital Rights Management (DRM) and the tethering of digital content. DRM offers access to control technologies, and tethered content is a form of Internet-based content delivery (or syndication) that enables the content producer to decide how their content is shared and consumed online. A trusted repository, along with metadata, should support the management of rights and restrictions on use of content as defined by contracts and license agreements.

More information on DRM is available in Chapter 10 of [Managing Content in the Cloud](#).



Preservation as a financial process

To date, collecting institutions like libraries, government archives, and museums have served as the stewards of preservation. They will, of course, continue to drive preservation initiatives. With the amount, characteristics, and complexities of digital objects, however, most collecting institutions will be unable to provide the resources needed to support the digital preservation process. The lifecycle of digital objects requires close and careful management, and for this reason, it can be expected that many stages of preservation will be outsourced to third-party vendors who specialize in different aspects of preservation.

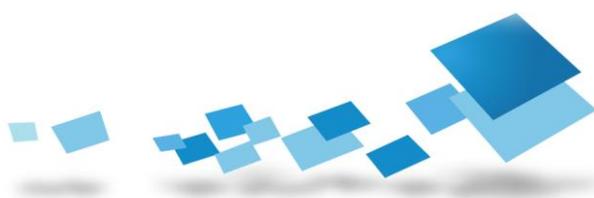
For preservation to be sustainable, organizations must work together to ensure that the appropriate resources are applied in an ongoing manner to digital objects. First and foremost, the process of preservation should be maintained by a governing body that oversees the technologies required and will persist over the long term. Both the technical and the operational infrastructure must endure over time if the digital objects themselves are going to persist. The repository should be stable enough to guarantee secure access to digital information. Maintaining this infrastructure requires dedicated and ongoing financial support.

For digital preservation to be successful and self-sustaining, new revenue streams must be combined with different and co-existing business models. Creating these models should take into consideration the key stakeholder groups involved, their interests in preserving digital culture, and the roles each will play in the process. If this is understood, incentives can be provided to motivate key organizations and institutions to contribute.

Partnerships for preservation

The stakeholder group for digital preservation is as broad as it is deep, ranging from universities and museums to libraries and research institutions. Each group faces similar challenges in digitizing their collections, developing standards for access and preservation, implementing infrastructure, and acquiring adequate funding. For this reason, many of these organizations are already working together to establish standards and share best practices.

The government must lead the charge in establishing a national agenda for sustained preservation, with a focus on preserving of culture for the future generations of digital natives. Only the government has the necessary influence to make preservation a national policy, drive incentives for preservation, and coordinate efforts across services, sectors, and stakeholders. A preservation agenda includes supporting unprecedented collaborative partnerships to help distribute resources, create economies of scale, and reduce the duplication of efforts. These partnerships would enable preservationists to outsource key preservation processes across different service providers, lessening the workload and refining expertise for a more efficient and streamlined outcome. To this end, commercial interests are not always at odds with preservation objectives, and preservationists would benefit from collaborating with private-sector organizations to leverage their solutions and learn from their experience.



Partnerships with commercial institutions are fundamental in raising the profile of preservation to national and even international levels. Commercial organizations are pioneering the development of digital technologies—from developing DAM and Enterprise Content Management (ECM) solutions to creating social media mashups and open source software. Many organizations are struggling to store, archive, and preserve their intellectual assets for reuse, especially as the baby boomers retire from the workforce. Much can be learned from the policies and procedures established around information governance, along with the development of technologies and standards in the private sector. As content is commoditized and libraries struggle with adequate resourcing, preservation will look more to the private sector for long-term services and solutions.

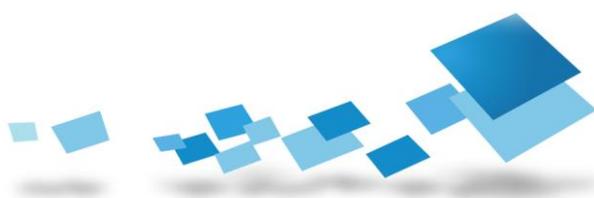
Digital preservation initiatives driven solely by the marketplace, however, will result in an uncoordinated patchwork of digital artifacts. The traditional information curators, librarians, archivists, NGOs, and historians should maintain a leading role in developing worldwide collaborative initiatives for making accessible significant and relevant content sensitive to the many cultural contexts and communities of users.

On the user side, digital preservation ensures ongoing electronic access to information, a requirement that is critical in today's digital world, where our children, as digital natives, are accustomed to accessing digital information from any place at any time across many devices. As consumers of digital content, they must be included in the preservation process to determine management and access issues. This expands the stakeholder group significantly and is exacerbated by increased access to the Internet through improved bandwidth and technologies. Access to digital information is a basic necessity for writers, journalists, researchers, educators, and students working in all fields. Here, preservationists and digital humanities can again benefit from the current policies established around end-user requirements in the private sector.

In short, governments are the new stewards for preservation. They must educate, inspire, and incite nations. For preservation to be truly authentic it must be inclusive of context—and this includes a cultural context. To be useful, our digital history must accurately reflect cultural diversity and pluralism in society. While ensuring the free flow of ideas by word and image, care should be exercised that people in all cultures can express themselves and make themselves known. Market forces alone cannot guarantee the preservation of cultural diversity, which is the key to sustainable human development. From this perspective, the importance of public policy, in partnership with the private sector and civil society, must be affirmed.

The first step is the establishment of a stakeholder organization or national board. That organization can then determine what should be preserved, decide on methods of digitization, assign resources, and regulate the procedure. As far as economic models are concerned, the government will need to establish policies to fund preservation for short-term access and long-term preservation.

Systematic mass digitization could begin with the large body of materials and studies published by the various levels of government, then older material outside of copyright. New approaches can be explored to deal with “orphaned” works or



works for which the author can no longer be traced. For materials out of print but in copyright, digital publication offers the prospect of a new revenue stream based on micro-payments for access. And, of course, publishers are exploring new online business models for recent publications. Local initiatives should link to national initiatives, and all contribute to developing a global preservation infrastructure. Online access should be multilingual and multicultural.

Stakeholders will need to begin today to define these new collaborative relationships in order to identify the digital objects that will be of the greatest value in the future so that they can be preserved into perpetuity.

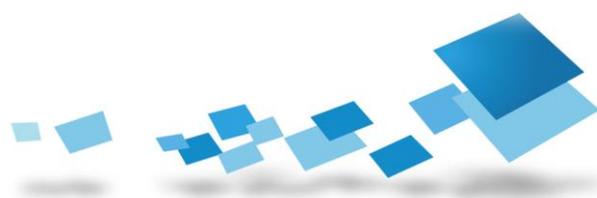
Conclusion

The challenges posed by digital preservation are far from unique to collecting institutions; many organizations in the private and public sectors grapple with effectively managing their digital records and preserving intellectual capital. For these organizations, preservation is critical to managing the lifecycle of content and making this content accessible over the long term to their workforce. Their requirements are driving the investments needed to develop suitable solutions.

A critical element in the definition of preservation is the ability to make digital content accessible to future users. Strategies around sustained digital preservation give nations the ability to make digital content available in new ways and offset costs of implementation by attracting new consumers and creating new revenue streams. The following benefits can be added to the traditional cost savings experienced by commercial organizations that effectively manage their content: improved access to information, reduced duplication of effort, and increased efficiency and productivity.

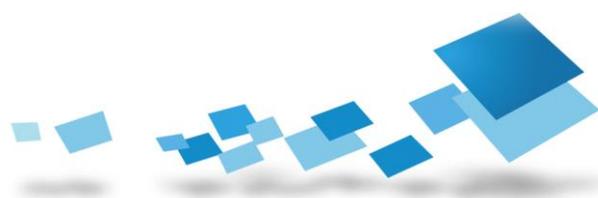
The involvement of organizations in the private sector to future preservation efforts is critical in defining the new collaborative models for preservation. A coordinated effort will result in the ability to access and use digital content that would have otherwise been lost. It will drive economies of scale and improve efficiencies at all levels of preservation. Joint ventures will direct preservation efforts as a matter of urgency and establish an interactive discussion on issues, establish national priorities, confirm standards and requirements for participation, secure financial support, and oversee the viability of the infrastructure.

Governments will be responsible for establishing the permanent infrastructure necessary to sustain digital preservation, with broadband access and a network of cooperating trusted repositories for the long term. Government agencies are currently being encouraged to improve their policy capability by digitizing their own publications and accumulated studies. They will be asked to match private sector contributions to provide incentives and assistance in preserving digital content that has been identified as a priority. A new level of public engagement is called for—one that will ignite the imaginations of citizens, and especially young people, to form creative communities based on emerging preservation-enabled business models.



There is a widely held belief with youth today—true digital natives—that if information is not preserved online, it simply does not exist. This is a silent threat to national histories across the globe. Proactive efforts must be made now to ensure that existing and new digital materials of value will be preserved and accessible for future generations. Discussions, education, and networks must be established between key stakeholders; standards developed around preservation technology; and new funding models studied and implemented to meet sustainability requirements. A sharing of powers, roles, and responsibilities, based on tested professional principles and respecting the imperatives of both cultural diversity and the marketplace is the most effective, long-term approach to sustained digital preservation.

Systematic mass digitization of national knowledge resources is a matter of pride and cultural sovereignty. It enables citizens to be engaged and informed on both local and national issues. It is also a means of sharing knowledge with the world and of providing access to modern library resources in developing countries. Such knowledge resources, developed through the dedication of generations of librarians and archivists, must respect that honoured tradition and continue as open, free public goods. A sustained approach to preservation will transform our scholarly institutions, great libraries, archives, galleries, and museums into our collective social memory: properly preserved, systematically growing, and conveniently accessible to all who wish to draw on it. This is the knowledge society, learning from the past to create and inspire the future.



About the Author: Dr. Ian E. Wilson

Dr. Wilson served as National Archivist of Canada, 1999 to 2004, and then as head of the newly amalgamated Library and Archives Canada. He retired in 2009 and received the unusual honour of being named Librarian and Archivist of Canada Emeritus. He is currently working with the University of Waterloo in establishing the Stratford Institute for Digital Media and has just completed a two-year term as President of the International Council on Archives.

Dr. Wilson's career spans many areas, including archival and information management, university teaching, and government service. He has worked diligently to make archives accessible and interesting to a wide range of audiences. While helping to safeguard the integrity of archival records and library services, he has encouraged public involvement and outreach. He has published extensively on history, archives, heritage, and information management, and has lectured nationally and internationally. He holds three honorary doctorates, is a Member of the Order of Canada, and was appointed Commandeur de l'Ordre des Arts et des Lettres by the Government of France. He is also a fellow of both the Association of Canadian Archivists and the Society of American Archivists.

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