

**Preserving the Long-Term Authenticity of Electronic Records:
The InterPARES Project
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As every archivist knows, the records created by individuals and corporations as evidence and memory of their actions need to be preserved, sometimes permanently, to protect individual and corporate rights, to serve the interests of social and historical accountability, and, more generally, to provide essential sources of information for research and study. Responsibility for the long-time preservation of records traditionally has fallen within the purview of the archival profession. As more and more records are created and maintained in electronic form, however, archival preservation methods require some adjustment to take into account the new reality of media fragility and technological obsolescence. As a result, the term preservation, as applied to electronic records, no longer refers to the *passive* protection of their physical carrier (their medium), it also refers to the *active* protection of their accessibility and authenticity over time. Protecting records accessibility means ensuring their readability and intelligibility over time; protecting their authenticity means ensuring that the records are not inadvertently or deliberately altered or corrupted over time.

Accessibility to authentic records over the long term is a critical need of individuals, organizations, and society in general. The International Research on the Preservation of Authentic Records in Electronic Systems (hereafter referred to as the InterPARES Project) was instigated to address this need. Its primary goal is to "develop the theoretical and methodological knowledge essential to the permanent preservation of authentic records generated and/or maintained electronically, and, on the basis of this knowledge, to formulate model policies, strategies and standards capable of ensuring that preservation." The project officially began in January 1999 and will conclude in January 2002. It builds upon the findings of a previous research project, entitled "The Preservation of the Integrity of Electronic Records," which was undertaken between 1994 and 1997 by researchers at the University of British Columbia. That project <<http://www.slais.ubc.ca/users/duranti>> aimed to establish standards for creating reliable electronic records and for maintaining their authenticity for as long as they reside in the original electronic system. In the course of the research, a number of concepts, drawn from diplomatics and archival science, were defined and elaborated, among them: *record*, *electronic record*, *the components of an electronic record*, *reliability*, and *authenticity*. Such concepts are fundamental to any sort of analysis of electronic records and systems. The InterPARES project differs from its predecessor by focussing on preserving the authenticity of electronic records that are no longer needed for the usual and ordinary course of business but that must be kept for broader social purposes and that either have been or will have to be removed from the original or "live" system. Although the InterPARES project will draw on the basic concepts and methodologies formulated by the previous UBC project, those concepts and methodologies constitute only a starting point.

InterPARES is an international collaborative project, which draws on knowledge from a wide range of disciplines and on the expertise of private, public and academic organizations from countries around the world. This is in recognition of the fact that the method of long-term preservation must be applicable across juridical systems, cultures and technologies and must constitute the foundation of international standards and protocols. The InterPARES collaborators are a consortium of eight national and multi-national research teams representing Australia, Canada, China, France, Hong Kong, Ireland, Italy, the Netherlands, Sweden, the United Kingdom and the United States. Although the research teams are headed primarily by archival scholars, they also include scholars and other specialists drawn from the humanities and social sciences, and from the computer, mathematical, and chemical sciences. One of the research teams is composed of a number of industries, including the pharmaceutical; chemical and biotechnology industries, as well as the computer, software, and high technology industries, all of which are represented by the Collaborative Electronic Notebooks System Association (CENSA).

The national teams include representatives from national archival institutions. These institutions will play a key role in

the project by contributing their expertise to the conduct of case studies and by testing research results. The participating institutions are: National Archives of Canada, National Archives of the United States, National Archives of Italy, Public Records Office (Hong Kong), Public Record Office (U.K.), the Archives Nationales de France, General Archives of the Netherlands, National Archives of Sweden, National Archives of Ireland, and the National Archives of China.

InterPARES is headed by a Project Director, Luciana Duranti, professor of Archival Studies at UBC, who is responsible for the intellectual and administrative direction of the research. She chairs the *International Team*, which meets three times a year and which acts as the Steering Committee of the Project. The team is composed of the chairs of the eight research teams, the representatives of the nine national archival institutions, as well as the Chairs of the Task Forces created during the course of the project. A project coordinator (Peter van Garderen) and a knowledge engineering expert are also members of the international team. This team is responsible for assigning tasks and responsibilities to the various task forces, and for reviewing, discussing and approving task force findings.

Below the International Team are the *national teams*. Their role is to secure funding from their respective national or multi-national granting agencies. Aside from funding administration, the other responsibility of the national teams is to coordinate the work of its members within the represented jurisdiction and to contextualize the InterPARES project findings within their jurisdictions. Funding for the Canadian research team has been provided by the Social Sciences and Humanities Research Council of Canada, which has committed \$845,000 to the project over three years, and by the Vice-President, Research, and Dean of Arts at UBC, who have contributed an additional \$200,000. The Canadian research team is headed by Terry Eastwood, associate professor and Chair of the Archival Studies Program at the University of British Columbia (UBC). Its members are Barbara Craig, associate professor of Archival Studies at the University of Toronto, Babak Hamidzadeh, assistant professor in the Department of Electrical and Computer Engineering, UBC, Heather MacNeil, assistant professor of Archival Studies, UBC, and John Roeder, professor and Associate Director, Department of Music, UBC. The National Archives representatives on the Canadian team are John McDonald, and Bruce Walton.

Separate from the national teams and cutting across them are the *task forces*. The responsibilities of the various task forces are to answer the project's research questions and to carry out the actual research activities. Each task force is composed of individuals from various research teams who have expertise in a particular area of inquiry. There are currently three main task forces: the *Authenticity Task Force*, led by Heather MacNeil, the *Appraisal Task Force*, led by Terry Eastwood, and the *Preservation Task Force*, led by Kenneth Thibodeau from the National Archives and Records Administration of the United States. Each of the task forces corresponds to one of the project's domains of inquiry.

The project's four interrelated domains of inquiry are: (1) Conceptual Requirements for Preserving Authentic Electronic Records, (2) Appraisal Criteria and Methods for Selection of Authentic Electronic Records (3) Methods and Responsibilities for Preserving Authentic Electronic Records, and (4) Framework for the Formulation of Policies, Strategies, and Standards.

Domain 1: Requirements for Preserving Authentic Electronic Records.

The goal of the research in this domain is to identify the elements of electronic records that must be preserved in order to ensure their authenticity over time. The concepts and principles of diplomatics, which were used in the previous UBC research project, will constitute the theoretical basis for the work carried out in this domain. The diplomatic analysis will be tested and refined on the basis of case studies of different kinds of electronic systems that will be carried out in the various jurisdictions represented in the research project. On the basis of the case studies, the Authenticity Task Force will develop a typology of electronic records and identify the requirements for authenticity associated with each type. The specific questions in this domain are:

- What are the elements that all electronic records share?
- What are the elements that allow us to differentiate between different types of electronic records?

- Of those elements, which will permit us to verify their authenticity over time?
- Are the elements for verifying authenticity over time the same as those that permit us to verify their authenticity in time, i.e., at the point at which they are originally created and transmitted?
- Can the elements be removed from where they are currently found to a place where they can more easily be preserved and still maintain the same validity?

Domain II: Appraisal Criteria and Methods for Electronic Records

The goal of the research here is to determine whether the evaluation of electronic records for permanent preservation should be based on criteria different from those applied to traditional records, and to develop a set of appraisal criteria for electronic records and specific appraisal procedures that meet the conceptual requirements for authenticity identified in domain I. The specific questions in this domain are:

- What is the influence of digital technology on appraisal?
- When in the course of their existence should electronic records be appraised?
- Should electronic records be appraised more than once in the course of their existence, and, if so, when?
- Who should be responsible for appraising electronic records?
- What are the criteria, methods, and strategies that satisfy the conceptual requirements identified in Domain I?

Domain III: Methods and Responsibilities for Preserving Authentic Electronic Records

The goal of the research here is to formulate procedures and rules for implementing the conceptual requirements identified in Domain I. This formulation also includes the assignment of responsibility for the application of procedures and rules. The work done in this domain will focus on the activities associated with each step of the preservation procedure and will result in a comprehensive model for the preservation and authentication of electronic records. The specific questions in this domain are:

- What technological and procedural methods of long-term preservation are in use or being developed? What is their success rate or potential?
- What are the media in use or being developed for long-term storage of electronic records? What is their success rate or potential?
- What methods and media will satisfy the conceptual requirements identified in Domain I?
- What are the technological and procedural methods of authentication for migrated electronic records?
- In what way can archival description be a method of authentication for electronic records?

Domain IV: The Framework for the Formulation of Policies, Strategies, and Standards.

In this domain, the findings of the previous three domains will be synthesized and distilled into a set of principles that will guide the development of international, national, and organizational policies, strategies and standards for the long-

term preservation of authentic electronic records and the specific criteria for each type. The distinction among jurisdictional levels stems from the recognition that different jurisdictions and organizations have different needs. The important point is to ensure that policies, strategies and standards are consistent with one another and this is only possible when they are inspired by the same principles. The final product of this domain is a set of principles and criteria, model policies and strategies, and procedural and technical standards for the long-term preservation of authentic electronic records. The specific questions addressed in this domain are:

- What principles should guide the formulation of international policies, strategies, and standards related to the long-term preservation of authentic electronic records?
- What should be the criteria for developing national policies, strategies, and standards?
- What should be the criteria for developing organizational policies, strategies, and standards?

Depending on the research questions being addressed, the task forces are expected to use a wide variety of research methodologies including surveys, case studies, literature reviews, storage media reviews, software testing, and so on. The common methodology, which will guide all research activity, however, will be modeling, which was used successfully in the UBC research project. Modeling methodology generally consists of two parts. The first is to graphically represent the entities identified by the task forces in each domain. An entity can be abstract or concrete (e.g., a concept, such as documentary form, a software component, or a storage medium). What are modeled are the entity's attributes or characteristics, and its relationship to other entities. The second part of modeling is identifying the activities in which the entities are involved. The representation of the activities is done by decomposing them hierarchically at as many levels as necessary and identifying for each activity at every level 1) what guides or regulates it, 2) what is used to perform it, 3) what initiates it, and 4) what results from it. To support the modeling process, every activity, entity, attribute, and relationship named in the models must be consistently and rigorously defined in an interdisciplinary international glossary. The use of modeling serves several purposes. When experts from different countries, disciplines, and perspectives are working together, it is normal for confusion to arise from the use of similar expressions to mean different things, and from the many assumptions, purposes, and interests that each one brings to the table. Modeling requires a rigorous and systematic determination of the meaning and implication of every term, concept or statement that is introduced.

The requirements for preserving authentic electronic records, as defined in the first two research domains, will be modeled at the International Team workshops. These models will then be used to develop the methodologies and technologies required by the teams working at the various national archival institutions. These teams will test the models and present the results back to the International Team. The results will be used, in turn, to refine the models. The outcome of this iterative process should be a foundation from which model or sample strategies, policies, and standards can be drafted. The project's national teams will then be responsible for contextualizing these model strategies, policies, and standards within their national legal and regulatory environments.

The advantage of using a modeling process is that it helps to eliminate vagueness and conceptual inconsistencies or conflicts and facilitates conceptual integrity. Moreover, if the modeling work is done well, it will be a relatively straightforward process to translate the models developed into working software systems. The models will also help the information technology professionals and software engineers who are charged with building systems to understand exactly what must be built to meet the requirements defined by InterPARES. The software engineering models and the dictionary of terms accompanying the models could even become a common language for the international archival community.

It is important to underline the fact that the InterPARES project is a Canadian-led international initiative. Funding for the administration of the International team, which includes, among other things, the maintenance of the project's website and the employment of the project coordinator and student research assistants, as well as for the activities of the Canadian research team, is provided by the grants given to the Canadian team by the Social Sciences and Humanities Research Council of Canada and by UBC. The Canadian contribution is, of course, more than financial. InterPARES was inspired by the UBC research and the project director is a Canadian. Moreover, the National Archives of Canada has committed two full-time equivalent positions to the project, and will play a critical role in testing and

refining the project's findings. We would like to see the Canadian influence extend even further into the archival community. A web site has been established to communicate the goals and objectives of the research, as well as its findings, and to encourage wide-spread discussion and debate about them. The address of the website is: <http://www.interpares.org>. Archivists are encouraged to visit the website, and to participate in the discussion forums that will be set up as soon as we have preliminary findings to report.

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[Back to Table of Contents](#)

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