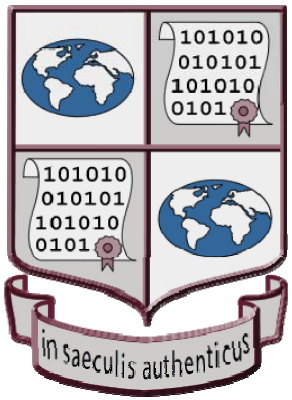
InterPARES 2 Project

International Research on Permanent Authentic Records in Electronic Systems



An Overview of the InterPARES Project: Objectives, Methodology & Outcomes (1999-2006)

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InterPARES 1 (1999-2001): Goal

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.

InterPARES 1: Funding and Participants

- Major funding from SSHRC, NHPRC, UBC, NARA, NAC
- 13 countries in 4 continents, 60 researchers
- Public and private sector
- Professionals and academics (ratio 80% to 20%)
- Archival science, diplomatics and records management, plus computer science and engineering, jurisprudence, research methods

What Did We Study?

- Mostly textual records born digital in the course of administrative and legal activities
- Databases and document management systems
- Inactive or non-current records
- Characteristics of e-records and concept of authenticity
- Activities of appraisal and preservation from the preserver point of view

Team Structure

Divided into four **Domain Task Forces**:

1. **Authenticity**: Goal was to identify conceptual requirements for assessing & maintaining authenticity of electronic records.
2. **Appraisal**: Goal was to determine whether selection of electronic records should be based on the same or different criteria as those for traditional records and how digital technologies affect appraisal methodology.
3. **Preservation**: Goal was to develop preservation methods for authentic electronic records.
4. **Strategy**: Goal was to develop an intellectual framework for articulation of international, national and organizational policies, strategies and standards for long-term preservation of authentic electronic records.

Methodology

- Theoretical and deductive approach based on theory and methods of diplomatics, archival science and law to define concepts and develop requirements and methods
- Inductive and empirical approach involving case studies to understand the records being generated
- IDEF(0) modeling to represent and define the activities involved in appraisal and preservation
- Chemistry and computer engineering for the study of storage media and of digital preservation technology and technological methods of authentication

InterPARES 1 Products

- **Body of concepts**
- **Principles** (e.g., trusted custodian)
- **Analytical instruments** for studying new types of digital documents and developing new requirements and methods, as needed

Examples of Concepts

- **data** are the smallest meaningful pieces of information
- **information** is a message intended for communication across space or time
- **document** is information affixed to a medium in a determined form
- **record** is any document created (i.e., made or received and set aside for action or reference) by a physical or juridical person in the course of a practical activity as an instrument and by-product of that activity
- an **electronic record** is a record created (i.e., made or received and set aside for action or reference) in electronic form

Examples of Concepts (cont.)

Key characteristics of an Electronic Record:

- fixed form and stable content;
- identifiable administrative and documentary contexts, and explicit linkages to other records within or outside the digital system; and
- five persons (author, writer, originator, addressee, creator) involved in its creation.
- It must participate in or support an action either procedurally or as part of the decision making process; and
- It presents formal elements, attributes, and digital components.

Examples of Concepts (cont.)

- **Reliability**: the trustworthiness of a record as a statement of fact (trustworthiness of content)
- **Authenticity**: the trustworthiness of a record as a record. An authentic record is one that has not been tampered with or otherwise corrupted. Authenticity comprises identity and integrity.
- **Authentication**: a means of declaring authenticity at a point in time
- **Accuracy**: the exactness and correctness of content, dependent on the competence of the author and the controls on the process by which data are recorded and transmitted through space (i.e., between persons, systems or applications) and time (i.e., when stored off line, or when the hardware or software used to process, communicate or maintain it is upgraded or replaced)

Examples of Concepts (cont.)

Authenticity

- **Identity** refers to the attributes of a record that uniquely characterize it and distinguish it from other records. These include: the names of the persons concurring in its creation (i.e., author, addressee, writer and originator); its date(s) of creation and transmission; an indication of the matter or action in which it participates; the expression of its relationships with other records; and an indication of any attachment(s).
- **Integrity** is the wholeness and soundness of a record. A record has integrity if it is intact and uncorrupted, that is, if the message that it is meant to communicate to achieve its purpose is unaltered. This means that a record's physical integrity, such as the proper number of bit strings, may be compromised, provided that the articulation of the content and its required elements of form remain the same.

Example of an Instrument

Template for Analysis

- Documentary Form
  intrinsic and extrinsic elements
- Annotations
- Contexts
  administrative, provenancial, procedural, documentary, technological
- Medium

Other InterPARES 1 Products

- Authenticity Requirements for those who generate and keep records and for those who preserve them (e.g., metadata for identity and integrity, access privileges, etc.)
- Selection and preservation methods and procedures (e.g., models representing activities and responsibilities)
- A framework for the development of policies, strategies and standards related to the proper creation, maintenance and preservation of digital records that can be proven authentic over time

Most Important Findings

- Most systems that should contain records do not, because the entities in them lack fixed form and stable content. The systems that do, contain bad records, primarily because of lack of identifiable contexts and relationships.
- Inactive records that are no longer kept in active systems often cannot be preserved because either they were not created and/or maintained in preservable formats or their formats are obsolete.

Most Important Conclusions

The preservation of authentic electronic records…

- is a continuous process that begins with the records creation and whose purpose is to transmit authentic records across time and space;
- must be predicated on the concepts of a trusted recordkeeping system and the role of the preserver as a trusted custodian; and
- must incorporate records appraisal and archival description.

Most Important Conclusions (cont.)

- The only way of preserving an inactive electronic record is to make an authentic copy of its last instantiation as an authentic record of the creator
- The preserver must be concerned with both the assessment and the maintenance of the authenticity of electronic records throughout their lifecycle

Lessons Learned

- Solutions to the preservation problem are inherently dynamic due to technological change and the increasing complexity of its products
- Technology cannot determine the solution to the long-term preservation of electronic records
- Archival needs define the problem and archival principles must establish the correctness and adequacy of each technical solution
- Classic concept of record limited our capacity to under-stand electronic systems containing a variety of complex entities that do not correspond to the existing concept

Based on these findings, conclusions & lessons…

We developed a new research project that:

- examined all kinds of digital entities in complex systems and then developed a concept of record;
- was concerned with the entire record lifecycle and developed a chain of preservation model and a business process model beginning with the design of the system and capable of ensuring accuracy, reliability & authenticity;
- studied digital entities created by artists and scientists, who began using complex digital systems long before most governments and businesses; and
- used the concepts and methodology of all the fields touched by our study ("open inquiry" approach).

InterPARES 2 (2002-2006): Goal

To ensure that the portion of society's recorded memory digitally produced in dynamic, experiential and interactive systems in the course of artistic, scientific and e-government activities can be created in accurate and reliable form and maintained and preserved in authentic form, both in the long and the short term, for the use of those who created it and of society at large, regardless of digital technology obsolescence and media fragility.

Funding and Participants

- Major funding from SSHRC, NHPRC, NSF, UBC, and UNESCO (for last 18 months)
- 21 countries in 5 continents, 100 researchers
- Public and private sectors
- Academics and professionals (80% to 20%)
- Archival science, diplomatics and records management; music theory, composition, performance; film theory, production, description; dance and theatre theory; a variety of hard and social sciences; jurisprudence; computer science and engineering

What Did We Study?

- **Dynamic entities**: objects that depend for their content upon data extracted from a variety of systems that may have variable instantiations.
- **Experiential entities**: objects whose essence goes beyond the bits constituting them to incorporate the behaviour of the rendering system and the effects of subjective user's interactions.
- **Interactive entities**: objects to which each user intervention or input from another system causes a change of content and/or form.

What Did We Study? (cont.)

- Live, active materials, followed from creation to preservation
- Obsolete inaccessible materials
- Approaches taken by both creators and preservers who have concerned themselves with accuracy, reliability and authenticity

Team Structure

Matrix depicting Focus and Domain Task Forces, Working Groups and Cross-domain Research Teams

	FOCUS 1 Artistic activities	FOCUS 2 Scientific activities	FOCUS 3 Governmental activities
DOMAIN 1 Records creation & maintenance	Working Group 1.1	Working Group 1.1	Working Group 1.3
DOMAIN 2 Authenticity, accuracy & reliability	Working Group 2.1	Working Group 2.2	Working Group 2.3
DOMAIN 3 Methods of appraisal & preservation	Working Group 3.1	Working Group 3.2	Working Group 3.3

Terminology

Policy

Description

Modeling

Methodology

- Interdisciplinarity
- Transferability
- Open Inquiry
- Layered Knowledge Environment
- Multi-method Design

Work Accomplished: Focuses

Case Studies (22 completed):

- represented in activity and entity models and analysed according to diplomatic and archival principles

General Studies (9 completed):

- surveys of: government Web sites; digital recordkeeping practices of photographers, composers, and GIS archaeologists; the practice of preservation of interactive music; file formats and encoding languages used for non-textual materials
- analysis of a prototype for a persistent archives based on data grids

Work Accomplished: Focuses (cont.)

- annotated bibliographies
- literature reviews
- conceptual analyses of the findings of the reviews
- bibliographic databases for management of references

Work Accomplished: Cross-domains

Terminology:

- terminology database including 3 lexicographic instruments:
  - *Register, Dictionary, Glossary*
- Ontology for interrelated terms

Policy:

- identification of barriers to preservation that currently exist in laws, regulations, policies and standards concerning copyright and intellectual rights, privacy and FOI, authenticity and authentication, open standards and open source, and records and archival management
- development of a framework of principles for creators and one for preservers

Work Accomplished: Cross-domains (cont.)

Description:

- Metadata Schema Registry
- identification of the relationship between metadata and archival description
- collaborations with modeling and policy researchers

Modeling:

- Manage Chain of Preservation (MCP) Model depicting all activities involved in the management of electronic records throughout their lifecycle, from creation to permanent preservation
- Business-driven Recordkeeping (BDR) Model, based on the records continuum concept

Work Accomplished: Domains

Development of:

- conceptual responses to the original research questions, primarily concerning identification of the 'record' and of the preservable entities

Production of:

- guidelines for records creation and records preservation for individuals and small organizations
- papers outlining the concepts of reliability, accuracy and authenticity in the areas of activity studied by the project

Findings and Products

The most important findings and products will be outlined by today's speakers. Copies of these and all the others will be made available on the InterPARES Web site:

www.interpares.org