

# Bridging the divide: from theory to practice

Luciana Duranti



**InterPARES Project**

Dr. Luciana Duranti  
Project Director

# Modern office

- Hybrid documentary systems
- Digital environments that support the manipulation of data
- Proprietary and idiosyncratic nature of applications
- Decentralization of records creation
- Repurposing of records
- Obsolescence of systems and media
- Requirements of regulatory agencies (e.g. SEC)



# Consequences

- Records are less reliable (manipulability), retrievable (incongruence of classifications), accessible, readable or intelligible (incompatibility and obsolescence)
- It is difficult to prove or verify the authenticity of records over time (no more originals—the best evidence)



# Attempts to solutions

- Standards for record-making/keeping systems: in the USA, Design criteria standard for electronic records management software applications (DOD 5015.2-STD) and, in Europe, Model REQuirements for Electronic Records Management Systems
- Guidelines for records preservation: International Council on Archives' Guide for Managing Electronic Records from an Archival Perspective



# Attempts to solutions

## Research Projects:

- The Pittsburgh Project, see “Functional Requirements for Evidence in Recordkeeping.”  
<http://www.web.archive.org/web/19981203042506/www.sis.pitt.edu/~nhprc/> (31 March 2003)
- The Philadelphia Project, in Weinberg, David M., Mark D. Giguere, David S. Miller, and Celia O’Leary. “The Philadelphia Electronic Records Project: Some Clarifications.” *Archivaria* 45 (Spring 1998): 1-3.
- The UBC Project, in Luciana Duranti, Terry Eastwood and Heather MacNeil, The Preservation of the Integrity of Electronic Records (Dordrecht: Kluwer Academic Publishing, 2002)



# Results

Good foundation for the development of trusted record-keeping systems, capable of ensuring the reliability and authenticity of the records they contain.

Definition of the fundamental concepts and methods that must be respected to control the trustworthiness of records throughout their life-cycle, including the concepts of record, reliability and authenticity.



# Record

Any document created (i.e., made or received and set aside for further action or reference) by a physical or juridical person in the course of a practical activity as an instrument and by-product of it.



# Electronic Record

A record created (i.e., made or received and set aside for action or reference) in electronic form





# A Trustworthy Record

A record that is reliable and  
authentic



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# Reliability

The ability of a record to stand for the facts it is about.

In other words, the trustworthiness of the record as a statement of facts.



# Authenticity

Refers to the fact that a record is what it purports to be and has not been tampered with or otherwise corrupted.

In other words, the trustworthiness of the record as a record.



# What about long-term preservation?

What does long-term mean?

- For most businesses and industry and their regulatory bodies, 2-3 years
- For governments and public bodies, anything from 30 years to forever
- For most individuals, their work-life or their lifetime. If they are artists, it may mean forever



# Two ways of addressing long-term preservation

- To those who must keep their non current records for 2-3 years in a way that their integrity can be proven, according to the directions of their regulatory bodies, the issue appears to be one of reliable storage.
- To those who must keep their non-current records for an undetermined period, possibly decades and centuries, the issue is much more complex, as it involves a chain of preservation procedures that begins with the design of digital systems and continues through records creation, maintenance, use, and repeated refreshment, reproduction, migration, and use by third parties.

An ancillary issue for both regards the validity of technological means of authenticating the records and the need and/or ability to preserve them across technological obsolescence.



# InterPARES: **INT**ernational Research on **P**ermanent **A**uthentic Records in **E**lectronic **S**ystems

An International Collaborative Research Initiative



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# Research 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.



# Methodology

- Theory and methods of diplomatics and archival science the definition of concepts and development of requirements and methods
- Grounded theory and statistical analysis for case studies
- Comparative analysis for the study of appraisal and preservation reports from archival institution
- IDEF0 modeling for the representation and definition of the activities involved in appraisal and preservation
- Computer engineering for the study of storage media and of digital preservation technology and technological methods of authentication
- Legal analysis for the study of certification methods





# Conceptual Framework for Authenticity

- In archival theory and jurisprudence, records that are relied upon by their creator in the usual and ordinary course of business are presumed authentic
- In electronic systems, the presumption of authenticity must be supported by evidence that a record is what it purports to be and has not been modified or corrupted in essential respects. To assess the authenticity of a record, the preserver must be able to establish its identity and demonstrate its integrity



# Identity of a Record

- It refers to the attributes of a record that uniquely characterize it and distinguish it from other records. These attributes include: the names of the persons concurring in its formation (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 archival bond; as well as an indication of any attachment(s).
- These attributes may be explicitly expressed in an element of the record, in metadata related to the record, or implicit in its various contexts (documentary, procedural, technological, provenancial, or juridical-administrative).



# Integrity of a Record

- Its wholeness and soundness. A record has integrity if it is intact and uncorrupted
- A record is intact and uncorrupted if the message that it is meant to communicate in order to achieve its purpose is unaltered
- 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
- Integrity may be demonstrated by evidence found on the face of the record, in metadata related to the record, or in one or more of its contexts



# Authentication

- A declaration of authenticity, resulting either by the insertion or the addition of an element or a statement to a record, and the rules governing it are established by legislation.
- A means of proving that a record is what it purports to be at a given moment in time (digital signature), as opposed to a quality of the record.



# **Intellectual framework: principles**

**What every organization must develop is a records preservation policy and a strategy that**

- **address records specifically rather than digital objects generally**



# Identifiable Characteristics of an Electronic Record

- Fixed form (i.e. its binary content is stored so that it remains complete and unaltered, and its message can be rendered with the same documentary form it had when first set aside)
- Unchangeable content
- Explicit linkages to other records within or outside the digital system through a classification code or other unique identifier
- Identifiable administrative context
- Author (the person *issuing* the record)
- Addressee (the person for whom the record is intended)
- Writer (the person *articulating the content* of the record)
- Participant in or supporting an action either procedurally or as part of the decision making process



# Intellectual framework: principles

- **focus on authentic electronic records**
- **recognize and provide for the fact that authenticity is most at risk when records are transmitted across space (that is, when sent between persons, systems, or applications) or time (that is, either when they are stored offline, or when the hardware or software used to process, communicate, or maintain them is upgraded or replaced)**
- **recognize that preservation of authentic electronic records is a continuous process that begins with the process of records creation and whose purpose is to transmit authentic records across time and space**



# Intellectual framework: principles

- be based on the concept of trust in records keeping and record preservation and specifically on the concepts of a trusted record-keeping system and the role of the preserver as a trusted custodian
- be predicated on the understanding that it is not possible to preserve an electronic record as a stored physical object: it is only possible to preserve the ability to reproduce the record
- recognize that the physical and intellectual components of an electronic record do not necessarily coincide and that the concept of digital component is distinct from the concept of element of documentary form a digital object that contains all or part of the content of an electronic record, and/or data or metadata necessary to order, structure, or manifest the content, and that requires specific methods for preservation





# Intellectual framework: principles

- specify the requirements a copy of a record should satisfy to be considered equivalent to an original
- integrate records appraisal and archival description in the continuous process of preservation
- explicitly state that the entire process of preservation must be thoroughly documented as a primary means for protecting and assessing authenticity over the long term
- explicitly recognize that the traditional principle that records relied upon in the usual and ordinary course of business can be presumed to be authentic needs to be supplemented in the case of electronic records by evidence that the records have not been inappropriately altered



# Intellectual framework: principles

- recognize that the preserver is concerned with both the assessment and the maintenance of the authenticity of electronic records. The assessment of the authenticity of electronic records takes place before records are transferred to the custody of the preserver as part of the process of appraisal, while the maintenance of the authenticity of copies of electronic records takes place once they have been transferred to the preserver's custody as part of the process of long-term preservation
- draw a clear distinction between the preservation of the authenticity of records and the authentication of a record



# Key points concerning preservation

- Solutions to the preservation problem are inherently dynamic
- 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, or...must they?



# Usefulness of Theory

- Demonstrated when systems were designed to contain data rather than records
- Showed what attributes of a record's identity are implicit in the system and need to be made explicit and linked to the record to ensure that they are not lost when the record is removed from the system
- Revealed the fundamental indifference of the creator to the issue of authenticity, due to unfounded confidence in technology
- Supported the identification of the requirements for a presumption of authenticity



# Contrast of Theoretical Approach

- The classic concept of record limited our capacity to understand electronic systems containing a variety of complex entities that do not correspond to it
- That which is known is not always very useful to understand the unknown
- Theory, which decontextualizes the record, is not useful to deal with the variety and complexity of systems: a complementary inductive approach is necessary



# Yet Again

- When everything is new and complex, theory is our only reference point (records of the creator)
- It provides rigour to definitions, procedures, methodologies
- The challenges presented by interactive, experiential and dynamic records appear insurmountable without the support of theory (see InterPARES 2)



# Conclusion

Recognizing that we require

- An inter/multi-disciplinary approach
- A direct analysis of the behaviour of new digital systems
- Testing of hypotheses and findings in real settings

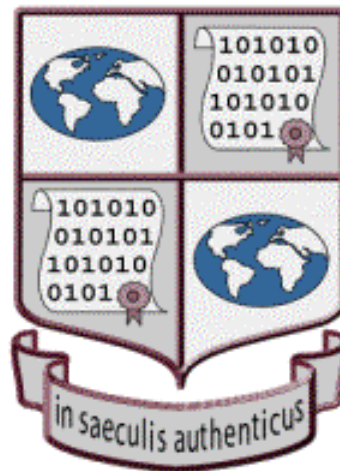
Archival and diplomatic theory remain the key to the understanding of the nature of new records and to the development of the methods for their long-term preservation.



# Reference

For the findings of InterPARES see the project's web site:

<http://www.interpares.org>



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Project Director