

The Preservation of Electronic Records

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What are electronic records?

- Records are created during and as a result of business and personal acts and transactions. They have content, context, and structure that provide evidence of the activities and processes through which they were created.
- Electronic records are those records that are created and/or maintained in electronic systems

The problem

- **How to maintain and demonstrate the intellectual integrity (reliability and authenticity) of electronic records in and over time?**
 - Records are heterogeneous, voluminous, and hardware/software dependent
 - Legal requirements promote risk management but fail to provide clear guidelines
 - Accelerating pace of media obsolescence
 - Lack of standardization of hardware, software, and recording media used in record-keeping applications
 - There are too many points in a record's life where its integrity can be compromised - how can these points be reduced?

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Media issues

- Media can outlive the software/hardware configurations on which they were used, and records can outlive the media on which they were created - how can records continue to be accessible, and how can the recording technology community help?
- How to prove that the integrity of the records was not compromised due to media failure, improper media preparation, maintenance or storage, or media aging?
- How to slow down the rate of change in media and associated devices for storage and retrieval? How to promote implementation of standards?
- Viability of developing a true archival digital storage medium? Industry incentives?

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Potential solutions

- Emphasize preservation of the intellectual rather than the media aspects of the record
 - Migration
 - Emulation
- Proven aging tests for media in order to anticipate schedules for migration through increased knowledge of the rate and nature of media decay
- Maintenance and accessibility of product specs/schematics for media as well as hardware and software
- Further development of lossless compression techniques
- Further development of techniques to prove that the integrity of the record has not been accidentally or deliberately compromised

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InterPARES (International Project on Permanent Authentic Records in Electronic Systems), 1999-2002

- Multi-disciplinary, international research project building on prior research to develop strategies, policies, and standards for the preservation of authentic electronic records.
- Research is broken into 4 domains. Task forces in each domain are using methodologies including diplomatic analysis, case studies, literature reviews, systems analysis and design, and activity and entity modeling.
- The requirements for preserving authentic electronic records, as defined in the first two domains, will be translated into models. Teams at national, university archives, and industry sites will test the models, and the results will be used to refine the models.

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Domain I: Conceptual Requirements for Preserving Authentic Electronic Records

- ◆ **Goal:** to identify the elements of electronic records which are necessary to maintain the authenticity of those records over time through an analysis of the elements of physical and intellectual form which may affect the authenticity and nature of an electronic record.
- ◆ **Research questions:**
 - ◆ What are the elements that all electronic records share?
 - ◆ What are the elements that allow us to differentiate between different types of electronic records?
 - ◆ Which of those elements will permit us to verify their authenticity over time?
 - ◆ Are these 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 used)?
 - ◆ Can those 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 Methodology for Authentic Electronic Records

- ◆ **Goal:** to determine whether the evaluation of electronic records for permanent preservation should be based on theoretical criteria different from those applied to traditional records. It will also investigate how digital technologies have affected the methodology of appraisal.
- ◆ **Research questions:**
 - ◆ What is the influence of digital technology on appraisal criteria?
 - ◆ What is the influence on appraisal of retrievability, intelligibility, functionality, and research needs?
 - ◆ What are the influence of the medium and the physical form of the record 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 appraisal criteria and methods for authentic electronic records?

Domain III: Methodologies for Preserving Authentic Electronic Records

- ◆ **Goal:** to identify and develop the procedures and resources required for the implementation of the conceptual requirements and the criteria identified in the first two domains.
- ◆ **Research questions:**
 - ◆ What 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 are the methods and media that meet the conceptual requirements and the principles identified in Domain I?
 - ◆ What are the methods of authentication for migrated electronic records?
 - ◆ What are the methods and responsibilities for the long-term preservation of authentic electronic records?

Domain IV: A Framework for Developing Policies, Strategies and Standards

- ◆ **Goal:** to formulate principles that will guide the development of international, national, and organizational strategies, policies and standards for the long-term preservation of authentic electronic records.
- ◆ **Research Questions:**
 - ◆ What principles should guide the formulation of 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?