

Preserving the Authenticity of Digital Evidence

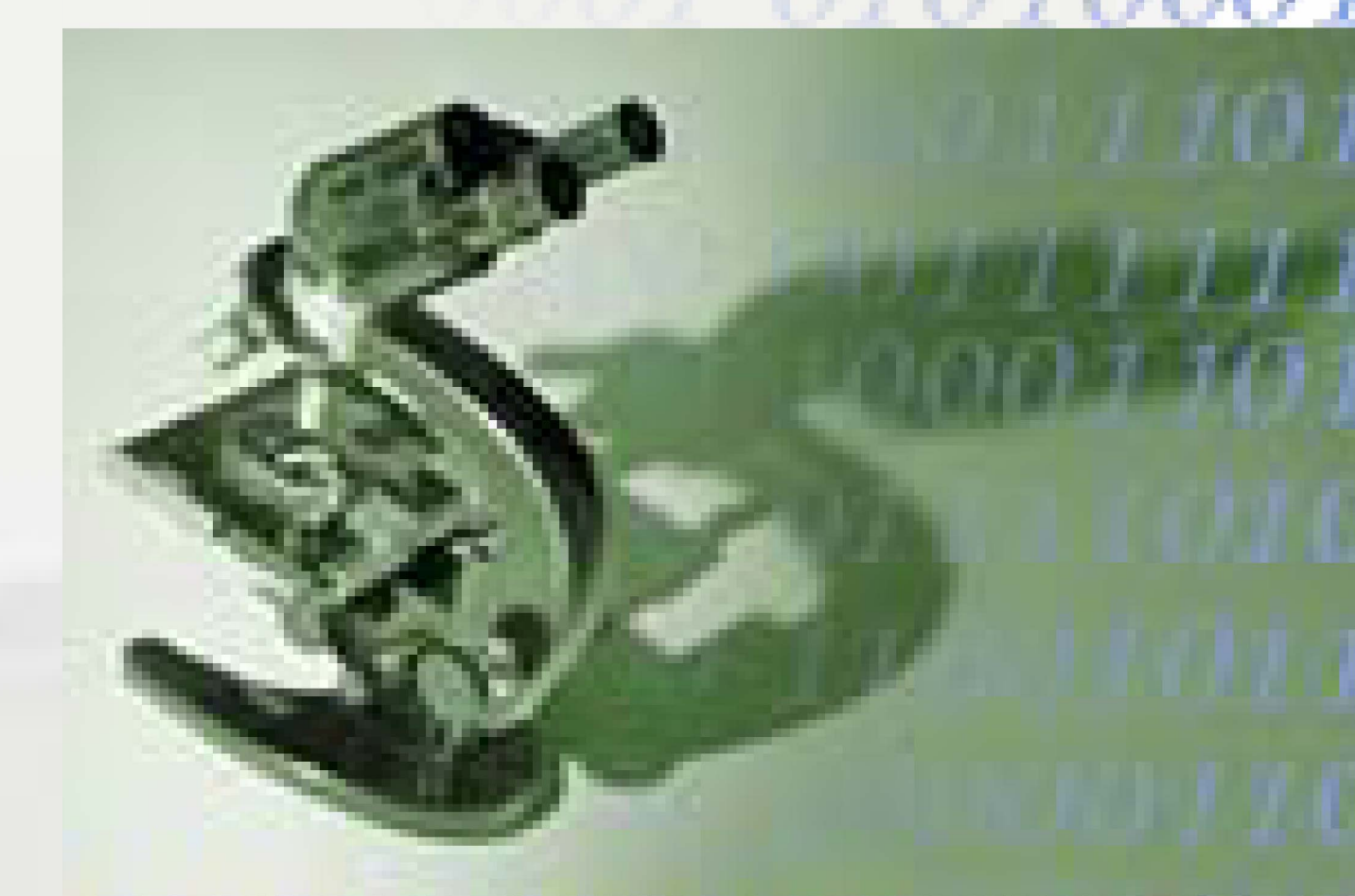
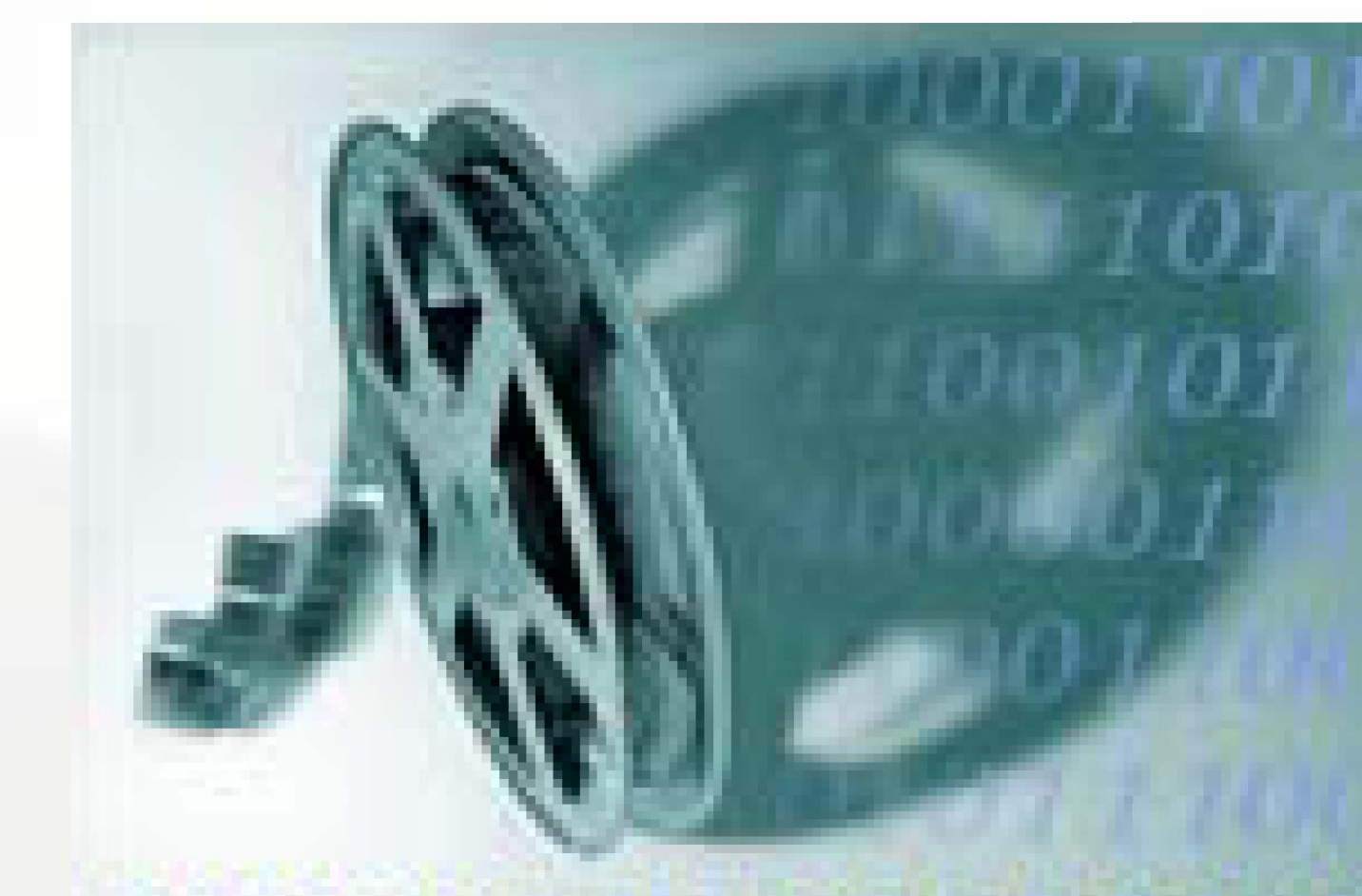
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Seventh Annual IFIP WG 11.9 International. Conference on Digital Forensics
1 Feb 2011, Orlando, FL, USA



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RELEVANCE OF ARCHIVAL SCIENCE TO DIGITAL FORENSICS

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Preserving the Authenticity of Digital Evidence

Preservation:

The physical and moral defence of documentary evidence of activity (Jenkinson 1922)

It involves the protection of the document as artefact as well as the protection of its innate qualities:

- Naturalness (by-product of activity)
- Interrelatedness (depending for meaning from other documents)
- Impartiality (capable of revealing the truth)
- Authenticity (uncorrupted)
- Uniqueness (in context)

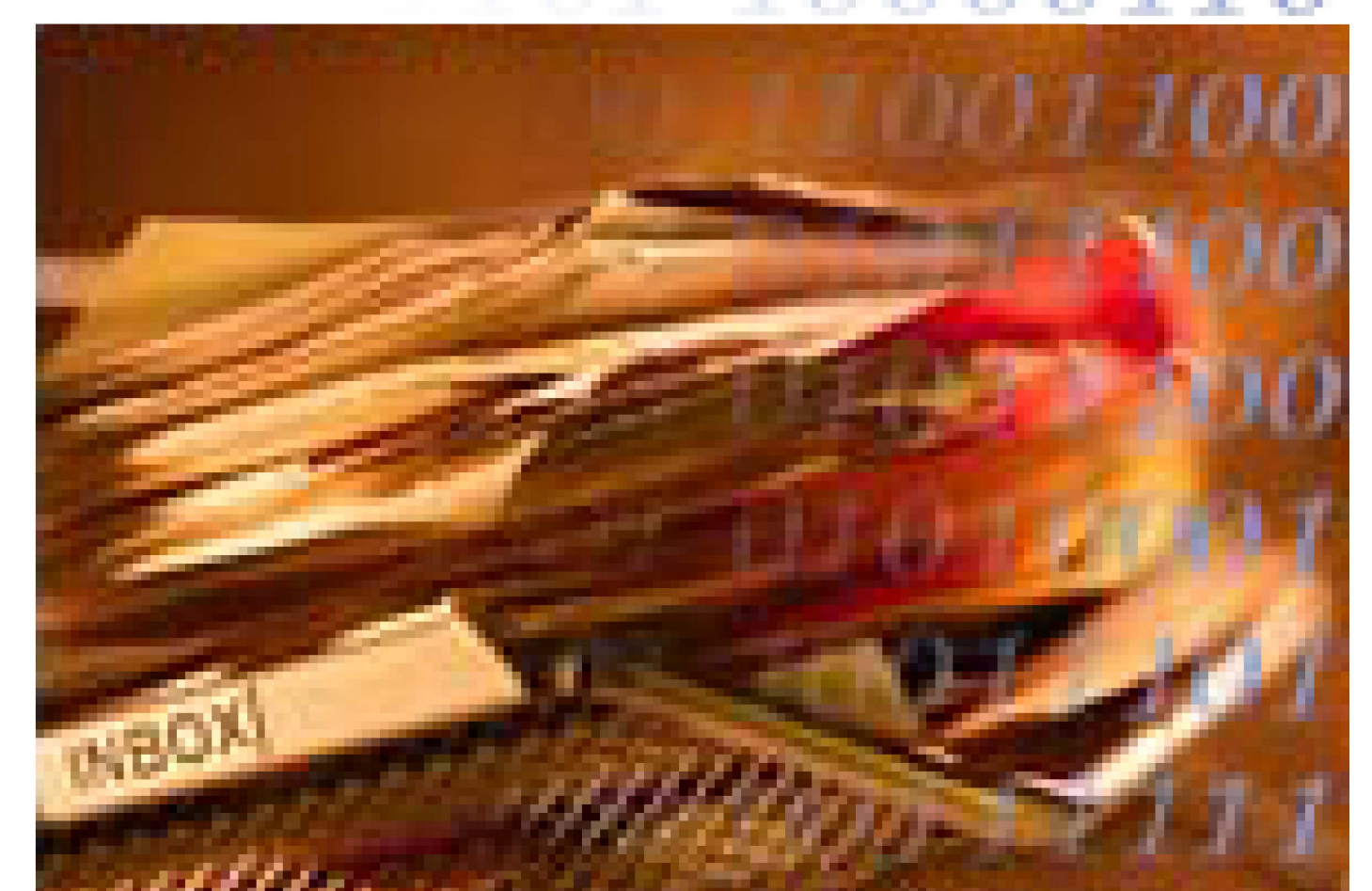
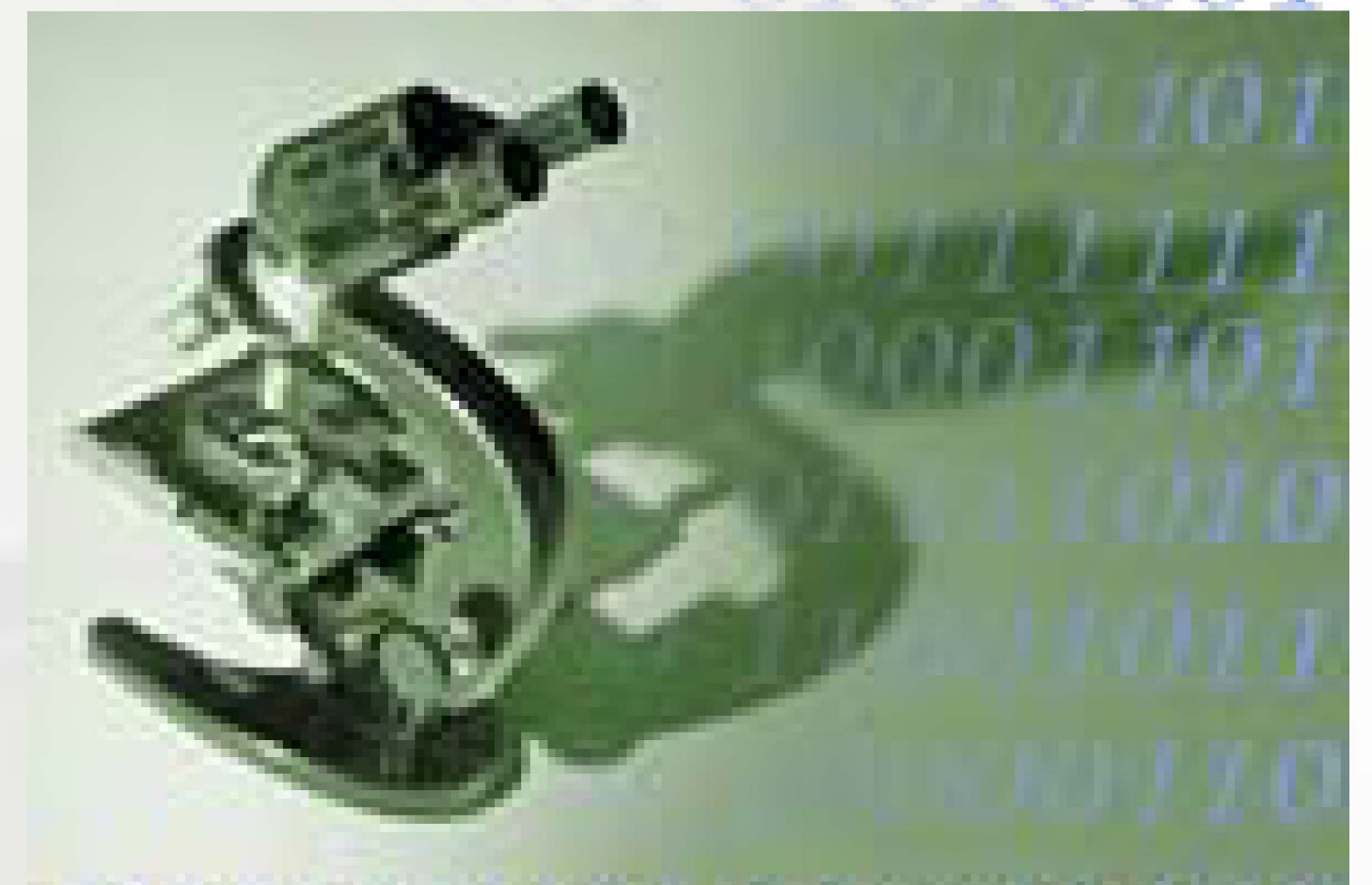
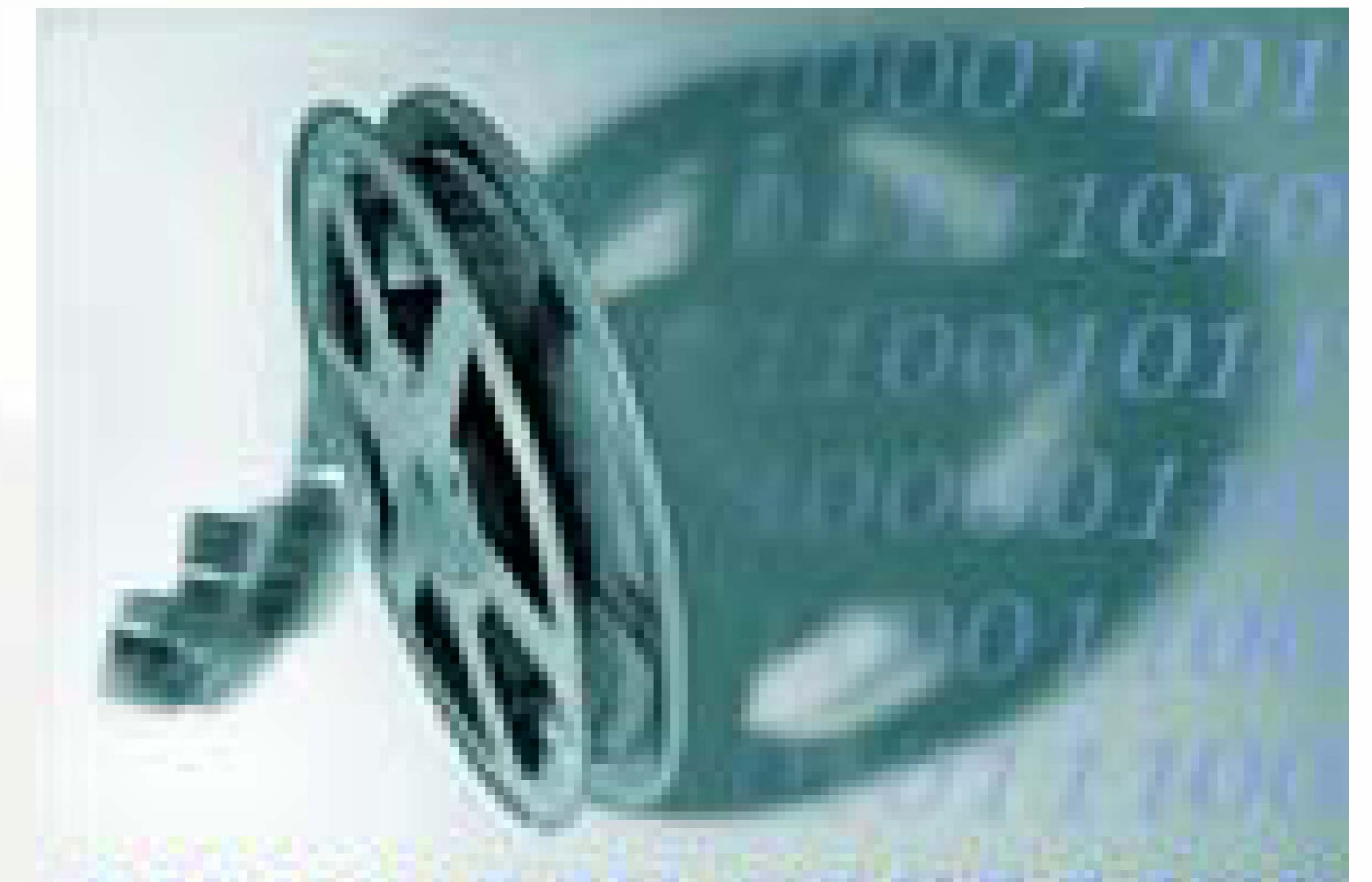


Archival Concepts

Archival concepts are grounded in Roman Law

- Records preserve perpetual memory of the acts to which they relate
- Deposit of the records in a public place guarantees the reliability of records as witnesses of action
- Antiquity provides records with the highest authority
- Unbroken legitimate custody ensures records authenticity
- Authentication is based on form

(Justinian Code A.D. 565)



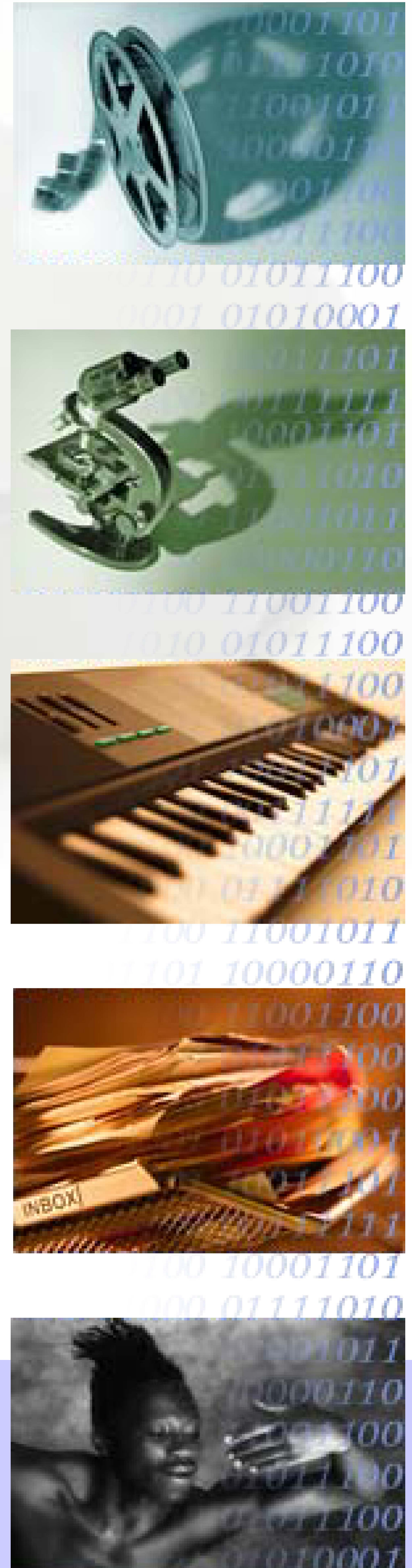
Archival Methods

Archival methods are embedded in legislative acts

- Swedish Law of 1766—freedom of information act
- French Decree 25 July 1793—public records belong to the people and must be kept for the people
- Decree of 1841—principles of provenance and respect for original order

Archival knowledge was codified as modern science in 1632 by Baldassarre Bonifacio. In his words:

“documents are much better than navy yards, much more efficacious than munitions factories, as it is finer to win by reason rather than by violence, by right than by wrong”



Diplomatics

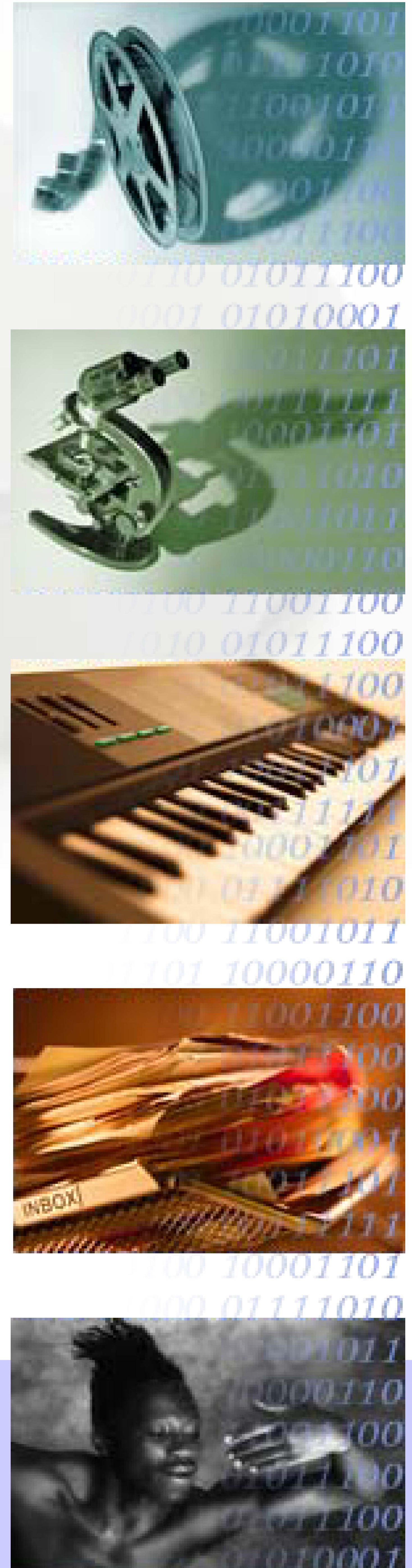
The rule of law was easily circumvented: the trustworthiness of documentary evidence needed to be tested using scientific methods, beyond Valla's textual criticism (donation of Constantine).

Diplomatics (1681) , Dom Jean Mabillon

Trustworthiness based on the process of formation of documents, and on their formal characteristics, structure, and transmission through time and space.

The **Bella Diplomatica** (judicial disputes on authenticity of documents) based on it gave origin to the **Law of Evidence**

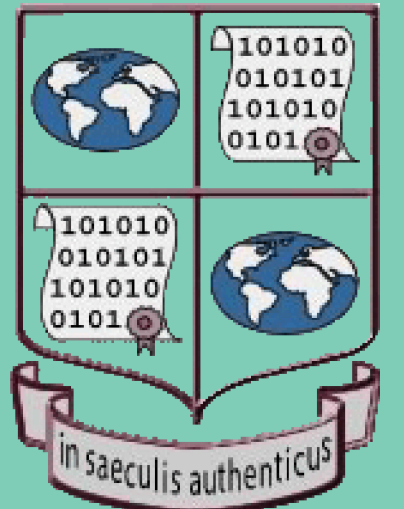
By mid 18th century all faculties of law in Europe taught archival science and diplomatics as “forensic” disciplines



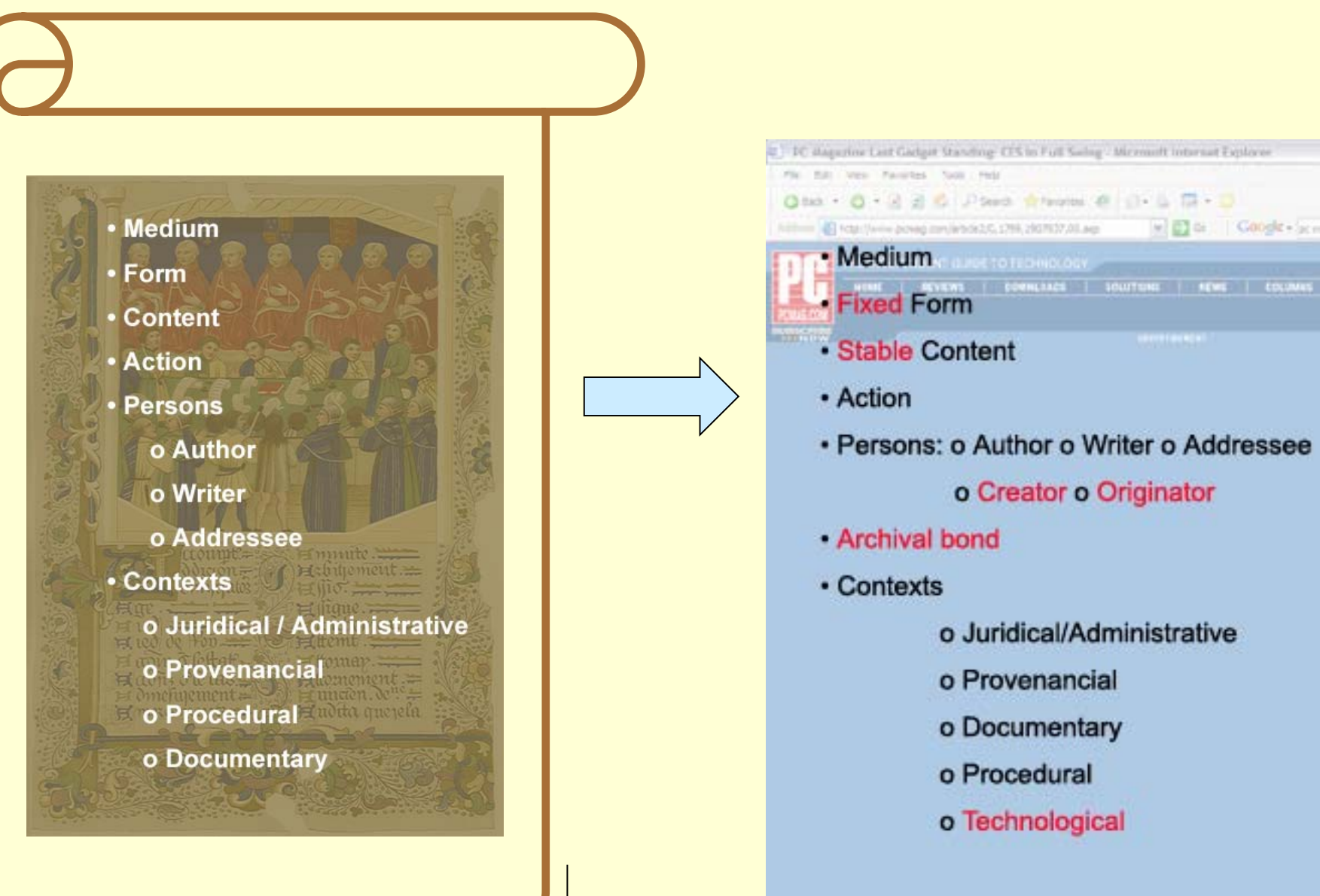


Archival Diplomatics of Digital Records

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The Concept of Record



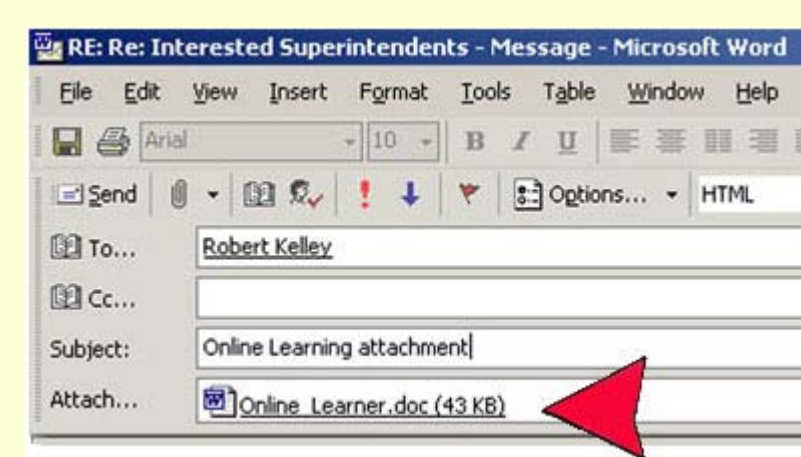
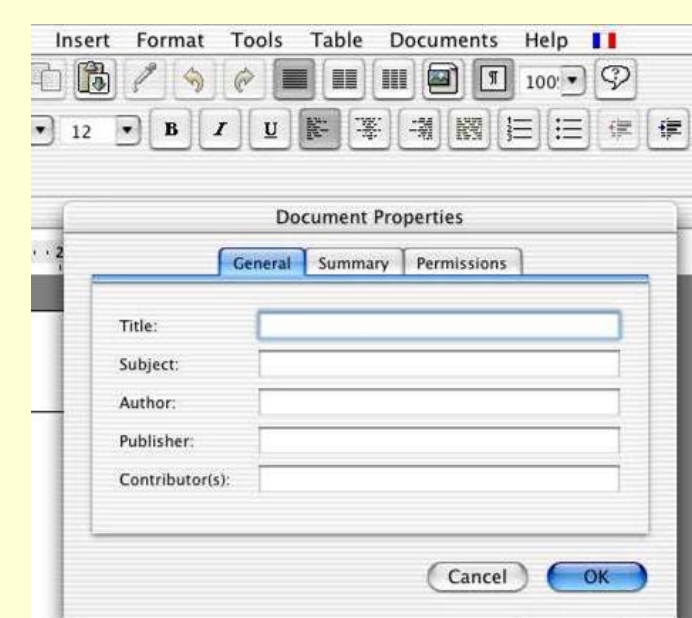
Digital Record Characteristics

On the face
Of the
Record

Formal Elements

Attributes

Digital Components



Lifecycle of Digital Records

Phase 1: Records of the creator
Phase 2: Authentic copies of the records of the creator

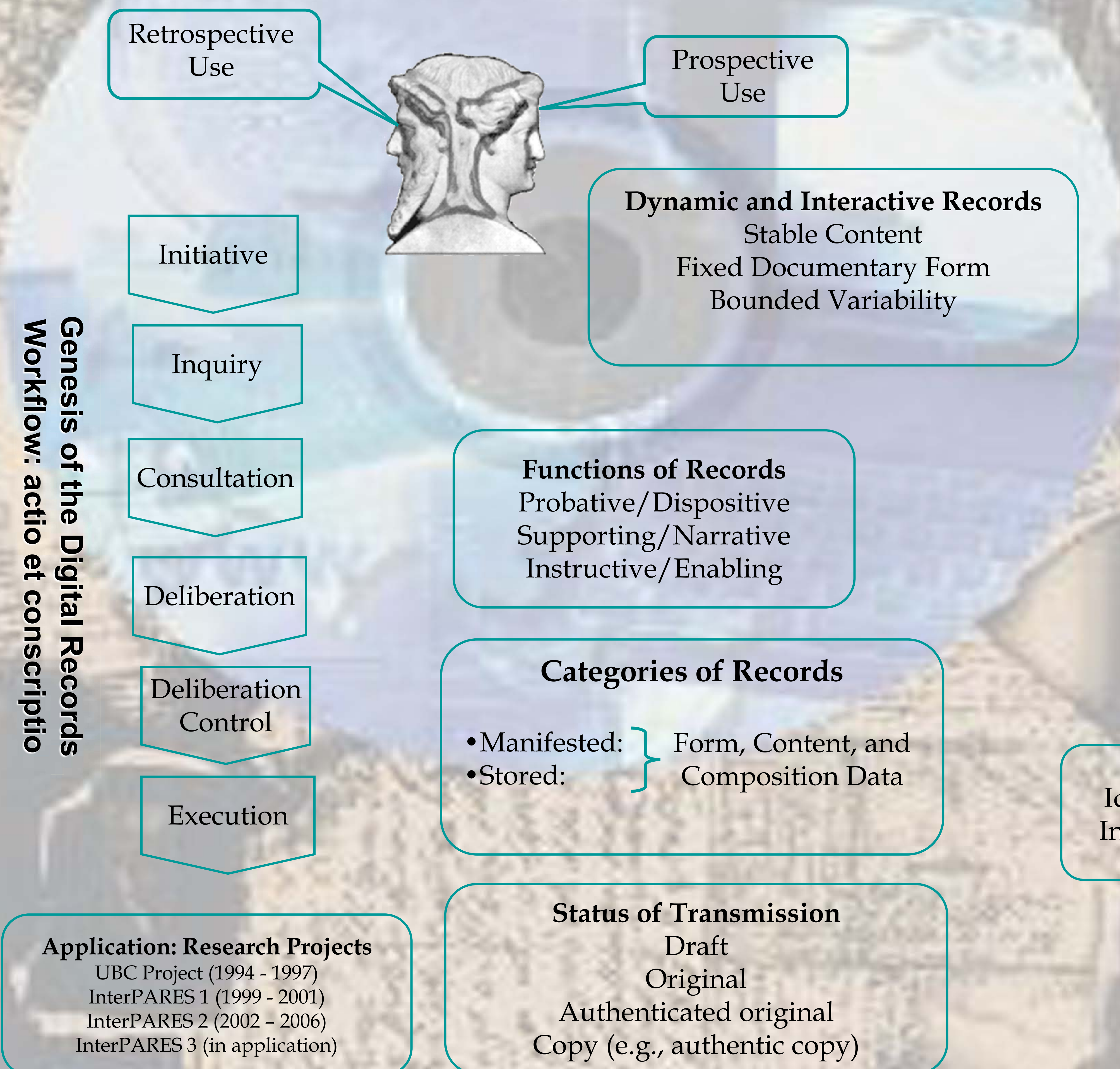


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Seventh

Archival Diplomatics

The integration of archival and diplomatic theory about the genesis, inner constitution, and transmission of documents; and about their relationship with the facts represented in them, and with other documents produced in the course of the same function and activities, and with their creators.



The Concept of Trustworthiness

Reliability

The trustworthiness of a record as a statement of fact. It exists when a record can stand for the fact it is about.

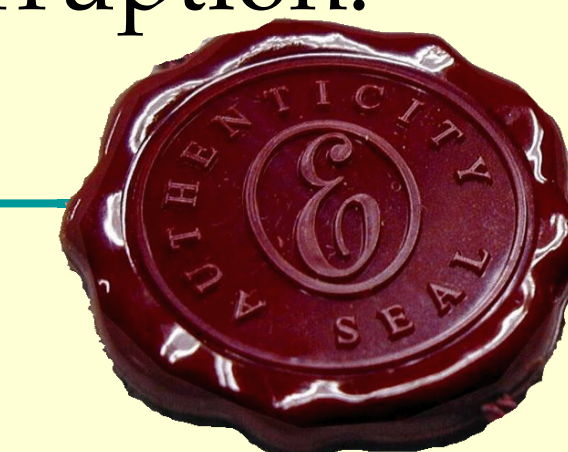
Accuracy

The degree to which data, information, documents or records are precise, correct, truthful, free of error or distortion, or pertinent to the matter.

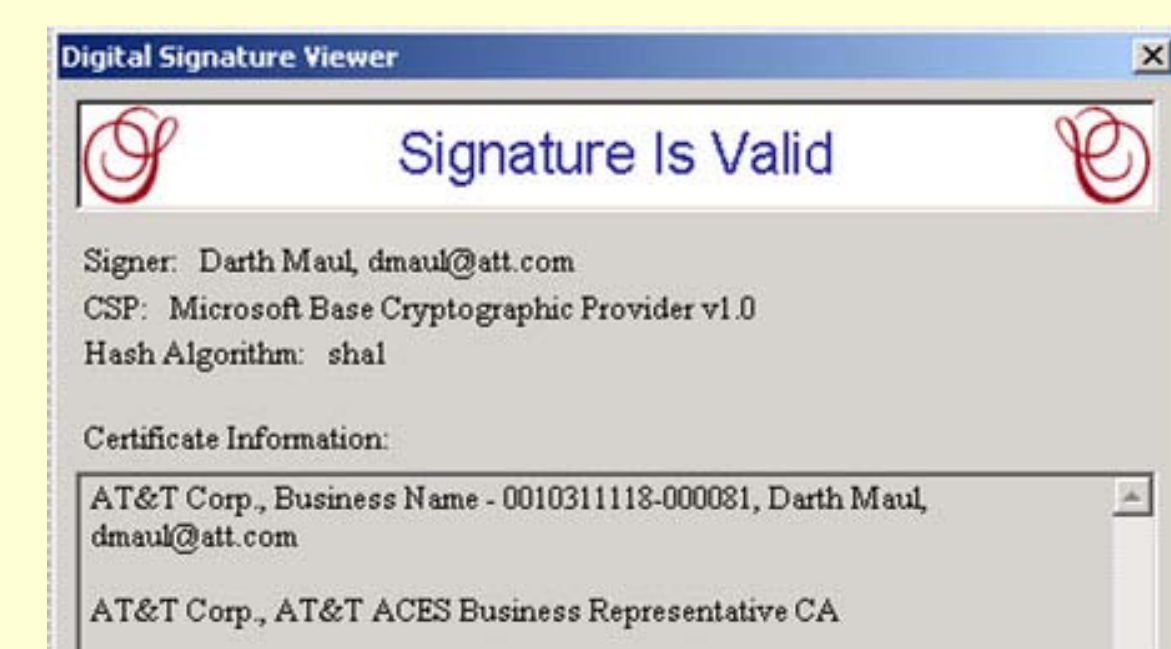
Authenticity

- identity
- integrity

The trustworthiness of a record as a record; i.e., the quality of a record that is what it purports to be and that is free from tampering or corruption.



Digital Signature



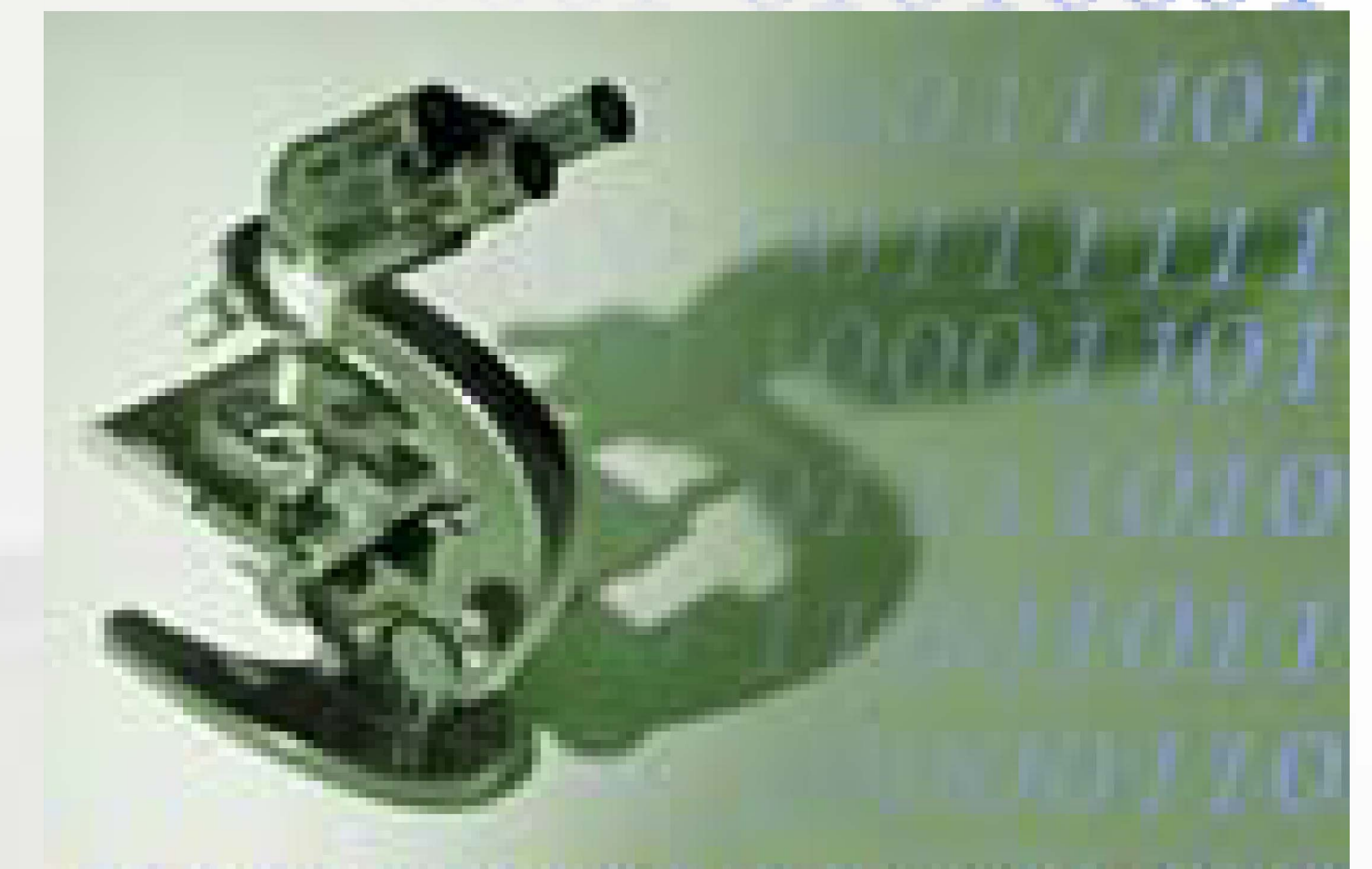
✓ As a Means of Authentication

Forensics

Authentication:

A means of declaring the authenticity of a record at one particular moment in time

Questions?



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