

Artful Trust of Digital Systems

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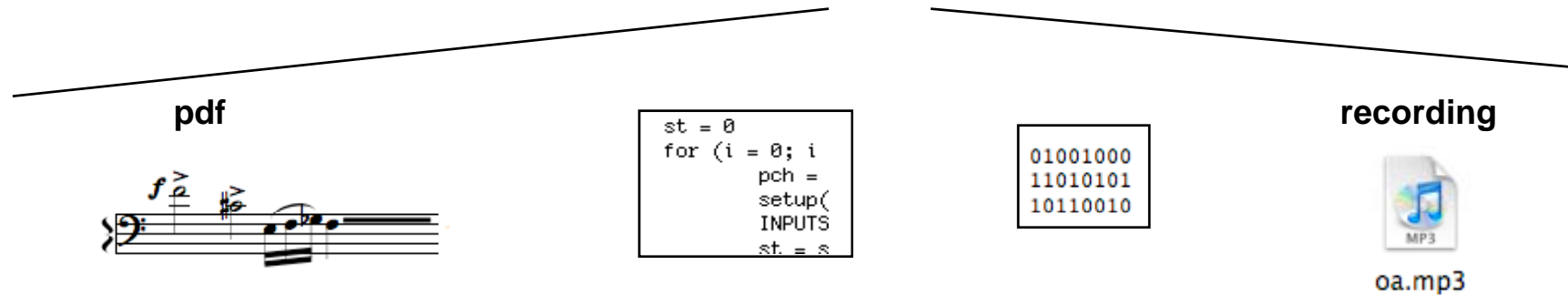
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Questions of a future music scholar

Found, in the year 2107:



(a string of binary digits)



What assurance can I have that:

- I am correctly grouping the bits and identifying their type?
- The files are what they purport to be?
- They have not been altered?
- I can combine/use them to perform the composition?
- Such a performance is what the composer intended?

Trustworthiness

Reliability

The trustworthiness of a record as a statement of fact,

based on:

- the competence of its author
- the controls on its creation

Accuracy

The correctness and precision of a record's content

based on:

- the competence of its author
- the controls on content recording and transmission

Authenticity

The trustworthiness of a record to be what it purports to be, untampered with and uncorrupted

based on:

- identity
- integrity

Authenticity: Identity

The attributes of a record that characterize it as unique, and that distinguish it from other records.

Identity metadata:

- names of the persons concurring in its formation
- the matter or action in which it participates
- time(s) of creation and transmission
- the expression of its archival bond
- the indication of any attachment(s)

Authenticity: Integrity

A record has integrity if the message it is meant to communicate in order to achieve its purpose is unaltered.

Integrity metadata:

- name(s) of handling persons over time
- name of person responsible for keeping the record
- indication of annotations
- indication of technical changes

Authentication

A means of declaring the authenticity of a record at one particular moment in time -- possibly without regard to other evidence of identity and integrity.

Example: the **digital signature**. Functionally equivalent to medieval seals (not signatures):

- verifies origin (identity)
- certifies intactness (integrity)
- makes record indisputable and incontestable (non-repudiation)

Trusted Systems

Rules, and tools and methods to implement rules, for

Making reliable and accurate records

- record-identity metadata schemes
- business and documentary procedures integrated in a workflow structure linked to classification schemes and filing plans
- specifications of record forms
- record-making access privileges

Maintaining and keeping authentic records

- record-integrity metadata schemes
- classification schemes and filing plans
- linked retention schedule
- registration system
- retrieval system
- record-keeping access privileges

InterPARES

Phase 1 (1999-2001)

- administrative and legal records in databases and document management systems
- requirements that support the presumption of the authenticity of electronic records *before* they are transferred to the preserver's custody
- requirements that support the production of authentic copies of electronic records *after* they have been transferred to the preserver's custody

InterPARES

Phase 2 (2002-2006)

- investigated issues of authenticity, reliability and accuracy from the perspective of the entire lifecycle of records.
- focused on records produced in complex digital environments in the course of artistic, scientific and e-government activities.

Aspects of trust: Science

- “data” not “records”
- “reliability”: based on credentials of creator and controls on data collection procedure
- “accuracy”: true representation of observed phenomena, within instruments’ capabilities
- “quality”: accuracy, consistency, completeness, and lineage
- “lineage”: documents the chain of transmission from creation to user (integrity metadata)
- importance of technological context

Art: overview

- Creators are interested in preserving final products, not just byproducts
- A work is not simply an attestation of a past act, but a vehicle of communication from artist to audience
- Most artists care that the message is clearly from them, and that it has not been corrupted.
- “Authenticity” frequently used, but it is entangled with notions resembling reliability and accuracy.

Various Senses of “Authenticity” in Art

How accurately it depicts truth (e.g. in photography)

The degree to which it manifests the essence of its creator. (“Mine”)

For “singular” art works:

For “multiple” art works:

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

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are needed to see this picture.

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TIFF (Uncompressed) decompressor
are needed to see this picture.

Authenticity = status as the “original”:

- Identity: artist’s title, date, signature
- Integrity: provenance

(Authentication can also establish this.)

Accurately produced from a
“master”, or from instructions

An “authentic performance”:

“reproduces all that is constitutive of
the work's individuality”.

- Relative, not absolute (!)

Serviceability of technical components

Technological context and authenticity

Instructive or enabling documents:



```
st = 0
for (i = 0; i
    pch =
    setup(
    INPUTS
    st. = s
```

```
01001000
11010101
10110010
```



oa.mp3

control specific technologies:

