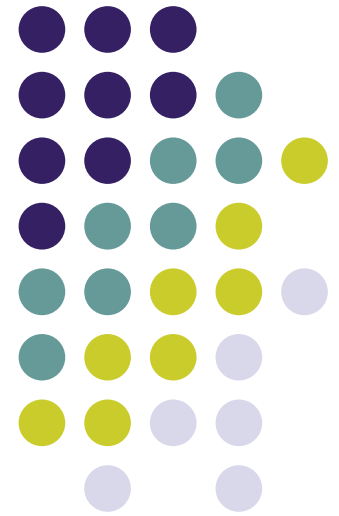


Preserving authentic electroacoustic music: the InterPARES project

IAML-IASA Congress 2004, Oslo

John Roeder

University of British Columbia School of Music
Vancouver, B.C., Canada





What is electroacoustic music?

Music made with electronic sound-producing devices.

Historical sketch:

- Early 1900s: Theremin (1918); Ondes-Martenot (1928)
- 1950s: *musique concrète* and analog synthesis; Paris, Milan, Köln; Schaeffer, Berio, Stockhausen
- 1960s: computer music, digital hardware synthesis
- Representations developed: MIDI, C-Sound, Max, Finale
- Today: software synthesis and control; interactivity

(Recall Arne Nordheim's *Ohm*, at the Oslo Rådhus)

To preserve any electronic object one must:



1. keep it continually accessible in its intended form

and

2. keep it safe from tampering and unintended modifications

1. Identity

+

2. Integrity

= Authenticity

General challenges of preserving electronic records



- Fragility of storage media
- Short life spans of software and hardware
- Ease of copying/repurposing obscures authorship
- Lack of standards for identity and integrity metadata
- Difficulty of controlling access to “originals”

Preservation problems special to electroacoustic music



- Widely varying types of electronic documents: digital, non-digital
- Special, in many cases unique, “instruments”
- Authors’ lack of expertise in preservation
- Authors’ lack of interest in preservation
- Questions about **identity**:
 - What constitutes a musical work?
 - Which digital objects are essential?
 - Who are the real authors? (composer? performers? technicians?)



International in participation and funding:

- National and provincial/state archives of U.S., Canada, seven European countries, China, Singapore, Australia
- Universities
- Private sector



Interdisciplinary:

- Archival theory (diplomats) gives direction
- Practicing archivists
- Theorists and practitioners in: space science, pharmaceuticals, aviation, geography, archeology, music, photography, dance, theatre, film, e-literature, multimedia production, ...
- Multi-method design



InterPARES 1 (1999-2001)

- Focused on common (database system) electronic records of business and government.
- Set benchmark and baseline requirements for establishing and maintaining authenticity of electronic records
- Built models of appraisal and preservation processes



InterPARES 2 (2002-2006)

Concentrates on electronic records that are:

- Interactive
- Dynamic
- Experiential (Lynch)

Focuses: Creative/performing arts, science, e-government

Domains: Records creation and maintenance;

Authenticity, reliability and accuracy;

Methods of appraisal and preservation

Cross Domains: terminology, policy, description, modeling



Facets of research:

- Theoretical studies: review of disciplinary notions of authenticity, reliability and accuracy
- Survey of creators' practices
- General studies of/collaboration with related research into electronic records preservation
- Case studies
- Modeling (including testing of IP1 models)
- Metadata survey and recommendations
- Policy survey and recommendations



Theoretical studies

What you choose to preserve depends on what you think you are preserving.

- What is a musical work?
- What makes it authentic?
- Is it enough to preserve the score?
A recording?

(Reconsider Nordheim's *Ohm*, for example.)

Theoretical studies



Stephen Davies, “Ontologies of Musical Works”

- “A musical work is a norm kind [of sound structure], with performances as its instances.”
- “Some of a work's constitutive properties depend on features internal to its sound structure, but others rely on the sound structure's external relation to musical practices, conventions, styles, and genres that are presumed by its composer.”



Theoretical studies

Stephen Davies, “Ontologies of Musical Works”

- Works not for performance:
 - ◇ stored as encoding
 - ◇ preservation reduced to preserving sound recording
- Works for performance: transmitted via instructions or exemplar
 - ◇ Works for studio performance/“virtual” performance
 - ◇ Works for live performance
 - ◇ Need to preserve instructions and interpretive conventions, including instruments.
- Works vary in how “thickly” they are specified.



Theoretical studies

Meanings of “authenticity”

1. In sound preservation literature:

- Unaltered from the original recording (Lazar)
- Fidelity: free of noises introduced by recording, copying, or playback.
- Approaching the acoustic experience of the original sound (Copeland, Fox), that is, “verisimilitude”.

2. In performance-practice literature:

- “An ideally authentic performance is a performance that is faithful to what is determined in the musical notation according to the conventions appropriate to the interpretation of that notation.” (Davies)

3. In diplomatic theory:

- An *authentic record* is a document, created or received in the course of an activity, that is what it purports to be, and that stands for the action that it documents.
- Every record derives its identity partly from its documentary, juridical, and provenancial contexts. (Duranti)

Survey of creators' practices



Of 161 responding composers:

- 43 percent produce interactive electroacoustic music of some kind
- 47 percent have lost files they considered valuable through hardware or software obsolescence
- There is an even split about whether a score-less musical work is best represented by the pre-existing digital documents that define and delimit its possibilities, or by an audio (or video) record of what actually happens.
- Most of the software they use (76 percent) is commercial, off-the-shelf product.

Other general studies: MUSTICA



A collaboration of InterPARES with French agencies that commission and produce electroacoustic compositions:
Groupe de Recherches Musicales (GRM) of L'Institut National de l'Audiovisuel (INA) and
Institut de Recherche et Coordination Acoustique/Musique (IRCAM)

Goal: to create a typology of the records generated by the composition and performance of interactive computer music

- interviews with composers and technicians
- prototyping of a database repository



Case studies

Obsessed again... for bassoon and interactive electronics, by Keith Hamel (Canada).

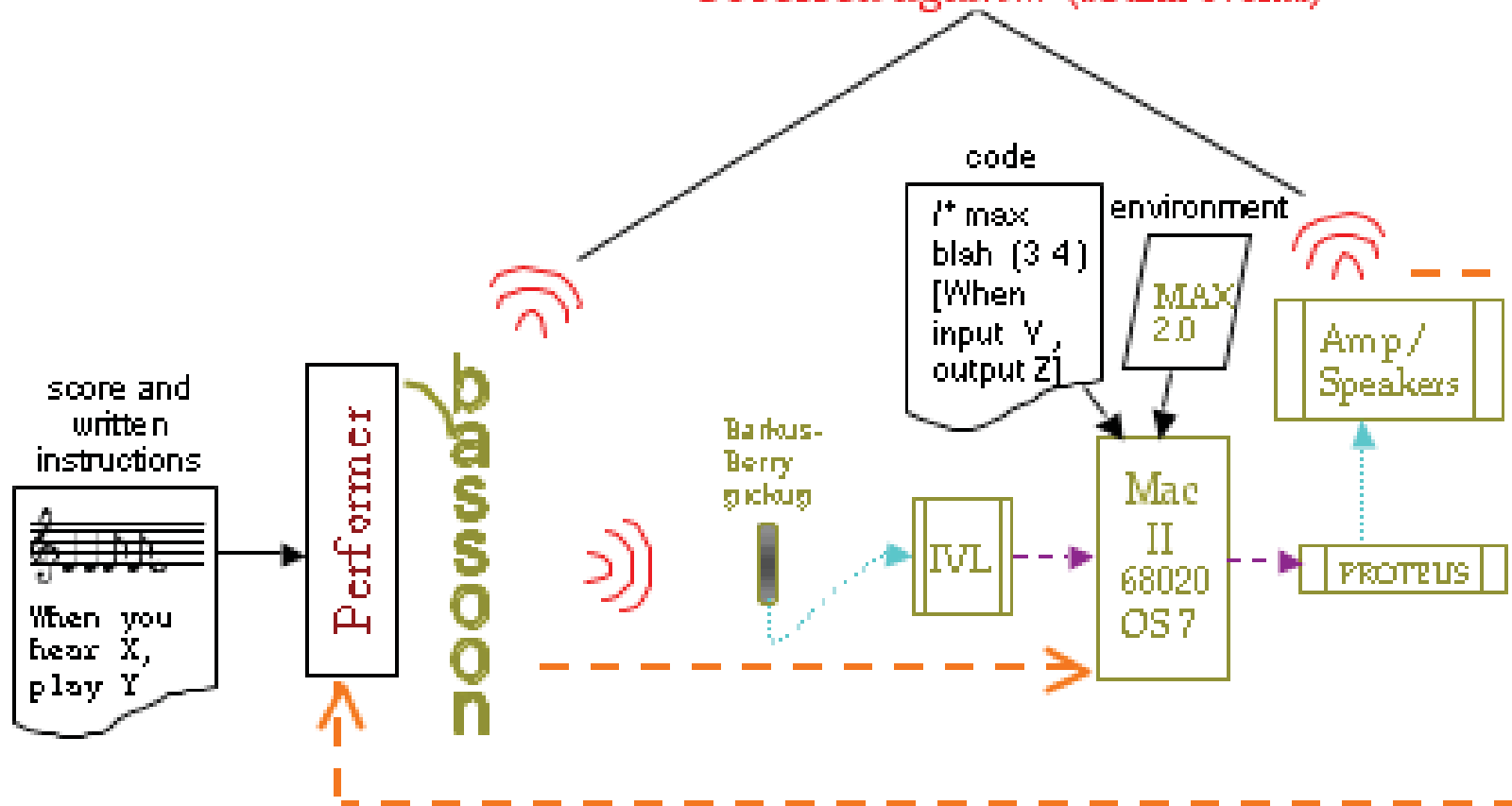
Commissioned and first performed in early 1990s.

- It is a typical interactive electroacoustic work for performance
- It presents typical issues of obsolescence

Case studies



Obsessed again... (sound-events)

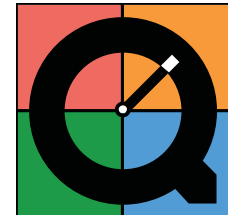


- ▶ MIDI signals
-▶ Analog-electrical audio signals
- ▶ Instructions
- - - - -▶ Interactive signals
- Descriptor Composer-specified instrumentation

Case studies



Obsessed again... for bassoon and interactive electronics, by Keith Hamel (Canada).



Examples of interactions (audio examples*)

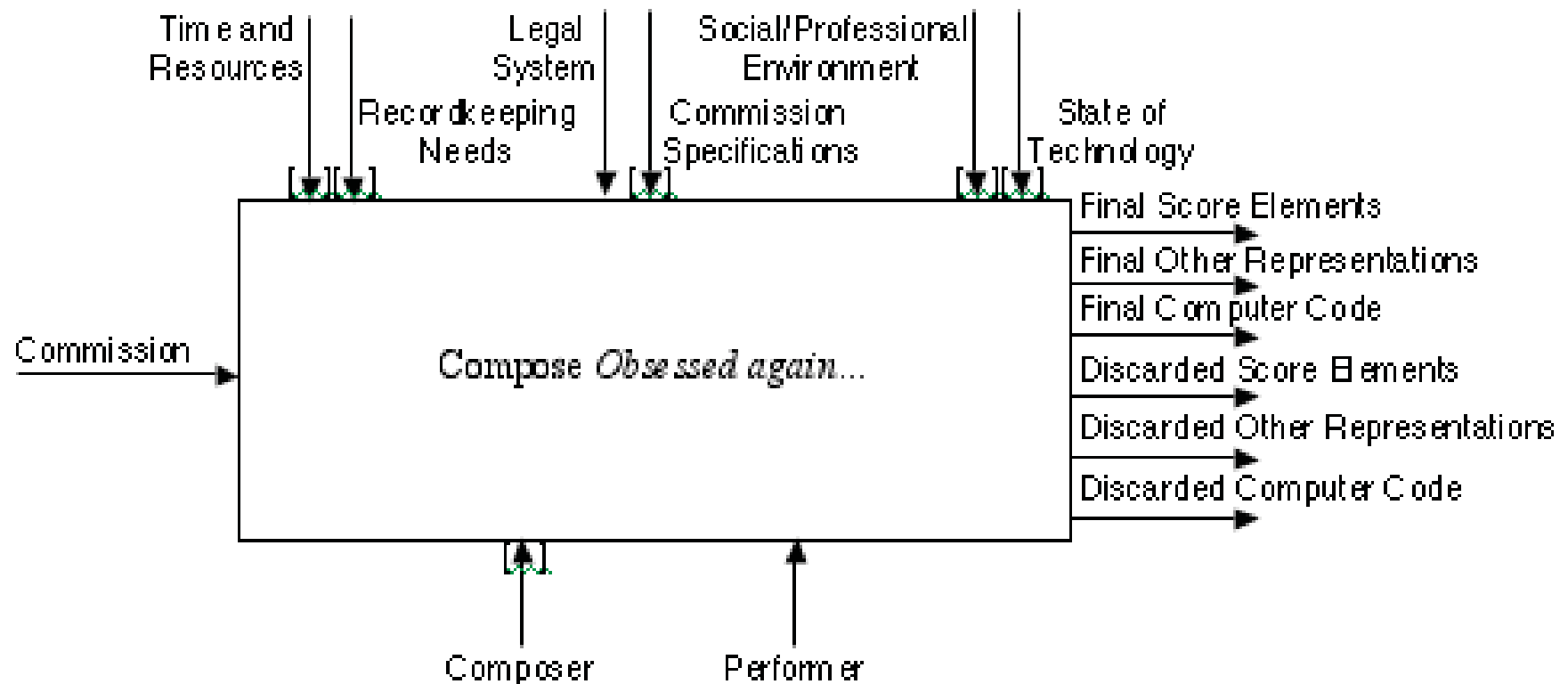
1. Computer sounds triggered by bassoon pitch.
2. Computer matches and sustains bassoon pitches.
3. Repeated bassoon pitches trigger different computer events.
4. As above, but bassoonist also follows computer's beat.

(*Recording reproduced by permission of the composer, Keith Hamel, and the performer, Jesse Read)



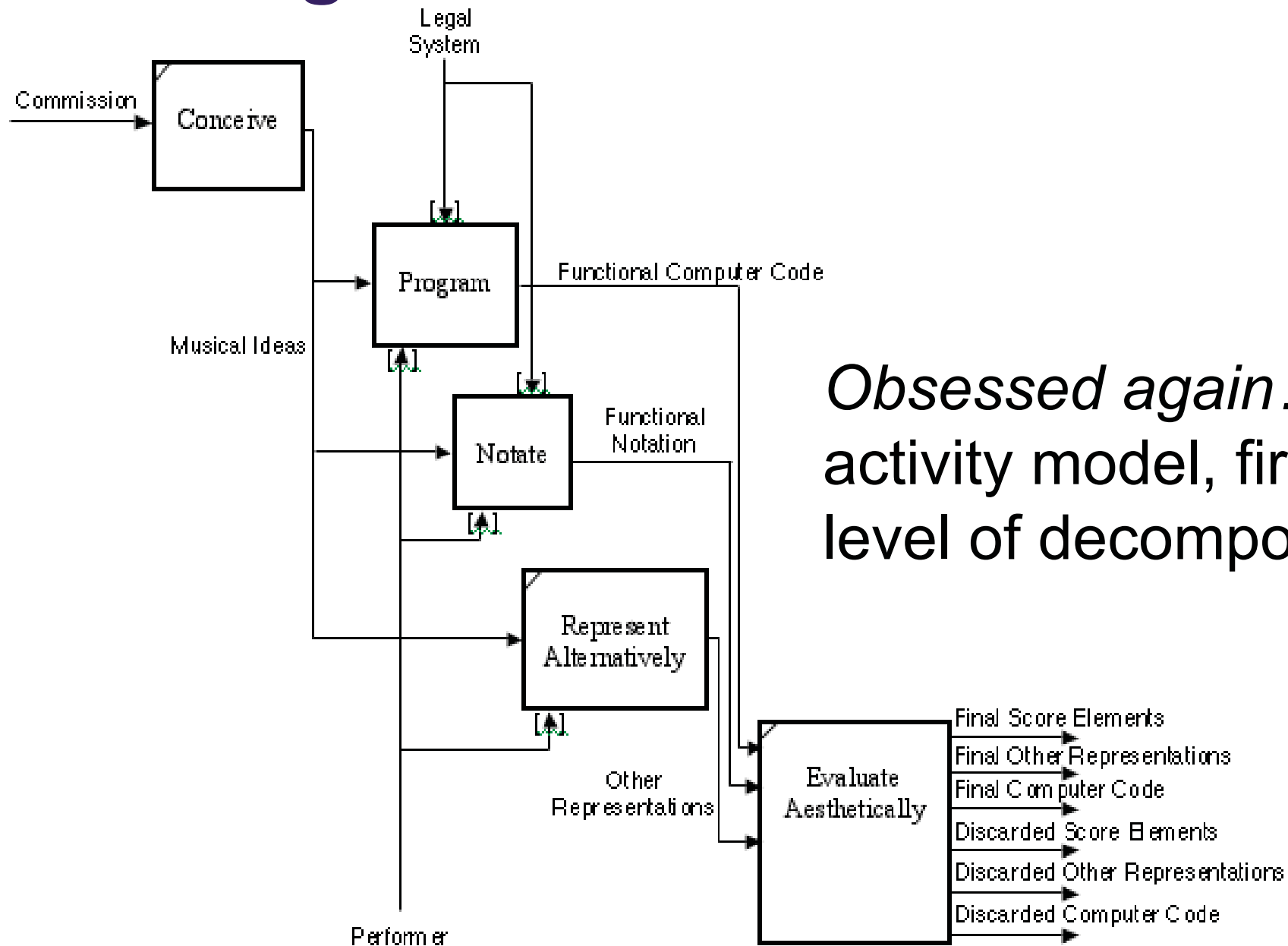
Modeling

Activity model (BPWIN) of composing *Obsessed again...*, top level





Modeling

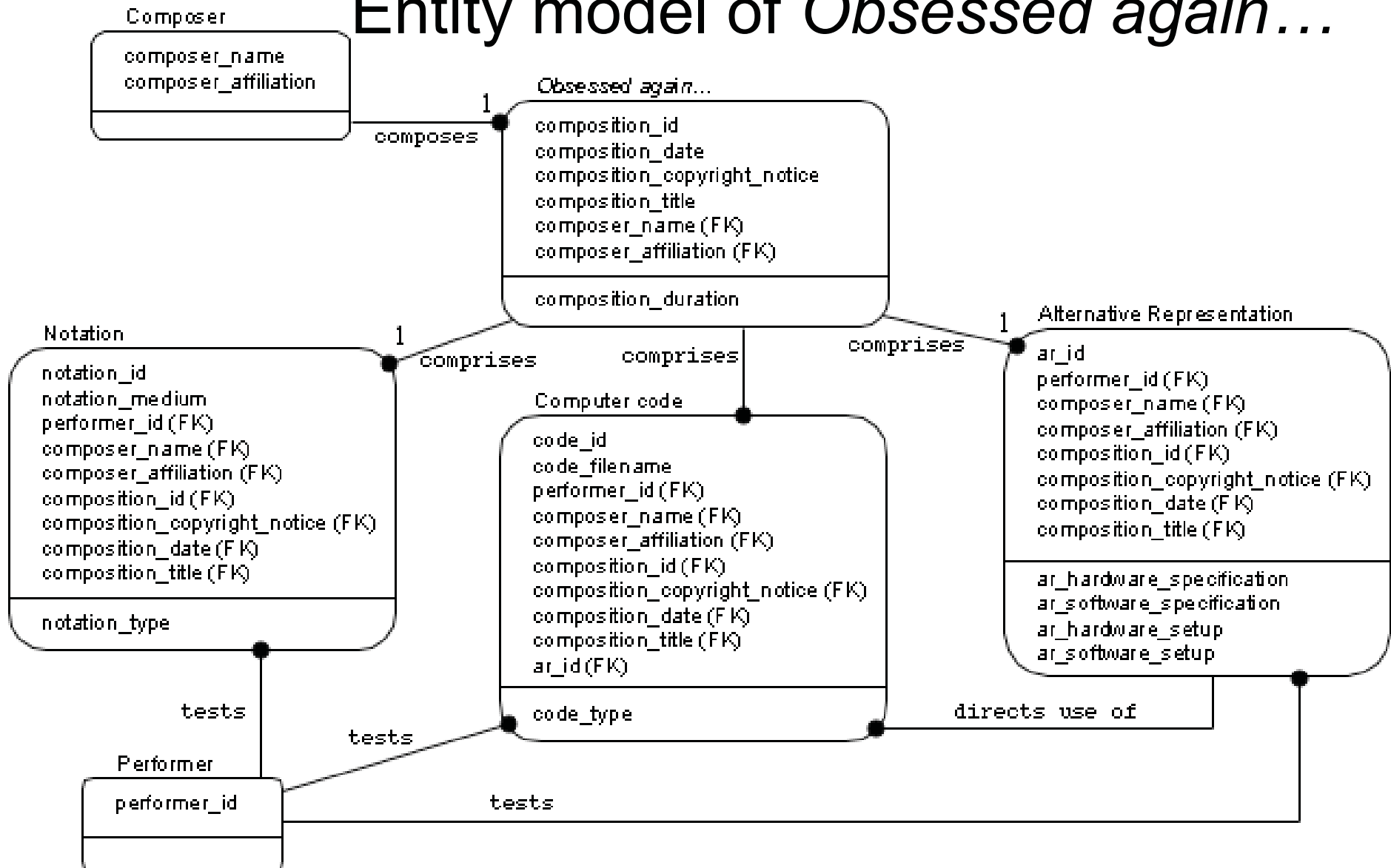


Obsessed again...
activity model, first
level of decomposition



Modeling

Entity model of *Obsessed again...*



Modeling



What the modeling so far shows:

- As now specified, the identity of *Obsessed again...* is tightly bound to idiosyncratic, obsolete hardware technologies;
- Work-characteristic interactivity is specified only implicitly;

But the composer says he conceives of the work essentially in a technologically independent way,

So to preserve the work, it must be renotated accordingly (and with the metadata shown in the entity model).

Coming soon:

- Case study continues as composer attempts migration.
- This model feeds into general model, along with models of other cases.

Some recurring themes



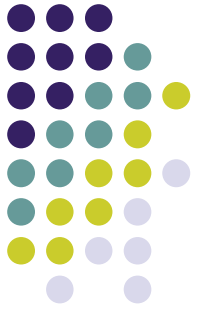
- Preserving electroacoustic musical works for performance means, at least, preserving the ability to perform them. Recordings may be necessary but they are rarely sufficient.
- There are many varied records associated with a work, including drafts, correspondence, and contracts, that form a context for the work's identity. Preserving a work requires maintaining the relations among these records.
- Modeling the entities and activities of creation helps determine the interdependencies of authors, performers, and technology that identify the work.
- Some of the content essential to the identity of these works may derive originally from properties of unpreservable electronic devices. By comparing authentic performances, one may be able to determine what is essential to the work's identity, and so what should be preserved.

Some recurring themes

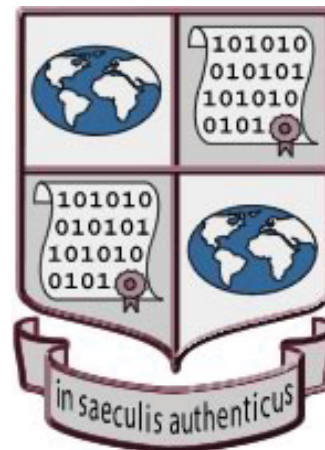


- Creators, while they are still living, are the best arbiters of the authenticity of performances. So it behooves creators to describe works in technologically independent (and authentically preservable) ways that will allow authentic performance in the future.
- To preserve a work authentically, its metadata should provide information about identity and integrity.
- Because the procedure of systematically migrating pieces onto new technological platforms to keep the pieces playable is labor-intensive, it may be that institutions are best equipped to carry out preservation functions.
- Learning how to preserve interactive electroacoustic music may teach us how to preserve other interactive experiences, such as citizens' online transactions with government.

Comments and suggestions are welcome!



www.interpares.org





References

- Copeland, P. "What Should a Sound Archive Really Do?" *Care of Photographic, Moving Image and Sound Collections: Conference Papers, York, England, July 20-24, 1998*. Susie Clark, ed. Worcestershire: Institute of Paper Conservation, 1999.
- Davies, S. "Ontologies of Musical Works." In *Themes in the Philosophy of Music*. Oxford University Press, 2003.
- Davies, S. "Transcription, Authenticity, Performance." *British Journal of Aesthetics* 18 (1988).
- Duranti, L. *Diplomatics: New Uses for an Old Science*. Lanham, MD: Scarecrow Books, 1998.
- Fox, B. "Not fade away." *New Scientist* 177.2384 (1 March, 2003).
- Lazar, W. "A proposed university specialization in sound preservation." *ARSC Journal* 26.1 (1995).
- Lynch, C.A. "When Documents Deceive: Trust and Provenance as New Factors for Information Retrieval in a Tangled Web." *Journal of the American Society for Information Science* 52.1 (2001).