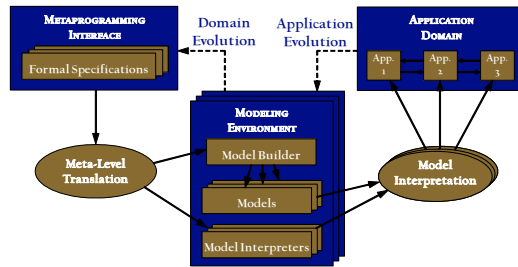


ABSTRACT

Model-based design is easy to praise, but non-trivial to follow, especially when designing from scratch! We describe a paradigm for instructing students in the art and science of Model-Integrated Computing (MIC), as well as a motivating example which demonstrates the phases of the design of a modeling environment.



0. BASIC CONCEPTS

- **Module Interconnection:** associate components through interfaces
- **Aspects:** multiple views or slices of the same model
- **Hierarchy:** encapsulation and hiding through containment
- **Object association:** association between objects
- **Specialization:** object refinement through inheritance

1. DOMAIN KNOWLEDGE

Before creating a modeling environment, the domain concepts must be understood;

EXAMPLE: KINDS OF PUBLICATIONS

Domain knowledge: There are many kinds of publications, but they all have certain common characteristics. Use domain knowledge obtained from years of thinking and best-practices in

EXAMPLE: AUTHORS OF PUBLICATIONS

Domain knowledge: Publications have authors, and authors are typically associated with more than one publication. Consider how to reuse authors across publications, and avoid re-entering information

2. CONCEPTS ENCODING

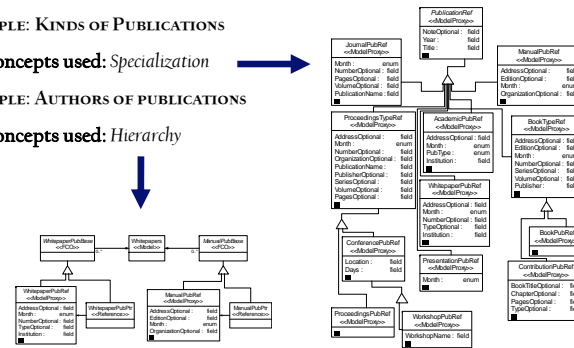
Once the concepts are understood the domain concepts are mapped using the basic concepts of modeling

EXAMPLE: KINDS OF PUBLICATIONS

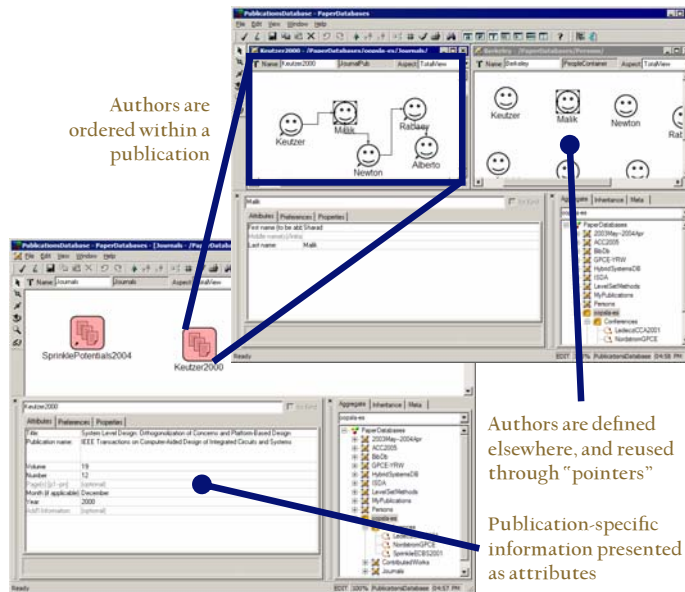
Concepts used: Specialization

EXAMPLE: AUTHORS OF PUBLICATIONS

Concepts used: Hierarchy



Authors are ordered within a publication



Authors are defined elsewhere, and reused through "pointers"

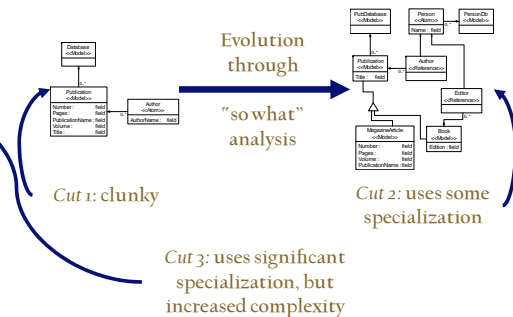
Publication-specific information presented as attributes

3. TRANSLATORS & 4. ARTIFACTS

Models are only useful if they can be translated or interpreted into some other useful form.

EXAMPLE: GENERATE DATABASE

EXAMPLE: GENERATE HTML VERSION OF BIBLIOGRAPHY



Cut 1: clunky

Evolution through "so what" analysis

Cut 2: uses some specialization

"SO WHAT?"

The designer learns that there is a difference between a useful modeling environment, and one for the sake of having one. Designs evolve, and a "fixed-point" of usability vs. overhead is reached. Metamodeling reduces the overhead of creating the GUI and syntax parser.

FOR MORE INFORMATION

DOWNLOAD THE TOOL: <http://www.eecs.berkeley.edu/~sprinkle/oops/la/>

GME INFORMATION: <http://www.isis.vanderbilt.edu/>

CHESS WEBSITE: <http://chess.eecs.berkeley.edu/>

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