

8th OOPSLA DSM Workshop

A Domain-Specific Approach to the Development of Ontology-Based Document Assessment Assistants

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Context

- Specific – Level 1: English professors/teachers evaluating hundreds of digital documents
- Specific – Level 2: Document evaluators evaluate digital documents
- General: “End–User Development”, “Natural Programming” → empowering users to solve problems without the assistance of software developers

Document Evaluation: Manual

- Grading codes mined over the years [→]
- Repeat until done:
 - Identify writing pattern/anti-pattern
 - Annotate paper (by hand/using MS Word's comment feature)
- Students need to go back to the “Grading codes” to understand what the evaluator meant.

Document Evaluation: Software Assistant (1)

- Domain-Specific Language:
 - Grading codes → Ontology → Taxonomy
 - Documents → MS Word Documents
 - Ontology Manipulation →
 - CRUD + Export (design and publish modes and direct manipulation)
 - Documents → as usual
- This is fundamentally a language of gestures.
- Syntax was not defined!

Document Evaluation: Software Assistant (2)

- Meta-Models (MM):
 - Ontology MM:
 - Ontologies represented as taxonomies → general trees. Inner nodes model the “category-subcategory” relation. Leaves are attributes of category-subcategory paths.
 - Document MM:
 - Word Object Model!

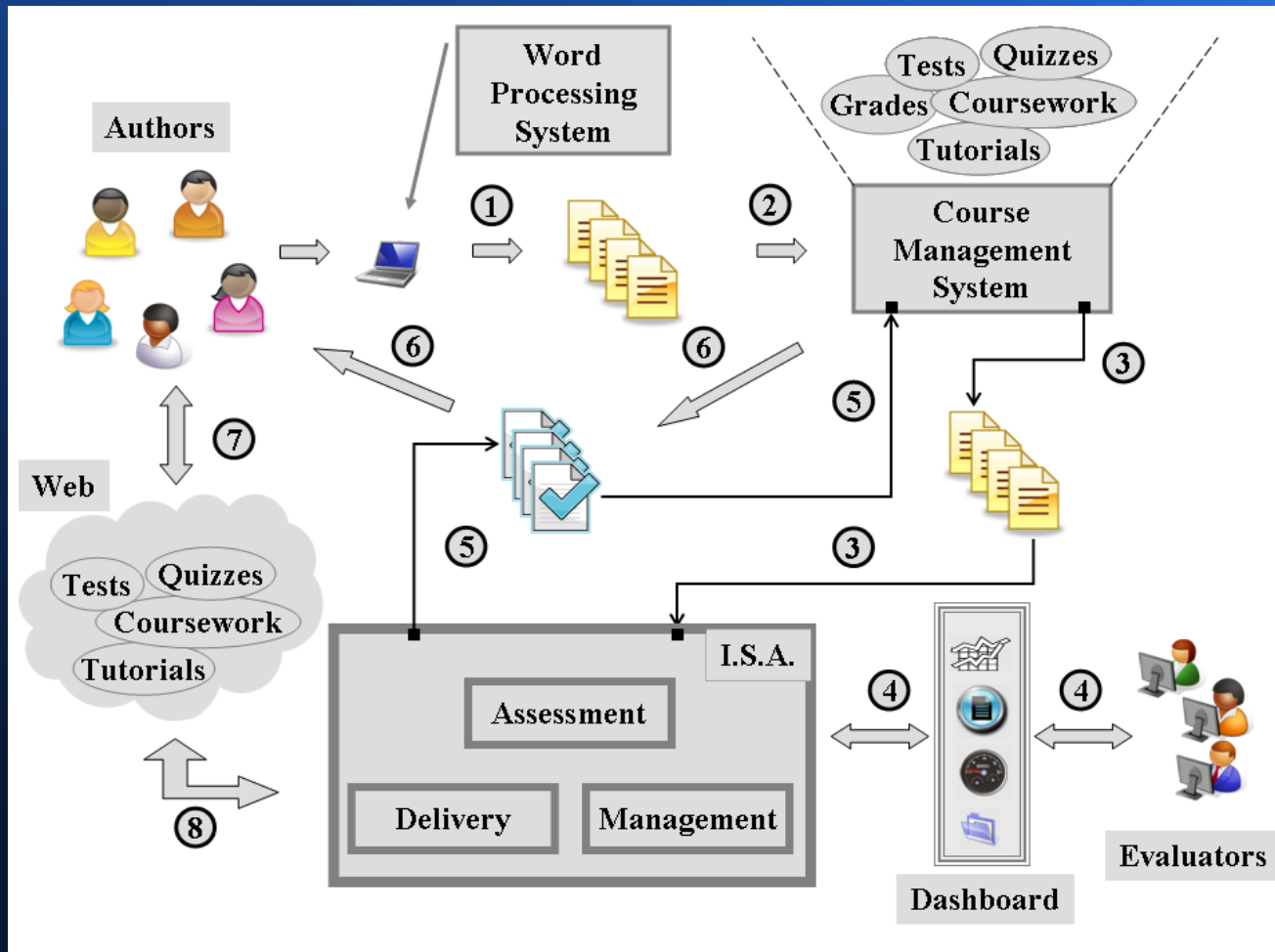
Document Evaluation: Software Assistant (3)

- Semantics of Meta-Models (Meta-MM):
 - Ontologies: operational semantics through ontology manager implemented in C#.
 - Documents: operational semantics through Primary Interop Assemblies (PIA) for the Word Object Model.

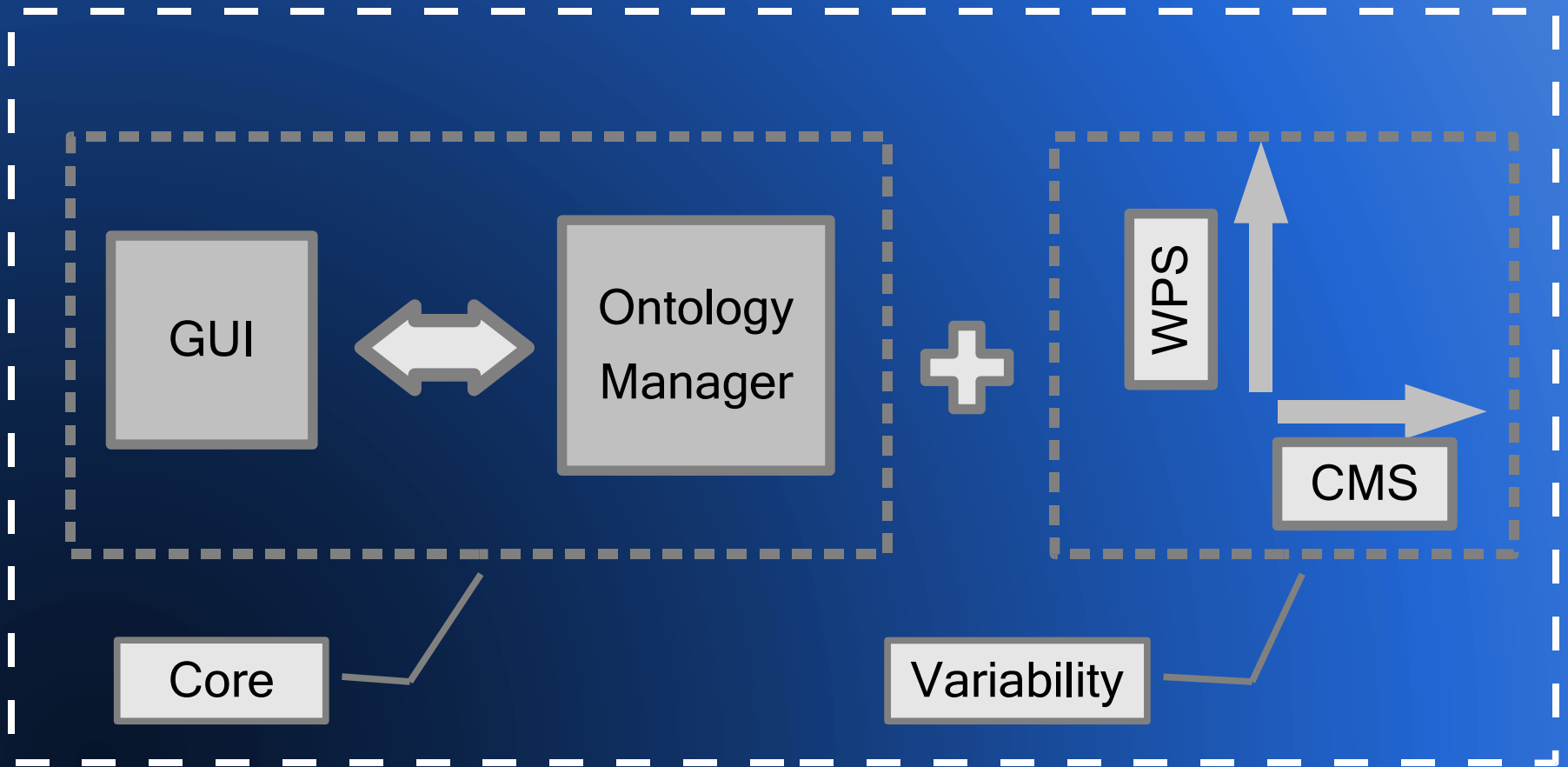
Quick Demo

- Hold on ...

Current Project



Software Product Line!



Future Work

- Generality of approach across disciplines (type of documents): legal, medical, software engineering, etc.
 - Ontologies are created by experts. The software assistant assists, does not usurp!
 - Humans are empowered by tools
- Communities of learners and educators → collaborative building of ontologies
- “Ontology Learning” → AI dreaming all over again!

Questions ?

- Thank you!