Collaborative Authoring of Learning Elements for Adaptive Learning Spaces

Workshop Authoring of Adaptive and Adaptable Hypermedia
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Outline

- Application Context
  - Experience management
  - Experiential learning
- Learning Space Approach
  - concepts and approach
  - Software Organisation Platform
  - authoring tools
- Conclusion and Outlook
– Application Context –

Experience Management
Experiential Learning

Software Engineering Experience Factory

[Basili, Caldiera, Rombach 1994]
Three Problems of Experience Package Reuse

1. **Bad understanding** of reusable experience packages
   - Bad quality of experience packages (e.g., lack of contextual description)
   - EM systems do not explicitly support understanding

2. **No explicit support for internalization** of knowledge and **no compliance with human information processing**
   - “Internalization” is harder than “externalization”
   - “Copy-model” → experience is transferred as it has been documented
   - EM approaches focus on the product of learning and not on the learning processes
   - Experts’ routine knowledge qualitatively different from novices knowledge structures
   - Novices lack of background knowledge

3. **No explicit connections between KM/EM and e-learning** (organizational and individual learning)

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– Learning Space Approach –

“Enhancing Experience Reuse and Knowledge Acquisition through Learning Spaces”
Learning Space Approach – Composition

Learning Space

Experience

Package

Learning Space structure template

Learning space adaptation and embedding

Learning component

Learning goal template

Learning element

Type/Aim/Context/Storage/LD/Database
learning objective
principle
description
framework
experience
pattern
law
survey
case study
controlled experiment
state experiment
introduction
conclusion
example
counter example
example
simulation
collaborative activity
integrated practice activity
text activity
overview
summary
scenario
reference
cross reference
communication reference

Learning Space
Learning Space Generation – Authoring

Software Organization Platform

ColL Authoring
LE Authoring
LE Base

Vocabulary Manager

Didactical Templates and Decision Models

Experience Package Base

Adaptivity Modelling

Experience Base (Extension in Wiki)

Learning Element Editor (Extension in Wiki)

Knowledge Engineer

Protégé (OWL)

Knowledge Engineer

Software Developer & Project Manager

Knowledge Engineer

Reload Editor (IMS LD)

Reload Editor (IMS LD)

Instructional Content

Situational Content (Context Model)

Experience Package

Domain Model

Context Model

Variability Model

Adaptive Instructional Design Modeler & Competence Manager

Reload Editor (IMS LD)

Learning Element Editor (Extension in Wiki)

Vocabulary Manager (Extension in Wiki)

Semantic MediaWiki

Experience Base (Extension in Wiki)

XML Editor

Fraunhofer ISE Decision Modeler (current and future work)

Authoring Tools

<table>
<thead>
<tr>
<th>Artifact</th>
<th>Role</th>
<th>Tool/Technology</th>
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<tbody>
<tr>
<td>• Learning Space Structure Template</td>
<td>Adaptive Instructional Design Modeler &amp; Competence Manager</td>
<td>• Reload Editor (IMS LD)</td>
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<tr>
<td>• Learning Goal Template</td>
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<tr>
<td>• Instructional Content</td>
<td>Knowledge Engineer</td>
<td>• Learning Element Editor (Extension in Wiki)</td>
</tr>
<tr>
<td>• Situational Content (Context Model)</td>
<td>Software Developer &amp; Project Manager Knowledge Engineer</td>
<td>• Vocabulary Manager (Extension in Wiki)</td>
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<td>• Experience Package</td>
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</tbody>
</table>

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Slide 10
Context Model (Semantic MediaWiki)

- [[Category:categoryName]]
- [relationshipName:wikiPageName]

Domain Model (Software Engineering Body of Knowledge)
Vocabulary Manager

![Vocabulary Manager Image]

Learning Element Editor

![Learning Element Editor Image]
Decision Model (XML Editor)

– Conclusion –
**Conclusion**

*Easy wiki-based collaborative content authoring*

*Easy annotation of situational and instructional content*

*Separation of content (Structure & Layout) and adaptive functionality*

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**Outlook**

- Enhance variability modeling
  - Develop decision modeler tool
  - Develop training for adaptive instructional design modeler
- Develop SOP 2.0
  - CASE tool integration
  - Connect to other repositories (like mashups)
  - Integrating folksonomies
- Empirical investigation
  - Use and acceptance evaluation of authoring tools
  - Impact of different adaptations to the learning space on knowledge acquisition
Thanks!

Questions?

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