IMS Learning Design: State of the art and research hot topics on eLearning standardization

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Part I: eLearning standardization

Part II: What is IMS Learning Design?

Part III: Research hot topics and projects
The eLearning standards and the educational modeling languages seen from outside
Part I: eLearning standardization
What are standards? An analogy

Think about ...

...different plugs around the world
The standardization process
Specification versus Standard

There is a need in industry or users

There is a regulation to face the need

Tools and environments are generated

Debugging and programming. New releases

Validation and launch
(ISO, BSI, CEN, IEEE...)

Independent institution
Standarization bodies

- IMS Global Learning Consortium.
- Advanced Distributed Learning (ADL).
- Dublin Core Metadata Initiative.
- Institute of Electrical and Electronic Engineers (IEEE) Learning Technology Standards Committee (LTSC).
- International Standards Organisation (ISO) Sub Committee 36 (SC 36).
- AFNOR, et cetera
eLearning specifications

SCORM
Dublin Core Metadata

IMS Simple Sequencing
IMS Content Packaging
IMS Question and Test Interoperability
IMS Learning Design
Why do we need specifications and standards in eLearning

- A teacher makes some content
- The teacher adapts the content online
- (s)He integrates the content with the platform
- Validation and use
- Change of platform, player, editor...

Without specification

Problem

SIIE06, León, Spain, October 24th-26th, 2006
Why do we need specifications and standards in eLearning

WIHT speciation

A teacher makes some content

The teacher adapts the content online

(s)He integrates the content with the platform

Validation and use

Change of platform, player, editor...
Why do we need specifications and standards in eLearning

1. They prevent content becoming “locked in” to proprietary systems
2. Ensure educational content can be reused
3. Enable educational content & learner information to be shared
4. Facilitate interoperability
5. Enable users to search for, locate and retrieve appropriate content
6. Share content between systems
7. Create and deliver computer aided assessments
8. Record and share learner information
9. Ensure educational content is accessible to all users
10. Improve the research and the quality
Main contribution of a spec to eLearning:
Interoperability of content, structures and technology
Where could we use standards in the eLearning process?
Where could we use standards in the eLearning process?

Original diagram by C. Duncan
Part II: What is IMS Learning Design?
What is IMS Learning Design?

- An eLearning specification
- to model Units of Learning
- in an interoperable way
Levels in IMS Learning Design

A. External resources, links and services (forums, chats...)

B. Users, learning activities, support activities, environments, resources, method, plays, acts, roles

C. Properties, conditions, calculations, global elements and monitoring services

Notifications
Example IMS LD Unit of Learning

Introduction: What is Candida?

What is Candida

Candida albicans is an opportunistic yeast that normally inhabits the mouth, throat, intestine and genitourinary tract of most humans and is usually considered to be a normal part of the bowel flora (the organisms that coexist with us in our lower digestive tract). Its job is to recognize and destroy harmful bacteria. Without Candida, we would be defenseless against many pathogenic bacteria. In a healthy person, Candida albicans is monitored by the immune system. However, if the number of friendly bacteria is decreased (antibiotics), the immune system is weakened, or other conditions for yeast proliferation occur (diet; stress; sugar, improper pH in the digestive system), Candida albicans will shift from yeast to a mycelial form. This stage is more virulent. The yeast state Candida is a non-invasive, sugar-fermenting organism, while in fungal state it is invasive and can produce hyphae, very long, thread-like structures. Hyphae can penetrate mucous or intestinal walls, leaving microscopic wounds.
IMS Learning Design, from 2003 to 2007

2003

Raw Spec
## IMS Learning Design, from 2003 to 2007

<table>
<thead>
<tr>
<th>2003</th>
<th>2004</th>
</tr>
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<tbody>
<tr>
<td>Raw Spec</td>
<td>Level A</td>
</tr>
<tr>
<td></td>
<td>Example UoL</td>
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<tr>
<td></td>
<td>Prototypes</td>
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<td>General dissemination</td>
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<tr>
<td></td>
<td>Awareness Rising</td>
</tr>
<tr>
<td></td>
<td>Engine</td>
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</table>
IMS Learning Design, from 2003 to 2007

<table>
<thead>
<tr>
<th>Year</th>
<th>Feature 1</th>
<th>Feature 2</th>
<th>Feature 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>Raw Spec</td>
<td>Prototypes</td>
<td>General dissemination</td>
</tr>
<tr>
<td>2004</td>
<td>Level A</td>
<td>Example UoL</td>
<td>Awareness Rising</td>
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<tr>
<td>2005</td>
<td>Levels A, B, C</td>
<td>UoL Templates</td>
<td>Technical Editing Tools</td>
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<tr>
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<td></td>
<td></td>
<td>Specific dissemination</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>General facilitation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Rough Players</td>
</tr>
</tbody>
</table>
### IMS Learning Design, from 2003 to 2007

<table>
<thead>
<tr>
<th>Year</th>
<th>Raw Spec</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006-07</th>
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<tbody>
<tr>
<td></td>
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<td>Level A</td>
<td>Example UoL</td>
<td>Levels A, B, C</td>
<td>Levels A, B, C</td>
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<tr>
<td></td>
<td></td>
<td>Prototypes</td>
<td>UoL</td>
<td>Technical Editing Tools</td>
<td>User-centered Editing Tools</td>
</tr>
<tr>
<td></td>
<td></td>
<td>General dissemination</td>
<td>Templates</td>
<td>Specific dissemination</td>
<td>Inductive dissemination</td>
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<tr>
<td></td>
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<td>Awareness Rising</td>
<td>Learning scenarios</td>
<td>General facilitation</td>
<td>Adaptation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Engine</td>
<td></td>
<td>Rough Players</td>
<td>Kind Players</td>
</tr>
</tbody>
</table>
Where could we use IMS LD in the eLearning process?
Part III: Research hot topics and projects on eLearning standardization
Research hot topics

- Learning Networks
- Interoperability
- Educational eGames
- Adaptation and eLearning
- Tools: second generation
Thematic and exogeneus Learning Networks
Thematic and exogeneous Learning Networks
Interoperability inter-systems-specs

IMS Learning Design and IMS Content Packaging

IMS LD is embedded in IMS CP
IMS CP, new release along 2006

Regular IMS Content Package

- Package
  - Manifest
    - Meta-data
    - Organizations: Organization
    - Resources: Resource
    - (sub)Manifest
  - Physical Files
    - The actual content: HTML, Media, Activity descriptions, Collaboration and other files

IMS LD Unit of Learning

- Unit of Learning
  - Manifest
    - Meta-data
    - Organizations: Learning Design
    - Resources: Resource
    - (sub)Manifest
  - Physical Files
    - The actual content: HTML, Media, Activity descriptions, Collaboration and other files
<table>
<thead>
<tr>
<th><strong>Moodle feature-component</strong></th>
<th><strong>IMS LD structure</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Full course</td>
<td>1 UoL, 1 play, 1 act, 1 activity structure (type selection)</td>
</tr>
<tr>
<td>Setting: Full name</td>
<td>Title of Learning Design</td>
</tr>
<tr>
<td>Setting: Short name</td>
<td>Title of Play</td>
</tr>
<tr>
<td>Setting: Hidden sections</td>
<td>Activity Structure:IsVisible</td>
</tr>
<tr>
<td>Setting: summary</td>
<td>LD learning objectives</td>
</tr>
<tr>
<td>Setting: Your word for Students</td>
<td>roles:learner:title</td>
</tr>
<tr>
<td>Setting: Your word for Teachers</td>
<td>roles:staff:title</td>
</tr>
<tr>
<td>Topic</td>
<td>Learning activity</td>
</tr>
<tr>
<td>Topic 0</td>
<td>Learning activity (first one)</td>
</tr>
<tr>
<td>Summary of Topic</td>
<td>Activity Description</td>
</tr>
<tr>
<td>Activity: Chat</td>
<td>Synchronous conference (conference-type)</td>
</tr>
<tr>
<td>Activity: Forum</td>
<td>Asynchronous conference (conference-type)</td>
</tr>
<tr>
<td>Activity: Glossary</td>
<td>-</td>
</tr>
<tr>
<td>Activity: Quiz</td>
<td>-</td>
</tr>
<tr>
<td>Activity: Scorm</td>
<td>No match</td>
</tr>
<tr>
<td>Activity: Survey</td>
<td>External</td>
</tr>
<tr>
<td>Activity: Workshop</td>
<td>External</td>
</tr>
<tr>
<td>Resource</td>
<td>Learning object</td>
</tr>
<tr>
<td>Resource: Directory</td>
<td>-</td>
</tr>
<tr>
<td>Resource: Label</td>
<td>Learning object</td>
</tr>
<tr>
<td>Resource: Link to file</td>
<td>Learning object</td>
</tr>
<tr>
<td>Resource: Link to website</td>
<td>Learning object</td>
</tr>
</tbody>
</table>

**Interoperability inter-systems-specs**

**IMS LD and Moodle**

Moodle will export a course to an IMS LD Unit of Learning along 2006

Moodle will integrate in 2006-2007 the importation facility

Moodle can link to SLED player to play UoLs
Interoperability inter-systems-specs

IMS LD and SCORM

Some research to communicate IMS LD and SCORM using CopperCore

Minimal integration: link to a SCORM player

```
RESOURCE href="www.scormserver.org/sco345"
```
Interoperability inter-systems-specs

IMS LD and external communication with others

Link without sending values

Sending values via a dispatcher

Learning Flow

Activity 1

Game

Activity 2

Unit of Learning

Learning flow

Communication dispatcher

Activity 1: Generic game

Activity 2
Re-purposing Educational eGames

Learning Flow

Activity 1

Game

Activity 2

Learning Flow

Activity 1: Game

Activity 2
1. Who is the final decision maker?
2. How much is the weight of each?
Tools on IMS LD

- CopperCore, www.coppercore.org
- Reload Project, www.reload.ac.uk
- Sled, http://sled.open.ac.uk
- IMS Specifications, www.imsglobal.org
- Moodle, http://moodle.org
- CopperAuthor, www.copperauthor.org
- Cosmos Tool
- ASK LDT
- netUniversité, dotLRN, et cetera

1st generation

2nd generation

- Easier authoring
- More powerful engines
- Smoother viewers
- Templates
- Flexible run-time
- Interoperability
Projects on research hot topics

- **Learning Networks and tooling:**
  - TENCompetence, www.tencompetence.org
  - Learning Network for Learning Design, moodle.learningnetworks.org
  - iCamp, www.icamp-project.org

- **Adaptive eLearning and professional learning:**
  - ProLearn, www.prolearn-project.org

- **Interoperability:**
  - Telcert, www.opengroup.org/telcert
  - Unfold, www.unfold-project.net
Stress: Research hot topics

Learning networks
Interoperability
Re-purpose of eGames
Adaptive eLearning
Second generation of tools
News and announcements

TENCompetence: Becoming an associate partner

Open University NL: Research visits

2 special issues and 1 workshop at ICALT 2007 on eGames and Personalized eLearning (with Baltasar F. Manjón and Griff Richards)

1 special issue on Adaptation and IMS Learning Design (with Alexandra Cristea)

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A few ways to say the same

Thank you
Yenkohe
Dank je
Muito obrigado
Danke
Molto grazie
Domo arigato
Merci
Spasiva
Tack
Sche-sche
Hvala lepa
Merci
Moltes gracies
Diolch
Gracias
...

“I think you should be more explicit here…”

Questions and contributions?

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