ReLOMS: Designing for Effective Use and Reuse of Learning Objects for E-Learning Systems

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E-Learning and Learning Objects

- ASTD’s (American Society for Training and Development): 'E-learning' covers a wide set of applications and processes, such as Web-based learning, computer-based learning, virtual classrooms, and digital collaboration.

- Wentling et al. (2000, p.5) define "e-learning as the acquisition and use of knowledge distributed and facilitated primarily by electronic means ".

- In the book *Empowering Enterprise e-Learning*, Himes and Wagner (2002) propose strategies for leveraging their content assets when developing and deploying e-learning. Developers can create content objects that can be used over and over again for a variety of applications. This is achieved through the use of modular pieces of content known as *learning objects*. 
E-Learning and Learning Objects

- **ASTD Learning Circuits** (2002) defines a **learning object** as “a reusable, media-independent chunk of information used as a modular building block for e-learning content”.

- The **Learning Object Metadata Working Group of the IEEE** (2002, Section 1.1) Learning Technology Standards Committee (LTSC) defines reusable learning objects as “any entity, digital or non-digital, which can be used, reused or referenced during technology supported learning”.

- In *The Instructional Use of Technology*, Wiley (2000) defines learning objects as any digital resource that can be reused to support learning.

- As e-learning environments become more and more popular, many attempts have been proposed to provide adaptive environments offering **learners** and **educators** customized courses for more effective learning and course construction (Muzio, Heins and Mundell, 2001).

Solutions Addressing Learning Objects

- There is a serious lack of conceptual clarity of definitions of learning objects, resulting in design, usability and reusability problems in current e-learning systems.

- More recent concerns in integrated learning systems have been on managing the millions of learning objects created, addressing disorganization, lack of use and reuse of these learning objects in e-learning systems (Polsani, 2003).

- Some solutions are aimed at helping learners, while others are aimed at helping educators and course designers/developers:
Concrete Proposal: ReLOMS

- In contrast with other studies, we propose **ReLOMS** (Reusable Learning Objects Management System) to address the serious lack of conceptual clarity of definitions, and uses of learning objects.
- We see ReLOMS helping teachers and administrators with a better course content management system and a proper taxonomy structure to support:
  - construction and de-construction and management of learning objects;
  - tagging of learning objects to Learning Object Metadata (LOM) standard with appropriate taxonomy frameworks and structures; and
  - search and retrieval of learning objects and associated metadata.

ReLOMS Architecture

- ReLOMS system architecture has two major modules to support construction and de-construction of LOs (next screen):
  - **Constructor Module**. This module is concerned with the creation of LOs and consists of three components: (i) **LO Search and Retrieval** supports personalized and collaborative searching and browsing; (ii) **Editor** provides an environment to create and edit new LOs; and (iii) **Control Authentication** incorporates authentication of users and LOs before allowing them to be stored in the respective databases.
  - **De-Constructor Module**. This module supports the de-construction or de-composition of LOs into smaller units of LO components with a learning objective, and consists of three components: (a) **LO Component Extractor** allows meaningful LO components be extracted for reuse; (b) **Metadata Tagger** provides a systematic, role-based workflow to complete the metadata details of the LO components; and (c) **LO Content Management** provides a course content management environment with a proper taxonomy structure to organize the LO components.
Conclusion and On-Going Work

- Initial feedback on ReLOMS has been positive.

- This is on-going work. More work needs to be carried out – our research agenda is ambitious but we want to look at ReLOMS from the different perspectives:
  
a. Learning Objects, Pedagogical Theories and Principles  
b. Users, Requirements and Usability of E-Learning Systems 
c. Concept Maps  
d. Taxonomy and Metadata  
e. Collaborative Information Retrieval  
f. Online Learning Communities  
g. Mobile and Collaborative Learning  
h. Economics of Learning Objects and Digital Rights Managements
Acknowledgements

- Daniel Tan and colleagues at the Centre of Educational Development (Nanyang Technology University).
- Mr Choy Fatt Cheong and the NTU library colleagues.

Thank You 😊

We welcome feedback on the prototype. Would be pleased to talk with you after this session.
ReLOMS HomePage

Login Module
### Create ID Module

Create your ID and password using the provided form. Enter your details in the fields provided and submit.

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Name 1</td>
<td></td>
</tr>
<tr>
<td>Last Name 1</td>
<td></td>
</tr>
<tr>
<td>Additional Contact</td>
<td></td>
</tr>
<tr>
<td>Email</td>
<td></td>
</tr>
<tr>
<td>Password</td>
<td></td>
</tr>
</tbody>
</table>

### Retrieve Password

Retrieve your password if you have forgotten it. Enter your email address in the form to receive a password reset link.

<table>
<thead>
<tr>
<th>Form Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enter your email address</td>
<td></td>
</tr>
</tbody>
</table>

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Constructor

Editor Module

Constructor : Launch Editor

Launch Editor

Please select the file you would like to upload.
Format of document:
Constructor: Editor

For example: Select Search to launch search

De-Constructor

Extractor Module
Deconstructor Module - Extractor

Deconstructor Module – List of LO Components
De-Constructor

Metadata Tagger Module
De-constructor Module

LOM Metadata - General

De-constructor Module

LOM Metadata - Lifecycle
De-constructor Module

LOM Metadata – Meta Metadata

De-constructor Module

LOM Metadata – Technical
De-constructor Module

LOM Metadata - Relations

De-constructor Module

LOM Metadata - Classification
De-constructor Module

LOM Metadata – Annotation (New)

De-constructor Module

LOM Metadata – Record of Use (New)
## Advanced Search

### Instructions:
- For more accurate search results, you might use advanced search bar.

### Advanced Search Features:
- **Title:** Enter the title of the object you are searching for.
- **Author:** Enter the name of the author.
- **Affiliation:** Enter the name of the institution.
- **Keywords:** Enter keywords to search for.
- **Language:** Select the language you want to search in.
- **Date Range:** Enter the date range for the search.
- **File Format:** Select the file format you want to search.
- **Sort By:** Select how you want the results to be sorted.

### How to Use:
- To search for learning objects, enter the relevant information in the search fields and click the *Search* button.
- Results will be displayed based on your search criteria.

### Additional Information:
- The system is designed to help educators find and use learning objects effectively.
- Regular updates and improvements are made to enhance the user experience.

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