

# Template proposal for the THEIERE project (II)

## *Technical support group (Vigo-Valencia)*

### **Introduction**

The previous THEIERE template proposal [1] described how to organise the different packages involved in the project. Currently, there are four packages which has been partially structured using this template:

- Computers.
- Internet.
- Communication.
- Fundamental.

The main questions which remain to be addressed are:

- The lack of an environment to manage the access to the package contents either as a teacher (content developer) or student (content customer).
- The management of different languages and the search of contents.
- The definition of a content template and the content edition.
- The questionnaire edition and processing.

### **Web environment**

A Web environment "in progress" tackles the first issue [2]. This environment (see Figure **Erreur! Argument de commutateur inconnu.**) will provide services such as:

- User identification and registration.
- Package access and search.
- Communication tools (e-mail, forum, news).

The user identification is based on a login/password information that will be sent to each authorised user. Additionally, a registration service will allow guest users to access to the Theiere Web.

Once the user is logged in, he can access to the different packages resources, look for them or communicate with other users (see Menu options in Figure **Erreur! Argument de commutateur inconnu.**).

The access to the package resources is managed by an index located at the left frame. Additionally, there are several controls available (see Index controls in Figure **Erreur! Argument de commutateur inconnu.**) over the index in order to move through the package components.

The upper corner on this left frame displays the current language (English in the case of Figure **Erreur! Argument de commutateur inconnu.**). The lower area shows the language options.

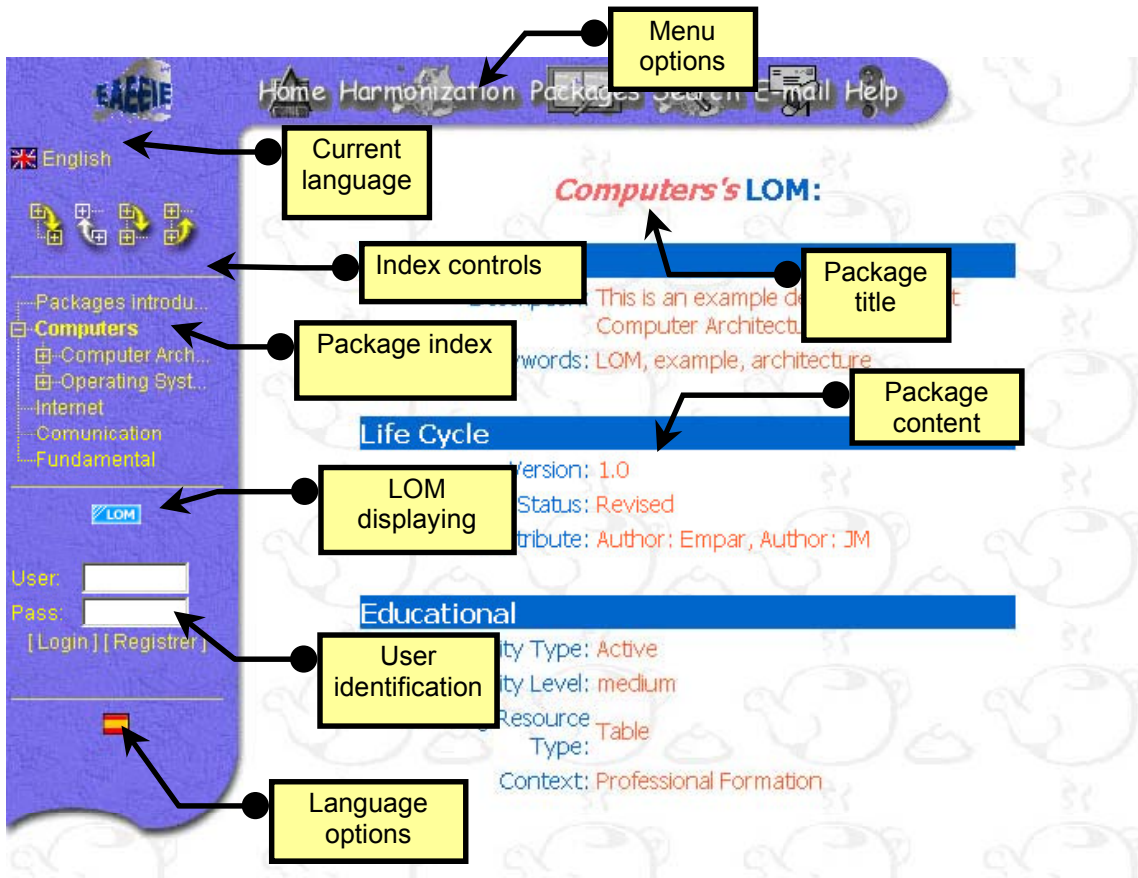


Figure Erreur! Argument de commutateur inconnu..- Theiere Web display.

### Language information

Package structure and contents can be developed in different languages. This feature is addressed in the current template proposal.

Figure Erreur! Argument de commutateur inconnu. shows an example of Internet package structure which is available both in English and Spanish. Current language option is English as it is shown in the upper area of the left frame. Now the Spanish language option can be selected clicking its flag icon on the lower area. The default option is English.

### LOM information

In addition to the language information, other attributes can be assigned to the package structure and contents. They are grouped in the LOM (Learning Object Model) specification, which is part of IEEE LSTC standard [3]. An example is shown in Figure Erreur! Argument de commutateur inconnu.. Such specification can be used to export contents to other learning systems or to search them through the package set.

Home Harmonization Packages Search E-mail Help

English

- Packages introdu...
- Computers
- **Internet**
  - Introduction
  - Communication
  - Fundamental

User:

Pass:

[Login] [Registrar]

## Internet

This package contains examples of courses and tutorials about different Internet aspects:

- Introduction.
- WWW protocols.
- FTP tutorial.
- Telnet tutorial
- ...

Figure Erreur! Argument de commutateur inconnu..- Example of Theiere English content.

Home Harmonization Packages Search E-mail Help

Spanish

- Introducción a los...
- **Ordenadores**
  - Arquitectura de...
  - Sistemas oper...
- Internet
  - Comunicación
  - Fundamental

**LOM**

User:

Pass:

[Login] [Registrar]

## Computers's LOM:

### General

Description: This is an example description about Computer Architecture

Keywords: LOM, example, architecture

### Life Cycle

Version: 1.0

Status: Revised

Contribute: Author: Empar, Author: JM

### Educational

Interactivity Type: Active

Interactivity Level: medium

Learning Resource Type: Table

Context: Professional Formation

Figure Erreur! Argument de commutateur inconnu..- Example of LOM information.

## Package contents

In the current work, the LMML (Learning Material Markup Language) [4] is being used to represent such contents. It allows the designer a combined representation of conceptual contents and modular structures. The LMML contents are based on entities, called ContentModules, such as definitions, examples, exercises, explanations, and so on. They contain Media Objects, for instance pictures, animations or text and they can be structured as lists or tables.

One of the most difficult instructor tasks is the edition of didactic resources. In the current context, we have chosen a XML editor called XXE [5]. It allows the instructor to edit LMML documents in a friendly way. First, it detects the DTD assigned to the document (e.g. LMML-CS.dtd) and thus, it guides the instructor using the DTD syntax. For instance, we can choose a <collection> structure, which groups the <section> components. A special section is configured as a <Motivation> element displaying the main goals of the instructional document as <LMMLtext> elements. Next <section> elements describe the learning material. They can include ContentModules, such as definitions (<Definition>), examples (<Example>), exercises (<Exercise>), explanations (paragraphs), and so on (see **Erreur! Argument de commutateur inconnu.**). These ContentModules contain Media Objects such as text (<LMMLtext>), images, lists (ordered <olist> and unordered <ulist>), tables (<table>). For example, image information is stored as attribute values (see Figure **Erreur! Argument de commutateur inconnu.**).

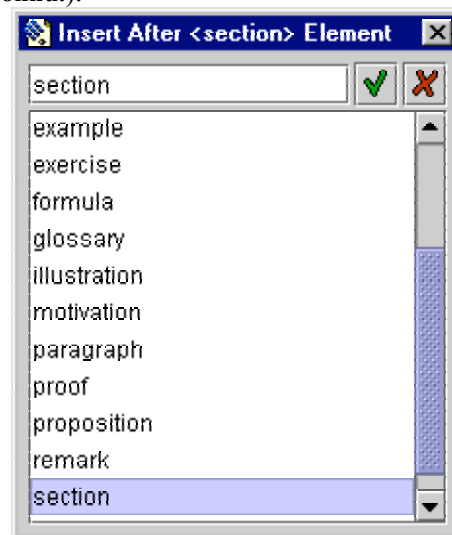


Figure **Erreur! Argument de commutateur inconnu.** – Insertion of LMML elements.

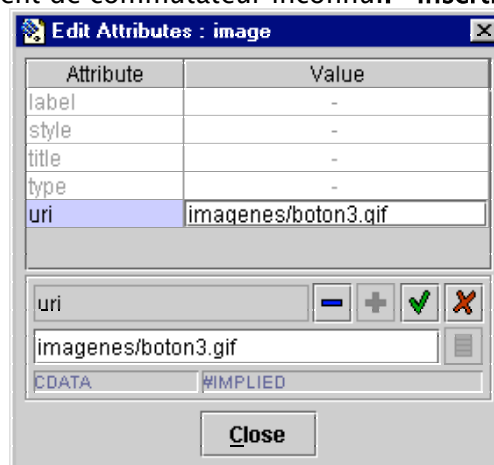


Figure **Erreur! Argument de commutateur inconnu.** – Image attributes.

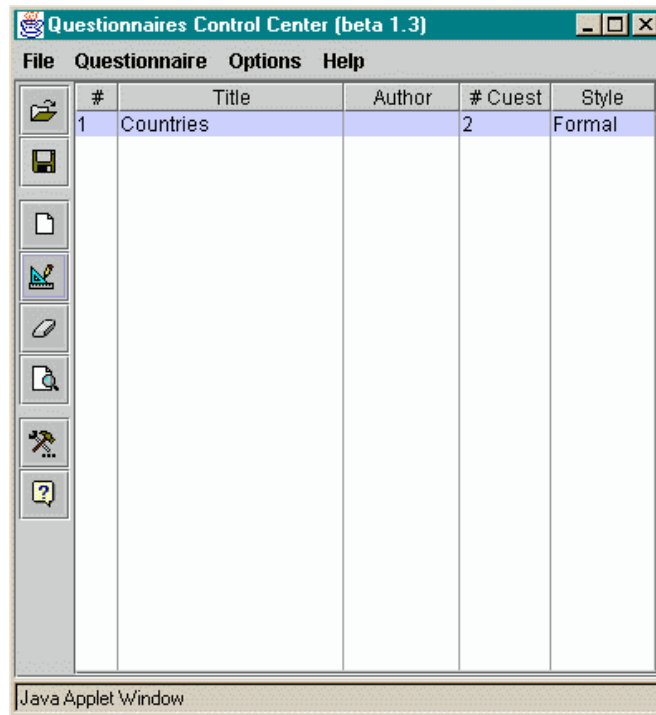


**Figure** Erreur! Argument de commutateur inconnu..- LMMML document example.

Other features such as link introduction can be carried out as <LMMMLcode> elements. **Erreur! Argument de commutateur inconnu.** shows a simple example of document editing. The current editing pointer is focused on a <LMMMLtext> element within a <proposition> section. Bottom bar shows this information. An issue that is not included in the original LMMML specification is the implementation of exercises and questionnaires. Interactive exercises are implemented by adding a special <LMMMLcode> element to the <Exercise> section. Their attributes have been adapted in order to define the answer type for the exercise. For example "line" if the answer is a single line; "multi\_line" for a scroll window; "file" if the requested answer is stored in a file with a given name, or "radio" if an option has to be selected.

Questionnaire is another didactic resource category, which is not addressed in the original LMMML specification. A questionnaire tool called X-Quest [6] has been developed. The tool offers the next features:

- Typical types of questionnaires: true/false, multiple choice, multiple response, fill in blank, as well as heterogeneous combinations of these basic types.
- Questions may contain multimedia resources: text, images, audio, video, etc.
- It is possible to define different feedback messages for each question/response.
- It includes support to be easily portable to different natural languages.
- Displays an intuitive and user-friendly graphical interface (see Figure **Erreur! Argument de commutateur inconnu.**).



**Figure Erreur! Argument de commutateur inconnu.- Main questionnaire interface.**

## References

- [1] THEIERE templates proposal, <http://www.eaeie.org/theiere/docs/theieretemplates.pdf>.
- [2] Theiere Web environment. <http://roger.disca.upv.es/WebTheiere/Theiere.html>
- [3] IMS Content Packaging Specification. <http://www.imsproject.org/content/>
- [4] Süß, C., Kammerl, R., Freitag, B. A Teachware Management Framework for Multiple Teaching Strategies. In: Proceedings of ED-MEDIA 2000, World Conference on Educational Multimedia, Hypermedia & Telecommunications, Montreal, Quebec, 2000.
- [5] Xmminder editor. <http://www.xmlmind.com/xmleditor/>
- [6] J.C. Burguillo, J.M. Santos, D.A. Rodríguez, F. Buendía\*, J.V. Benlloch\*, J. Rodríguez. A Questionnaire-Authoring Tool to Support Computer Based Training through Distance Evaluation. 12th Annual Conference of the EAEEIE, Nancy 2000.