Wolfgang Volz, Ralph Trapphoener:

A Case-Based Approach to Educational Cross-Media Publishing.

Presentation

ICCBR Industry day, Chicago, 2005-08-23.
1. An Approach to Introduce Rapid Prototyping in the Field of Educational Publishing

The use case described in the following is the intermediate outcome of an international Project funded by the European Commission. The project's name is Metokis which is an acronym for “Methodology and Tools Infrastructure for the Creation of Knowledge Units”. (more information is available at [http://metokis.salzburgresearch.at](http://metokis.salzburgresearch.at)). Back to our use case, let's call it “Klett Use Case”, and let's have a look at its environment.

1.1 The Business Case

Even though the traditional text book is the core product in educational publishing, complementary teaching aids e.g. CBTs running online and/or offline become more important. And educational publishers need to answer this need given by the market.

The German Market

Ernst Klett publishing house primarily produces teaching aids for the German market. This market is characterised by its high diversity which results from the cultural independance of the 16 German states. Education is the field where the states show their cultural independence, thus they tend to have syllabusses that are different from the other states' syllabusses. Eventually, this results in a demand for many different textbooks and accordingly many different CBTs to complement them. The illustrartion below intends to give overview of the aspects that make the German educational market so complex.

Illustration 1) Graph indicating the reasons for the complexity of the German educational market.

In order to be able to answer the needs of the market an educational publisher needs to optimise the workflow of creating CBTs.

This need for optimisation is the starting point for the application developed in the Metokis project.

1.2 The Business Process

A first step to improve the workflow is to analyse the current workflow. The result of the analysis should provide a overview on the weaknesses an strengths of the workflow from which the required improvements can be inferred.
The business process at Klett is illustrated below.


The business process is fairly standard from the first sketch via the clearing of the business plan onwards to planning, realisation, production, archiving and finally to sales/distribution.

The interesting part for the improvements turned out to be the first 3 steps of the business process plus some aspects of the clearing of the business plan. Zooming in this part of the business process reveals some of the weak points of the current workflow. Two of the most important ones are:

1. When handing in the business plan for clearance there is only little but figures to illustrate the CBT to be created.
2. Most of the content created to populate the CBT is archived in a way that makes it next to impossible to reuse this content for another CBT.
Illustration 3) The current workflow.

Having spotted the weaknesses of the current workflow the way is clear for creating an idealised work which to support is the requirement for the Metokis application. Ideally the business plan is complemented with a mock-up and the content of the CBT is compiled from formerly created content plus new content to be created particularly for the new CBT. This new content again is to be made available for future products.
Illustration 4) The idealised workflow.

The idealised workflow may look as illustrated above. As a matter of fact this new workflow changes the traditional sequence of sketch – planning – realisation dramatically as they begin to become less clearly distinct. This is, compiling the mock-up at a later point actually becomes part of the realisation, as the structure and content selected and retrieved from the database at the start, actually are the beginning of the realisation. More details will be given in the following.
2 The Metokis Application

The four core components of the Metokis Application are:
1. A relational database
2. Orenge® by empolis for defining the Ontology which serves as database model
3. Publication Build® by empolis that serves as CBT-structure editor, which facilitates semantic retrieval of content from the inhouse database and external database
4. LeMOlernen editing tool by Fraunhofer ISST and Klett which is a Flash®-based environment for editing CBTs

2.1 Creating a Mock-Up

- The idea for the new Project is to create a CBT on 20th century history suitable for year 8 students of secondary schools with a vocational bias in Bavaria.

- As mentioned above the creation of a mock-up is part of the project sketch phase in the business process.

Using the Publication Build®, the editor uploads the structure of a formerly created CBT (existing case base) which is suitable for year 10 students of grammar schools. This is a software which comes close to the new software and therefore will contain much of the structure and content required for the new software.

The editor then adapts the structure of the CBT according to the syllabus whose requirements the CBT has to meet.

The screenshot below shows the structure of the new CBT.
Adaptation, here, means that the editor will delete parts that are not relevant for the new CBT and/or he may have to add new parts. The new parts in the structure are not yet bound with content. Thus the editor can semi-automatically search the database for content (Object Query) that best suites the topics of the new parts (see illustration below).

Illustration 6) Object Query -tab in PublicationBuild®.

The mock-up now may complement the business plan in order to illustrate the Project.

2.2 Realisation of the new CBT

Let us assume that the work was done well and the business plan was cleared and the editor may proceed with the creation of the new CBT for the year 8 students in Bavaria.

The next steps will be iterations of the first two steps until the level of perfection has been reached the the structure and the bound content is ready to be exported into the editing suite. Whereas the structure and much of the bound multimedia assets may serve well for the new CBT, the didactical texts need to be adapted to the target user group. This is done in the LeMOlernen-environment.

Illustration 7 shows a screen shot in the editing mode. The editor may change the texts in the text boxes and the positions of the objects, and/or exchange multimedia assets in the LeMOlernen structure-editor (Illustration 8). In order to to the latter, he can access the inhouse or external databases via an extra browser-based database interface.
After all the content has been adapted and now suites the requirements of the syllabus the software is ready for being pressed on CD-ROM/DVD or being uploaded to the internet.
2.3 Archiving

The new CBT is also ready to be archived in the database (as a new case base) to serve as a starting point for a new CBT. This is done again using the PublicationBuild®: All the entries of the CBT are tagged with the metadata provided in the ontology, and the circle is closed.
3 Summary an Outlook

The use case presented shows the following this approach of rapid prototyping utilising case base reasoning may well be beneficiary for educational publishers. The Metokis application facilitates the reuse of content by granting intelligent access to existing content (in house) and to external content. It speeds up the compilation of content for new CBTs through automated aggregation of content. All this is based on structural data and semantic data of existing content and the semi-automatic tagging of content with semantics when archiving new content.

Following the approach is beneficiary as it has as effect an increase of reuse of existing content and the increase of number of derivational products. It will decrease of time to market. And it may open new business opportunities through download of presentation materials, worksheets, etc. by teachers.