Modelling of e-learning course scenario's
Peer-reviewed author version

SCHREURS, Jeanne & MOREAU, Rachel (2006) Modelling of e-learning course
scenario's. In: EDEN Research Workshop: Research into online distance education
and e-learning..

Handle: http://hdl.handle.net/1942/1385

MODELLING OF E-LEARNING COURSE SCENARIO'S

Rachel Moreau, Universiteit Hasselt, Belgium, Jeanne Schreurs ,Universiteit Hasselt, Belgium

Introduction

Just publishing learning content on the website is not enough. To deliver the learning content following a creative e-learning concept is a real challenge. It means analyzing the content and cutting it into pieces, called blocks and also find out what is the focus of the course. It means finding the best presentation layer and putting it above the content layer to create a scenario model fulfilling the requirements of the learner. This is the focus of our paper and we will present our findings step by step.

1.   Converting a course into an e-learning presentation

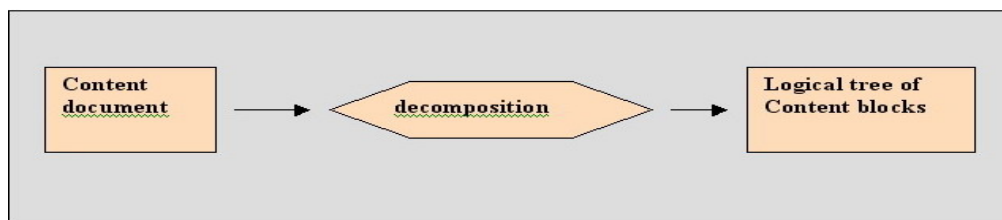### 1.1. Learning content decomposition and tree structured content parts or BLOCKS

Figure 1: decomposition of content document

We are all very familiar with the structure of a book in chapters. A course is similar with a book. A chapter contains many blocks, being smaller content parts. If the chapter can really be split into more individual content topics, or which can be learned as individual topics, than the learning content is split into two or more independent content units, put together in a sequence. So the learner will learn them as one logical content module. Each unit is composed of a set (one or more) of blocks, corresponding to some smaller content parts, being structured as a relational tree. The learning content is split into a set of full text documents each linked with a block in this structure. The relation between a block and another block of lower level (a sub block) is defined as: "can be explained as" or "consists of" or other explaining expressions**.**
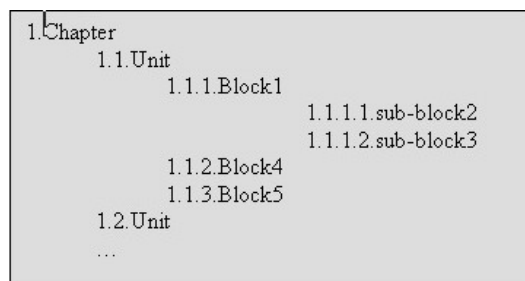

Figure 2: three structure of content blocks

Example of a decomposition of a text document

Figure 3: learning content document

Hoofdstuk1: Internet als info en communicatie kanaal van het bedrijfsleven

I. De toegang tot bedrijfsrelevante informatie

0. Inleiding

Wanneer men op zoek is naar bedrijfsrelevante informatie, is het internet een uiterst geschikt middel. Het internet kan namelijk gezien worden als een bibliotheek van allerhande informatie van heel de wereld over de meest uiteenlopende onderwerpen. De kunst is enkel, in dit ongestructureerde geheel van data de juiste en relevante informatie te vinden die men zoekt.

1. Zoekmachines

Elke internetsite heeft een uniek adres. Men weet echter vaak niet op welk adres men de nodige informatie kan vinden, het is dus nu juist de kunst dit adres te vinden. De gemakkelijkste manier is door gebruik te maken van allerhande zoekrobotten. Zij zorgen namelijk voor een snelle en makkelijke navigatie over het Web door het simpelweg intypen van sleutelwoorden, waarna de zoekrobot sites waar het kernwoord in voorkomt gaat opzoeken. Vervolgens bekomt men een lijst van adressen waar het vermelde trefwoord in voorkomt. Een voorbeeld van een bekende zoekrobot is Yahoo.

Hierbij is ook interessant te vermelden dat je op de volgende sites terecht kan voor het adres van de internetsite van een bedrijf of voor het telefoonnummer en het adres ervan:
http://www.infobel.be
http://yellow.advalvas.be/
http://www.digikids.be/dk_NL/SITES_FORUMS/THEMASITES/BEDRIJVEN/A.htm
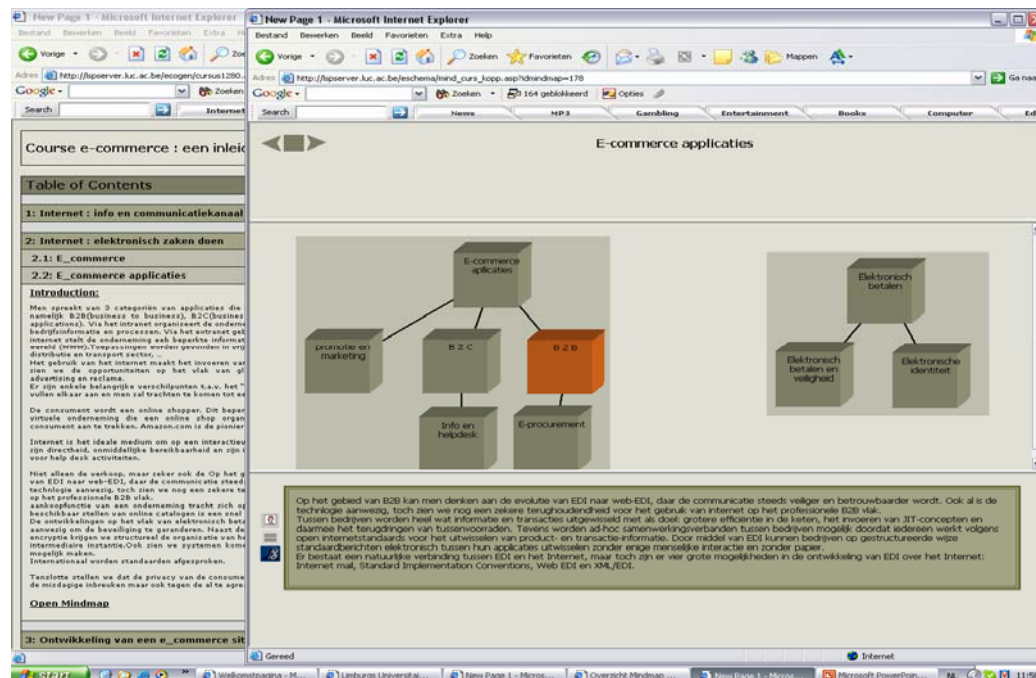
The content tree structure of the text:

Figure 4: three structure of content blocks

1.2. Decomposition of the blocks into the ALO's

A learning object (LO) is an independent content component that can function as the learning content of a course module. It can be defined as any digital content resource that supports learning, that can be re-used and that can be delivered on demand across the network, be it large or small. A learning object

is such a composition of a set of blocks. The blocks, presenting the smaller learning content parts, are composed of the learning content (full text doc) and of a set of added atomic LO's, being small learning content elements (short text documents, figures, digital images or photos, live data feeds, live or pre-recorded video or audio snippets, animations, some questions and answers, some tests, some mouse-over animations, and smaller web-delivered applications).

The content linked with a block is a part of the original text, it is a full text document, including figures, Q&A, test questions, hypertext links, …being all the atomic learning objects (ALO). This full text document will be decomposed into ALO's, namely figures, Q&A … all being the presentation elements.
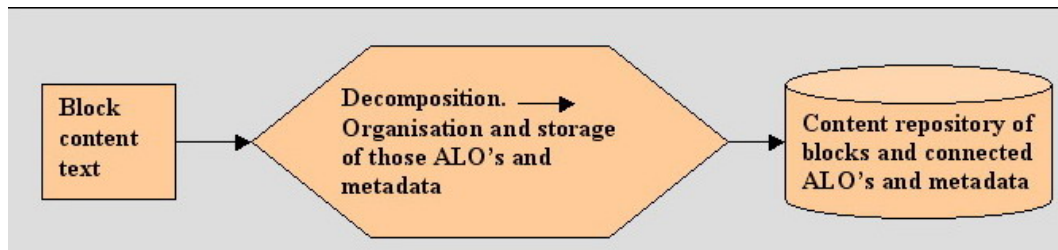

Figure 5: a block content text decomposed into ALO's

1.3. A scenario model

In instructional design a scenario model has to be defined. A composition of blocks will be choosen and the architecture of the blocks will be designed. All additional elements are parts of the presentation layer. The learning content included in the block (being the full text document) will be supplemented with other supporting, interactive and animating elements, being all parts of the presentation layer.

The presentation layer is composed of presentation components put above the same original content components. Some of the presentation components are content related and others are more design/format related. An example of content related presentation component: someone tells the story of a best practice. An example of design related presentation component: a live picture of the storyteller is shown on the screen. The presentation components are belonging to one or more scenarios models.

e-learning course module						LO
Scenario model	Scenario model 1 **EDU-MAP**	Scenario model 2 **Story-telling**	Scenario-model 3 **Tree structured html pages**	……	Scenario model n **Dialogue**	
Presentation layer	Presentation components: Pci: **building components of the scenarios (short text docs, figures, pictures, …)**					ALO
Decomposition of content	Learning Content components: Cci: **tree-decomposition of learning content module into n parts (full text docs)**					ALO
Learning content of the course module = e-book						LO

Figure 6: a scenario model

1.4. Process of LO creation as a composition of blocks in a scenario model

We can create different compositions or scenario models of the set of blocks to present the learning content to the learner as an e-learning course module. The blocks are the building blocks and linked with them are the basic atomic learning objects.
Not only the blocks are presented in a different composition, the blocks themselves differ in architecture by using the atomic learning objects on a different way.
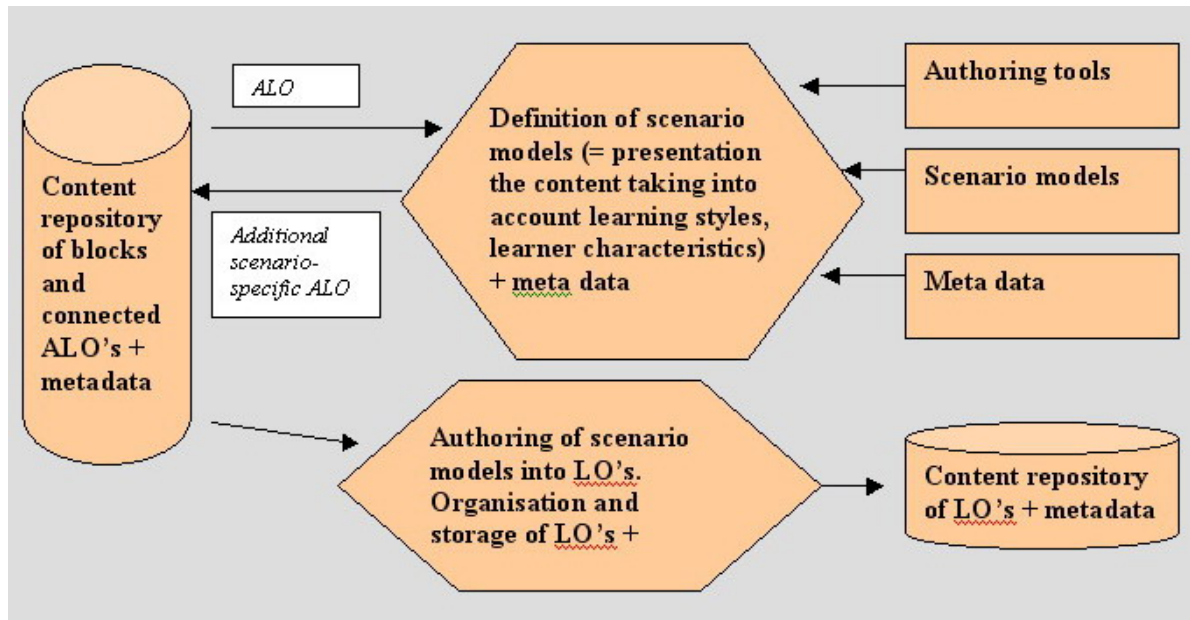

Figure 7: process of LO creation

Following the traditional "web-pages e-learning "concept, we can built a tree structured html scenario model. We can bring together the full text docs of all blocks and put them in the pre-defined tree structure. On this time the block, being a html page must be designed using the presentation of the full text and the other atomic elements, being figures, hypertext links, Q&A, keywords, audio fragments, … can be linked with it following the design of the scenario model.

Following the e-MINDMAP concept, we can build an EDUMAP scenario model.
We can organize the blocks in a graphical way in units and in EDUMAPS. Relevant atomic objects are the full text, the short text, figures, video's, ….
The datamodel is very similar to this of the previous scenario model.

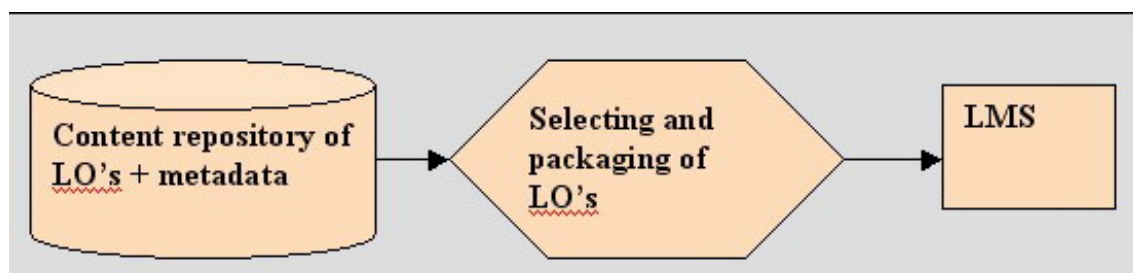## 1.5. Process of course module creation by packaging the LO's

Figure 8: process of course module creation

The course module or the course consists of one or more chapters. Each chapter can be converted in one or more LO's. The course can be built by packaging some LO's, fitting the characteristics of the learner.

2. COURSE MODULES OR COURSES PRESENTED IN A CHOSEN PRESENTATION SCENARIO.

More and different scenarios can be built upon the same decomposition of the learning content. Dependent on the type of scenario model, a set of presentation components or atomic learning objects, will be defined and are brought together into a scenario model design. The learning objects (LO) structure corresponding to a scenario model, has to be defined and the corresponding relational data model has to be customised.

Some of the presentation components are common to different scenarios and can be re-used. Others are very specific for the scenario to which they belong. The structure of the Learning Object database has been set up to contain all kind of presentation components required to build e-learning courses following several scenario models.

We can create different compositions or scenario models of the set of blocks to present the learning content to the learner as an e-learning course module. The blocks are the building blocks and the basic atomic learning objects are linked with them.

Not only the blocks are presented in a different composition, the blocks themselves differ in architecture by using the atomic learning objects on a different way.

2.1. e-MINDMAP scenario

The e-EDUMAP is so telling the story in a graphical way and in a sequence of steps.

The blocks are composed of some atomic learning-elements, being the short text or audio document, the full text, some additional text or graphical presentations, or pictures, some questions and answers, some tests, some mouse-over animations, … .

The most challenging characteristic of the e-MINDMAP is the visual way of structuring the content. Animation can be built in too. The learner will be supported by this way to understand and to print in memory the structured content with the underlying relations between the content blocks.

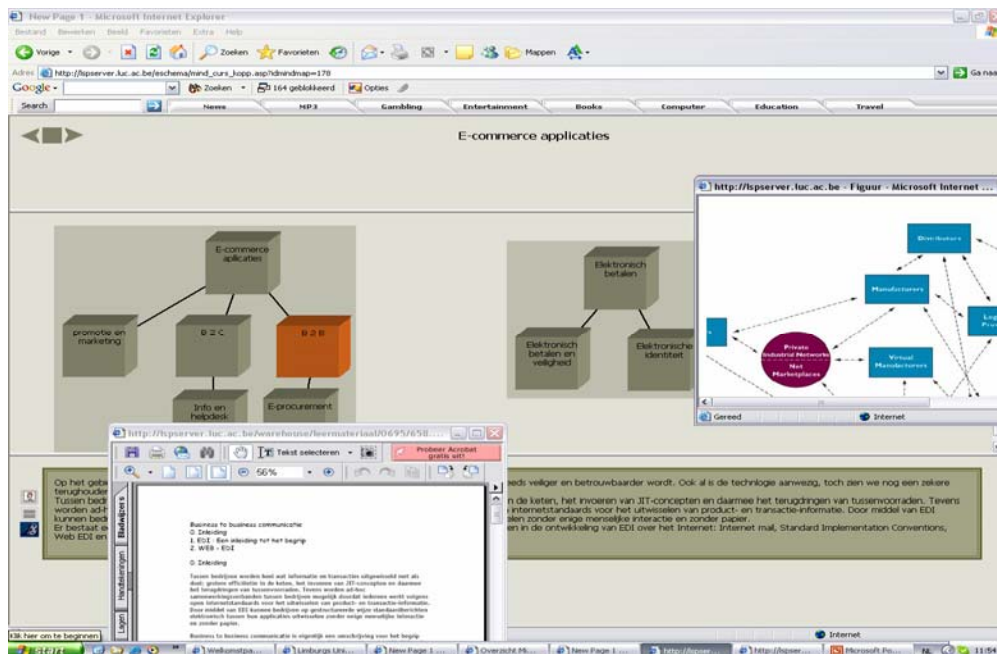An example of a course module following the e-MINDMAP concept:

Figure 9: e-Mindmap

2.2. Tree structured interactive internet pages

We can build a tree structured html scenario model. We can bring together the full text docs of all blocks and put them in the pre-defined tree structure. On this time the block, being a html page must

be designed using the presentation of the full text and the other atomic elements, being figures, hypertext links, Q&A, keywords, audio fragments, … can be linked with it following the design of the scenario model.

In this concept the focus is not the creation of the "visual overview" structure. But now it is possible to built in more interaction and a rich presentation layer.

Figure 10: a tree structured html scenario model

3. Conclusion

Our learning content can be structured as learning objects (LO) and as atomic learning objects (ALO). A learning object is seen as a composition or a scenario model of a set of blocks. The blocks, presenting the smaller learning content parts, are composed of the learning content (full text doc) and of a set of added ALO's, being small learning content elements. The blocks function as the nodes in a content tree and are the basis for the composition of a course.

A scenario model has to be defined, meaning a composition of blocks will be choosen. The learning content will be supplemented with other supporting, interactive and animating elements, being all parts of the presentation layer. The presentation layer is composed of presentation components put above the same original content components. Meaning different scenarios can be built upon the same decomposition of the learning content. Depending on the chosen scenario model, some scenario specific ALO's will be added and the LO will be created. To improve e-learning effectiveness authors can produce highly interactive and engaging content applying innovative approaches in some designed scenarios models.

References

1. F.Benneker, B.Delchot, R. Paankeet, J.Schoonenboom, A.Strijker : "Werken met metadata in DU projecten, Deel1: Handleiding; Stichting Digitale Universiteit, 1/2004. (http://www.digiuni.nl/digiuni/download/7B8DE6C2-FAA2-4E6C-4B48947A2948CF25.pdf)
2. Y.Biletskiy, a.o.: "Context mediation for learning objects exchange"; Proceedings EDEN2004 pages 379-384.
3. CISCO SYSTEMS, Reusable Learning Object Authoring guidelines: How to build modules, lessons and topics. 8/2003.
4. CISCO SYSTEMS, Reusable Learning Object Authoring guidelines: How to build modules, lessons and topics. 8/2003. http://business.cisco.com/prod/tree.taf%3Fasset_id=104120&ID=44748&public_view=true&kbns=1.html)

5. A.Damstra, M.Van Geloven, F.Kresin: "Handboek technologie en standaarden, voor het ontwikkelen van digitale content." Stichting Digitale Universiteit Utrecht 5/2003. (http://www.digiuni.nl/digiuni//download/DI.PROC.014.Handboek%20techniek.v11.pdf).
6. The Herridge Group, Learning Objects and instructional design, online version. (http://www.herridgegroup.com/pdfs/learning-objects-&-instructional-design.pdf)
7. H.W.Hodgins: The instructional use of LO's, Online version: "The future of Learning Objects" (http://www.reusability.org/read/
8. IEEE Learning Technology Standards Committee. http://ltsc.ieee.org/wg12/
9. M.Martinez, The instructional use of LO's, online version: "Designing Learning Objects to personalize Learning". (http://www.reusability.org/read/)
10. Robson: 1999. Object Oriented instructional design and web-based Authoring. http://robby.orst.edu/papers/objectoriented.html.
11. J.Schreurs, R.Moreau, I.Picart: "e-learning process and content management", Proceedings Eurosys ISBN 90-77381-09-0.
12. J.Schreurs, R.Moreau, I.Picart: "The use of learner objects for building a flexible e-learning course". Proceedings EDEN2004 pages 368-374.
13. J.Schreurs, R.Moreau, I.Picart: "E-blended learning course building based on learner objects or learning process objects", EISTA 2003 Florida 31 July-2 August 2003.
14. J.Schreurs, R.Moreau: Presentation of learning content as an e-MINDMAP and putting together more learning styles, to improve the e-learning adoption. Proceedings of KAM'2005 conference Lubanski May 12-14; ISSN 0324-8445; pages 246-256. http://www.uwm.edu/Dept/CIE/AOP/learningobjects.html

Authors

Prof. Jeanne Schreurs
Universiteit Hasselt
Campus Diepenbeek, Agoralaan-Gebouw D, 3590 Diepenbeek
jeanne.schreurs@uhasselt.be

Rachel Moreau
Universiteit Hasselt
Campus Diepenbeek, Agoralaan-Gebouw D, 3590 Diepenbeek
rachel.moreau@uhasselt.be