

# LOExtractor - Rapid Authoring Tool to Support Workflow-Embedded Authoring

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**Abstract.** Creation of reusable learning content in the process of work is a challenging but promising trend in e-learning and knowledge management. Whereas well established authoring methodologies like instructional system design seem to be too complicated to be used by employees during their work, new authoring methods using rapid authoring tools do not provide content quality that is enough to support goal-oriented adaptive learning. To overcome the shortcomings of the rapid authoring tools, the authors designed and implemented an alternative authoring tool LOExtractor that is aimed to support learning content authoring in workflows.

**Key words:** workflow embedded authoring, rapid authoring, concept map

## 1 Introduction

Nowadays there is a lot of rapid authoring tools appeared that allow non-professionals to create learning courses in standard sharable formats using existing MSOffice documents (see THESIS<sup>3</sup>) or making them from scratch. The main weakness of the modern rapid authoring tools is that they do not allow reusing parts of existing documents as learning objects (LO, see [1]). The reused documents cover normally more than one topic, i.e., having been delivered to the learner in the certain working situation may be only partly relevant. The rest of the document that the learner has to look through is not relevant in the situation. Further problems can occur when the generated course (as a rule in SCORM<sup>4</sup> format) has to be repurposed for another audience or adapted to the individual user. The tools does not provide functionality that allows to assign created LOs to an individual or collaborative topic map. In [2] we also proposed a new approach to the process-embedded content authoring called SLEAM that is aimed to solve the above mentioned problems. The purpose of this paper is to present a tool that supports the SLEAM authoring process.

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<sup>3</sup> THESIS homepage. Url: <http://www.getthesis.com>

<sup>4</sup> <http://www.adlnet.gov/scorm/>

## 2 SLEAM Authoring Process

SLEAM stands for **S**earch, **L**earn, **E**xtract, **A**nnotate, **M**ap that are the main phases of the proposed authoring process. The SLEAM authoring process is based on the reuse of document parts as LOs. The output of the process are reusable LOs that are annotated with metadata and mapped to corresponding concepts in the concept map. The output of the SLEAM processes provides a basis for automatic goal-oriented compilation of learning programmes that are adapted to the user's needs and skills [4]. On fig. 1 the main phases of SLEAM are shown in the working context:

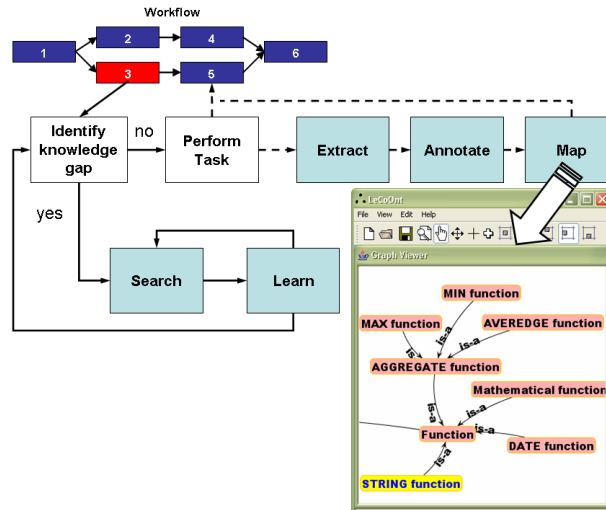


Fig. 1. SLEAM process

1. After a user starts a new task, a knowledge gap preventing the user to perform the task might be identified. Identification of the knowledge gap can be done by the working environment (e.g. workflow management system, see [3]) or by the user herself.
2. **Search**: After identifying a knowledge gap the user starts looking for the necessary information in the internet, intranet or in the corporate DMS.
3. **Learn**: After the user found the relevant information, the process of learning is started. If the found information does not satisfy current user's needs she can return to the task and complete it.
4. **Extract**: The system asks user whether the found information can be reused by other team members in the context of similar tasks and offers her to extract reusable LOs from the documents. If the user agrees, a context-

aware rapid authoring tool is started that allows the user easily to extract parts of documents or web pages as reusable LOs.

5. **Annotate:** After the LO extraction the user is proposed to annotate extracted LOs with metadata. User context information should be used to assist the user in annotating LOs with metadata (author, task name, search query).
6. **Map:** In order that the LOs could be efficiently used in the process of the workflow-embedded e-learning, they have to be mapped to the ontology of learning concepts or the concept map(see [3]).

### 3 Prototypical Implementation of a Rapid Authoring Tool - LOExtractor

To support the SLEAM process, an experimental authoring tool called LOExtractor was implemented. The tool helps knowledge workers to selectively transform the information that they found and used during their work into reusable LOs and map them to the corresponding concepts in the concept map.

LOExtractor (see fig. 2) allows authors browsing in the hierarchical structure of the documents to be transformed (e.g. a HTML page or PDF document), see content of the document nodes in the detail pane (see upper right frame). The detail pane consists of three view types: text view, image view and table view to display plain text nodes, images and tables in the document respectively. The author can also concatenate document nodes, delete them or choose for extraction. The document nodes that will be extracted as LOs can be annotated with simple metadata (author, title, keywords, language) and mapped to a corresponding concept from the imported concept map (see lower right frame). After mapping the tree nodes to the concepts, the author initiates LO extraction procedure by clicking the corresponding menu in the LOExtractor GUI.

LOExtractor is build using Eclipse RCP platform<sup>5</sup> and has an open plugin-based architecture. The tool can be extended by providing input filter plugins and extractor plugins that allow to import different types of information and export extracted LOs in different formats. At the moment, input plugins for MediaWiki<sup>6</sup> content and HTML content and extractor plugin for SCORM and DaMiT<sup>7</sup> formats are realized. MediaWiki was chosen as a source of LOs, because it is a outstanding representative of wikis<sup>8</sup> that are commonly used tools for capturing the tacit knowledge in companies [5] that can be valuable source for creating reusable LOs.

### 4 Conclusion

The objective of this paper is to present a novel rapid authoring tool LOExtractor that is aimed to overcome weaknesses of rapid e-learning tools by assisting

<sup>5</sup> <http://www.eclipse.org/home/categories/rcp.php>

<sup>6</sup> <http://www.mediawiki.org/wiki/MediaWiki>

<sup>7</sup> <http://damit.dfki.de/>

<sup>8</sup> <http://en.wikipedia.org/wiki/Wiki>

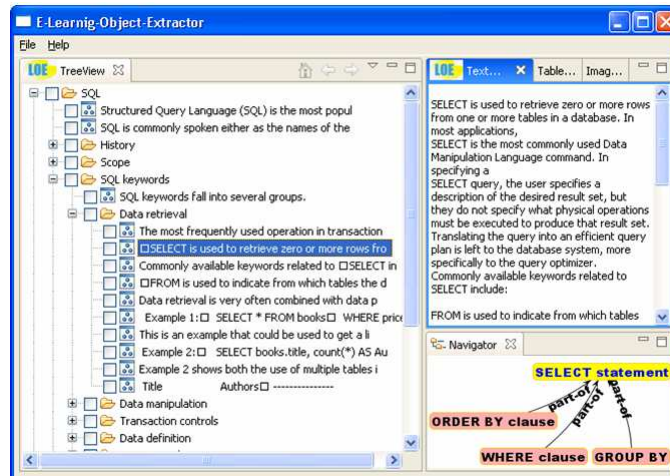


Fig. 2. LOExtractor tool

authors at extracting reusable LOs from the existing documents, helping to annotate them with metadata and bind them to the concept from an individual or collaborative concept map. The ongoing step will be to evaluate the SLEAM approach and LOExtractor tool that will be done in 3 steps: 1) usability test for creating a project management course for self-study; 2) internal group usage at DFKI in parallel with using workflow-embedded e-learning; 3) dependently on the results of the step 2) a case with external partner can be conducted. The main goal of the planned case studies will be to check the feasibility of the approach, find new requirements and opportunities to better intergrate the tool into the process of work.

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