

# Using metadata for re-using material and providing user support tools

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**Abstract:** The reuse of learning content in educational technology attracts much attention. This is mainly caused by recent initiatives for standardization of learning technology, but also by the necessity of a more efficient usage of valuable learning resources and development time. Standards for reuse can provide uniform specifications for exchange of learning content. To make reuse efficient, metadata is needed to find and select relevant content. Metadata, information about data, describes this data on a higher level, so that material can be identified, ordered, categorized and selected. However, adding metadata can be very time-consuming. This paper describes a support system for users, like educational developers, teachers and learners, to add metadata to existing learning content and courses.

## Introduction

The faculty of Educational Science and Technology started a faculty wide implementation of Telelearning with the TeleTOP project in 1997. The aim of the project was to support teachers and students with a web based database driven environment. In three years time educational designers created a very large quantity of learning content stored in more then 600 courses. It is very beneficial if this set of learning content could be reused in different courses.

## Metadata

Metadata can be seen as descriptive information; description as in providing more information about data. This is analog to the information such as found in a card index in the library, where information can be found about the stored books. Metadata is used to structure the collection of books. The better the material is organized, the better and faster a useful selection can be made. The themes used in a library (Nature, Science, Sports) are standardized and very easy to understand, even for non-experienced readers. So, these themes are used to guide the library visitor through the large collections of books. Returning to educational technology, using metadata can guide non-experienced users through a large collection of useful learning material. Presently, in the TeleTOP system metadata is already added to the content to structure learning content within a course. The set of metadata was kept minimal because filling in a data set of metadata is often a boring and time-consuming task. Beside that, creating metadata is not considered important or useful by the users, as it is not directly beneficial for them.

## Standards

Standards for reuse can provide exchange specifications. For instance, the Advanced Distributed Learning (ADL)<sup>1</sup> developed the Sharable Content Object Reference Model (SCORM) that applies state-of-the-art technological developments from groups such as the Instructional Management Systems project (IMS)<sup>2</sup>, Global Learning Consortium, Inc., Aviation Industry CBT (Computer-Based Training) Committee (AICC)<sup>3</sup> and the Institute of Electrical and Electronic Engineers (IEEE) Learning Technology Standards Committee (LTSC)<sup>4</sup> to a specific content model to produce recommendations for different target groups. The recommendations can be used to structure learning material in a consistent format so that different learning management systems can make use of the material.

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<sup>1</sup> ADL: <http://www.adlnet.org>

<sup>2</sup> IMS: <http://www.imsproject.org>

<sup>3</sup> AICC: <http://www.aicc.org>

<sup>4</sup> LTSC: <http://ltsc.ieee.org/>

### **A support tool for metadata application**

SCORM can be used as a basis to specify the metadata within the TeleTOP system. However, only a small part of the metadata that is needed to be SCORM 'compliant' is currently available within in the present TeleTOP system. Additional metadata that is needed is available in the general administrative databases. For this purpose, we developed a tool that offers support in adding metadata that makes use of different data sources. The TeleTOP system users (the teachers) that are involved in the reuse process of material, and therefore in the metadata creation process, have to deal with 4 aspects: 1) adding metadata, 2) finding material based on metadata, 3) selecting useful content and 4) making the content available for use. The application of these 4 aspects should be as easy as possible for the users. One way to do this is to automate the creation of metadata as much as possible. This automation promotes the usability of the system and the acceptance of the users.

The support tool guides the user in retrieving data from the administrative and educational system and combines the data in a SCORM compliant metadata set that is stored in a database. This database can be used to search for relevant learning content. Because of the structured storage of the metadata, the user can also search on categories, authors or dates. Search engines are provided to make full-text searches on the metadata available. Relevant hits can be previewed and selected immediately for reuse. A software agent makes reuse available for the users. After selecting material, the software agent copies the needed material to a new target learning environment. Users do not have to make links themselves; the database generates needed links on the fly. The tool makes it possible to add metadata to existing material and using for these process external data sources.

### **Challenge, future plans**

Research is necessary for the use of metadata in different situations in learning and for different users. Research should focus on the different support tools needed for this settings and if a general metadata set can be extracted that is useful for most situations.