

Abstract

Over the last years, the development of multimedial learning material and the construction of technical learning systems has had an increasing effect on both university education and company training. Apart from the variety of learning management systems (LMS) for the administration of courses and students as well as technical systems for the support of the construction process, standardisations in context of structured course definition and metadata have been specified.

However, the development of interdisciplinary learning material requires the modelling of abstract modular material which conventional approaches often hardly consider. This is why the integration of existing resources within a development process is often an insuperable and cost-intensive problem.

As to present a way out of this problem, this thesis introduces a technical model which allows the development of technical systems for the definition of modular and layout free learning objects. Motivated by the SCORM reference model, this model extends the aggregation model defined in SCORM by a content model. This is done in two stages: during the first stage, the development process, only the content and the structure of the material is specified. They are organised in separate modules whereby the definition of free scalable aggregation levels is possible. In the second stage, a presentation format is attached. Based on specific rules an individual course is generated from the abstract modules. Moreover, the model provides an approach for the integration of existing learning material. The material is split up into the parts structure, content, metadata and binary resources. These parts are mapped to the course model which is responsible for the construction of modularized learning objects.

Unlike customary systems, this approach supports the cooperative development process of teams. Abstract defined learning modules and course fragments are coordinated by a central repository aiming at the generation of interdisciplinary learning material which can be adapted to a specific learning scenario.

The capability of this model is introduced by the authoring tool Lyssa. Apart from containing an authoring tool for the aggregation and transformation, it also contains a tool for layout definition as well as a central repository for the administration of abstract learning material.