

## Chapter 2

# Adapting SCORM Compliant LOs in a Knowledge Engineering Scenario

**Pierpaolo Di Bitonto**  
*University of Bari, Italy*

### **ABSTRACT**

*The success of communities generally implies both growth of the participants (and thus of their contributions), and an increasing array of services offered. For this reason, it is often difficult for new users to fully understand the potential of the community, while for expert users it becomes difficult both to manage the resources available in an effective and efficacious way, and to keep track of the expansion of the community. In order to overcome this problem it is necessary to provide the user with some teaching about the changes occurring in the community.*

*The present paper focuses on the problem of personalising such teaching, tailoring it to the user's cognitive and learning styles in order to supply the didactic material in the form best suited to the user, and thus facilitate learning of the knowledge sharing environment. Tailoring the teaching strategy is an innovative issue in the context of knowledge sharing communities.*

### **INTRODUCTION**

One of the main obstacles to the growth of communities for knowledge sharing, in particular in open source settings, is their increasing complexity of use for the end user, that is a direct consequence

of the expansion of the communities themselves. The McDermot model (McDermott, Wenger & Snyder, 2002) states that after an initial growth phase, a community is likely to shrink back. There may be many different causes of this phenomenon, that can vary according to the specific context.

The success of the community generally leads both to a growing number of participants (and

DOI: 10.4018/978-1-61350-483-3.ch002

hence of their contributions), and to an increase in the services offered. In this way, new users will find it difficult to gain a full understanding of the potential of the community, while even for expert users it will become difficult both to manage the resources available in an effective and efficacious way, and to keep track of the expansion of the community.

Although the growing complexity attributable to the increased number of users and resources can be compensated by the introduction of advanced techniques for information retrieval or recommendation, the evolution of the environment requires a greater user involvement. Users should be informed about any new features and, if interested, should also be able to find instructions on their use.

The problem of the complexity of knowledge sharing communities is common in the open community, where anyone can contribute with new resources. The risk in this case is to create a “jungle” of objects where one can very easily get lost. In the open source and open innovation scenario there are two significant instances of this. The Linux community, for example, despite supplying top level technological solutions, is not widespread among non expert users because it is not always easy to choose the right version or the right available plug-in. In the open innovation community, instead, the Eclipse (Maresca, 2008) community is still expanding. In this community many plug-in software are released every week which aim at extending the Eclipse IDE (Integrated Development Environment). Even if the environment is thus constantly enriching its potential and functions, users are not always able to exploit all the opportunities offered. In fact, the middle-user is able to handle just a few of the functions available in the Eclipse IDE.

In this scenario, it is clear that an innovative learning environment that can teach users how to use the community in the most effective and efficient way, without causing cognitive overhead, needs to be included in knowledge sharing com-

munities. This kind of environment should be able to tailor the learning path both as regards the domain content and in terms of the pedagogical strategies selected. To make the domain content more inviting, the user needs to be immersed in a specific context of use. Meanwhile, the teaching strategies need to personalise the domain content to the user’s cognitive and learning styles.

The present paper focuses on the problem of personalisation of the teaching strategies based on the user’s cognitive and learning styles, with the aim of supplying the domain content in the form best suited to the individual user, so as to facilitate her/his learning of the knowledge sharing environment. The technique proposed in the paper is general in order to be applied to any context, the knowledge engineering scenario will be the context in which the technique will be experimented. Tailoring the teaching strategy is an innovative issue in the context of knowledge sharing communities but after all, in practice, supplying one for all didactic material is no different from enclosing a readme file in the software resource.

This study proposes a technological solution that, when integrated in such a community, can deliver adaptive learning content. A technique based on the rule-based approach is adopted, that can adapt to both the user’s cognitive style and the teaching strategy to be applied, thus modifying the navigation within a didactic resource built using the SCORM (Sharable Content Object Reference Model) (SCORM 2004) standard.

The innovative aspect of the technique defined is that according to the user cognitive styles defined in the Felder model (Felder, 1988), it can modify the Sequencing and Navigation rules contained in the `imsmanifest.xml` file. This makes it possible to personalise the learning experience.

The methods adopted in the proposed solution, which confer the system its intelligent and adaptive behaviour, are defined in a general context but applied in a knowledge engineering scenario. For the knowledge representation, symbolic methods are used based on First Order Logic (FOL); in order

12 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:  
[www.igi-global.com/chapter/adapting-scorm-compliant-los-knowledge/61960](http://www.igi-global.com/chapter/adapting-scorm-compliant-los-knowledge/61960)

## Related Content

---

### Perceptions of Students About the Use of Webinars in Classrooms: A Case of Abu Dhabi University

Asma Abdallah, Osama Ismail, Rasha Khalil Abdallah and Ahmed M. Alkaabi (2023). *International Journal of Information and Communication Technology Education* (pp. 1-17).

[www.irma-international.org/article/perceptions-of-students-about-the-use-of-webinars-in-classrooms/322793](http://www.irma-international.org/article/perceptions-of-students-about-the-use-of-webinars-in-classrooms/322793)

### Inhabited Virtual Learning Worlds and Impacts on Learning Behaviors in Young School Learners

Chi-Syan Lin, C. Candace Chou and Ming-Shiou Kuo (2009). *Methods and Applications for Advancing Distance Education Technologies: International Issues and Solutions* (pp. 342-355).

[www.irma-international.org/chapter/inhabited-virtual-learning-worlds-impacts/26410](http://www.irma-international.org/chapter/inhabited-virtual-learning-worlds-impacts/26410)

### Factors Affecting Students' Adoption of ICT Tools in Higher Education Institutions: An Indian Context

Salini Rosaline and J. Reeves Wesley (2017). *International Journal of Information and Communication Technology Education* (pp. 82-94).

[www.irma-international.org/article/factors-affecting-students-adoption-of-ict-tools-in-higher-education-institutions/176361](http://www.irma-international.org/article/factors-affecting-students-adoption-of-ict-tools-in-higher-education-institutions/176361)

### Enterprise Systems Software in the Business Curriculum: Aligning Curriculum with Industry Requirements

Ravi Seethamraju (2007). *Information Systems and Technology Education: From the University to the Workplace* (pp. 57-81).

[www.irma-international.org/chapter/enterprise-systems-software-business-curriculum/23394](http://www.irma-international.org/chapter/enterprise-systems-software-business-curriculum/23394)

### Listening and Learning through ICT with Digital Kids: Dynamics of Interaction, Power, and Mutual Learning between Student Teachers and Children in Online Discussion

Dianne Forbes (2014). *Cases on Professional Distance Education Degree Programs and Practices: Successes, Challenges, and Issues* (pp. 149-176).

[www.irma-international.org/chapter/listening-learning-through-ict-digital/80344](http://www.irma-international.org/chapter/listening-learning-through-ict-digital/80344)