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## **Chapter XII**

# **Usable and Interoperable E-Learning Resources Repositories**

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## **Abstract**

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*The Web puts a huge number of learning resources within reach of anyone with Internet access. In many cases, these valuable resources are difficult for most users to find in an efficient and effective manner. What makes an e-learning resources repository much more than a portal is the ability to discover a learning object and put it to a new use. The purpose of an e-learning resources repository is not simply safe storage and delivery but the ability of their administration, in terms of updating, identifying, utilizing, sharing and re-using them, which remains a great challenge. Moreover, the various repositories are either closed systems or systems that allow user access only through proprietary interfaces and data formats. In brief, there*

*is lack of interoperability. The aim of this chapter is to present the requirements of an ideal e-learning resources repository that will provide services for covering the aforementioned critical issues. We will also describe such an ideal system could be non-centralized, which is the main difference from all the system that exists today in the WWW. Peer to Peer (P2P) based approaches are more flexible than centralized approaches with several advantages.*

## Introduction

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The Web puts a huge number of learning resources within reach of anyone with Internet access. One can mention a lot of Web sites that hold learning resources, such as Canada's SchoolNet (<http://www.schoolnet.ca/>), MathGoodies (<http://www.mathgoodies.com>), or the U.S.-based site maintained by the Educational Object Economy Foundation (<http://www.eoe.org/>), and many more. The National Governors Association in the United States published a report in 2001 mentioning that "58% of all two- and four-year colleges offered distance learning courses in 1998, while 84% of all colleges expected to do so by 2002" (NGA, 2002). As the number of Web sites continues to grow, search engine retrieval effectiveness is likely to decline, and there is a need to consider alternative resource discovery mechanisms (Milstead & Feldman, 1999).

Apart from the "discovery" problem, the learning resource sharing appears as a major challenge and necessity, because development costs are becoming significant (Zlomislic & Bates, 2002). Since the old days, educators have been reusing learning resources. Textbooks, wall maps in geography classes, periodic tables of the elements in science classes, filmstrips and videos, etc., are resources that appear in many K–12 classrooms worldwide (Downes, 2001). Nowadays, coming into the e-learning era, educators and learners need to have access to as well as to reuse e-learning resources of their interests, needs, and preferences.

This is why e-learning resources repositories or e-Learning Resources Brokerage Systems (LRBS) have emerged. In very generic terms, an online "brokerage system" is an online entity that acts as a one-stop electronic marketplace. A brokerage system has two types of users: those who offer their products for sale (*providers*) and those who buy the products offered (*consumers*). An e-learning objects brokerage system facilitates the exchange of learning objects among organizations and individuals.

The term "learning object" is not intended to be restrictive but refers to any digital asset that can be used to enable teaching or learning (IEEE, 2001). A learning

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