19 An Executable Model for Virtual Campus Environments

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In this chapter, we revisit an innovative model of a virtual campus developed and implemented in the second half of the 1990s and we compare it with the main evolution in the field of E-Learning that has occurred in the last decade. We present the vision and the orientation principles for a new virtual campus model and a conceptual framework for a virtual campus support system called TELOS. This TELelearning Operation System is service-oriented and ontology-driven and aims to support a larger set of actors than before, while generating a cascade of portals based on aggregation scenarios. We summarize the technical architecture of that system, which provides an implementation of the new virtual campus model, present some use cases and discuss its intended benefits for E-Learning systems.

19.1 Introduction

Distance education, or distributed learning, has finally acquired general support in most circles. More than a hundred countries have built distance universities. Most campus universities are developing distance education units or courses. All major companies are building training Intranets for their personnel. An E-Learning industry has developed to provide E-Learning tools and services.

At the turn of the century, distributed learning appeared to be an indispensable solution to the exponential growth of information in the knowledge society and for the support of new cognitive and learning activities it demands from individual and organizations. The extremely rapid spread of the Internet has accelerated this movement. The concept of a virtual campus,
resting on the networking of actors and resources much more diversified than in the past, has become prevalent. These resources or learning objects include not only multimedia or web-based documents, but also learning scenarios and persons to interact with: instructors and tutors, subject-matter experts, training managers, and professors acting as designers.

LICEF, founded in 1992 as Télé-université’s research center adopted right from the start, the many dimensions of a virtual campus model as its unifying research orientation (Paquette 1995). The first research efforts provided insights into specific applications of multimedia telecommunications in distance learning. The virtual learning center (VLC) model and architecture has been identified as the central parts of the virtual campus. Within a VLC, five theoretical actors were then identified: learners, trainers, content experts, designers, and managers. Sixty-three roles have been defined for these actors, each one being a set of use cases. Then, for some of these roles, built object-oriented graphs to design or reuse tools to be integrated in a VLC.

In 1997, the virtual campus became a powerful integrative concept at Télé-université and elsewhere. The Ministry of Education supported an ambitious 5-year plan to transform the 23-year-old distance university into a virtual campus based on a merge of hypermedia and telecommunications technologies. At the same time, we decided to re-implement the VLC architecture on a web-based platform. In 1999, we achieved the Explor@ implementation (Paquette 2001) and we started using it to develop and deliver telelearning courses and environments at Télé-université and other institutions.

Since the turn of the century, a rapid evolution has occurred marked by the convergence of three main movements. First, we are in the midst of the evolution towards a new generation of the Internet based on a services-oriented system and the semantic web. Second, an international standardization movement in the field of E-Learning has gained momentum, particularly regarding the concept of learning object repositories. Third, a growing emphasis on the use of web portals as the main information and knowledge exchange media has provided more flexible learning environments than the first generation of Learning Content Management Systems (LCMS). Taking in account this evolution, we have conducted work in the last 3 years on two fronts: implementing a new VLC system at Télé-université called Concept@, based on web-based learning portals, and launching a new R&D program, within the LORNET1 pan-Canadian research network, aiming to develop TELOS, a new generation for a virtual campus support system.

1 LORNET is a pan-canadian research network, a 5-year project aiming to developed eLearning and knowledge-based technologies for the Semantic Web.