Chapter 12
An Ontology-Based Learning System in IT Project Management

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ABSTRACT

This chapter presents a Web-based learning system in IT project management, capable of building and conducting a complete and personalized training cycle, from the definition of the learning objectives to the assessment of the learning results for each learner. The focus is on the content management solution, using an educational ontology and a competency catalogue, both of them developed by the author in line with the ICB 3.0 competency standard. Ontology-based learning is considered in the context of competency-based learning. The competency catalogue allows the identification of a possible gap between the reference and the actual competency profiles and the identification of the training requirements. An ontology-based project management learning approach allows one to find the most suitable educational programmes and training when there is a similarity but not an exact match between education and training offers and the competency gap.

The development process is based on the state of the art IT technologies (metadata and ontology for knowledge manipulation, Web services, learner model, and intelligent tutoring systems). Besides interoperability and personalization, the proposed approach brings additional advantages, including: unitary interpretation of the content structure by different user categories or content providers; explicit specification of the knowledge domain, allowing the updating of the domain definition without major changes of e-learning tools and programmes; reuse of the learning objects with economical advantages by saving costs of (re)writing the content for the different course forms and strategies; reuse of the created tools in one domain in other domains; promoting the competency-based learning through the domain ontology and the relations between concepts and competencies. The results obtained in practice are very encouraging and suggest several future developments.

INTRODUCTION

The importance of education is becoming more and more widely accepted. The 21st century is considered the education century (Shi & Tsang, 2008) because education is becoming a vital and continuous process, and a crucial element in order to survive in the knowledge society. Huggins (2004) identified the following three reasons to get involved in learning activities: personal and professional potential benefits, opportunities for learning and external factors. According to the Huggins's study, when individuals are engaging in learning activities, they are looking for personal development, performance at work, confidence and promotion. Other studies stress the financial and non-financial benefits of education (Demirel, 2009; Fabra & Camisón, 2009). As non-financial benefits, the following are often mentioned: more interesting and stimulating work, higher stability and autonomy of the job, safer working conditions. Demirel emphasizes that people should be engaged in learning activities in order to cope with the constantly changing environment. In this context, they should constantly renew their existential perspective, behaviour and values.

The software industry is currently governed by several major forces: global competition (software companies compete globally, national boundaries become less visible), interdependence between many sectors, a high rate of innovation, significant risk exposure and a high degree of professionalization.

In the software industry, the human resources are subject to a continuous process of improvement. Otherwise, they quickly become obsolete and are released. According to Morris (2009), investment in skills development remains a long-term imperative and co-ordinated efforts among governments, universities and IT firms are needed to improve the quality of technology training and expand the pool of potential recruits. Education and training need to address the competencies required by the software industry.

The pillars of a competency-based education are the skills and traits (knowledge, experience, attitude and abilities) that individuals use to perform successfully. The identification, modeling and assessment of competencies represents the foundation of a competency-based education.

Project management is a core competency in the software industry. The correlation between business performance and project success can not be disputed (Ling et al., 2009). Extensive research has been done on this topic, but project management is a highly dynamic field. Several categories of key factors have been revealed, relating to project management actions, project related factors, project procedures, human factors and environmental factors. All of these factors are described in standardized guides and codes of practice. Prominent among these codes is the IPMA Competency Baseline, Version 3.0, developed by the International Project Management Association (2006).

The increasing need for IT education and the demand for more flexible ways of acquiring competencies are forces that motivate the use of e-learning. Due to the technological explosion, e-learning has gained an important position among the range of educational tools. It offers convenience, flexibility, mobility and adaptability. In consequence, e-learning has become a strategic vector in the development of the knowledge-based economy (Charpentier et al., 2006). This change in education and training has resulted in the intensification of research on e-learning. Researchers seek to discover students' preferences for various tools and e-learning platforms, the relationships between online learning and other learning styles, and the factors affecting student performance and satisfaction in the online environment (McFarland & Hamilton, 2006).

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