

Chapter VII

An Ontological Representation of Competencies as Codified Knowledge

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Abstract

In current organizations, the models of knowledge creation include specific processes and elements that drive the production of knowledge aimed at satisfying organizational objectives. The knowledge life cycle (KLC) model of the Knowledge Management Consortium International (KMCI) provides a comprehensive framework for situating competencies as part of the organizational context. Recent work on the use of ontologies for the explicit description of competency-related terms and relations can be used as the basis for a study on the ontological representation of competencies as codified knowledge, situating those definitions in the KMCI lifecycle model. In this chapter, we discuss the similarities between the life cycle of knowledge management (KM) and the processes in which competencies are identified and assessed. The concept of competency, as well as the standard definitions for this term that coexist nowadays, will then be connected to existing KLC models in order to provide a more comprehensive framework for competency management in a wider KM framework. This paper also depicts the framework's integration into the KLC of the KMCI in the form of ontological definitions.

Introduction

Models of knowledge creation inside organizations are considered as dynamic processes of development that evolve over time (Cavaleri & Reed, 2000). These models provide a breakdown of the creation process in terms of concrete processes and elements that drive the overall production of knowledge as targeted to satisfy organizational expectations. For example, the knowledge life cycle (KLC) model of the Knowledge Management Consortium International (KMCI, <http://www.kmci.org>) distinguishes the knowledge processing environment (KPE) from the business processing environment (BPE), describing the latter as the context of actual usage and field assessment of the claims formulated, produced and evaluated in the former. As the KPE is divided into two sub-processes, namely knowledge production (KP) and knowledge integration, the existence of a BPE emphasizes the fact that knowledge codified in artefacts as part of KP processes and disseminated as part of KI processes will be subject to further validation in actual business experience.

Previous work has shown KLC models as a comprehensive framework for situating learning-oriented artefacts in an organizational context (Sanchez-Alonso & Frosch-Wilke, 2005; Sicilia, 2005). The work of Sicilia (2005) has demonstrated that the design and creation of learning resources as described by Downes (2004) is not essentially different from knowledge production. The integration processes, in particular, might be considered to subsume programmed organizational learning activities. Thinking about learning as an outcome of the need to acquire new competencies, learning activities inside the organization can be considered enablers of knowledge acquisition activities. In this context, the concept of competency becomes essential in the KLC model, both as a prerequisite to perform knowledge acquisition activities and as an outcome of these kinds of activities. Furthermore, meta-claims about the knowledge produced—in the case of competencies—may be interpreted as the recording of usage conditions, hypotheses, and assumptions on the acquisition of the competencies evaluated. In consequence, the concepts related with competency management can be put in connection with existing KLC models, in an attempt to provide a comprehensive framework for reuse-oriented competency management and KM. In this chapter, we approach the integration of concepts related to competencies into the framework of the KLC. This would clarify the relationships between knowledge management and competency definition standard efforts. The method to develop the conceptual integration is that of engineering an initial ontological description for the main concepts, connecting them to existing ontological databases. This continues existing work described by Sicilia, Lytras, Rodríguez, and García (2006) regarding the ontological description of learning activities as an extension of the ontology of KM described recently by Holsapple and Joshi (2004).

Formal ontologies (Baader, Calvanese, McGuinness, Nardi, & Patel-Schneider, 2003) are a vehicle for the representation of shared conceptualizations that is useful for technology-intensive organizations. Ontologies based on description logics (Gruber, 1995) or related formalisms provide the added benefit of enabling certain kinds of reasoning over the terms, relations, and axioms that describe the domain. A pragmatic benefit of the use of formal ontologies is that it is accompanied by a growing body of semantic Web (Berners-Lee, Lassila, & Hendler, 2001) tools, techniques, and knowledge. Previous work considered here as a point of departure (Sicilia, García, Sánchez-Alonso, & Rodríguez, 2004) has described the integration of e-learning technology concepts with the OpenCyc knowledge base, the open source version of the Cyc system (Lenat, 1995).

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