Chapter 2.15
Leveraging Knowledge Reuse and System Agility in the Outsourcing Era

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ABSTRACT

Collaborative work groups that span multiple locations and time zones, or "follow the sun," create a growing demand for creating new technologies and methodologies that enable traditional spatial and temporal separations to be surmounted in an effective and productive manner. The hurdles faced by members of such virtual teams are in three key areas**:** **d**ifferences in concepts and terminologies used by the different teams; differences in understanding the problem domain under consideration; and differences in training, knowledge, and skills that exist across the teams. These reasons provide some of the basis for the delineation of new architectural approaches that can normalize knowledge and provide reusable artifacts in a knowledge repository.

INTRODUCTION

The increasing prevalence of collaborative work groups that span multiple locations and time zones create a growing demand for creating new technologies and methodologies that can enable traditional spatial and temporal separations to be surmounted in an effective and productive manner. In the specific case of information technology (IT), more than 380,000 professionals are currently focused exclusively on export-oriented activities (Aggarwal & Pandey, 2004). The hurdles faced by members of such virtual teams are in three key areas**:** **(i)** differences in concepts and terminologies used by the different teams; (ii) differences in understanding the problem domain under consideration; and (iii) differences in training, knowledge, and skills that exist across the teams (Chang, Dillon, Sommerville, & Wongthongtham, 2006). These reasons provide some of the basis for the delineation of new architectural approaches

that can normalize knowledge and provide reusable artifacts in a knowledge repository.

This article focuses on the issue of providing information systems agility, especially when the work is outsourced from one country (or company) to another or as the work is performed in multiple countries using a hybrid offshoring model such as the 24-Hour Knowledge Factory concept (Gupta, Seshasai, Mukherji, & Ganguly, 2007). This article also deals with the issue of creating an evolving knowledge repository that can be used when systems need to be redesigned or reimplemented.

RELATED WORK

The object management group (OMG) is actively involved in the creation of a heterogeneous distributed object standard. In a departure from modeling standards, such as the common object request broker architecture (CORBA) and the related data distribution service (DDS), OMG moved towards the unified modeling language (UML) and the related standards of meta-object facility (MOF), XML data interchange (XMI), and query views transformation (QVT). The latter standards provide a foundation for the model drive architecture (MDA). In an effort to bring UML and the Semantic Web together, OMG is leading progress toward the ontology definition metamodel.

More specifically, MDA, as related to software engineering, composes a set of guidelines for creating specifications structured as models. In MDA, the functionality is defined using a platform-independent model with a domain-specific language. The domain specific language definition can be translated into platform-specific models by use of a platform definition model (PDM). The ontology definition metamodel is an OMG specification that links common logic and OWL/RDF ontologies with MDA. Common logic being an ISO standard for facilitating the exchange of knowledge and information in computer-based systems, and resource description framework (RDF) and Web ontology language (OWL) being the latest examples of framework and related markup languages for describing resources authored by the World Wide Web Consortium (W3C). OMG and W3C standards are available online at omg.org and w3.org, respectively.

The notion of reuse of knowledge has been previously explored with respect to organizational memory systems. Markus (2001) identified distinct situations in which reuse arose according to the purpose of knowledge reuse and parties involved. The knowledge reuse situations exist among producers who reuse their own knowledge, those who share knowledge, novices seeking expert knowledge, and secondary knowledge miners. The solutions to the problems of meeting the requirements of knowledge storage or retrieval were presented as a combination of incentives and intermediaries.

In the context of allocation of IT resources, O'Leary (2001) conducted a case study of a knowledge management system of a professional service firm concluding that service-wise requirements for knowledge reuse should impact the design of knowledge systems. For example, the studied firm contained three primary service lines: tax, consulting, and audit. Differential reuse, stemming from the relatively low reuse in the consulting service line to high reuse in the tax line, leads to a particular allocation of knowledge bases, software, hardware, and network resources. O'Leary's paper supports earlier work by Vanwelkenhuysen and Mizoguchi (1995), which showed that knowledge reuse has depended on organizational aspects of knowledge systems. Their work suggested dimensions along which ontologies for knowledge reuse may be built, based on workplace-adapted behaviors.

The concept of knowledge reuse and agility is especially relevant to "follow the sun" models, similar in spirit to the 24-Hour Knowledge Factory, and have been attempted by others. Carmel

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