Context-Aware Framework for ERP

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INTRODUCTION

Like many existing ERP models (e.g., Podolsky, 1998; Van Stijn & Wensley, 2001), the OOAB framework is also based on a widely accepted assumption that a corporate-wide information system consists of a set of potentially related subsystems; and as a result, information flows among these subsystems must be identified, and required resources planned, using an appropriate ERP methodology. However, up until now there existed no formalised framework that facilitates sharing of contextual knowledge in ERP processes. A unique attribute of the OOAB framework is that it treats ERP processes as a collaborative processes where various roles/actors collaboratively perform tasks in order to achieve a common overall goal. An object-oriented framework is presented in this article that facilitates sharing the contextual knowledge/resources that exist within ERP processes. Context is represented by a set of relevant collaborative semantic concepts or “objects”. These are the objects that are localised/contextualised to specific sub-process within the ERP process.

BACKGROUND

From a purely object orientation perspective, a collaboration is defined as “the structure of instances playing roles in a behavior and their relationships” (OMG, 2001). The behaviour mentioned in this definition refers to an operation, or a use case, or any other behavioural classifier. This article provides an overview of a framework for analysing awareness requirements of the actors in ERP systems using an object-oriented awareness-based approach. A similar study was also conducted for developing a new version of this framework that takes into consideration the specific characteristics of virtual communities (Daneshgar, 2003). The proposed approach specialises the notion of collaboration and extends it to the ERP processes. This has roots in the activity network theory (Kaptelin et al., 1995) and is based on the fact that all ERP processes involve multiple roles performing various tasks using appropriate artefacts (e.g., departmental sub-systems, databases, etc.) in order to achieve both their local as well as the overall organization-wide goals. Conceptually speaking, this will justify a frame-based object-oriented approach to analysis and design for ERP processes (Turban & Aaron, 2001). The conceptual model of the proposed framework is made of the following components:

- a set of collaborative semantic concepts including roles, the tasks that these roles play within the process, and the artefacts that these roles use to perform various tasks within the process, and
- relationships among these semantic concepts.

This conceptual model can then be mapped directly to an object model and be used as an analytical tool for identifying awareness requirements of the actors within the ERP process. The fact that ERP is treated as a collaborative process calls for a mechanism for maintaining awareness requirements of the actors involved in this collaboration. Furthermore, due to its object orientation, the framework is capable of encapsulating all complications and dependencies in sub/local processes within individual tasks as well as resources required to perform those tasks, further relieving the ERP management and the associated software.

OOAB FRAMEWORK

A domain-specific conceptual model of a hypothetical ERP process that resembles an object diagram is shown in Figure 1. Use of a domain-specific conceptual model instead of a straight object diagram is justified by the fact that the ontological foundation of the framework prevents growth of the objects and relationships indefinitely, and as a result using an object model may hide such ontology. In Figure 1 there are two roles: R1 and R2; six tasks: FAT1, FAT2, OPT1, FAT4, FRT1 and FRT6 (all shown by circles). It also shows various resources by straight lines connecting tasks and roles. These lines represent rich ontological relationship between a pair of semantic concepts. Each task object requires certain resources for achieving its local/departmental goal or purpose (called process resource), as well as certain other resources for achieving the collaborative organization-wide goals of the ERP process (called collaborative resource). In Figure 1, a line connecting a role vertex to a task vertex is a process resource, whereas a line connecting two tasks together is a collaborative resource.

According to the framework, effective knowledge and/or resource exchange among actors is closely related to the level of awareness as defined in the awareness model that each
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