Chapter V

Towards User-Oriented Enterprise Modeling for Interoperability

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ABSTRACT

This chapter introduces Enterprise Modeling from a user point of view as a means to support new approaches for the development of networked organizations. User-oriented Enterprise Modeling must be capable to capture a multitude of enterprise aspects and present them to users in their preferred ways. Such aspects are concerned with the business processes themselves, their integration in inter and intra organizational environments, as well as active knowledge management to support the enterprise operation as a whole. Today, these requirements are addressed separately, using single non-interoperating modeling tools. The chapter describes the structuring of user requirements as well as the initial design of the Unified Enterprise Modeling Language (UEML) developed in a research project sponsored by the European Commission. During this project, the feasibility and benefits of user-oriented modeling have been proven with a Web-based demonstrator integrating three commercial modeling tools. Broadening the generic approach taken will provide more solutions for interoperability in the extended enterprise environment.
INTRODUCTION

In the highly competitive global economy, many enterprises need to better understand and manage the way they operate their businesses. Enterprises must frequently realign their organization along the supply chain interoperating with their suppliers and customers. They must flexibly respond to the need for change imposed by increasing customer satisfaction in terms of quality, cost, and timeliness. The efficient design, analysis, and optimization of enterprise operations require notations, formalisms, methods, and tools to capture the various facets of a business organization. All the aspects of this modeling process are collectively called Enterprise Modeling (Vernadat, 2001).

BACKGROUND

Enterprise Modeling (EM) can be defined as the art of externalizing enterprise knowledge adding value to the enterprise or needs to be shared. The prime objective is to capture the entities of the enterprise and their relations, an effort which usually concerns function, behavior, information, resource, organization, or economic aspects of a business entity, which may be part of a single enterprise, one enterprise, or a network of enterprises. The goal is to represent the structure and behavior of enterprise components and operations in order to understand, engineer or re-engineer, evaluate, optimize, and control the business organization and operations (Vernadat, 2001).

Enterprise Modeling started in the 1980s with functional modeling (e.g., SADT), Information modeling (e.g., the entity relationship model), and data flow diagrams and was initially used in software engineering and information system analysis. Within the Initiative of Computer Integrated Manufacturing (CIM), business architectures were developed, for example, the business process centered CIMOSA architecture (AMICE, 1993), the more object-oriented approach of Integrated Enterprise Modeling (IEM) (Spur, Mertins & Jochem, 1996), or the GRAI method focusing on decision processes and the enterprise control system (Doumeingts et al., 1992). Usually, an architectural framework, a modeling language, and a methodology supported by tools are required to make Enterprise Modeling operable and applicable by the end user (Bernus, Mertins & Schmidt, 1998). GERAM, the Generalized Enterprise Reference Architecture and Methodology of the IFAC-IFIP Task Force (1999) was developed as a consolidation and harmonization of several architectures.

Many Enterprise Modeling languages (e.g., IDEF3, IEM, EEML, GRAI, event process chains, or DEM) and many EM tools appeared on the market place during the 1990s (e.g., ARIS Toolset, Bonapart, e-MAGIM, Enterprise Modeller, FirstSTEP, METIS, MEGA Suite, MO2GO, PrimeObject, PROPLAN, to name a few). The situation deteriorated with workflow management systems appear-

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