Chapter 18

Knowledge Base Development in Virtual Enterprise Network as Support for Workplace Risk Assessment

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ABSTRACT

The article presents research results based on the concept of collaborative infrastructure (as the virtual enterprise network PREMINV e-platform from “Politehnica” University of Bucharest, Romania), in order to unify existing standards for supply chain management and to provide support in various decision making processes in manufacturing supply networks. The intent is to facilitate and enhance the required knowledge management processes linked with the business process management. The virtual enterprise network expects to reduce small and medium-sized enterprises involvement in networking efforts, enable better and faster decision processes and promote the development of the business services. In addition, the new product development paradigm requires software tools for risk estimation and assessment. For this purpose, the authors describe a knowledge bases method build and use for the professional risk assessment as part of risk management process. The risk level is established based on the probability and severity of its consequences.

INTRODUCTION

Today’s enterprises need more than just choice when looking at networking solutions. They need solutions that empower a quickly respond of the information technology to changing and dynamic business requirements, improve time-to-service, while simplifying their network and reducing costs of all categories. Enabling the agile enterprise requires a new way of approaching network architecture. It requires a new level of synergy between collaborative real-time applications, the virtualized data center environment and the un-
derlying, enabling network (Kayworth & Leidner, 2000; Draghici & Draghici, 2006).

Through the years, the role of the network has changed with computing transitions, since the dawn of the mainframe through the transition to a virtual enterprise. Each computing transition has also increased the network’s value and reshaped the vendor landscape. If we consider the item analyze as major computer transition in comparison with the network role and value there can be identified four periods. First period was from 1960 to 1980 when the existing computing mainframe solutions cannot support networks. Second period consider from 1980 to 1995 when client/server solutions and applications support low connectivity and low network value. Third period, more recent, from 1995 to 2010 when Internet explode and support limited intelligence role of network but the network value is at medium level. The fourth period, in present and future time, from 2010 and beyond when virtual solutions support network role as virtualization enabler and the network value is high. Therefore, the transition to a virtual enterprise has an impact on the network similar to the previous computing shifts. The network will become a strategic point of competitive advantage for companies that use it to accelerate virtualization deployments (Kerravala, 2009; Chen, Kang, Xing, & Lee, 2008).

Virtual enterprise network conceived in the beginning of this century as a European response to the needs of manufacturing facing the knowledge economy, and therefore contributes with a high-level strategy that provides the reference model for industrial transformation (Camarinha-Matos & Afsarmanesh, 2007).

The Research Innovation Value Chain, as an action line, represents the operational place where stakeholders can network to respond to the multiobjectives of modern enterprise in the new era of knowledge society (Rosu, Dragoi, & Guran, 2009). Therefore, enterprises continue to implement information and communication technology strategies to improve their business processes, such as manufacture, research, products quality, sales, services, costs control etc. The enterprise model architecture uses the Intranet/Internet/Extranet technologies. As a general requirement for an infrastructure support is that enterprises must be able to inter-operate and exchange information’s and knowledge in real time so that they can work as a single integrated unit, although keeping their independence and autonomy. For the future, e-services and e-business require the enterprise re-thinking and re-modeling the system and applications design for an efficient use of new network technologies. Building the e-economy is a complex challenge and its main requirements (Rosu, Dragoi, & Guran, 2009; Dragoi, Draghici, Rosu, Radovici, & Cotet, 2010). The strategies develop and implement will require partnership and collaboration among the private, public and academic sectors as well as other agencies and organizations that strive to link them together. It will require the active involvement of consumers (clients, customers) and citizens (users of all kind) (Jarvenpaa, Shaw, & Staples, 2004; Bjorn & Ngwenyama, 2009).

In the context of this article, the collaboration infrastructure as a virtual enterprise network, implemented in the PREMINV e-platform (from the “Politehnica” University of Bucharest, Romania), intend to facilitate and enhance the required knowledge management processes. These are linked with the great diversity of the business process management.

In the European countries, more than 95% of the companies are small and medium-sized enterprises and the majority of the European Union employees work in such companies. The proposed collaboration infrastructure, based on a virtual enterprise network, expect to reduce involvement of individual small and medium-sized enterprises in networking efforts, enable better and faster decision processes and promote the development of the business services sector. Because of the new product development paradigm, there is a greater need for software tools to risk estima-