Chapter XIX
Towards Adaptive Business Networks:
Business Partner Management with Ontologies

Peter Weiß
Universität Karlsruhe (TH), Germany

ABSTRACT

This chapter proposes a new approach for business partner management with ontologies in large business communities. The often postulated adaptiveness and intelligence of new collaborative structures, foremost collaborative networks, require new approaches to deal with the increasing difficulty in handling the resulting complexity of relational ties in communities and business networks. With a growing number of business entities involved in the system, the network management starts to lose overview and control concerning the entities in the pool of partners. Then it seems asked too much establishing, promoting, and maintaining relational ties on a personal basis. A possible solution seems to be support through adequate services of the information and communication technology (ICT) infrastructure. Ontologies offer support for communication processes and complex interactions of business entities in collaborative spaces.

INTRODUCTION

New business patterns are characterized by diminishing geographical and time boundaries, globalization of the labor market, increased connectivity, extended or virtual enterprises, new forms of customer management, and individualized marketing (Lengrand & Chatrie, 2000). Beyond doubt, the relevance of networked cooperations in business can be expected to increase strongly in future. Delic and Dayal (2003) discuss and describe future enterprises that will transform themselves into better forms by becoming “more intelligent”. In this connection the authors refer to the capability of a business entity to exploit emerging business opportunities and to adapt its operations to changing market conditions. Intelligence in this sense
Towards Adaptive Business Networks

requires the ability of a business entity to sense its environment, to understand the situation, and to adapt its business objectives and behavior accordingly. Delic and Dayal (2002) argue that in near future enterprises will form strategic partnerships with other enterprises “to create dynamic business ecosystems”, that will be self-managed, self-configured, and self-optimized. Self-organization is a popular concept that is currently raising considerable interest among researcher from different background (Martin-Flatin, Sventek, & Geihs, 2006). However, there is still considerable controversy regarding how self-managing systems are to be defined and how they can be engineered. Biological and sociological phenomena often serve as inspirations and guidelines for the design of systems. Adaptation can be identified as a key behavior derived from the behavior of natural systems. Both systems natural and business systems share the same ultimate objective: to survive in an evolving environment and changing circumstances (Delic & Dayal, 2002).

Thus the question arises: how far are future dynamic business ecosystems from real business reality? Actually, new efficiencies can be mainly achieved through the automation of core business processes and the exploitation of collaborative knowledge. In this connection, popular concepts are customer relationship management (CRM), enterprise resource planning (ERP), enterprise application integration (EAI), and enterprise knowledge management (EKM). In essence, they encompass enterprise activities that strive for improving efficiency or injecting intelligence into operations (Delic & Dayal, 2002). This requires the availability of standardized interfaces for integrating proprietary information systems from both internal perspective and external perspective to realise the flexible integration of respective business partners, suppliers, and customers into the enterprise’s own operations. Consequently, enterprise’s borders are blurring, turning into fuzzy and dynamic borders (Picot, Reichwald, & Wigand, 2003). Today, many research endeavors noticeably gravitate around the realization and problems related to the implementation of the concepts mentioned above. The common denominator and underlying problem of many business endeavors can be subsumed in the right combination of two extremes: self vs. extrinsic organization or more general evolution vs. organization. The vision sets clear targets for this research endeavor. After having motivated the background of our research, the following actual needs and aims of the research are further elicited. One strand to be specifically looked into relates to problems associated with the interplay and interdependency of concepts as ERP, CRM, EKM (see Figure 1). This has been the subject of many past and ongoing research projects (Camarinha-Matos, 2002; Camarinha-Matos, 2004; Camarinha-Matos & Afsarmanesh, 2003; Camarinha-Matos, Afsarmanesh, & Ollus, 2006). The holistic view on an enterprise’s operations through integrating information flows and respective applications and systems can be envisioned to be the foundation of any required business intelligence.

Many of these new paradigms are currently being broadly discussed by academia. Industry has commenced with the design and engineering of new software concepts, architectures, and solutions. The newly emerging concepts and architectures based on the new paradigm “service-orientation” as, for example, SOA (service oriented architecture) strive to overcome actual limits of traditional solutions for managing and controlling networked systems (Newcomer & Lomow, 2005; Martin-Flatin et al., 2006). However, problems related to the technical integration of heterogeneous enterprise information systems are not subject hereafter. Although it has to be underlined that any research endeavor addressing electronic networks is likely more or less intertwined and dependent on ICT technology.

In the following, it is focused on the implementation of described abilities and the prior motivated behavior of dynamic business ecosystems, namely evolution and organization. Self-organization serves as inspiration and guideline. The selection of business partners is to be seen as key to success for the realization of dynamic business ecosystems in the near future; therefore, business relationships need to be perceived increasingly as intangible assets of an enterprise that need special care. Namely, they have