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

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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
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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 cur -
rently 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 dy-
namic 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 implementa-
tion 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 
进一步 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 intel-
ligence.

Many of these new paradigms are currently be-
ing 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 implementa-
tion 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 busi-
ness 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