

## Chapter 88

# Ontological Representation of Virtual Business Communities: How to Find Right Business Partners

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### ABSTRACT

*Business knowledge that is embodied in texts such as business news and companies profiles has become widely accessible to the business community, as well as to the general public, mostly due to the growing popularity of the Internet. The field of efficient information retrieval and knowledge discovery from textual data is an increasingly important research topic driven by the Internet growth and easy access to very large business directories on the Internet. To become acquainted with a particular domain and to better understand the underlying concepts, domain knowledge can be represented by ontologies. In addition, ontologies can be used for identification of potential links in virtual business communities and for decision support when searching for right business partners, which is very relevant to small to medium-sized enterprises. Potential applications range from dynamic supply chain configuration to building consortia as quick responses to business opportunities.*

### INTRODUCTION

The difference between being able to use the right knowledge and not being able to do so shows most dramatically when facing difficult decisions. One example of such decisions is how to find a right

business partner for a given business idea. This has been a research issue for many years, from 1960s when it was mainly a part of the problem of supply chain management, until now, when it is mostly investigated in the context of virtual organizations. The historical span and the range of used methods is nicely presented in (Jarimo et al., 2008).

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Interesting information about enterprises from a particular business sector can be found in various Internet business directories. They list enterprises according to different criteria (e.g. regions or company profiles) providing a broad range of information. One such directory is BizEurope.com – the European Business Directory (UGA media, 2009). It includes export and import trade leads, suppliers, importers, distributors, business resources and contacts. Besides offering payable data to BizEurope members it enables free search on various product categories and provides lists of companies and links to their websites. Internet and real-time communication provide the possibility to build virtual communities in different platforms, which can foster enormous business opportunities. Those SMEs which are able to quickly recognize potential partners' products, expertise and skills, are in advantage when developing new services, products or new ways how to produce or deliver them in a cooperative, more effective way.

Since business research is increasingly relying on the Internet as information source and communication medium, managers and experts in enterprises have to master rapidly changing Information and Communication Technology (ICT) in order to explore heterogeneous data sources that are constantly on the increase. Besides operating with collections of well structured data, they often have to deal with semi-structured text collections, too. To analyse such datasets, the use of text mining techniques is required. The principal feature of text mining is its concentration on the document collection, which can be any group of text-based documents (Feldman and Sanger, 2006). Essentially, the term text mining is used to denote the analyses of large quantities of natural language text and the detection of usage patterns with the goal to extract some useful information (Sebastiani, 2002). Having access and ability to work with the newest information that is increasingly available on internet, indeed means great potential for experts, who can benefit from the advantages of information systems and

technologies. Business informatics thus presents an essential element of business research process.

Generally, small to medium-sized enterprises (SMEs) do not possess all necessary information and knowledge that is required for business success and therefore need to acquire external knowledge through different channels of knowledge interactions. The empirical evidence collected from an investigation conducted in the United Kingdom by Chen et al. (2006) confirms the crucial importance of external knowledge for SMEs. External knowledge is often distributed in various documents from heterogeneous sources. Text mining tools make it possible to discover new knowledge through analysis of text. Extracting important information from the knowledge that is represented in digital text forms has been proved as an important opportunity for the development of solutions and novel discoveries also in the context of business. News and other information from business domains can be extracted by text mining tools and represented as ontologies in the form of a tree-based concept hierarchy. We propose the use of ontologies constructed by using information from the application domain as an important component of the knowledge base used in the research process. Such domain ontologies contain background information and define the concepts and the structure of a conceptualization of a particular target domain. As an example we examined the pump manufacturing domain.

This chapter is in particular addressing the possibilities to improve the enterprise integration and organisational capabilities using ontological representations of business information. With ontologies construction tools text documents containing business information can be automatically analysed and placed into ontologies according to their content similarity. In particular, domain ontologies can support enterprises in organising business information and finding associations among organisations and linking them through the relevant relationships by utilising textual information. Such identification of links contributes

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