Chapter 3

Integrating Heterogeneous Enterprise Data Using Ontology in Supply Chain Management

Kamalendu Pal
City, University of London, UK

ABSTRACT

Many industries prefer worldwide business operations due to the economic advantage of globalization on product design and development. These industries increasingly operate globalized multi-tier supply chains and deliver products and services all over the world. This global approach produces huge amounts of heterogeneous data residing at various business operations, and the integration of these data plays an important role. Integrating data from multiple heterogeneous sources need to deal with different data models, database schema, and query languages. This chapter presents a semantic web technology-based data integration framework that uses relational databases and XML data with the help of ontology. To model different source schemas, this chapter proposes a method based on the resource description framework (RDF) graph patterns and query rewriting techniques. The semantic translation between the source schema and RDF ontology is described using query and transformational language SPARQL.
INTRODUCTION

A supply chain is a network of business facilities and distribution options that performs key functions: raw material procurement, transformation of these materials into intermediate and finished products, and distribution of these finished products to customers (Pal, 2017). In a typical supply chain, raw materials are purchased from different vendors and products are manufactured at one or more manufacturing plants, shipped to warehouses for intermediate storage, and then shipped to retailers or customers. All supply chains share the following characteristics: (i) in an enterprise all business activities are focused to supply products and/or services to its customers; (ii) any number of supply chain business-partners can be linked in the supply chain; (iii) a customer can be a supplier to another customer within the supply chain, which means that the total network of activities can consists of a number of supplier/customer relationships; (iv) the path from supplier to customer, can include a number of intermediaries (distributors) such as wholesalers, warehouses, and retailers, depending on the products and markets. Associated information flows among different supply chain business-partners. In this way, a supply chain creates a complex set of networked business processes, which need to be optimized for organizational profit. The core business processes of modern supply chains are: procurement, production, and sales. Moreover, these business activities need to consider scheduling, delivery, inventory planning, distribution, and understanding market conditions. Market specific supply and demand information, and warehousing facilities along the supply chain, are highlighted in Figure 1.

Figure 1. A diagrammatic representation of supply chain business processes
Knowledge Identification and Acquisition in SMEs: Strategically Emergent or Just Ad Hoc?
[www.igi-global.com/article/knowledge-identification-and-acquisition-in-smes/148315?camid=4v1a](www.igi-global.com/article/knowledge-identification-and-acquisition-in-smes/148315?camid=4v1a)

Creating a Knowledge Supply Chain for e-Tourism Curriculum Design: Integrating Knowledge Management and Supply Chain Management
[www.igi-global.com/article/creating-knowledge-supply-chain-tourism/75167?camid=4v1a](www.igi-global.com/article/creating-knowledge-supply-chain-tourism/75167?camid=4v1a)