Chapter 41

How Semantic Web Technologies can Support the Mediation between Supply and Demand in the ICT Market:
The Case of Customer Relationship Management

Anna Goy
University of Torino, Italy

Diego Magro
University of Torino, Italy

ABSTRACT

This chapter presents the ARNEIS framework, i.e., an architecture enabling intelligent Web-based repositories of descriptions of software products and services. ARNEIS exploits Semantic Web technologies in order to support the interaction between ICT companies offering software solutions for business automation, and small-to-medium sized enterprises looking for technological support to their business. In particular, the authors chose Customer Relationship Management (CRM) as a field for the evaluation of the framework, and thus in this chapter, they describe how the ARNEIS framework enables a Web-based service that supports an intelligent matching between supply and demand for CRM-related tools. After presenting the background of the project and discussing related work, the chapter describes the ARNEIS framework, starting from its architecture and user interaction flow. The domain analysis of the CRM field and role of ontologies is then discussed. The chapter then focuses on the user interfaces and matching between semantic descriptions of offers and needs. A brief discussion of future challenges concludes the chapter.

INTRODUCTION

Small-to-Medium Sized Enterprises (SME) should take advantage of the opportunities offered by Information and Communication Technology (ICT), but they are traditionally very suspicious towards the adoption of new technologies, especially in Italy: convincing them to abandon their traditional work methods (e.g., based on legacy software, phone calls or paper archives), in favor of new business processes supported by advanced Web-based technologies, is usually a challenging task. However, in order to keep abreast of competitors, SME need to overcome their own resistance, in order to adopt ICT-based solutions that could automate their business processes, in order to rationalize such processes and, as a consequence, save money.

Moreover, the Internet and Web technologies offer new possibilities to develop network-based fruitful relationships with partners, suppliers, and customers. To exploit such opportunities, an agreement about the meaning of the information exchanged - i.e., an integration at the semantic level - is needed. Semantic Web standards[1] provide the means to represent the semantics of data in a Web-based and machine-understandable way. In particular, semantic Web technologies can be exploited in order to support the interaction between two categories of SME:

a. ICT companies (i.e., software houses) that offer software solutions for business automation and need to get in contact with their potential customers; henceforth referred to as *ICT companies*, or *software houses*.
b. SME that feel the need of improving their technological integration and business automation, but lack the know-how to find the most suited ICT solution that fits their needs; henceforth simply called *SME*.

However, the exploitation of the technological support is not enough for being competitive in the global market: SME should also take into consideration new business and management approaches, and, first of all, the way in which they handle their relationships with customers. The new market, in fact, requires personalized approaches to the single customer, and flexible offers, that need to be updated rapidly. Moreover, in order to be aware of the market and customer behavior trends, data about sales and communications with customers have to be elaborated very quickly, to support suitable management and marketing decisions. For these reasons, SME should embrace the principles of Customer Relationship Management (CRM), as well as those ICT products and services supporting it (Freeland, 2005).

The key feature of the CRM approach is a one-to-one marketing perspective, i.e. the idea of establishing personalized relationships with the single customer, by producing personalized offers, pricing, after-sale services, and so on. Moreover, CRM is a field in which technological innovation could bring great benefits since it requires analysis, integration, and processing of a huge amount of heterogeneous knowledge (about customers, sales, communications, etc.), besides effective, fast and integrated communication tools.

Within this scenario, the choice of the "right" CRM tool is an issue of major importance and, at the same time, it is a very challenging issue (CRM-Reviews.com, 2011; Netsuite, 2011), especially for SME, that would thus get great benefits from a Web-based service supporting an intelligent matching between supply and demand for CRM-related tools. In this chapter, we present the result of the ARNEIS (Advanced Repository for Needs of Enterprises and Innovative Software) project, i.e. an architecture for an intelligent Web-based repository of descriptions of CRM solutions. ARNEIS represents a step in the direction of providing a Web-based, friendly and automatic recommendation service for CRM tools, especially designed for SME.

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