Chapter 28
Semantic Technologies in Motion:
From Factories Control to Customer Relationship Management

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ABSTRACT

Semantic technologies are evolving to reach a mature state. Given the importance of Information Technologies in general and Internet in particular to organizations worldwide, these technologies can provide enhanced functionality to both existing and future solutions. This chapter provides an overview of the use of semantic technologies in several application domains, namely: construction & real estate, customer relationship management, e-government, e-learning, environmental sciences, health domain, human resource management, Information Technology, manufacturing, media and tourism, and cultural heritage. More than a hundred references are provided to support the idea that semantic technologies are applicable to almost all areas of interest.

INTRODUCTION

In recent years, the information technologies (IT) field has expanded beyond traditional stove-pipe organizational systems to infiltrate companies and homes alike (García Crespo et al., 2008). Today, the contribution of IT to economies is un-

questioned (Stehr, 2007). IT has been considered fundamental for the development of productivity and knowledge-intensive products and services (Soto-Acosta et al., 2010). Moreover, the Internet-driven networked economy is evolving to the point where businesses are fully aware of the enormous business opportunities of online transactions (García-Crespo et al., 2011a) and such importance in recent years has turned their development into

a critical task for corporations (García-Crespo et al., 2009a). Given that organizations must continuously innovate in terms of product, process, market and business model to remain sustainable (O'Sullivan & Dooley, 2010), many organizations rely their innovation process and, in many cases, the whole of their business to IT systems. Advances in technology, emergence of new business practices, and shifting social and geopolitical circumstances have combined to create a "brave new IT world" for organizations (Goles, Hawk & Kaiser, 2008).

In this scenario, organizations use multiple IT/IS solutions to support their activities at all management levels (Trigo, Varajao & Barroso, 2009) and this is so because IT-enabled services makes possible to overcome geographical, temporal and organizational barriers to communication and knowledge transfer (Corso, Giacobbe & Martini, 2009). Moreover, Information technology organisations, who frequently lead the development of change based around ICT, are being asked to develop new products and services that add significant value for customers and to radically change their internal processes so that they are more cost effective (O'Sullivan & Dooley, 2010). One of the main strengths of the Web is that it allows any party of its global community to share information with any other party (Presutti & Gangemi, 2008). In an environment of globalization and competition, institutions have turned to knowledge as a strategic asset that drives sustainable economic advantage (Sharma et al., 2010) in which technology is the means in which enterprises collaborate all over the world. In this environment, the power of knowledge in our contemporary life has produced many new terms and concepts including: "knowledge society"; "knowledge economy", "knowledge management", and "knowledge culture" (Bakry & Alfantookh, 2010).

Since its humble beginnings, the Internet has gained vast importance in today's society, both in terms of consumer reach and the volume of fundamental information it contains for millions of users worldwide. Transforming from a host-to-

host network connection in ARPANET (Abbate, 1999) on October 29, 1969, it has advanced to become what Tim Berners-Lee has termed the "Giant Global Graph" (Berners-Lee, 2007). As stated by Bieber et al. (1997), one of the original success factors of the Web is that it provides simple access to the information contained in it. Because of the power of IT, human kind has been turning its concentration on developing web-based services (Sudhahar et al., 2010). Moreover, according to Targowski (2009) Web technology is key solution for the provision of e-Service systems. When we talk about the development of the web and where we stand today, we stumble across two main buzzwords: Web 2.0 and Semantic Web (Lux & Dösinger, 2007).

The evolution of the Web from Web 1.0 to Web 2.0, and to what has recently been termed by some as Web 3.0, has caused a paradigm shift in a user's access to and control of websites. The Web 2.0 phenomenon made the Web social, initiating an explosion in the number of users of the Web, thus empowering them with a huge autonomy in adding content to web pages, labeling the content, creating folksonomies of tags, and finally, leading to millions of users constructing their own web pages (Breslin & Decker, 2007). Logically, the result of this movement was a significant increase in the number of web pages available. Surfing through endless links is no longer an efficient method for finding relevant information. This not only applies to the standard user, all owners of web pages, whether organizations or consumers, lose target audiences as users of the Web are unable to access their pages in an efficient time frame (García-Crespo et al., 2010a). Both the information that is stored on the Web and the number of its human users have been growing exponentially in recent years and, for many people, the Web has started to play a fundamental role as a means of providing and searching for information (Eiter et al., 2008). In this environment, both user computing and IT in organizations can benefit from the application of semantic technologies that enable

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