# Chapter XV
# Knowledge Management in Virtual Enterprises:
## Supporting Frameworks and Enabling Web Technologies

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## ABSTRACT

*The new globalized and demanding business environment of the 21st century has created a shift from traditional organizations to more loose and flexible business schemes shaped in the form of Virtual Enterprises. This transformation would never have been successful without the support of Information Technologies and particularly the Web. Internet, in the last decade, has become the universal medium of interactions between distributed entities. In this chapter, the issue of Knowledge Management support for Virtual Enterprises is discussed. Building upon the current state of the art, this chapter aims to identify the major knowledge requirements of VEs, in an effort to provide a roadmap towards a holistic Knowledge Management framework that will satisfy the excessive knowledge needs of Virtual Enterprises at the interorganizational level. In that context, the role of supporting Web and Semantic Web technologies for the enactment of KM in VEs is described in detail.*

## INTRODUCTION

The 21st century's unstable and highly competitive business environment is calling for a fundamental reassessment of the way enterprises are doing business. Modern business entities, more like world-class competing athletes that are constantly asked to run faster, jump higher, and throw further, are continuously stressed,

by both competitors and customers, to produce more customized products in low costs and high quality. Competition is relentless and according to Zwegers et al. (Zwegers, Wubben, & Hartel, 2002), three are the major factors that put additional requirements to enterprises, namely the globalization of market, production and supply; the emergence of outsourcing activities; and the turn of customers' demand towards highly customized products.

This new and demanding environment has created an enterprise management shift from well-defined, stable enterprises having limited relationships with other companies and focusing on internal efficiency and effectiveness, toward loose enterprise formations, tightly integrated with their suppliers and customers, pursuing overall optimization. In a nutshell, one can argue that nowadays, there is a well-recognized change of management direction, from "self-centered" closed enterprises to global, open enterprises (Browne & Zhang, 1999), cooperating and forming interenterprise organizations in order to achieve a sustainable position in the market, and ensure their survival and business success.

In this new networked business reality, the 30-years old slogan "knowledge is power," by the ACM (Association for Computing Machinery) Turing Award winner, Ed Feigenbaum (Feigenbaum & McCorduck, 1983, p.8), has proved more than accurate. As Peter Drucker (1993) and others have claimed, Western organizations are not becoming more labor, material, or capital-intensive, but more knowledge intensive, an observation that holds particularly true in the case of the competency-oriented networked-enterprise formations of the new era. As a result, there is an unambiguous recognition by academics, researchers, and practitioners about the importance of knowledge and knowledge management (Drucker, 1968; Nonaka, 1991; Wiig, 1997), which displays all the characteristics of a nascent megatrend (Bair, Fenn, Hunter, & Bosik, 1997).

Especially in the case of virtual enterprises (VEs), one of the most dominant contemporary organizational schemes, knowledge and its inter-organizational management, is a crucial factor for gaining and sustaining competitive advantages (Preiss, Goldman, S& Nagel, 1996). This chapter aims to address the issue of Knowledge Management (KM) support for virtual enterprises with the use of IT, and particularly, Web technologies. Our perspective on KM, as presented in this section, is not static. Knowledge is generated, passed on, used, and in turn, contributes to its regeneration. In order for this to happen, an intensive cooperation and an open real-time knowledge exchange between participants in the global information environment are required, so that the right knowledge from distributed sources can be integrated and transferred to the right person within the right context at the right time for the right purpose. The aggregate of these interrelated activities is found in the literature under the term, Knowledge Logistics-KL (Ponis, Tatsiopoulos, & Vagenas, 2006; Smirnov, Pashkin, Chilov, & Levashova, 2004). An often critique on KL goals is that they describe mostly an "ideal world." Still, in the highly demanding reality of VEs, in which excellence is the prime requirement, Knowledge Logistics and the constant pursue of its optimistic goals is an imperative, even though most of the time the road to their achievement is harsh and the results often dubious.

In the next section, a brief literature review on KM, and existing state of the art on KM frameworks, is conducted. This section provides the reader with the necessary theoretical background, and enables the better understanding of the next section dealing with VEs' particular knowledge characteristics and needs.

## KNOWLEDGE MANAGEMENT: DEFINITIONS AND APPROACHES

A fundamental issue in providing a complete definition of knowledge and its management is to understand its differences in comparison to information and data. The distinction between