Chapter XVIII

Information Technology Infrastructure and Solutions

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ABSTRACT

Agile and virtual enterprise (A/VE) is a leading organisational model characterized by a high flexibility and a fast reconfigurability or adaptability of the networked structure to face the dynamically changing market. A Market of Resources is a tool proposed in the BM_virtual enterprise architecture reference model (BM_VEARM) as an appropriate environment to accomplish the intrinsic requirements of the A/VE model, by supporting the creation, dynamic integration, and operation of A/VEs. The Market of Resources is an electronic and virtual market matching the offer and demand of resources providers, the basic elements that will integrate the A/VE. The existing e-marketplaces support a wide range of features required by the Market of Resources. Given the available software development platforms based on the existing technology and standards that support the e-marketplaces, we discuss in this chapter the feasibility the Market of Resources and its implementation using those software platforms.

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INTRODUCTION

Several organisational approaches have emerged during the last decade. Agile manufacturing, concurrent engineering, virtual organizations, extended enterprise, one-product-integrated-manufacturing (OPIM), etc., are examples of emerging organisational models with the main characteristic being interorganizational flexibility, and all of them represent attempts to increase competitiveness and efficiency. Some of these models rely on strong alliances, dynamic partnerships, and permanent alignment with the market, and are strongly supported by information and communication technology, classified in the text as virtual enterprise (VE) models in broad sense.

According to several definitions, virtual enterprises (VEs) are defined as enterprises with integration and reconfiguration capability in useful time (agility), integrated from independent enterprises (resources providers), with the aim of taking profit from a specific market opportunity. After the conclusion of that opportunity, the VE either reconfigures itself or is dissolved and another VE is integrated, due to new market opportunities. Even during the operation phase of the VE, the configuration can change, as the need for readjustment or reconfiguration facing unexpected situations can happen at any time, raising the importance of the reconfigurability dynamics (Cunha & Putnik, 2002).

In the agile/virtual enterprise (A/VE) model, agility means the ability of fast and active adaptation of the integrated resources providers in face of erratic and unpredictable changes in the environment market, implying the substitution of A/VE participants to keep permanent alignment with the market.

During the last few years, several information technologies, tools, and Web-based applications have been developed, with the purpose to enable the electronic business, some of which can be relevant in supporting some of the tasks required by the VE model. We are referring to technologies as Internet, agent-based systems, artificial intelligence, and to (Internet-based) applications as electronic payments, electronic marketplaces, electronic negotiation, electronic contractualization, etc. (Cunha, Putnik, Carvalho, & Ávila, 2002).

Two critical factors against networking and reconfigurability dynamics—the basic characteristics of the A/VE model—can be identified: transaction costs and leakage of firm’s knowledge. To overcome these disabling factors, the authors have proposed a Market of Resources (Cunha, Putnik, & Ávila, 2000) as the environment enabling and supporting management of efficient A/VE (re)configuration, and assuring virtuality, at low transaction costs and reduced risk of knowledge leakage (Putnik, 2000).

In this chapter, we briefly identify the requirements of the A/VE model and introduce a new environment—the Market of Resources—that presents the required functionalities to cope with the A/VE model requirements, and finally, we discuss the features of some commercially available technologies and applications and how could these be used in the implementation of the Market of Resources environment.

REQUIREMENTS OF THE A/VE MODEL

The A/VE model is characterized by a fast reconfigurability dynamics, in order to yield its maximum competitiveness.
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