Chapter IV

Requirements for Agile/Virtual Enterprise Integration

Introduction

This chapter introduces the requirements for Agile/Virtual Enterprise (A/VE) integration, discusses reconfigurability dynamics and business alignment and proposes a virtual enterprise extended life cycle. The requirement of dynamic reconfigurability of the A/VE model is introduced in and the causes of reconfiguration needs are presented. This chapter also clarifies the concepts of basic resources and complex resources, and discusses concepts related with selection complexity, selection models and solution space dimension. It gives examples of reconfigurability dynamics, and introduces three dynamics parameters. The need of keeping the A/VE aligned with business requirements results in A/VE reconfiguration. The permanent business alignment of the A/VE requires a high reconfiguration dynamics. This chapter introduces a referential for A/VE alignment, involving the market opportunity (or the product required by the market), the A/VE project and the resources providers. It also presents the main functionalities that must be assured to support the implementation of the A/VE model. Finally, this chapter presents a new VE lifecycle, the Agile/Virtual Enterprise extended life cycle.
Requirements for the Agile/Virtual Enterprise Model

In the *BM Virtual Enterprise Architecture Reference Model* Putnik (2000) presents “fast adaptability” or “fast reconfigurability” as the main characteristic for the competitive enterprise, considering that the concepts of “Agile Enterprise” and “Virtual Enterprise” are the new organizational paradigms that incorporate that characteristic. Other models presenting this feature of fast reconfigurability are the concepts of Virtual Factory and Agile Manufacturing (Goldman, Nagel, & Preiss, 1995; Kim, 1990; NIIIP, 1996; Onosata & Iwata, 1993; Putnik, 1997; Putnik, Guimarães, & Silva, 1996).

As presented earlier, the requirements for competitiveness include: agility, virtuality, distributivity and integrability, which are the characteristics of the A/VE organizational model.

In the A/VE model, agility means the ability of fast and active adaptation of the integrated resources in face of erratic and unpredictable changes in the environment/market, implying substitution of resources (reconfiguration, transition to a new A/VE instantiation or physical structure) to keep permanent alignment with the market. The efficient implementation of the A/VE model must assure a high reconfigurability dynamics, as a requirement to be permanently aligned with the market (i.e., to be competitive in delivery time, quality and cost, and to yield satisfactory profit margins).

This requirement of the A/VE model claim for an extended life cycle of the VE, which should integrate a new dimension of enterprise dynamic integration, to assure the most suitable configuration of the A/VE.

To respond to the A/VE requirement for reconfigurability dynamics, it is essential to assure the ability of:

1. Flexible and almost instantaneous access to the optimal resources to integrate in the enterprise, negotiation process between them, selection of the optimal combination and its integration;
2. Design, negotiation, business management and manufacturing management functions, performed independently from the physical barrier of space; and
3. Minimization of the reconfiguration or integration time.

As we will see, this requirement can only be assured by an adequate environment to support A/VE dynamic integration and business alignment. The organizational challenge of partitioning tasks among partners, selecting re-
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