Chapter II

A Review on Virtual Enterprise Models

Introduction

In this chapter the most relevant and most discussed virtual enterprise models are introduced in a broader sense: the Supply Chain Management, Extended Enterprise, the Agile Enterprise/Manufacturing, the Virtual Enterprise/Virtual Organization, the \(BM\_VEARM\) Agile/Virtual Enterprise and OPIM (One Product Integrated Manufacturing). At the end of the chapter a discussion is presented.

The Emergence of the Virtual Enterprise as an Organizational Concept

The eighties have seen the rise of a plethora of models and acronyms always used in conjunction with production and operations management and control, such as Just-in-Time (JIT), Total Quality Management (TQM), Zero Inventory (ZI), Efficient Consumer Response (ECR).
During the first half of the nineties, several criteria for competitiveness have emerged, including requirements such as quick response, high flexibility and quality, constrained by environmental concerns (Yusuf, Sarhadi, & Gunasekaran, 1999). The goal of the enterprise was to fulfill the customer requirements, traditionally, using the limited set of resources available within the walls of the organization. As during the nineties, the requirements for competitiveness of today remain the same, and the goal of the enterprise is still to fulfill the customers’ wishes.

Several organizational approaches have emerged since then, some based on technology, others relying more on organizational or on human aspects. Holonic Manufacturing Systems, Bionic Manufacturing Systems, Fractal Factory, Lean Production, Agile Manufacturing, Concurrent Engineering, Anthropocentric Production Systems, are examples of emerging organizational models whose main characteristic is flexibility, and all of them represent attempts to increase competitiveness and efficiency. Other recent models rely on more or less strong alliances, more or less dynamic partnerships, and more supported or less supported by ICT, some of which can be classified as agile and virtual enterprise models.

Williamson (1991) identified two distinct economic forms of governance: hierarchy and market. Hierarchy denotes common ownership of successive stages of the supply chain, whereas market represents the transactions between atomistic organizational units. Recent attention has focused on intermediate forms of economic organization, lying somewhere between a market and a hierarchy. Williamson refers to these as hybrid organizations, whereas more recently other authors use terms such as network, virtual organization, extended enterprise, etc.

It is recognized that the value chain in modern economies is characterized by inter-firm specialization such that individual firms engage in a narrow range of activities that are embedded in a complex chain (Dyer, 1997). As Browne et al. (1995) suggest, manufacturing systems can no longer be seen in isolation; they must be seen in the context of the total business and the linkages from the supplier chain forward into the distribution and customer chain. Browne and Zhang (1999) refer the shift from “self-centered” closed-enterprises to global open-enterprises.

*A more dynamic theory of the firm would (...) view a firm as the capability to design and assemble assets, organizations, skill sets, and competencies for a series of temporary competitive advantages, rather than a set of activities held together by low transaction costs, for example.* (Fine, 1996)
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