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## **Chapter X**

# **Global Manufacturing Virtual Network (GMVN): Its Dynamic Position in the Spectrum of Manufacturing Collaborations**

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This paper seeks to understand the relationship between virtual organizations (VOs) and international strategic alliances (ISAs) in the manufacturing industry. Aiming to develop frameworks demonstrating the position and role of the global manufacturing virtual network (GMVN) in the spectrum between VO and ISA, the paper suggests that GMVNs represent a new form of manufacturing system based on Internet interfirm collaborations.

## **INTRODUCTION**

Manufacturing increasingly relies on swift collaboration and on agile re-configuration of its whole supply chain to effectively and efficiently deliver benefits to customers worldwide. Global manufacturing systems are expected to have much more flexible organizational architectures and operational mechanisms to respond to dramatic changes and an accelerated customization in the world market. But responsiveness and resource flexibility are limited by a company's physical and commercial boundaries as well as geography. The concept of manufacturing

networks without such limitations—sometimes called virtual networks—is attracting increasing attention. Indeed practical progress has been made in some sectors.

However, as promising as manufacturing globalization and virtualization are, as difficult are they to establish and manage. There are many outstanding questions:

- Why does e-manufacturing develop much slower than e-commerce?
- Why do companies need e-manufacturing or virtual manufacturing networks?
- What are the virtual manufacturing implications for strategic alliances?
- Is there a common framework which could draw together different strands and provide guidance?

This paper seeks to take a first step towards understanding the underlying issues, especially the relationship between virtual organization (VOs) and international strategic alliances (ISAs). It aims to build conceptual frameworks demonstrating the position and role of global manufacturing virtual networks (GMVNs) in VOs and ISAs and to develop a common language among different disciplines. It suggests that GMVNs represent a new form of manufacturing system based on Internet communication and new models of collaborations.

The paper is structured into four sections. The first section reviews the wide range of relevant researches, especially from the perspectives of ISAs, e-business, global manufacturing networks, and virtual aspects including virtual manufacturing, organization and corporations. The second section maps the GMVN in the context of VOs and ISAs to demonstrate the missions, structures and attributes of the GMVN. Then, further research considerations develop the implications of the GMVN and related issues and how these might be tackled. The paper ends by summarizing emerging knowledge about GMVNs and new frameworks for understanding practice and research.

## **IN SEARCH OF NEW MANUFACTURING SYSTEMS**

In an era of globalization, the nature and the intensity of competition have been changed drastically. In the new game, no company can play without partners in either domestic or global markets. ISAs and networks have become one of the most critical vehicles pursuing globally competitive advantages (Hinterhuber & Levin, 1994). If the strategic networks were the dominating forms in the 1990s as Figure 1(a) demonstrates, how will these be influenced by the rapid growth of e-business? In this section, ISAs and VOs are reviewed and contrasted to clarify the characteristics of virtual organizations and explore whether GMVNs can be better designed based on existing knowledge and principles.

### **What Are International Strategic Alliances (ISAs)?**

International strategic alliances are a logical and timely response to intense and rapid changes in economic activity, technology, and globalization, which require

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