

Global operations strategy: Coordinating manufacturing networks[☆]

Martin Rudberg^{a,*}, B. Martin West^b

^a*Department of Science and Technology, Linköping University, SE-601 74 Norrköping, Sweden*

^b*Department of Production Economics, Linköping Institute of Technology, SE-581 83 Linköping, Sweden*

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Abstract

This paper presents a concept that describes how companies can manage their international operations so as to facilitate the coordination of their manufacturing networks. The research presented originates from a model that was developed at the Swedish telecommunications company Ericsson in the mid-1990s, but has since then been further elaborated. More specifically, the purpose of this paper is to show how Ericsson Radio Systems incorporated the recent research on manufacturing networks found in literature in their global operations strategy, and to present the conceptual model that was the result of these efforts. The conceptual model described in this paper focuses on the blending of cost competitiveness, flexibility, and innovativeness; a combination termed the “transnational solution” in the literature. In addition to a literature review on manufacturing networks and global operations and the proposed conceptual model, the paper also contains a case illustration showing how Ericsson has implemented a version of the conceptual model so that their global operations strategy realizes the transnational solution.

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1. Introduction

The world of business is becoming more and more international. The last two decades shows an explosive increase in both international trade and foreign direct investment and no company can stay indifferent to the increase in world trade in manufactured goods. Many companies are becoming more and more international, in terms of both sales and manufacturing, and the role of manufacturing companies has changed to adapt to the global market, and is still changing. Johanson and

Vahlne [1] discerned a trend already in the 1970s and the trend is still present; companies are changing from supplying domestic markets with products, via supplying international markets through export, to supplying international markets through worldwide local manufacturing. Hence, the research on international issues in manufacturing has evolved from global sales and marketing into global manufacturing. As competition becomes global and the complexity of the environment in which companies operate is increasing, managing an integrated international network has become an increasingly important task for managers [2,3].

Pursuing the best network of manufacturing and supply facilities relative to the marketplace applies not only to firms operating in a worldwide context, but to all kinds of companies that have multiple sites [4]. Yet, worldwide manufacturing networks may be considered

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* Corresponding author.

E-mail addresses: marru@itn.liu.se (M. Rudberg),
martin.west@ipe.liu.se (B. Martin West).

to be one end of a manufacturing network continuum, a continuum that is characterized by varying degrees of complexity. Coordination inevitably becomes more difficult as the geographical dispersion of a company's sites increases. The ever-present issues of, for example, where to allocate production so as to be most responsive and how to maintain low production and transportation costs, become more complex because new factors arise when dispersion increases. As such, studies on global operations usually centers on what has been identified as the two main issues concerning the management of manufacturing networks; *configuration* and *coordination* [5–11].

This paper is mainly concerned with the latter, i.e. the coordination of the network. To facilitate the smooth coordination, companies typically develop common policies regarding manufacturing structure and infrastructure [12,13], not only in terms of manufacturing capacity and technology, but also with respect to new product introduction (NPI), production ramp-up, planning and control systems, and organizational issues. For example, Intel [14], Ericsson [15], and Honda [16] have created clear and standardized guidelines for manufacturing and related activities as the means to better coordinate their manufacturing network operations.

Although there has been research on why companies become more and more international and how these companies should be managed, there is still a lot to be done. In the 1980s, Hamel and Prahalad [17] noticed the lack of practical guidance on *how* to go international and on *how* to manage an international company. A decade later, Klassen and Whybark [18] pointed out that the body of knowledge in global manufacturing still lacked documented cases of good practice. Yet another decade later, Vereecke and Van Dierdonck [3] and Shi [19] argue that academicians have to pay attention on providing understandable models of international manufacturing systems that help managers to design and manage their network.

The research presented in this paper will therefore focus on a concept for coordinating manufacturing networks that was originally developed at Ericsson Radio System, but has since then been further elaborated. The conceptual model presented in the following focuses on the ability to blend cost competitiveness, flexibility, and innovativeness; a combination that Bartlett and Ghoshal [20] refer to as the "transnational solution". More specifically, the purpose of this paper is to show how Ericsson Radio Systems incorporated the recent research on manufacturing networks found in literature in their global operations strategy, and to present the conceptual model that was the result of these efforts.

This conceptual model will describe how companies can manage their operations so as to facilitate the coordination of the network in order to establish a transnational solution. The importance of developing a global operations strategy and guidelines for managers, so as to enhance managers' understanding of manufacturing network properties, has been noticed in the literature (see e.g. [11,18,21]). Designing a global operations strategy is, however, not an easy task and since it would be impossible to cover all facets of network issues in this paper, a number of demarcations have been made. The main ones are the following.

Snow et al. [22] distinguish between internal and external forms of network organizations. Internal networks consist of independent business units or facilities within a single firm, whereas an external network is made up of different firms working together. Shi and Gregory [10] focus their study on manufacturing networks where the firm has direct investment, giving it direct managerial control. Based on a review of both manufacturing network and supply chain literature, Rudberg and Olhager [4] classify networks in terms of the number of organizations in the network and the number of sites per organization. They differ between supply chains (multi-organization, single-site focus) and intra-firm networks (single-organizations, multi-site focus). In that sense, this research is mainly concerned with manufacturing issues in internal, intra-firm factory networks that are under direct managerial control.

Furthermore, the theories and models on manufacturing networks found in literature and the concept presented in this study are of a rather basic and typical nature. However, simple models and classification schemes are useful aids when reflecting upon core attributes for manufacturing firms, both for managers and academics [23]. Thus, the conceptual model described in this paper can be used as a sound guide for companies in their search for competitive network coordination.

From a methodological perspective, the general aim of this research is theory development resulting in applicable tools for both academic and industrial use. In addition to an analytical approach, the research in this paper is based on a conceptual and descriptive research method [24–26]. The literature review is founded in the fields of manufacturing strategy, international business, and global manufacturing, according to the demarcations stated above. The case study is descriptive and illustrative [26] in nature, and data have been gathered during 5 years through surveys, semi-structured interviews and on-site visits at plants in the Ericsson network.

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