

Virtual Logistics from Outsourcing Logistics



Vladimír Modrák

Technical University of Košice, Slovakia

INTRODUCTION

The wide utilisation of information communication technology has significantly affected also a development of logistics services concepts. Consequently, research in the area of virtual companies including logistics services is developing. Presented visions are commandingly optimistic, even though sceptics are already gathering counter-arguments against those visions. As an important factor of strengthening, the above-mentioned optimistic vision can be accounted for by a tendency of wider applications of outsourcing. Activities carried out by specialised external providers for a larger number of customers are usually cheaper, particularly because of fixed costs. Moreover, organisations that provide outsourcing bring into partnership their own know-how from optimisation of logistical activities. Cooperation in this field helps to eliminate or reduce unexpected idle periods in transport, such as long transport routes, reloading, customs clearing, and other. A higher form of outsourcing is the inclusion of logistical centers (LC) into a supply chain (SC). With the progressing globalization, the significance of integrated logistical centers is increasing.

The aim of the article is to describe the concept of an integrated architecture of a logistic center reflecting progressive trends in logistic management. It also includes a model of features for a designing of a virtual logistical center and description of typical signs of virtual corporations.

BACKGROUND

It is the paradox that information and communication technology (ICT) is from one side a precondition for modern business concepts and, on the other hand, is a significant barrier for their building. Especially, the problem of information incompatibility between companies prevents an effective deployment of ICT systems within the integrated supply chain (Hertz, 2001). The reason for the creation of integrated SC is

in the establishment of close relationships and in the creation of unified procedures aimed at increasing the effectiveness of the whole logistical chain. In these terms, SC can be characterized as a worldwide network of suppliers, factories, warehouses, distribution centers and retailers through which raw materials are acquired, transformed, and delivered to customers (Fox et al., 2000). Interest in the implementation of ICT in SCM has grown recently along with the change in the orientation of logistical management from internal attention to the overall company strategy focus, which was oriented to an integration of relations with suppliers and distributors (Meade, 1988). It led to gradual integration of logistical companies. Currently, increasing development in e-commerce and ICT is supporting this tendency. Important applications include, for example, Electronic Data Interchange (EDI) and Extranet. These information systems act as platforms for the integration of several of the phases (plan, source, make and deliver) of the supply chain with the objective of promoting open communication among partners (Gunasekaran & Ngai, 2004). Especially a phase of planning is critical in order to gain supply chain advantages, as companies need to exchange large amounts of planning and operational data (Edwards et al., 2001).

Due to the onset of advanced ICT in SCM, development of virtual companies is relatively expanding. According to Davidov and Malone (1992), the virtual company of the future will look in the eyes of an observer as being almost limitless, with ever changing contact surfaces between the company, the supplier and the customers. Birchall and Lyons (1995) claim that, from the nineteen-nineties onwards, only intelligent organisations, which will not try to avoid new organisation forms, will survive. Kalakota and Robinson (2000) state that, "The design of a new model of business should be able to create alliances that emerge whenever a new type of response is necessary and most, or preferably all of a demanding, fickle customer's rising needs can be satisfied." In this sense can be seen also the perspective of virtual manufacturing and logistics. Franke and Jockel (2000) define a term—"virtual logistics"—as a

management process that consistently obtains and coordinates critical logistical resources provided primarily by virtual corporation members, but also by externals. Understandably, there are more views on virtual logistic centers, which are in this article one of the objects of interest. In concordance with the aim of this article, a virtual logistic center can be defined as an organization that consists of several logistics service providers and their facilities in a region (Meidute, 2004).

FROM LOGISTIC CENTERS TO VIRTUAL LOGISTICS

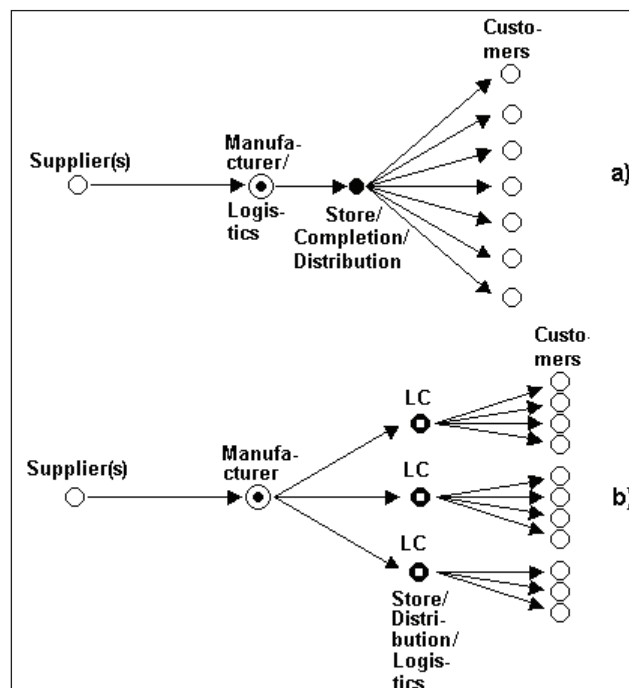
Infiltration of information and communication technology into manufacturing technologies and logistic tools is formulating new challenges for the creation and implementation of modern manufacturing and logistics concepts. In connection with that, in logistic management a positive shift in organisation of material flows from less effective—discrete material flows—to economically effectual—continual material flows—is registered. Discrete material flows in supply chain basically are caused by applying push system. By this strategy manufacturers push products to the customers in response to demand estimates but in quantities

that minimise production costs. In general it results in excess inventory and the longer the lead-time.

Continual flows in SC are resulted from the conditions of pull system, in which the goods are delivered to the customer with an agreed batch of material at a time and in a quantity that suits the supplier's needs. There is no need of a stock between the supplier of materials and the production, and the stock of finished products can be reduced to an essential capacity, which buffers the flow from the production to the customer. The frequency of the flow increases, chains pass on smaller batches, the flow is smooth. To avoid transport problems due to an increased flow frequency, a segment for completion of goods and an aggregation of deliveries for customers is inserted into SC (see *Figure 1a*). Customers' regular requests are directed right into the production, which should be capable to react promptly and individually to a change in orders that occurs in the course of the framework contracts fulfilment.

A supply chain with a synchronous material flow is an ideal type of supply chain, where production and transport processes are completely adapted to flexible reactions to any change in a requirement. The material flow is balanced, smooth, without a stock (with the exception of a minimal backup stock). Inside of any element and on the way between chains there is only

Figure 1. a) Insertion of completion and aggregation into SC; b) Inclusion of LC into SC



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