

The rediscovery of postponement a literature review and directions for research

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Abstract

The concept of postponement is increasingly drawing the attention of researchers and practitioners. Postponement means delaying activities in the supply chain until customer orders are received with the intention of customizing products, as opposed to performing those activities in anticipation of future orders. This paper reviews the literature on postponement dating back to 1965, and puts it in a systematic framework. In light of the classification of the literature developed, opportunities are identified for integration and cross-fertilization between research papers in disciplines such as logistics and operations management and between the variety of research methods used. Some directions for research (in terms of content and methodology) are then formulated. For instance, the development of a more integrated supply chain perspective on postponement, and the application of triangulation rather than single methods. Specific research activities to meet these challenges are suggested in the paper. © 2001 Elsevier Science B.V. All rights reserved.

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1. Introduction

1.1. The postponement concept

Postponement is an organizational concept whereby some of the activities in the supply chain are not performed until customer orders are received. Companies can then finalize the output in accordance with customer preferences and even customize their products. Meanwhile, they can avoid building up inventories of finished goods in anticipation of future orders. Moreover, transportation between warehouses and factories can be avoided by shipping products directly to the customer rather than keeping them in stock. Even though it should be noted that this may lead to smaller

sized shipments over longer distances. As a result postponement is often more relevant when products are more sensitive to inventory than transport costs (e.g. higher value added products with large product variety). Additionally, lead time constraints may limited the possibility to perform postponed activities while still assuring delivery windows that meet customer's willingness to wait. Later sections will further introduce operational constraints and conditions for postponement.

Postponement can occur along the entire supply chain, from sourcing to final distribution. The concept can be applied to a minor or a major share of the operations in the supply chain. Consider Fig. 1. Mars (a Masterfoods company) postpones the packaging and distribution of special products for the Christmas season. Thus, postponement goes (only) as far as packaging on the horizontal bar. It remains in the lower area

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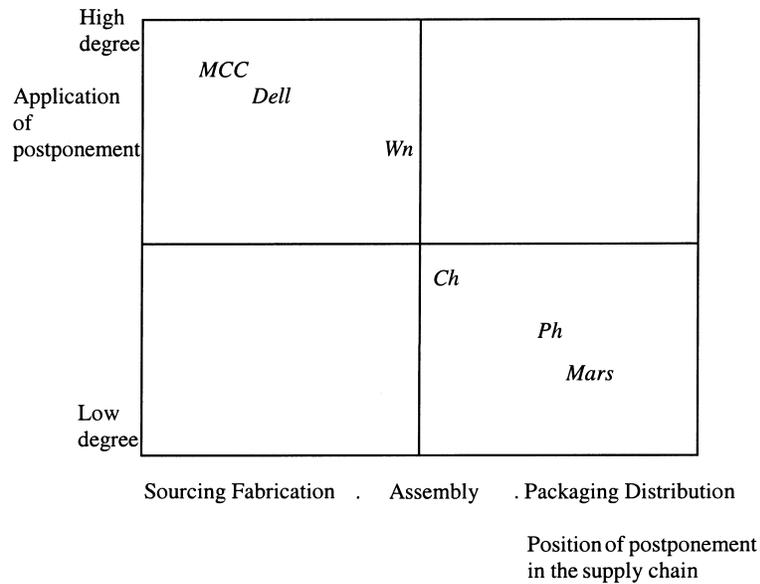


Fig. 1. The application of postponement.

of the vertical bar, as this application pertains to a minor share of the packaging and distribution operations. On the other hand, MCC (a DaimlerChrysler car company) and Dell postpone virtually every operation in their supply chains and apply this approach to every order. Hence, they are positioned in the top left quadrant of Fig. 1. Hewlett Packard, like Dell, is often cited as an example of a company that applies postponement in the final assembly, packaging, and shipment of many of its computer and printer products. The company has decided to standardize some of its modules and then combine those generic modules to customize its products. It is not suggested here that postponement in manufacturing is limited to the electronics and automotive industries. Consider the example of Wn representing the position of a wine company in Fig. 1. The company stores table wines in tanks close to the market until orders come in. At that point additives may be mixed in and the wines can be bottled, labeled, and shipped. In the same figure Ch is a chemical firm and Ph is a pharmaceutical company, both of which that postpone their compounding and packaging activities.

In applying postponement, firms can customize and localize products according to customer demand and local market circumstances from a vantagepoint close to the market (which is especially relevant when a

company operates in varied international markets). This enhances the efficiency of various operations, as they avoid uncertainty about the specification of orders and order mixes. In other words, the company can cope with complexity without having to lower product variety; in fact, they may decide to expand it. Besides customizing (job shop) postponed operations, those activities that are not postponed (for example, up-stream activities) can be run (like a flow shop) in a mass production environment, thereby maintaining efficiency. Hewlett Packard has reported double-digit savings in supply chain costs by applying postponement in manufacturing and distribution. Similarly, Dell Computers-based a significant share of its competitive approach on its strategy of close-to-the-market customization and on the direct-delivery capabilities of postponement.

In summary, Table 1 compares traditional approaches with the postponement approach. Volkswagen and MCC might be used to illustrate the operations covered by the table. Volkswagen faces major uncertainty about order volume and mix; product variety only adds to the obsolescence risks. As a result, the strategy of limiting variety (through platform sharing for example) is actively pursued in the supply chain. Large volumes are considered favorable for efficiency.

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