

Chapter 10

Leagility in Manufacturing and Procurement: A Conceptual Framework

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ABSTRACT

A combination of lean and agile concepts, leagility has gained ground in recent years. While it has found widespread applications in the domain of manufacturing, other domains such as procurement can also benefit from the principles of leagility. We study the application of concepts of leagility in PC manufacturing through the case of Dell and based on our experience with a worldwide retailer, we develop a conceptual framework in this paper which can be used as the basis for applying the principles of leagility in the domain of procurement. The framework would be of particular significance to academics as it extends the field of leagility to procurement. At the same time, manufacturing and retail firms can derive benefits by downsizing their inventory using the principles and conceptual framework discussed in this chapter.

INTRODUCTION

The pressure of increasing global competition and shift of power from suppliers to buyers has spurred many manufacturers to adopt a lean production

philosophy which ties closely with the tenets of just-in-time philosophy. Lean paradigm is about eliminating wastes from the supply chain with the ultimate objective of cutting costs. On the other hand, the increasingly demand-driven marketplace (and the consequent demand volatility) is motivat-

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ing companies to adopt an agile approach. In the agile paradigm, a company attempts to make its processes flexible so as to cater to the fluctuating and volatile customer demand.

Traditionally, the lean and agile manufacturing paradigms have been viewed in a progression and in isolation of each other but not together (Naylor et al., 1999). Using the principles of leagility, both lean and agile paradigms can be applied together successfully for achieving maximum efficiency. According to Naylor et al. (1999), both lean and agile paradigms can be combined with a total supply chain strategy particularly considering market knowledge and positioning of the decoupling point as agile manufacturing is best suited to satisfying a fluctuating demand and lean manufacturing requires a level schedule. In fact, for success in global markets a firm must be both lean (so as to reduce its inventory and wastes) as well as agile (to be market responsive). When lean and agile paradigms are applied together, the approach is known as leagility (lean+agile).

The concept of leagility has been adopted mostly by manufacturing firms. Retailers can also benefit from the principles of leagility, by improving their procurement. This paper discusses the application of principles of leagility to procurement based on the authors experience with a world-wide retailer and develops a conceptual framework which can be used by retailing firms in procurement.

The paper is organized as follows. In the next section (literature review) we discuss separately the lean supply chain paradigm, agile supply chain paradigm and the combination of two (i.e., the leagile supply chain paradigm). Then we discuss the application of leagile supply chain paradigm in case of PC manufacturing through the case study of dell in the third section. In the fourth section we discuss how these principles can be applied in case of procurement. In the last section we conclude the chapter with a brief discussion and conclusion.

LITERATURE REVIEW

Lean Supply Chain Paradigm

The lean supply chain modeling approach, first introduced by Womack et al. (1990), calls for the elimination of all waste in the supply chain (Harris, 2004/05). In the lean paradigm, activities that consume resources but generate no redeeming value in the eyes of the consumer are waste that must be eliminated (Womack & Jones, 1996). The wastes can be classified into seven basic forms, namely, defects in production, overproduction, inventories, unnecessary processing, unnecessary movement of people, unnecessary transport of goods, and waiting by employees (Ohno, 1988). A lean enterprise is one that seeks out the value inherent in specific products, identifies the value stream for each product, supports the flow of value, allows the customer to extract value from the producer, and pursues perfection (Womack & Jones, 1996).

The epitome of the lean supply chain is Toyota, where manufacturing reacts to a combination of dealer orders and sales forecasts provided by Toyota Motor sales. The focus of Toyota production system (TPS) was on the reduction and elimination of waste or muda. Toyota's manufacturing responds to the demand signal emitted by the next-stage customer who is rarely the end user. Thus, the principle behind lean enterprise is pull replenishment from the next-stage customer and not the end user. (see Figure 1)

Agile Supply Chain Paradigm

The concept of agile manufacturing was put forward by Iaccoca Institute of Lehigh University in 1991. The agile manufacturing focuses on the ability to respond rapidly to changes in demand, both in terms of volume and variety. The origins of agility as a business concept lie in flexible manufacturing systems (FMS). Flexibility is one of the key characters of an agile organization (Qi

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