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The Flexible Supply Chain's Strategies for Success in Uncertain Markets

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Abstract

As life cycles are shorter and global economic and competitive dynamics increase unpredictability, markets are more turbulent and unpredictable. Logistics "pipelines" that are too long and move too slowly carry too much risk, and this has prompted businesses to reevaluate their supply chain management practices. This article argues that "agility," namely the development of flexible supply networks, is essential for thriving in the new environment. Differentiating "leanness" and "agility," and discussing when and when to use each, are covered topics here. Rights protected by Elsevier Science Inc., publisher, 2000.

INTRODUCTION

It's been known for a while that time is a potent competitive weapon [1]. Clearly, in this age of BR> time-based com- petition [2], the ability to fulfill the expectations of consumers for ever-shorter deliv- ery times is of crucial significance, as is ensuring that supply can be coordinated to match the peaks and troughs of demand. It takes more than just quickness to adapt to the demands of the market. It also calls for a great deal of what we now call agility and nimbleness.

SUBSTANCE OF AGILITY

Agility is a business-wide competency that incorporates or- ganizational structures, information systems, logistical pro- cesses, and, in particular, attitudes. Adaptability is a cornerstone of an agile business. Indeed, flexible manufacturing systems (FMS) are the genesis of agility as a business idea.At first, it was believed that increased responsiveness to changes in product mix or production volume could be achieved by increased use of automation to facilitate quick transition (i.e., shorter set-up periods). The notion of agility as a way of running a firm was developed out of this original idea of manufacturing adaptability [3].Agility should not be confused with leanness. Lean is all about optimizing efficiency. Lean manufacturing [4] often use this word to refer to a "zero inventory" just-in-time strategy. Despite their embrace of lean manufacturing, many businesses are sluggish when it comes to managing their supply chains. The auto business is a good example of this conundrum. The Toyota Production System (TPS) [5] might be considered the progenitor of lean manufacturing due to its emphasis on waste minimization.Despite the widespread influence that the TPS principles have had on manufacturing operations in a broad variety of sectors throughout the globe, it seems that the advantages of lean thinking have been kept inside the factory walls. Because of this apparent contradiction, customers may have to wait weeks or even months to get the car of their choice despite the fact that vehicle production is extremely efficient, with throughput time in the factory typically down to 12 hours or less.While leanness may contribute to an organization's overall agility in certain contexts, it cannot, on its own, help it respond swiftly and precisely to changes in consumer demand. The difference between lean and agile is highlighted by their respective definitions in Webster's Dictionary: lean means "containing little fat," while agile means "nimble."Where demand is predictable, the need for variation is minimal, and volume is high—the precise circumstances under which Toyota established the lean philosophy—a lean strategy makes sense. It is more typical of the Western car sector to have a strong demand for diversity and a low number of individual stock keeping units (SKUs). In other words, many businesses may have been led astray by trying to implement a lean model in settings where it is inappropriate.

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The three important elements of diversity, variability (or predictability), and volume (see Figure 1) seem to determine whether an agile or lean strategy is most appropriate. One possible definition of agility is the capacity of an organization to swiftly adapt to changes in demand, both quantitatively and qualitatively. The market condi- tions in which many organizations find themselves are characterized by turbulent and unpredictable demand; hence, the heightened urgency of the hunt for agility.

THE ROUTES TO AGILITY

To be truly agile, a supply chain must possess a num- ber of distinguishing characteristics, as suggested in Fig-ure 2. The agile supply chain is *market sensitive*. Market sensitive means that the supply chain is capable of read- ing and responding to real demand. Most organizations are forecast-driven rather than demand-driven. In other words, because they have little direct feed-forward from the marketplace by way of data on actual customer requirements, they are forced to make forecasts based on past sales or shipments, and convert these forecasts into inventory. The breakthroughs of the last decade in the form of efficient consumer response (ECR), and the use of information technology to capture data on demand di- rect from the point-of-sale or point-of-use, are now transforming the organization's ability to hear the voice of themarket and to respond directly to it.

The use of information technology to share data between buyers and suppliers is, in effect, creating a *virtual* supply chain. Virtual supply chains are information-based rather than inventory-based.

Conventional logistics systems are based on a paradigm that seeks to identify the optimal quantities of in- ventory and its spatial location. Complex formulae and algorithms exist to support this inventory-based business model. Paradoxically, we are now learning that once we have visibility of demand through shared information,the premise upon which these formulae are based no longer holds. Electronic data interchange (EDI) and, now, the Internet have enabled partners in the supply chain to act upon the same data, i.e., real demand, rather than be dependent upon the distorted and noisy picture that
 emerges when orders are transmitted from one step to another in an extended
 chain.Shared information between supply chain partners canonly be fully leveraged through *process integration.* Pro- cess integration means collaborative working between buyers and suppliers, joint product development, com- mon systems, and shared information. This form of cooperation in the supply chain is becoming ever more preva-lent, as companies focus on managing their corecompetencies and outsource all other activities. In this new world, a greater reliance on suppliers and alliance partners becomes inevitable and, hence, a new style of re- lationship is essential. In the "extended enterprise," as it is often called, there can be no boundaries, and an ethos of trust and commitment must prevail. Along with pro- cess integration, comes joint strategy determination, buyer-supplier teams, transparency of information, and even, open-book accounting.

This idea of the supply chain, as a confederation of partners linked together as a *network*, provides the fourth ingredient of agility. There is a growing recognition that individual businesses no longer compete as stand-alone entities, but rather as supply chains. We are now entering the era of "network competition," where the prizes will go to those organizations who can better structure, coor- dinate, and manage the relationships with their partners ina network committed to better, closer, and more agile rela-tionships with their final customers. It can be argued thatin today's challenging global markets, the route to sustain-able advantage lies in being able to leverage the respectivestrengths and competencies of network partners to achievegreater responsiveness to market needs.

HYBRID STRATEGIES AREOFTEN APPROPRIATE

There will be occasions when a "pure" agile or a lean strategy might be appropriate for a supply chain. How-ever, there will often be situations where a combination of the two may be appropriate, i.e., a hybrid strategy.

Hybrid supply chain strategies recognize that, within amixed portfolio of products and markets, there will be some products where demand is stable and predictable, and some products where the converse is true. As Fisher points out [6], it is important that the characteristics of demand are recognized in the design of supply chains. However, it is not necessarily the case that a supply chain should be either lean or agile. Instead, a supply chain may need to be lean for part of the time and agile forthe rest.

Zara, the Spanish fashion company, provides a good example of this hybrid supply chain strategy [7]. Zara is one of Spain's most successful and most dynamic apparelcompanies, producing fashionable clothing that appeals to an international target market of those between the ages of 18 and 35. Zara's international market position- ing places it in direct competition with some of the most skilled operations in the business, including Italian fash ion giant Benetton and U.S.-based Gap and The

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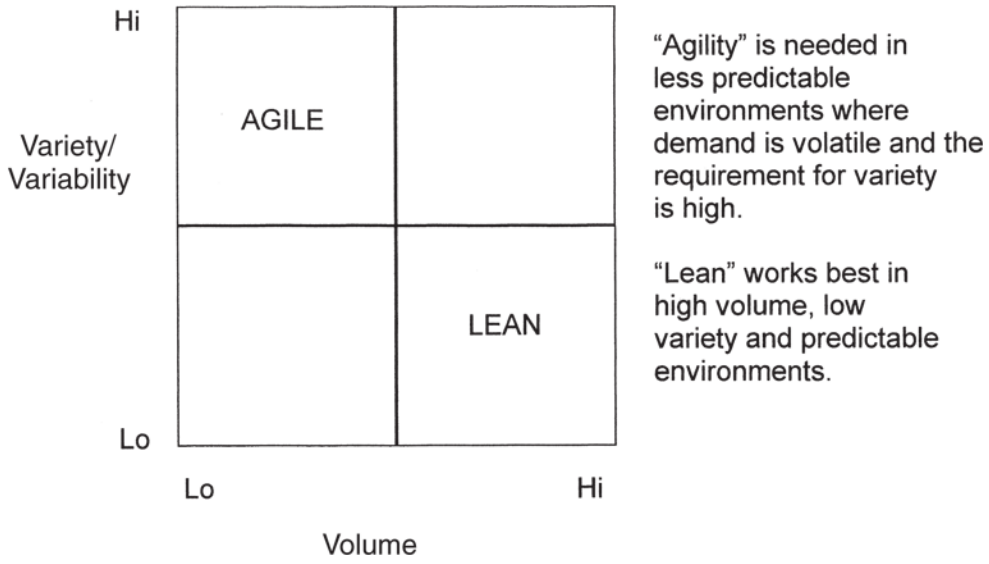

FIGURE 1. Agile or Lean.

Zara's rapid growth and on-going success in such a fiercely competitive environment is, in fact, a testamentto its ability to establish an agile supply chain which still incorporates many "lean" characteristics. The pursuit ofthis hybrid strategy has enabled Zara to develop one of the most effective quick-response systems in its industry.The whole process of supplying goods to the stores begins with cross-functional teams–comprising fashion,commercial, and retail specialists–working within Zara'sDesign Department at the company's headquarters in La Coruña, Spain. The designs reflect the latest in interna-tional fashion trends, with inspiration gleaned throughvisits to fashion shows, competitors' stores, universitycampuses, pubs, cafes, and clubs, plus any other venuesor events deemed relevant to the lifestyles of the target customers. The team's understanding of fashion trends isfurther guided by regular inflows of electronic point ofsale (EPOS) data and other information from all of the company's stores and sites around the world.Raw materials are procured through the company's buying offices in the United Kingdom, China, and The Netherlands, with most of the materials themselves com-ing from Mauritius, New Zealand, Australia, Morocco, China, India, Turkey, Korea, Italy, and Germany. Approximately 40% of the garments–those with the broad- est and least transient appeal–are imported as finished goods from low-cost manufacturing centers in the Far East. The rest are produced by quick-response in Spain, using Zara's own highly automated factories and a net- work of smaller contractors. Material or fabric is also held in "greige" (i.e., undyed and unprinted) and, if demand for a particular garment turns out to be higher thanexpected, local manufacturers can then quickly manufac- ture additional products.Zara's manufacturing systems are similar in many ways to those developed and employed so successfully by Benetton in Northern Italy, but they are refined using ideas developed in conjunction with Toyota. Only those operations that enhance cost-efficiency through econo- mies of scale (such as dying, cutting, labeling, and pack- aging) are conducted in-house. All other manufacturing activities, including the labor-intensive finishing stages, are completed by networks of more than 300 small sub- contractors, each specializing in one particular part of the production process or garment type. These subcontrac- tors work exclusively for Zara's parent, Inditex SA. In re-turn, they receive the necessary technological, financial, and logistical support required to achieve stringent time and quality targets. The system is flexible enough to copewith sudden changes in demand, although production is kept always at a level slightly below expected sales to keep the stock moving. Zara has opted for undersupply, viewing it as a lesser evil than holding slow-moving or obsolete stock.

THE ROLE OF THE DE-COUPLING POINT

A major problem in most supply chains is their limited visibility of real demand. Because supply chains tend to be extended with multiple levels of inventory between the point of production and the final marketplace, they tend to be forecast-driven rather than demand-driven.

The point at which real demand penetrates upstream in a supply chain may be termed *the de-coupling point.* Pre- viously, this idea has been termed *the order penetration point* [8]. However, the issue is not how far the order penetrates, but how far real demand is made visible. Or- ders are aggregations of demand, often delayed and dis- torted due to the actions and decisions of intermediaries [9]. On the other hand, demand reflects the ongoing re- quirement in the final market place as close to real- time as possible.

The de-coupling point should also dictate the form in which inventory is held. Thus, as in the uppermost exam-ple in Figure 3, demand penetrates right to the point of manufacture, and inventory is probably held in the form of components or materials. In the lowermost example, demand is only visible at the end of the chain. Hence, in-ventory will be in the form of finished product. The aim ofthe agile supply chain should be to carry inventory in a ge- neric form–that is, standard semifinished products await-ing final assembly or localization. This is the concept of *postponement*, a vital element in any agile strategy.

Postponement, or delayed configuration, is based on the principle of seeking to design products using com- mon platforms, components, or modules, but where the final assembly or customization does not take place until the final market destination and/or customer requirementis known.

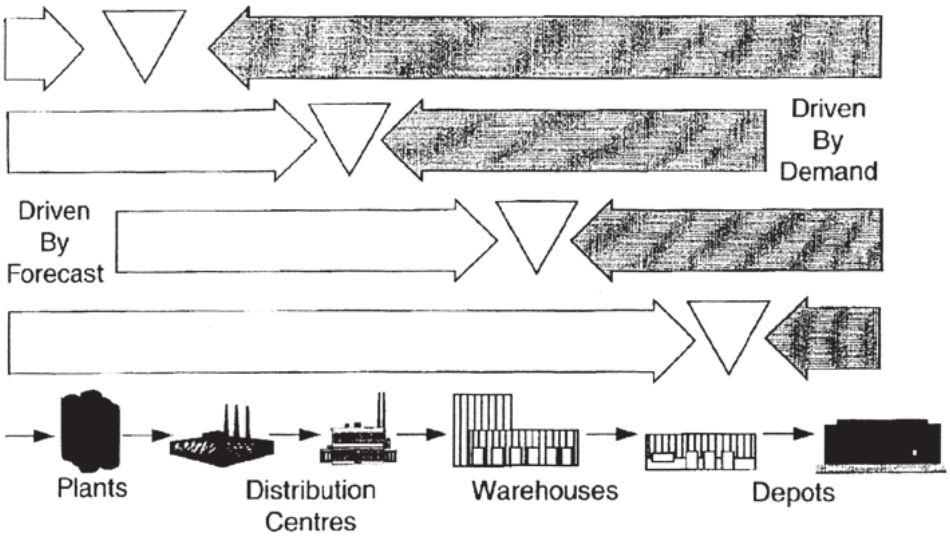

FIGURE 3. De-coupling points and strategic inventory.

CONCLUSIONS

Marketing management has not traditionally recognizedthe importance of logistics and SCM as a key element in gaining advantage in the marketplace. However, in today's more challenging business environment, where volatility and unpredictable demand have become the norm, it is es-sential that the importance of agility be recognized.Leading companies are already implementing market- ing strategies that are underpinned by a supply chain strategy designed with agility in mind. These are the or- ganizations that will be best equipped for survival in the uncertain markets of the twenty-first century.

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