Dublin Institute of Technology
ARROW@DIT

Practitioner Journals | National Institute for Transport and Logistics

2004-03-01

Lean and Agile Supply Chains: Jargon or Action?

Edward Sweeney
Dublin Institute of Technology, edward.sweeney@dit.ie

Follow this and additional works at: http://arrow.dit.ie/nitloth

Part of the Business Administration, Management, and Operations Commons

Recommended Citation
Sweeney, E.:Lean and Agile Supply Chains: Jargon or Action?. Logistics Solutions, the Journal of the National Institute for Transport and Logistics, Vol. 7, No. 1, pp. 17-19, March 2004

This Article is brought to you for free and open access by the National Institute for Transport and Logistics at ARROW@DIT. It has been accepted for inclusion in Practitioner Journals by an authorized administrator of ARROW@DIT. For more information, please contact yvonne.desmond@dit.ie, arrow.admin@dit.ie.

This work is licensed under a Creative Commons Attribution-Noncommercial-Share Alike 3.0 License

LOGISTICS SOLUTIONS
ISSUE 1 2004 / 17

Lean and Agile supply chains: jargon or action?

by EDWARD SWEENEY, Director of Learning, NITL

1. BACKGROUND

Development of an understanding of supply chain management (SCM) and its role in improving business performance is often complicated by the terminology which has evolved over the years. In a series of articles in this year's *Logistics Solutions*, various authors will attempt to demystify SCM by explaining some of the words and phrases which have come into relatively widespread use in both commercial and academic circles. This article explores the words lean and agile with specific reference to their respective meanings and potential role in improving supply chain performance.

2. LEAN SUPPLY CHAINS

Concept and Definition

A cursory glance at a dictionary or thesaurus indicates that possible synonyms for "lean" might include *thin, trim* or *slim*. The most widely quoted antonyms of these words (i.e. words with the opposite meaning) include *fat, messy* and *out of shape*. In the context of a business or a supply chain lean was originally used to describe the situation where many of the non-value adding activities (NVAs) had been identified and eliminated. NVAs are activities which add cost without necessarily adding value. Value in this context can best be described as something which a customer is willing to pay for. Another perspective on NVAs is that they are activities which add time to supply chain processes without necessarily adding value from a customer point of view. The latter is important in two respects. Firstly, time **is** money and, therefore, taking unnecessary or wasteful time out of processes should lead directly to cost reductions. Secondly, taking wasteful time out of processes should result in faster product supply and, as a result, improve this important aspect of customer service. From a financial perspective going lean should reduce operating costs and facilitate more effective use of working capital and fixed assets, thus contributing significantly to overall profitability. This approach suggests that in going lean the major benefits are derived directly from efficiency improvements.

There is another element of lean worth referring to by way of introduction. Just-in-Time (JIT), with its origins in the Japanese automotive industry, is essentially a philosophy aimed at the elimination of waste (or *muda* in Japanese). Implementing JIT involves identifying the various forms of muda and endeavouring to eliminate them as far as possible. While they

may differ in terms of the detail of their respective constituent elements, the similarity in approach between lean thinking (eliminate NVAs) and JIT thinking (eliminate muda) is evident. Indeed, lean thinking can be regarded as having its origins in the Toyota Production System back in the 1970s.

Principles and Characteristics

Lean thinking was popularised by the 1990 book "The Machine that Changed the World" (Womack, Jones and Roos). This book illustrated the significant performance gap between Japanese and western companies in the automotive sector and attributed the main reasons for this gap to the fact that Japanese approaches tended to use less of everything (e.g. less human effort, less stock and less time) across supply chain processes. In other words, Japanese supply chains tended to be *leaner*. It is not uncommon in production operations for as a few as 5% of activities to be classified as "value-adding". Value in this context needs to be considered from the customer's viewpoint. The potential exists to eliminate the majority of the NVA, thus providing great potential for bottom-line improvement. The process of eliminating waste needs to go beyond the boundaries of individual companies and take a "Value Stream" or supply chain perspective. The key is to re-

organise activities so that higher levels of synchronisation are achieved between supply and demand, with product being pulled through the supply chain based on customer requirements. Improved flow makes the various forms of waste more visible thus giving the potential to achieve sustained levels of waste reduction. The quest for perfection is also a characteristic of lean thinking. Perfection in this context is where every resource and every activity is adding value. Whilst lean thinking has its origins in the automotive sector it has been successfully applied in other industries. An extensive toolkit has by now been developed which helps companies with the analysis, planning and implementation of lean supply chains. The Lean Enterprise Research Centre (LERC), under the direction of Professor Peter Hines at Cardiff University is the leading academic authority in the field of lean SCM (see http://www.cf.ac.uk/carbs/lom/lerc for more information).

3. AGILE SUPPLY CHAINS

Concept and Definition

In the case of the word "agile", a dictionary or thesaurus indicates that possible synonyms might include *swift*, *responsive* or *nimble*. The most widely quoted antonyms of these words include *clumsy*, and (as with "lean") *out of shape*. This suggests that the concepts of **speed of response** and **flexibility** are the keys to distinguishing between lean and agile. The need for agility in SCM is based on increasingly volatile market demand patterns and shortening product life cycles. The leading academic authority on agility, Professor Martin Christopher of Cranfield School of Management, states that:

'Whilst "leanness" may be an element of "agility" in certain circumstances, by itself it will not enable the organisation to meet the precise needs of the customer more rapidly'

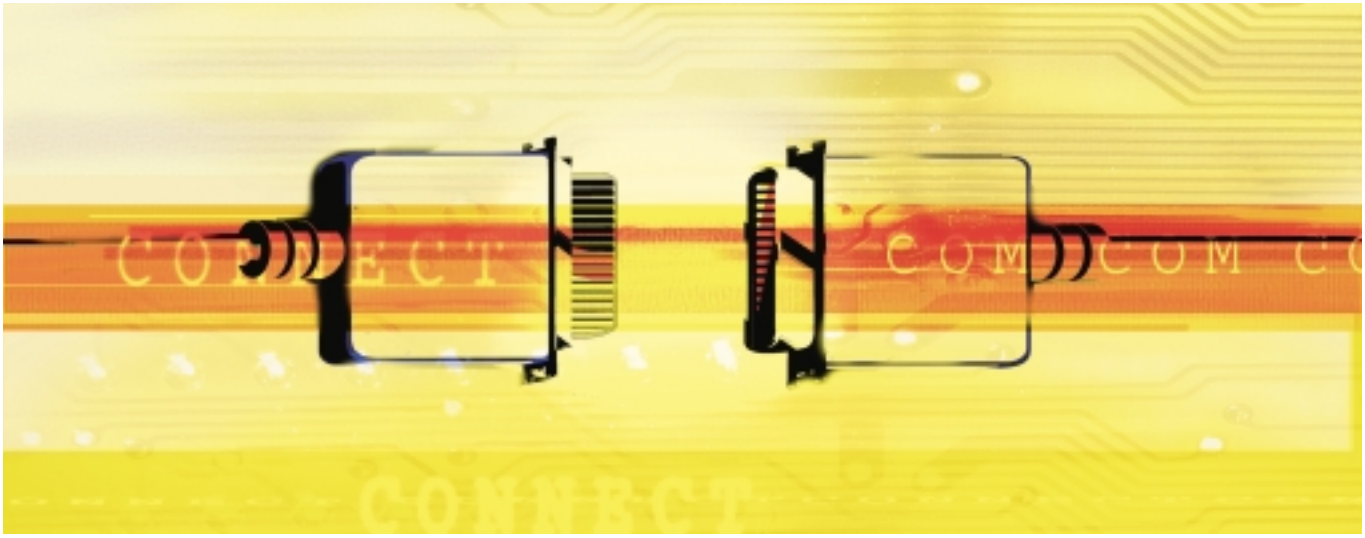
This implies that lean is effectively a subset of agile. Furthermore, the emphasis on speed is evident in Christopher's use of the word "rapidly". The implication here is that time is a key competitive weapon, with reduced new product introduction (NPI) and order fulfilment times, for example, providing the potential for significant performance improvement.

Principles and Characteristics

Martin Christopher describes agility in terms of four characteristics.

1. Market sensitive: A truly agile supply chain must be capable of delivering based on real demand in the market. This often requires a shift from forecast-driven planning to demand-driven planning. It also means moving from traditional make-to-stock towards make-to-order approaches.

2. Virtual: Agile supply chains share real time data across companies boundaries. These virtual supply chains aim to reduce inventory levels through the more effective use of information, particularly information about customer demand. Recent developments in ICT (as discussed elsewhere in this edition of *Logistics Solutions*) have facilitated this.



'In an agile supply chain there are high levels of integration between processes within the firm and between the firms upstream and downstream in the external supply chain. This replaces the fragmentation which is a characteristic of many traditionally managed supply chains.'

	LEAN	AGILE	LEAGILE
FOCUS	EFFICIENCY	EFFECTIVENESS	EFFICIENCY & EFFECTIVENESS
CHARACTERISTIC	TRIM	RESPONSIVE	TRIM & RESPONSIVE
ORIENTATION	REDUCE WASTE	INCREASE SPEED	DELIVER VALUE
OBJECTIVES/METRICS	COST	SERVICE	COST & SERVICE

Table 1: Lean, agile and leagile comparison

3. Process integration: In an agile supply chain there are high levels of integration between processes within the firm and between the firms upstream and downstream in the external supply chain. This replaces the fragmentation which is a characteristic of many traditionally managed supply chains.

4. Network-based: This recognises that increasingly supply chains compete with other supply chains (as opposed to companies competing with other companies as was the traditional view). An agile supply chain attempts to leverage the competencies of all players in the supply chain (the "network partners") to ensure higher levels of responsiveness to dynamic market requirements.

4. LEAN AND AGILE: RELATIONSHIP WITH EFFICIENCY AND EFFECTIVENESS

NITL's definition of SCM is based on the *Four Fundamentals*, the first of which is concerned with overall SCM objectives. The main objectives are to:

- Deliver appropriate levels of customer service to targeted market segments; and
- Optimise total supply chain costs and investment.

Traditionally companies, and management accounting systems, measure two key aspects of performance, namely effectiveness and efficiency. *Effectiveness* is the degree to which a predetermined objective or target is met. *Efficiency*, on the other hand, is the degree to which inputs are used in relation to a given level of outputs. Colloquially, effectiveness is concerned with *doing the right things* while efficiency is concerned with *doing the things right*. Customer service measures are examples of the former while many cost-based measures are aimed at the latter. It is possible to achieve one of these aspects without the other but obviously both efficiency and effectiveness are required simultaneously (i.e. one would ideally like to be *doing the right things right!*). Lean supply chains, based on the intuitive definitions, tend to be efficient and, therefore, perform well in relation to economic and cost objectives and metrics. Agile supply chains, on the other hand, tend to be effective and, therefore, perform well in relation to customer service objectives and metrics.

5. LEAGILE SUPPLY CHAINS

The desirability to be both lean and agile has resulted in a rather contrived term, *leagile*, being coined. A leagile supply chain is defined as one which is both lean and agile. In technical terms, leagility involves the strategic use of a decoupling point (Naylor et al). This decoupling point aims to achieve responsiveness to volatile demand downstream (i.e. in the market) while providing level scheduling upstream from the decoupling point. In essence it is an attempt to get the best of both worlds. A more detailed discussion of leagility and the creation of the decoupling point is beyond the scope of this article but will be provided in a subsequent edition of *Logistics Solutions*. Lean, agile and leagile philosophies are summarised in Table 1, in terms of focus, characteristic (as defined by the synonyms), overall orientation and the most commonly used objectives and metrics. LS

REFERENCES

Womack, J.P., Jones, D. and Roos, D. (1990), "The Machine that Changed the World", New York, Macmillan.

Christopher, M. (2003), "Creating the Agile Supply Chain", originally published in Supply Chain Excellence, Cranfield University School of Management web site, http://www.som.cranfield.ac.uk/som/scrc/agilesupplychain.

Naylor, J.B., Naim, M.M. and Berry, D. (1997), "Leagility: integrating the lean and agile manufacturing paradigm in the total supply chain", MASTS working paper No. 47, Re-published in International Journal of Production Economics (1999), No. 62, pp. 107-118.