CIPS KNOWLEDGE

Lean Supply Chain (LSC)

Lean supply is often viewed as one of a set of techniques for managing operations effectively (Found and Rich).

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01 CPD HOURS

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Lean Supply Chain (LSC)

Introduction

The 'lean revolution' can be traced back to 1980s Japan where companies successfully operated just-in-time (JIT) systems. Over the subsequent decade elements of the Japanese manufacturing and inventory techniques were incorporated into the Western supply chains (CIPS: Lean and agile purchasing and supply management). Today, lean supply chain and lean manufacturing are applied to many organisational processes. The major difference between the two is the scale and the basis of lean implementation. Thus, lean manufacturing practices are inward-oriented and are "carried out on the basis of expert-driven projects", while lean supply chain are "outward and carried out on the basis of full collaborations" (Rivera et al., 2005).

A simple manifestation of lean thinking in application to supply chain requires analysing the supply process and internal ordering (requisition to payment) and removing any unnecessary steps or processes, thus minimising waste (e.g. transport, defects, inappropriate processing, waiting, unnecessary motion, unnecessary inventory and overproducing) (CIPS: Lean and agile purchasing and supply management). In a lean supply chain closed relationships are established among all members sharing gains and responsibilities (Rivera et al., 2005).

The emergence of new conditions, pressure from competitors, decreasing resource base and the fact that the share of purchases of many utility companies in the UK has reduced from around 60% to 10-15% thus reducing their market power, forced organisations seek better strategies to improve responsiveness and reduce costs. Thus, organisations in many different sectors have implemented the lean management approach as a technique to underpin operational activities (CIPS: Lean and agile purchasing and supply management; Keen and Carl, 2010).

Despite its benefits the LSC is fragile and prone to external changes. For example, the recent earthquake in Japan is viewed as a test for companies with lean supply chains. Environmental shocks like the Fukushima disaster can ripple through company supply chains when there is not a lot of slack in the systems of these companies to "act as a buffer". Sony's lithium battery cell plants and many of its suppliers are based in the Fukushima area. This might have an effect on the supply of notebook computers assembled in China (Shin, 2011).

Definition

Lean supply chain (LSC) can be defined as a "set of organisations directly linked by upstream and downstream flows of products, services, finances and information that collaboratively work to reduce costs and waste" (Vitasek et al., 2005: 21). Management of an LSC is a process aimed at eliminating waste and nonvalue-adding activities from the overall value stream in the supply chain (Jung et al., 2007).

Successful Application

Supply chains generally contain flows of products/services, information and finance. To build a lean supply chain it is important to identify the wastes associated with these flows and eliminate them. Lean logistics and information technology can help companies smooth out and facilitate supply chain flows. Performance management systems must also be in place to sustain their efficiency and effectiveness (Rivera, 2007).

Steps to Successful Application

- Select critical supply chain members (by importance of products and the impact on overall production cost and time) to gradually implement lean supply chain.
- Assess the current state of the supply chain and develop value stream maps of critical products.
- Develop an overall value stream map and establish a cross-organisation assessment team to identify improvement opportunities.
- Develop a detailed time-line chart.
- Develop potential value stream maps of company level and supply chain level in order to guide the project.
- Implement improvement project.
- Introduce cross-enterprise collaboration to achieve consistency: collaborative practices and processes across departments allow a company as a whole to maximise the value stream to the customer.

Phelps et al. (2004) in Rivera et al. (2007)

Hints and Tips

- It is important to ensure consistency, collaboration and sharing across the supply chain:
- lean supply should be viewed as a collaborative, iterative process (Keen and Carl, 2010).
- It is essential to consider your area of operations. This has become increasingly difficult as an increase in outsourcing and global sourcing opportunities result in supply chains becom- ing longer, more complex and fragmented (Vitasek, 2005).
- Inventory accuracy and production execution accuracy need to be high for achieving a lean supply chain (Berstein, 2005).
- It is important to address variations in the supply chain (Berstein, 2005).
- It is important to rate suppliers and monitor their performance (Berstein, 2005).

Potential Advantages

- LSC facilitates permeation across the vendor base and logistics operation (Vitasek et al., 2005).
- LSC can enable member companies to align themselves with each other and to coordinate their continuous improvement efforts (Vitasek et al., 2005).
- Lean logistics and IT can help achieve decrease in inventory levels, shorten lead times, low- er costs, deliver quality and customer satisfaction (Rivera et al., 2007).

Potential Disadvantages

- There is a general problem around the lack of awareness about LSC and its implementation.
- Lean techniques are often limited to manufacturing operations and the shop floor (Rivera et al., 2007).
- Cost and profit allocations between companies can be problematic due to increased levels of integration and cooperation (Rivera et al., 2007).
- Over-utilisation may turn lean supply into a 'tool' for profit-making rather than a manageri- al technique (Keen and Carl, 2010).

Performance Monitoring

Level 1: Key performance indicators (KPI) metrics: (1) reliability and responsiveness - perfect order fulfilment, order self-fulfilment cycle times; (2) flexibility - supply chain flexibility, supply chain adaptability; (3) cost - total supply chain management cost, cost of goods sold; (4) assets - cash-to-cash cycle time, return on supply chain fixed assets (Husby and Swart- wood, 2009).
Level 2: Performance metrics: (1) delivery performance/quality; (2) flexibility and responsiveness; (3)costs; (4) assets (Husby and Swartwood, 2009).
Level 3: Diagnostic metric: (1) supply chain complexity - % of order changes, number of end devices/stock-keeping units, inventory carrying costs, % of purchasing spending by distance, number of suppliers; (2) supply chain configuration - product volume by channel, number of channels, purchased material by geography, % of purchasing spending by distance; (3) sup- ply chain management practices - planning cycle time, forecast accuracy, obsolete/end of life inventory days of supply, re-plan cycle, order entry methods, order entry modes, supplier delivery performance (Husby and Swartwood, 2009).

Case Evidence

The Shirakawa plant of the Shin-Etsu Handotai, producer of the silicon wafers and ingots used in the manufacture of semiconductors, is located in Fukushima close to the epicenter of the earthquake and near the site of the nuclear power plant. Since the disaster in 2001
Shirakawa plant, responsible for 22% of the world's supply of silicon wafers, has been shut down due to lack of electric power resulting in under-delivery of 22% of the global supply of a vital commodity to the next chain (Shin, 2011).
Delphi Automotive Systems, a global company with 200 manufacturing sites and 200,000 employees in 2005, applied lean principles to simplify and streamline its complex supply chain. As a result, the number of organisations necessary to bring the product to the end customer was reduced from 171 to 73 and the number of handoffs decreased from 288 to 82 (Berstein, 2005).
Fujitsu have drawn on the experiences of world class companies and combined the use of lean supply chain management techniques together with Fujitsu's own unique Sense and Respond approach to provide continuous service improvement. Fujitsu's supply chain now has a programme of change utilising elements of lean, Kaizen and Six Sigma (Cooley, 2007).

Further Reading/Reference

Web Resources

Lean Enterprise Centre, University of Cardiff http://www.leanenterprise.org.uk/
Lean supply: fact or fiction http://www.slideshare.net/TheSupplychainniche/the-lean-supply-chain-the-lean-supply-chain-fact-or-fiction
Lean supply chain blogspot http://www.lean-supply-chain.blogspot.co.uk/

Books

Lean Six Sigma for Supply Chain Management, James W. Martin, ISBN 978-0071479424
Lean Thinking, James P. Womack & Daniel T. Jones, ISBN 978-0743231640
Dynamic Supply Chains, John Gattorna, ISBN 978-0273730408
The Machine That Changed the World, James P.Womack, Daniel T.Jones & Daniel Roos, ISBN 978-0060974176
Lean Supply Chain Management Essentials, Bill Kerber & Brian J Dreckshage, ISBN 978-1439840825

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Wince, J.P. (2004) Lean Supply Chain Management: A Handbook for Strategic Procurement. New York Press: New York.

Video

Emerson case study on lean supply chain collaboration
https://www.youtube.com/watch?feature=player_embedded&v=TKMKuKgH0-I