

Agile Supply

In today's globalised, free-market environment, the ability to satisfy customer expectations is core to profitability. If you are not agile, you can't do it, because customer expectations are never static (Peter Weill, Director of the Centre for Information Systems Research, MIT)



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Introduction

The most prominent academic work in the field of agile supply chain was undertaken in the 2000s by Professor Martin Christopher, the Emeritus Professor of Marketing and Logistics at Cranfield School of Management. Agility has its origins in manufacturing flexibility (Aitken, Christopher & Towill, 2002). The agile model of supply chain management emerged as a response to volatile and unpredictable markets and shortening product life cycles (Christopher, 2000). The model implies the ability of the supply chain to react quickly to changes in market demand (Towill & Christopher, 2002).

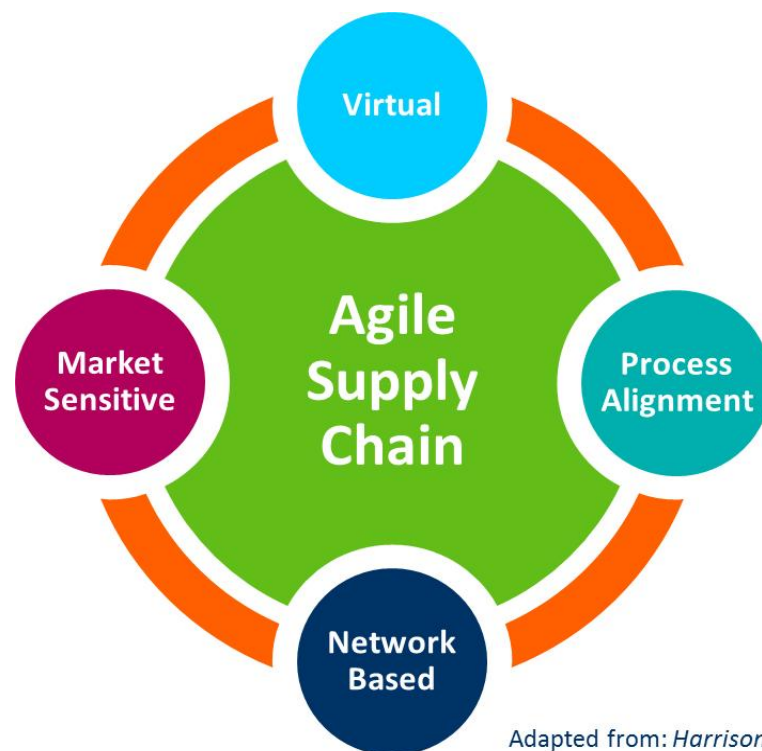
Agility allows companies to reduce costs and rationalise inventory by anticipating demand as effectively as possible. Building an agile and resilient supply chain is not always the lowest-cost option for a company. However, it delivers a predictable supply chain with the optimum balance between speed, quality and value (Ernst & Young, 2011).

Some studies suggest that the 'agile' model of business operations is distinct from the 'lean' approach. More recent work in the field advocates that both approaches can successfully complement each other (Towill & Christopher, 2002). The CIPS also takes the view that lean thinking and agility can exist side by side in organisations: if 'very lean' and 'extremely agile' are two ends of a continuum, most organisations are placed somewhere in the middle (CIPS: Lean and agile purchasing and supply management). Combining agility and leanness in the supply chain has sometimes been referred to as 'le-agility' (Agarwal, Shankar & Tiwari, 2006).

The agile paradigm places special emphasis on product innovation, speed and flexibility to read market opportunities to satisfy the needs of increasingly demanding and well-informed customers. Agility is related to an enterprise's processes and interfaces between these processes and the market. Goldman et al. (1993) outline four principles of agile organisations: 1) enriching the customer; 2) cooperating to enhance competitiveness; 3) organising to master change and uncertainty; and 4) leveraging the impact of people and information. Christopher's (2000) take on agility also includes four guidelines: 1) competition based on core competence and process management; 2) virtual enterprise formation; 3) market sensitivity; and 4) knowledge-driven enterprise with high investment in technology.

Definition

Agility is a "business-wide capability that embraces organisational structures, information systems, logistics processes, and ... mindsets" (Christopher, 2000:37). The agile supply chain is a fast-moving, adaptable and robust system capable of rapid adaptation in response to turbulent and volatile markets, uncertainty created by economic and competitive forces, market opportunities, and customer requirements (Christopher, 2000).



Adapted from: Harrison et al 1999

Successful Application

The agile supply chain model requires that: (1) the stock is held at the fewest echelons (if at all) with finished goods sometimes being delivered directly from factory to customer; (2) replenishment of all echelons is driven from actual sales/usage data collected at the customer interface; (3) production is planned across functional boundaries from vendor to customer, through highly integrated systems and with minimum lead times; (4) the majority of stock is held as 'work in progress' awaiting build/configuration instructions (Christopher, 2001). Systems and process flexibility are the key components of agility (Lee, 2004).

Steps to Successful Application

- Use a wide network of suppliers that are flexible and responsive to changes in demand and also serve as design partners.
- Install processes and systems that are adaptable, flexible and reconfigurable.
- Postpone decisions in manufacturing until final customer demand is received.
- Provide data on changes in supply and demand.
- Invest in a cross-functional and highly skilled workforce and sophisticated information systems and technologies.
- Reduce echelons in the supply chain.

Lee (2004)

Hints and Tips

- In addition to being able to rapidly respond to fluctuating demand, to be effective an agile supply chain exhibits ease of response, predictability and consistent high quality (Ernst & Young, 2011).
- When building agile supply chains firms tend to focus on procurement, manufacturing and logistics. It is also important to pay attention to product development and launch activities (Ernst & Young, 2011).
- A combination of effective management techniques and new technology helps 'more agile' companies achieve high levels of customer focus and customer satisfaction (Power et. al., 2001).
- Effective management of the total supply chain is important for the development of strategies for competing on the basis of agility. On the one hand, a manufacturer with key suppliers that have poor quality and delivery records will find it very difficult to provide high levels of customer service even in stable environments. On the other hand, the same manufacturer will find it hard to operate if distribution channels are unable to respond due to physical or information flow errors (Power et al., 2001).
- The agile supply chain often relies on the involvement of suppliers when responding to changing demand and requires the use of technology to promote productivity, new product development and customer satisfaction (Power et al., 2001).

Potential Advantages

- Agile supply chains are capable of fulfilling variable and unpredictable customer demand in a rapidly changing and volatile business environment (Christopher, 2000; Agarwal et al., 2006).
- Agile supply chains can deliver a broad variety of products in a relatively short time (Christopher, Lowson & Peck, 2004).
- Agile supply chains can substantially increase profit margins by reducing costs and rationalising inventory (Agarwal et al., 2006).

Potential Disadvantages

- Agile supply chains are over-reliant on people and systems. Agility is lost when information does not flow due to technical or human error. Similarly, if users are unwilling and reluctant to accept agile practices and enabling technologies, agile manufacturing may fail from the inability to overcome the inertia of traditional and deeply ingrained practices (Maskell, 2001).
- Building an agile and resilient supply chain can be expensive (Ernst & Young, 2011).
- Agile supply is not recommended where the 'order winners', cost, efficiency and profit margins are low. In such a scenario, having spare capacity or investing in inventory as advocated by agility can lead to higher production costs (Mason-Jones, Naylor & Towill, 2000).

Performance Monitoring

- Several authors have presented frameworks for measuring supply chain agility (Yauch, 2011; Swafford et al., 2006; Yusuf et al., 2001). These frameworks are based on the measurement of agile capabilities. The capabilities are assessed in terms of new products developed; reconfigurability of the systems; modularity index; adoption of information systems; expansion ability; and improved customer service. These frameworks are applicable in a turbulent environment for any type of manufacturing organisation.
- Customer centered agile policies (as opposed to product centered logistics policies) require more attention to customers and markets. Lean policies, on the other hand, focus on the elimination of waste in products and processes (Remko et al., 2001).
- It is important to measure capabilities. Agile policies should be founded on broad-based measures that underpin capabilities, while lean policies mostly rely on quality and productivity (Remko et al., 2001).
- Agile policies focus on instantaneous demand capture, interpretation and response (Remko et al., 2001).

Case Studies

- The agile practices of Zara and Benetton have become a benchmark in the highly innovative fashion industry where demand is unpredictable and short time-to-market is crucial to gain competitive advantage. These companies use point-of-sale data to gauge market trends (Christopher et al., 2004).
- Japan's retailer Seven-Eleven uses up-to-the-minute demand information (point of sales, customer profiles, local events, weather data) to drive its replenishment/product development processes. The company reorganises its retail shelf three times a day to meet changing customer needs, utilises multiple modes of transportation, smart consolidation at distribution centres and flexible delivery processes (Chopra, 2005). Its stock out rates are low with inventory turnover of 55%. By building agility and adaptability in its supply chain Seven-Eleven has gained a 30% gross profit margin (Lee, 2004).
- Philips Semiconductors factory in New Mexico was destroyed by fire in 2000. Its customer Nokia had an agile supply chain model in place which allowed the company to quickly respond to unexpected supply chain disruptions. Nokia promptly assessed the problem, made design changes and tapped backup sources. Unlike Nokia, another Philips' customer, Ericsson, couldn't cope with the disruption and had to scale back production affecting handset supply for months. Eventually, Ericsson implemented new processes and tools for supply chain risk management (Norrman and Jansson, 2004).

Further Reading/References

CIPS Source Downloads

- CIPS: Lean and Agile

Web Resources

- Supply chain risk management blog <http://scrmblog.com/>
- Special academic journal issue on creating agile supply chain <https://shib-idp.ucl.ac.uk/idp/Authn/UserPassword>
- Cranfield University SCM research centre (agile SCM club) <http://www.som.cranfield.ac.uk/som/p10777/Research/Research-Clubs/Agile-Supply-Chain-Research-Club>
- Accenture's resource on SCM <http://www.accenture.com/us-en/consulting/operations/supply-chain-management/Pages/index.aspx>
- International conference on agile SCM <http://logisticsconference.wordpress.com/>

Books

- Strategy for the Reverse Supply Chain, Daugnoraitė & Slaitas, ISBN 978-3838371603
- Agile Manufacturing, Kidd, ISBN 978-0201631630
- The Handbook of Logistics and Distribution Management, Rushton, Croucher, Baker, The Chartered Institute of Logistics and The Chartered Institute of Logistics and Transport, ISBN 978-0749457143
- Logistics management and Strategy, Harrison & Van Hoek, ISBN 978-0273730224
- Modeling the Supply Chain, Shapiro, ISBN 978-0495126096

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Video

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https://www.youtube.com/watch?feature=player_embedded&v=nbWalgv3f7s

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