Loosely-Coupled vs. Tightly-Coupled Supply Chain

Cutting-edge companies are swapping their tightly coupled processes for loosely coupled ones, making themselves not only more flexible but also more profitable (Brown et al., 2002)

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Introduction

Traditionally relationships between organisations were transaction-oriented, where supply chain members acted as competitors and opportunistic behaviour was promoted. However, the adoption of modern supply chain practices such as vendor-managed inventory (VMI), collaborative planning, forecasting and replenishment (CPFR) and early supplier involvement, transformed relationships from purely transactional to collaborative (Karuranga et al., 2008).

The aim of the tightly-coupled relationship model is to reduce inventory and avoid the situation where a manufacturer is out of stock. Close relationships between chain partners and crossing corporate territories helps to achieve this objective (Elmuti, 2002). The loosely-coupled model allows for higher flexibility due to low-interdependency. When applied to the supply chain the model leads to faster integration of the abilities of collaborating participants, known as orchestration (Brown et al., 2002, El Sawy, 2003). Sometimes companies choose to create buffers at different stages of supply. This supply chain approach is referred to as the 'arms-length relationship'. It has been observed that those companies that exhibit the best strategies have swapped their tightly-coupled processes for loosely-coupled ones, thus gaining much-needed flexibility and achieving performance improvements (Brown et al., 2002).

Determinants of collaboration include institutional background, resources, psychological and intellectual proposition and learning styles. Large companies are more predisposed to collaborate than smaller ones, this applies particularly to research and development (R&D) activities. Trust and commitment are central to collaboration: the higher the level of supplier involvement (e.g. exchange of staff during design, development or testing of new products and ideas), the higher the collaboration level. Finally, the company's network competence is highly dependent on access to resources, network orientation of HR management, integration of intra-organisational communication and the openness of corporate culture (Karuranga et al., 2008).

Definition

Tightly-coupled (also known as hard-wired or linked) and loosely-coupled supply chains are two polar models of collaboration between buyer and supplier where a linked model represents a close relationship and a loosely-coupled model refers to low-interdependency between partners. Supply chain collaboration is defined as "two or more chain members working together to create a competitive advantage through sharing information, making joint decisions, and sharing benefits ..." (Simatupang and Sridharan, 2002).

Successful Application

Many organisations eventually undertake loosely coupled supply chains because there is a lack of trust and partnership in the formation of very well integrated supply chains. Tight coupling remains very unattainable during actual implementation as both parties refrain from establishing dependencies on one other (Elmuti, 2002). In addition, loosely coupled supply chains require resources, management involvement, lengthy negotiations, detailed contracts and extensive monitoring of trading partner performance (Balasubramanian and Tewary, 2005).

Steps to Successful Application

- Recruit participants into process network.
- Structure appropriate incentives for participants and encourage increasing specialisation over time.
- Define standards for communication and coordination.
- Dynamically create tailored business processes (involving multiple service providers) to meet customer needs.
- Assume ultimate responsibility for end product.
- Develop and manage performance feedback loops to facilitate learning.
- Cultivate a deep understanding of processes and practices to continually improve quality, speed and cost-competitiveness of network.

Brown et al. (2002)

Hints and Tips

- Creating a loosely-coupled supply chain requires a range of different skills (Brown et al., 2002).
- Strong corporate/industrial culture is not likely to be in favour of loosely-coupled collaboration (Karuranga et al., 2008).
- The supply chain must be a good observer and manager of performing networks. Competence at the job would directly depend on the in-depth understanding of how networks operate (Brown et al., 2002).

Potential Advantages

- Only companies that are following the loosely-coupled paradigm today can operate as networked companies (Brown et al., 2002).
- What is very important today is to focus on the management of processes and not how to structure, monitor and revolutionalise one's supply chain by using technology (Brown et al., 2002).
- Loosely coupled, also termed as orchestration, can benefit every company even if they transform only one or two tightly coupled processes into a loose one simply because it will help them to learn the skill of orchestration (Brown et al., 2002).

Potential Disadvantages

- Very few companies are able to switch to a loosely-coupled supply chain model as it requires the re-alignment of the entire organisation (Brown et al., 2002).
- It is difficult to achieve success in integrating collaborating participants in the supply chain because different companies have different goals. For example, the retailer is looking to increase the variety of goods, while the manufacturer is aiming to reduce production costs (Baiman et al 2002).
- While it is believed that a tightly-coupled relationship between buyer and seller would mean more profits and higher competitiveness, for the purchasing manager the doubt persists and for the buyer there is the loss of flexibility (Spekman 1988).

Performance Monitoring

- Assessment of the collaboration level between supply chain partners: qualitative assessment identifies the close class of collaboration level that B2B belongs to (Karuranga et al., 2008).
- Impact of particular B2B collaboration on supply chain performance: empirical assessment through a five-point scale that evaluates the adoption level of a set of specific collaborative practices (Karuranga et al., 2008).
- Quantitative index of collaboration: a three-dimensional network based on information-sharing, decision synchronisation and incentive alignment (Karuranga et al., 2008).

Case Studies

- A trading company in Hong Kong, Li & Fung, doesn't manufacture any product but orchestrates the goods produced by others by making use of its global network for European and American clothiers. Li & Fung gain efficiency through their supplier's specialisation. Since the 1990s the company has had a 30% increase in return on equity (Brown et al., 2002).
- Dell, who started out as a hardware manufacturing company, has transformed its supply chain to a loosely-coupled model. This allowed the company to reduce its infrastructure by 200 servers, 20 networks, 20 data centre racks, 10 databases and six terabytes of storage. The new supply chain strategy was a great success and registered a profit of 58% in the first year of implementing the strategy in 2010 (Clapperton, 2010).
- As an element of the loosely-coupled supply chain model, Procter & Gamble involved all its stakeholders in its innovation process. The R&D teams worked with the information received from users, partners and other parties, leading to a 35% increase in production of new products and a 3.4% reduction of R&D costs (from 4.8%) in 2006 (Huston and Sakkab, 2006).

CIPS Source Downloads

- CIPS: Supply chain vulnerability
- CIPS: Collaboration Between Organisations
- CIPS: Partnering

Further Reading/Reference

Web Resources

- P&G supply chain collaboration http://hbr.org/2006/03/connect-and-develop-inside-procter-gambles-new-model-for-innovation/ar/1
- Dell creating loosely coupled supply chains http://www.information-age.com/it-management/outsourcing-and-supplier-management/1261013/dell-outsources-its-supply-chain-reinvention
- Supply chain collaboration: Transport http://www.ft.com/cms/s/07566cb8-9400-11dd-b277-0000779fd18c,Authorised=false.html?_i_location=http%3A%2F%2Fwww.ft.com%2Fcms%2Fs%2F0%2F07566cb8-9400-11dd-b277-0000779fd18c.html%3Fsiteedition%3Duk&siteedition=uk&_i_referer=#axzz1kYqy4zxi

- Advantages of highly integrated supply chain http://smallbusiness.chron.com/advantages-tightly-integrated-supply-chain-37115.html
- From tightly coupled to a dynamic demand-supply network http://www.industryweek.com/articles/the_death_of_the_supply_chain_18600.aspx

Books

- Introduction to Computational Optimisation Models for production Planning in a Supply Chain. Stefan VoR & David L Woodruff, ISBN 978-3642067556
- Life Cycle Management in Supply Chains, Toru Higuchi & Marvin Troutt ISBN 978-1599045559
- Competing in Flat World, Victor K.Kung, Willaim K. Fung, Yoram (Jerry) R. Wind, ISBN 978-0132618182
- New Supply Chain Agenda, Reuben E.Slone, John T. Mentzer & J.Paul Dittmann, ISBN 978-1422149362
- Essentials of Supply Chain Management, Michael H. Hugos, ISBN 978-0470942185

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Video

Prof. Richard Wilding on supply chain collaboration
https://www.youtube.com/watch?feature=player_embedded&v=K68zKQFRmec

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