ROLE OF SUPPLY CHAIN VISIBILITY IN COMPETITIVE ABILITY

Petr NOVOTNY

ŠAVŠ, Mlada Boleslav, Czech Republic, EU, novotny78@hotmail.com

Abstract

In our globalised world today, in which companies increasingly compete with one another not only on their products that may be manufactured anywhere on the planet, but undoubtedly also on their functional and flexible supply chain and its visibility. Owing to unpredictable catastrophes on the opposite side of the Earth, or due to bad planning of its customers any producer may be affected – through a chain of mutually interconnected suppliers – by supply shortages. Here information systems and the ability of the whole system to identify, in real time, the situation of the required material play an irreplaceable role. Following correct identification, the next condition of successful delivery is material flow control. The company that can be considered as the winner is the one that – thanks to its high flexibility and visibility of its own supply chain – is capable to inform its customers in real time while being ready to offer them the best alternative solution if necessary. The aim of this article is to characterise individual features of the supply chain visibility problem, proposing systemic solutions employing available technologies as well as standardised processes.

Keywords: SCM, Visibility, Technologies, Competitive ability.

1. INTRODUCTION

This paper deals with the problem of supply chain visibility, and with specifically distribution centres that anticipate the role of the final link in the chain. In the globalised contemporary world, in which companies increasingly compete with one another not only on their products that can often be manufactured anywhere on the planet, but also on their perfectly operating and flexible supply chain and its visibility (see Fig. 1). The main goal of most companies that wish to maintain their market-leader position consists in achieving a high level of customer services and the maximum possible elimination of the costs of those activities that are not regarded by clients as added value. In the majority of company business plans, both shareholders and the management expect their firm to grow, cut down material procurement costs, shorten delivery periods and reduce costs throughout the production process. Correctly set processes within the supply chain, along with the use of suitable technologies, constitute one of the crucial tools to facilitate these trends.

![Fig. 1. Information visibility across whole SCM](image-url)
2. SUPPLY CHAIN COMPETITIVENESS

In order to improve a company's competitive ability it is first necessary to map out the supply chain and the linkages of its individual, mutually interconnected components (see Fig. 1). Sharing information across the entire supply chain considerably improves its visibility while reducing the "bullwhip effect" and its impact on production in course as well as stock material at all stages of the supply chain. The visibility of the supply chain is the keystone for the adoption of any further measures aimed at optimising the whole process. Such measures cast a direct influence upon both the massiveness and risk management within any given supply chain; they also influence its reactivity period and, last but not least, the sustainability of the measures adopted and the chain stability. Figure 2 shows the extent of employment of all the above-mentioned processes that could be arched over as a degree of maturity of a particular supply chain with a direct relation to its competitive ability.

![Fig. 2. Maturity of SCM](image)

3. SUPPLY CHAIN VISIBILITY

Supply chain visibility means the traceability of products within the course of their transit from the manufacturer or supplier to the final destination. Visibility, control and a high degree of flexibility (i.e. the chain’s ability to provide immediate response) of the supply chain are critical to ensure that a final product reaches the right destination in the right amount and at the right time. This paper looks into the problem of supply chain visibility, and also addresses the issue of a specifically distribution centre that anticipates the role of the final component of the chain, dispatching goods straight to customers; as such it has an obligation to carry out timely forwarding while being measured in terms of on-time dispatching and on-time to request (OTTR hit) performance.

![Fig. 3. Bullwhip effect](image)
Viewed in its integrity, the supply chain may – depending on the nature of the manufactured product – contain several suppliers in an interrelated sequence. Hence, it can be said that the length itself of the chain, in which every supplier’s relation toward himself is that of supplier - customer, often correlates with the length of the delivery period as well as with the response time that is enormously important and can frequently be crucial, notably in the context of a non-linear demand and a higher-level customer service to be provided while maintaining stock within the whole system. The bullwhip effect (see Fig. 3) in case of insufficient supply chain visibility complicates the transmission of client’s demand up to the end source of raw materials.

3.1. Distribution centre

The entire process, i.e. acceptance of goods for storage, incoming goods inspection, storage, receipt of an order from a client, removal from storage including a detailed analysis, consists of yet many other partial operations that involve huge amounts of human labour and are thus vulnerable to the occurrence of potential divergences from the desiderative outcome. On the example of a distribution centre serving suppliers of aeronautical components that had been analysed within this particular case study, it was found that goods to be delivered to a client who may need it urgently, had to wait in line in the goods acceptance area for up to forty-eight hours to be gradually accepted. The only clue here is using a full list of components and the precise number of boxes containing consolidate goods; such inventories may be extremely long which makes it necessary – when there is an acute need of finding an incriminated component – to carry out a manual search which can easily take a few hours without being adequately effective. At this point, a possible way out consists in the implementation of Radio Frequency Identification (RFID) solutions that will activate incoming goods within the system immediately after its acceptance, considerably increasing the productivity of manual acceptance of goods for storage.

3.2. Supply chain

Visibility across the whole supply chain is the basis for all additional project cost savings initiatives. Reducing all costs related to stock and simultaneously ensuring customer satisfaction.

- Abatement in stock keeping
- Improving the efficiency of resource management (humans, machines, warehouses etc.)
- Enhancing the capacity to respond to client requirements
- Acceleration of processes
- Streamlining communication with key customers
- Improving efficiency of the fulfilment of client claims
- Giving precision to the value process

![Fig. 4. Actual Global Supply Chain](Fig. 4. Actual Global Supply Chain)
Each of the two cases manifestly has a very different solution. However, the requirement for the improvement of the visibility factor is common to both of them, led by a shared objective of achieving higher competitiveness of the supplier solution as well as providing clients with higher level services while minimising costs.

4. RFID

One of the rapidly evolving technologies permitting to establish visibility within the supply chain is RFID. Strategic application of the RFID technology to business problems and data leveraging has a potential to optimize critical processes, enhance business intelligence, and improve collaboration across industries. (Klein, 2006) RFID, which stands for Radio Frequency Identification, is an automatic identification method based on the use of radiofrequency waves. Far from being unknown to the world of logistics, this method was first pioneered by the department store chain Wal-Mart, which had been testing it early during the 1990s. At the present time, the use of this method has been on a rise; it has primarily been implemented into storage, logistics and manufacturing processes. The main advantage of this technology, in contrast to optical codes, is the possibility of contactless scanning, i.e. remote reading. Moreover, the information-bearing tag need not be visible. This means that, for example, several packing cases placed on a pallet can readily be identified within a mere second without the necessity of scanning each of the boxes separately.

Fig. 5. Scheme of Distribution Centre using RFID

The basis of this technology is a chip, or a tag, on the one hand, and a tag reading system, or a wireless station, on the other. Tags can take on various forms, dimensions and shapes. Today, we may even happen to come across them when doing our shopping at an ordinary supermarket. What matters here, though, is the fact that besides a chip every tag also contains a transmitting aerial that is interconnected with this particular chip.

5. CONCLUSION

The next step to be taken by manufacturers is to improve their operations performance and effectiveness in areas such as control systems, tracking, quality, maintenance, and visibility. Furthermore, as automotive or aerospace companies tend to outsource more and more of their manufacturing processes, there is a greater need for real-time visibility, speed, and accuracy in dealing with demand fluctuations and supply chain disruptions. The ability to make right decisions on short notice in order to coordinate a complex array of
activities among various partners is of great importance. This has a major influence on a company's productivity, profitability, and its ability to stay competitive in the long run.

**LITERATURE**


