

OVERVIEW OF SUPPLY CHAIN MANAGEMENT CHALLENGES

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Purpose: The article aims at presenting possible challenges faced by supply chains in the upcoming years.

Design/methodology/approach: The article employs analysis of the literature on the subject.

Findings: As a result of the critical analysis of the literature, the authors have highlighted what they consider to be the most significant challenges facing supply chain managers in the coming years. These include meeting increasing customer demands for on-time delivery, the skillful use of new technologies and an increasing emphasis on environmental issues in supply chain management. These are challenges arising from changes in the business environment. The last few years, and many examples of broken supply chains, have shown that changes in the way we think about how supply chains operate are required in many areas. Trends in the environment are forcing the challenges listed above to be addressed urgently. These challenges are closely interconnected. For example, changes in purchasing behaviour are also increasingly concerned with environmental issues, which translates into the need to 'green' supply chains. Also, customer expectations for greater visibility of processes in supply chains and increasing pressure to deliver as quickly as possible (which is linked to the growth of e-commerce), are driving the need for new technologies, including automation.

Research limitations/implications: The authors have focused on the most important trends and challenges and the article certainly does not cover all the topics studied. It is to some extent a subjective selection made by the authors. In addition, it should be noted that dynamic changes in the environment may influence the emergence of new challenges that are not presented in the article.

Practical implications: The supply chain management challenges presented in the article may be of interest to those responsible for the operations of supply chains within companies.

Originality/value: The article is a subjective indication of the most important trends in supply chain management and stems from a review of the literature on the subject. Although the issues analysed are present in other research papers, here we have the authors' choice.

Keywords: supply chain management, smart logistics, GSCM.

Category of the paper: Viewpoint.

1. Introduction

Supply chain management has progressed from a theoretical concept to a widely accepted practical paradigm. Since the increased opportunities for information exchange thanks to the development of the Internet, companies have been keen to use the concept of supply chain management and, despite implementation difficulties, its popularity has grown. This was due to the increasing complexity of inter-organisational linkages, particularly for multinational companies. In a globalised world, proper supply chain management can give a competitive advantage. At the same time, it should be noted that there are many risks and threats to the operation of supply chains in the modern world.

This article aims to identify trends in the functioning of supply chains and also to present the most important challenges in the coming years. The rationale for the article was the changes in the turbulent business environment, which have greatly influenced the way we think about the functioning of supply chains in the future. Using a critical analysis of the literature on the subject under study, the authors sought to identify the most likely trends and resulting challenges for supply chain management.

2. Supply Chain Management

Supply chains are an integrated network of entities responsible for supply, manufacture, storage, and distribution of goods and materials. The entities making up supply chains are suppliers, manufacturers, distributors and logistics operators. Supply chains can differ in terms of size and complexity depending on industry specifics (Simchi-Levi, 2005; Chopra, Meindl, 2012).

In an increasingly competitive environment, companies have realised that success can be determined by a well-functioning supply chain according to the principle that the weakest link can affect the whole chain. This leads to the notion of managing the supply chains in order to improve the flow of goods and information.

Supply chain management is the management of relationships with suppliers, customers and clients to ensure the highest customer value at the lowest cost for the entire supply chain (Christopher, 1998).

Supply chain management is aimed at orchestrating intra- and inter-firm activities to create integrated and synergistic relationships. These linkages in the supply chain, can be defined as the “explicit and/or implicit connections that a firm creates with critical entities of its supply chain in order to manage the flow and/or quality of inputs from suppliers into the firm and of outputs from the firm to customers (Rungtusanatham et al., 2003)”.

The management of supply chains must ensure the efficient coordination of cooperation between partners in the chain. Effective management of supply chains should lead to a stronger competitive position for companies.

Through supply chain management, companies are able to develop a number of benefits such as increased customer service, greater responsiveness to market demands, the ability to anticipate changes in consumer demand, better inventory management and others.

3. Key trends and risks in the environment

Factors that may influence the functioning of supply chains are of endogenous and exogenous character. The former may include inter-organisational cooperation and communication, supply chain design and objectives, how the supply chain is integrated, inventory control techniques and methods and others. From the point of view of this publication, exogenous factors seem to be more relevant. These include the international environment, the megatrends shaping this environment, the impact of customers and their power as well as changes of a technological nature (Wincewicz-Bosy et al., 2017).

Walters (2006) looks at factors and risks affecting supply chains in a similar way. Internal factors mainly depend on relationships with customers and suppliers while external factors are related to the economic, political, social and natural environment.

In today's globalised world, supply chains are increasingly complex. The longer international supply chains are, the greater the risk of disruption. In theory, companies have always been aware of these risks, but the Covid-19 pandemic has made the need to be flexible crucial if they want to be competitive. Other events such as the problems with the Suez Canal and the war in Ukraine further influenced the creation of disruptions along supply chains and caused many companies to take risk management more seriously. As a result, companies will need to rethink the configuration of their chains.

In order to properly control the supply chain, companies need to be able to locate their materials and products. Visibility in the supply chain is becoming a key challenge. At the same time, new technologies mean that companies are able to collect and share real-time data, which should translate into a faster response when problems arise. Technological possibilities are increasing, but often companies do not fully know how to use particular techniques. There is a need to develop coherent strategies for operating in the new digitized chains.

Climate change is undoubtedly one of the most significant problems the world faces today. This inevitably also applies to logistics processes and the functioning of supply chains. Companies are aware of this and have been taking actions of greening their supply chains for years. Now environmental practices can prove to be a competitive factor. At the same time, it is a major challenge from the point of view of companies. It is related to a number of issues

such as new packaging methods, optimisation of transport routes and the use of renewable energy.

The above considerations may lead to the conclusion that the most important trends on the basis of which supply chains must be modified are:

- consumer pressure and increasing demand on the availability of goods and on companies to reduce their environmental impact,
- the increasing importance of visibility of all processes in supply chains due to the unpredictability and disruption of flows in the chains,
- the development of technology and the growing amount of data that can be used to improve supply chain operations.

4. Major challenges of supply chains

Supply chain management has become a source of competitive advantage for many companies, especially larger ones. However, in addition to the benefits, there are risks and challenges associated with it. These are largely due to the trends and phenomena emerging in the corporate environment outlined earlier, which must be taken into account in the coming years. Of course, there are many more challenges, but for the purposes of this publication, the authors have focused on the most important ones after analysing the literature sources. At the same time, it is important to be aware that changes in the environment can very quickly make new challenges, that are not currently identified, emerge.

As noted earlier, one of the challenges arising from changes in the market is dealing with increasing customer expectations in terms of service quality. Logistics customer service has always been treated as a factor to increase competitiveness in the market (Yazdanparast et al., 2010). Emmet (2007) briefly defines customer service as the ability to continually exceed customer expectations.

Today's consumers are increasingly exacting about service levels and delivery times. Thus, logistics processes are becoming more and more important and need to take into account the increasing demands of customers. This applies to both business customers and end customers and their sales experience.

The development of e-commerce has accelerated significantly in recent years and has made anticipating market changes even more important. Online shopping has also become popular among people who have not previously used this form. This has caused, and will continue to cause, difficulties related to increased demand and rising consumer expectations in terms of delivery times.

Companies, if they have not already done so, need to ensure the visibility of all processes in their supply chains. This applies to both transports, where visibility of shipments is crucial to notify customers about delays and take appropriate action in the event of problems, as well as to flow of goods in warehouses.

Many authors (Shahin et al., 2020; Khanchanapong et al., 2014) indicate that increased use of automation improves outcomes such as delivery times and costs. Companies will increasingly have to try to automate their processes. This has been identified for many years as a future trend in line with the concept of Industry 4.0. New technologies such as blockchain, artificial intelligence, automation can make operations in supply chains more transparent and visible and the chains themselves are already likely to become more resilient and flexible. Technological advances can increase productivity, save time and reduce the risk of errors, thereby reducing costs. This is particularly true of automation and robotisation in packaging, labelling or warehouse operations. Furthermore, the labour shortage problems during the pandemic have influenced the increased interest in automation processes. Of course, there are more new technological developments.

Some of industry 4.0 technologies include Blockchain, Big Data Analytics, Internet of Things and Cloud Computing. DHL identified six technologies that will cause significant changes in logistics by 2030 (Ecommercenews, 2016). They are: Big Data, Sensor Technology, Augmented Reality, 3D printing, Robots, and Drones. Some of the solutions are already implemented by companies, however, companies will try to use new solutions on a wider scale, especially as some of them are relatively cheap (e.g. cloud computing). According to the Capgemini report (2021), 66% of organisations anticipate significant changes in their supply chain strategy over the next three years in terms of the use of modern technology. This is due to market disruption and difficulties with demand planning and the associated risks.

The ever-increasing amount of data available through the IoT, among other things, will require insightful analysis which should facilitate better planning in supply chains. Access to data and also the ability to use and analyse it appropriately can make the supply chain more efficient and effective.

Successful organisations must be effective in the areas of customer service focus and information management. But another important theme linking the previous two is the growing importance of environmental issues in supply chains. Paying attention to the environment is increasingly becoming a requirement for long-term profits and also for ensuring the quality of resources in supply chains (Krejci et al., 2010). Focusing on environmental issues in supply chains operations balances market demands and environmental needs, while at the same time being important in terms of increasing customer demands and environmental awareness. This raises the significance of green supply chain management (GSCM) topic. Although the origins of the green supply chain concept date back to the early 1990s, an increase in interest from academics is noticeable after 2000 (Ming-Lang et al., 2019).

Andic et al. (2012) consider GSCM to be efforts to minimise and preferably eliminate any negative environmental impacts of supply chains. According to Zhu et. al. (2005), GSCM is "an important new archetype for enterprises to achieve profit and market share objectives by lowering their environmental risks and impacts while raising their ecological efficiency".

Many countries and international organisations are recommending closer attention to environmental issues. For example, the European Union (2011) has emphasized the importance of sustainable development for years, also in the context of transport, as a factor shaping future development.

Environmental changes will be reflected in new legislation. It may be that companies that pollute less will be given a premium in terms of winning new contracts. It is important to be aware that regulations concerning, for example, emission reductions will have a significant impact on the initial increase in operating costs for companies.

Of course, environmental action in supply chains is currently undertaken mostly by large companies (perhaps some of whom see this as part of building the image). However, over time, smaller companies should emulate the larger ones in terms of environmental standards based on their experiences (Ming-Lang et al., 2019). Over time, smaller companies will increasingly contribute to offsetting environmental negatives.

At the same time, despite a growing body of literature on sustainable supply chains, there is a need to develop new models and methods to implement new solutions (Roy et al., 2018). Thus, the challenge for companies will not only be to rethink the functioning of their supply chains and integrate environmental aspects into their operations, but also to adopt specific models to make such a change (Surmacz, Wierzbinski, 2019).

5. Conclusions

Presented from the authors' point of view, the three most important challenges for supply chains could be summarised by the term smart logistics. According to Lee et al. (2016) smart logistics is aimed at solving problems such as increased vehicle fleets, transportation networks, and increased delivery demands. Therefore, smart logistics helps to satisfy customer expectations along with meeting environmental goals using different ICT tools and techniques. It will be the task of those managing supply chains to reconcile these issues. New technologies can help to meet customer expectations and at the same time have a positive impact on environmental issues. Hence, the challenges of managing supply chains are interlinked and the ability to deal with them will affect the effectiveness and efficiency of supply chains.

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