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GAINING COMPETITIVE ADVANTAGE BY DEVELOPING LOGISTICS SYSTEMS

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Abstract: *The circumstances of the last decade (such as the catastrophe of September 11, 2001, the Ebola virus, the global drought or flooding, often as an answer to climate change, and the most recent, the COVID-19 global pandemic) the effects of which are still felt, have shown that both companies as well as, entire logistics systems and networks (Supply Chains (SC)) were not in any way prepared to handle this kind of events and situations, and the consequences are devastating for all involved and the global economy as a whole. Some of these effects will still be felt in the years to come. Moreover, while, up to recently, it was the individual companies that competed among themselves, today, due to the globalisation phenomena, entire supply chains compete. The internal logistics, the internal SC of a company has expanded into an external SC among companies (Vgl. Geimer (2005), S. 38.). In the course of this development, the risks, that were previously faced by individual companies and now endanger entire SCs, have changed and, thus, require new approaches. The tools used for Risk Management in an individual company are no longer sufficient in monitoring the entire SC. It is, therefore, mandatory to develop new concepts and tools which, holistically, can serve to support risk management in the SC.*

Keywords*: internal logistics, logistics systems, logistics networks, competitiveness, globalization.*

JEL CLASSIFICATION: P13

Efficient management of logistics networks is regarded as a very important topic nowadays. This can be illustrated by an example where poor management of logistics networks has had considerable negative consequences, not only on the individual company. For example, in the case of the 2004-2005 influenza epidemic in the US, the country suddenly faced a bottleneck in the vaccine chains, as a result, there was a shortage of about 50 million doses. Efficient management of the logistics network, providing this bottleneck was not considered, could have sorted the issue in a short time (Burt (2006), p. 17).

One effect occurring in most markets, locally, regionally and internationally, is their intensification in recent years. Among other things, this would mean that, from the customer's point of view, the products should be available anytime and anywhere. The main reasons are the growing societal demands and the rapid technological progress. Today, the main concern of Supply Chain Management (SCM) is to meet customer demand as quickly and as flexibly as possible. This is based on the assumption that customer satisfaction is equally dependant on the end link in the logistics network and the performance of the entire network. The motivation of companies to merge their capabilities into a logistics network and build a common management system is, therefore, aimed at aligning their activities within logistics chains as efficiently as possible, and adapting to customer requirements. The so-called "Efficient Consumer Response" (ECR) could be the solution. The goal of the ECR is to use vertical integration (cooperation) strategies to streamline processes between companies and thus meet the customers' increased requirements. Similar to Customer Relationship Management (CRM), the ECR is part of Supply Chain Management (SCM). If, for example, the prerequisites for an ECR are met, they also serve the SCM. The most important prerequisites in the ECR, as well as in the field of IT and EDP, are based on extensive process analysis.

Companies are increasingly turning to international procurement markets. One of the consequences is that, on the one hand, their added value is reduced, and, on the other hand, the development of the business networks is achieved. Often, the complexity of the logistics chain increases due to offshoring (relocation of business processes to (typically) lower-cost foreign locations, such as Asian or East European). Market success increasingly depends on successful cooperation. As a result, companies need to focus more on their core competencies to remain competitive in saturated markets. The prerequisite is the creation of complex business networks. The efficient partnership allows for the planning, management, control and maximum optimization of the entire logistics network - from the end customer to the sub-suppliers of raw materials.

Moreover, the increasing complexity and diversity of the product due to the growing demands of individual customers and the short product life cycles can be considered as a particular reason for the efficient management of the entire network. Generally, an active transition from the seller's market to the buyer's market can be observed. In addition, the phenomena that play an important role are the rapid technological progress, the diversity of organizational structures, processes and IT solutions, as well as the increasing globalization of markets and value chains.

The change in perspective from individual ownership, "independent" companies to development and action as a network, is also evident from the fact that in the past, certain departments of a company divided work processes aiming at increasing productivity, today, the same effect must be achieved by division of labour among "independent" enterprises.

Some authors briefly define the task of SCM as the coordination of the flow of goods throughout the network. The high level of efficiency within the systems is achieved only if all physical flows circulate without any impediments within the network of "individual" enterprises. This immediately leads to the need for network interface monitoring. If the managers of the involved companies have "isolated" thinking, unnecessary resistance to overcoming interferences arises. An important term that is often used in this context is "vertical cooperation". This involves cooperation at several successive stages of the supply chain and concerns the interface issue, in particular. The process is registered within individual companies, however, it mainly concerns the different levels of the SC.

SCM should develop strategies and concepts by which disruptions in the logistics network, such as fluctuations in consumption orders, supply gaps, inaccurate sales forecasts and non-compliance with delivery deadlines, can be eliminated or avoided in the long term despite high inventory levels. The choice of SC strategies and tools is based on the strategic direction and SC objectives, and overall on its complexity, the type and intensity of cooperation with the customers and suppliers, the final product and customer requirements. By applying different strategies in the SC, two different directions can be identified, one of which is the efficient (weak) SC Strategy that is primarily aimed at high capacity use and is mainly applied when there is a stable, predictable demand and limited options. The supply chain is managed according to the PUSH principle. If, on the other hand, the demand fluctuates or the product life cycles are rather short, a responsive (agile) SC is often chosen. In this case, instead of high capacities use, the focus is on shorter delivery times and maximum flexibility in the production process. Based on this strategy, the network is managed according to the PULL principle. In addition to the materials flow, as in the case of logistics management, the SCM must also ensure a safe and fluent information flow throughout the SC. Moreover, unlike classical logistics, much more far-reaching tasks are established, because SCM, unlike logistics management, is much more strategic and the business processes are viewed from a holistic perspective and not just from the perspective of pure logistics.

At the emergence and coinage of SCM as a concept, only two flows were considered, namely the *material flow and the information flow*. However, in recent years, the importance of

the *third stream has increased,* gently moving to the foreground, namely the *financial flow*. This plays a particularly important role in SC risk management, since all the risks that arise usually negatively impact the finances of the companies involved.

Material flows have already been optimized in many SCs, leaving few opportunities for improvement. It, therefore, makes sense to discover and exploit the previously unknown hidden potential in financial flows. Only a holistic view of all SC flows and the financial flow inclusion could guarantee processes optimization and is, therefore, decisive for the overall success of the SC.

The enormous importance of these considerations is proven by the fact that several independent terms have been coined and researched in the specialised literature, thus, giving rise to an increasingly wide-ranging discussion. The first publications on this topic can be found beginning with 2002.

As for the definition, one can distinguish the terms of Supply Chain Finance or Financial Supply Chain, which, however, are sometimes used as synonyms. In very general terms, Atkinson defines the financial side of the SC as the flow of money, highlighted to support the materials flow (Atkinson (2006)).

Pfaff et al. define "Financial Supply Chain" as the ensemble of all processes that are involved in the financial flows in the SC. As a result, "Financial Supply Chain Management" handles the management of these processes from the qualification process to financing and invoicing, to customer payment. In turn, the term "Supply Chain Finance" should be regarded as an element of Financial Supply Chain Management and comprises the financing tools within the SC. Supply Chain Finance can be supported by banks or financial service providers. On the one hand, this outsourcing causes additional costs. However, on the other hand, it makes it possible to avoid labour costs in the SC, and provides the advantage of accessing expert experience and knowledge, which are not often available in current SCs, facts which usually outweigh the costs.

One of the tasks of the financial service provider is the early control of the flow of money. The main task is to generate transparency in all payment processes and optimize their management and control. Due to financial processes transparency, extensive and controlled information exchange within the SC, the risk costs can be reduced, and, therefore, significantly improve the cash flows. The focus here is on the planning, management and financial control along the value chain. One of the objectives is to reduce funding costs throughout the SC. In addition to minimising costs, a fair distribution of finance costs and profits must also be ensured.

The advantage of successful Financial Supply Chain Management lies in the discovery of the optimization potential for value chain actors. Furthermore, the objective of Supply Chain Finance is, among other things, to increase current assets or cash flow in the network to create a flexible financial domain. To reduce the working capital, the borrowing of funds and costs, as well as the outstanding debts should be reduced.

In Financial Supply Chain Management, as in higher-level SCM, the main focus is on the end customer. All services are aligned with it and the client is involved in optimizing financial processes, for example via credit checks. As in the case of SCM, IT and innovative technologies are regarded as decisive success factors for SC financing, by synchronizing the financial flows of the companies involved. For example, costs can be reduced by automated invoicing or IT-supported monitoring of financial processes.

According to Harland C. M. (2006), the other tasks of the SCM include the selection of network partners, resource and tasks allocation, network cooperation regulation and finally the evaluation of all companies and relationships in the network. If the final product is characterized by a short life cycle and demand fluctuations, the network management must follow and monitor the inherent dynamics of the SC. Generally, the SCM deals with stock reductions, all interfaces coordination and the synchronization of previously unconnected processes.

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In short, the tasks of the SCM consist in the control of the SC structure, the cooperation and communication between the participating companies and the optimization of the three flows of the SC.

The merging of several individual companies into one network has multiple advantages. On the one hand, a cost reduction can be achieved by lower storage and operating costs and optimized coordination between process participants. On the other hand, improved order processing, optimized business processes and shorter delivery times generate time savings. All parts of the unimportant, low value-added processes are reduced and the important components are automated. In addition, the early warning system can be improved and the capacity bottlenecks can be prevented by continuously updating fault information. This reduces the number of bad decisions in each of the companies involved. An improvement in customer satisfaction results from enhanced compliance with deadlines, accurate delivery times, which come as a result of optimizing long-term order processing. Moreover, integrated information and communication processes can be used to quickly respond to changing customer needs.

If the positive effects are to be measured by using key figures, which can be further divided into three categories: *cost, time and quality advantages*. It has been found that all these positive effects generally occur regardless of the SC industry.

The observations on the practical results have shown that in a successful SCM, by reducing stock up to 60% and the production times by 50%, a 30% increase in customer satisfaction can be achieved. However, this potential for improvement can only be exploited by implementing holistic thinking in all the companies involved and by integrating these individual companies into a single SC.

The successful SCM must be preceded by a fundamental change in the employees' critical thinking in all the companies involved. This comprises the holistic employee experience that goes beyond the boundaries of their own company and includes the entire SC.

Furthermore, several other requirements must be met so that the SCM functions successfully. This includes a uniform IT system with standardized interfaces. This allows for the smooth transfer of relevant information and reduces unnecessary expenses.

Since the number of SCs has increased in recent years, as well as the number of companies in a network, the network structure is more complex and manageable. For this reason, a well-established network structure and operation is imperative. The SC managers must ensure the transparency of all material flows and allocate individual areas of responsibility. Furthermore, information transfer and management must be established to avoid redundancies or errors due to poor provision of information.

All types of resources play an important role in the SC, thus, good resource management is required. This encompasses transparency and a constant overview of the available resources needed for the value chain, such as material, staff and space. This is subject to stocks (inventory) management. On the other hand, the resources in the SC must be distributed among all the parties involved. The objective of the management and distribution of SC resources is again governed by expenditure reduction. To support resource management in logistics networks, some research tools have been developed. For example, we would mention the cost of the process based on the available resources.

Another prerequisite for the comprehensive management of the SC is the choice of the right partner since this can be the decisive criterion for the success or failure of an alliance of companies. Here, the strategic company direction is of utmost importance. The strategies pursued by potential partners should match those of their own company, otherwise, a mutual blockage may occur. In this regard, the objectives and strategies must be openly discussed and presented during the first negotiations on the possible cooperation in the SC. In addition, the description of the long term actions to achieve the set goals should be determined during the

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discussions, as the opinions may differ. Finally, both their skills and those of potential partners need to be critically assessed and weighed. Overall, strategy management in a network usually consists of the following steps: Strategic Analysis, Strategy Formulation, Strategy Implementation and Strategy Control and Coordination.

CONCLUSION

Individual network partners should be able to identify the effects of their internal decisions on the whole Supply Chain. Furthermore, the network partners must be willing to temporarily give up on their advantages in favour of the SC. In the long term, however, a compromise for all involved parties is to be sought, thus, promoting a win-win relationship. The ability to work in a team and the willingness to cooperate with all involved is a prerequisite in obtaining a competitive advantage via developing logistics networks, regardless of the industry. Moreover, the company managers will solve the internal issues and will take responsibility for the entire logistics chain and/or network, thus, adjusting the measures and strategies implemented.

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