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COMPETITIVE ADVANTAGE IN COST SENSITIVE GLASS PACKAGING INDUSTRY THROUGH OUTBOUND LOGISTICS

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Abstract

Achieving and maintaining a long-term competitiveness is one of the key prerequisites of a sustainable business. Companies put a lot of effort into enhancing different value chain activities in order to achieve it. Initially, manufacturing companies were focused inwardly on increasing efficiency of tightly controlled logistics activities. When those opportunities were exhausted, the focus expanded beyond the firm boundaries through establishing trust-based relationships with specialized logistics service provider (LSP) companies. The aim of this paper is to analyse a case of innovative outbound logistics practice within mature glass packaging industry. Due to relatively high weight and low utilisation of freight space, glass packaging is considered as unsuitable for long-distance transportation. With incrementally small developments in improvement of freight space utilisation, high transportation cost remains as one of the most restrictive industry level success factors. Based on a series of in-depth interviews with management personnel of a European mid-sized glass packaging producer, innovative approaches in its outbound logistics practices has been evaluated. Paper analyses the process of close cooperation between the manufacturer, customer and LSP which resulted in an innovative solution and optimisation improvements within the outbound logistics activities. As the findings suggest, close cooperation between stakeholders and customer co-creation contribute to the company's competitive advantage.

Keywords: outbound 3PL, customer value, value co-creation, glass packaging industry

1. INTRODUCTION

Traditionally, manufacturing companies were primarily devoted to optimizing inbound logistics and cost cutting within the supply chain as a primary path to superior

performance. However, with on-going development of a trust-based long-term relationships with customers, (re)focusing on the outbound logistics and development of innovative solutions together with logistics service providers (LSP) is gradually emerging as the new area through which companies seek to enhance market performance. A review of the literature reveals that third-party logistics and logistics outsourcing have meant different things to different people since the subjects first appeared in the academic literature in the late 1980s (Leuschner et al. 2014). The third-party logistics (3PL) is commonly referred as the outsourcing or contracting-out of multiple or all components of logistics that were previously organized in-house (Prockl et al., 2012). As the result of this development, third-party logistics service providers (3PLSPs) emerged. Giri and Sarker (2017) define a third-party logistics service provider as an independent enterprise who does not own the product(s) or service(s) but participates in the supply chain and provides logistics services under a contract to the manufacturer, retailer(s) and/or consumers of a product or service. The third party logistics and its alliance with the clients, therefore, play an important role in modern supply chain management. This way businesses are outsourcing part or all of their supply chain operations, and are able to reduce the burden of logistics activities in order to effectively reduce logistics cost and enhance customer satisfaction and overall performance. Maloni and Carter (2006) pointed out that three primary reasons for outsourcing logistics services are (1) service improvements, (2) cost reduction, and (3) a desire by the organizations that purchase these logistics services to focus on their own, non-logistics core competencies.

Outsourcing logistic processes became a general trend for the movement and storage of goods and information within companies' supply chains (Núñez-Carballosa & Guitart-Tarrés, 2011). The most recent annual studies found that over 54% of shippers' transportation spend and 39% of their warehouse operations spend were outsourced (Langley, 2012). Additionally, the use of a 3PL provider to take over some or all of a firm's logistics responsibilities is becoming more prevalent, and more than 70 % of companies in Western Europe, USA and Asia Pacific have logistics outsourcing experience (Hsiao et al. 2010). On the other side, Jiang et al. (2016) study found out that whether the cost sharing contracts perform well critically depends on chain members' unit profits. Only if chain members have sufficient profit margins to compensate the logistics cost of the 3PL provider, then the cost sharing becomes an effective strategy, and the cost sharing mechanisms enable the chain members' profits to increase.

In the US and Europe, 3PL has shown its great potential; it is now close to its maturity stage of life cycle. In Asian countries like China, Japan and India, 3PL is in the path of high growth stage. However, there has been a further evolution in supply chain outsourcing and it is called Fourth-party Logistics or 4PL because corporations are now looking for chain integrator, a single outsourcing partner who will assess, design, build, run and measure integrated comprehensive supply chain solutions on their behalf in a sustainable way (Mehmann & Teuteberg, 2016). For example HAVI Logistics has set up an extensive logistics network for McDonald's across Europe in order to be able to supply about 5,300 restaurants with quality food and packaging every day. 4PL is the new type of outsourcing in logistics services, of which the

appearance is not only on the basis of the development of IT, but also the application of the Theories about the Modern Division and Exchange Cost (Qiuping, 2011).

The aim of this paper is to analyze a case of innovative outbound logistics practice within mature and partially rigid glass packaging industry. Paper analyses the process of close cooperation between the manufacturer, customer and LSP which resulted in an innovative solution and optimisation improvements within the outbound logistics activities.

2. VALUE CREATION THROUGH OUTBOUND THIRD PARTY LOGISTICS

Long-term relationship characteristics between partner companies are continuously evolving from the aspect of lower or higher operational integration. The growing number of strategic alliances that companies are entering serves as a vivid reminder of numerous benefits that companies perceive materialising by engaging in deeper operational relatedness with their partners throughout the supply chain. However, as complexities rise, it becomes costly for companies to manage rising number of complex activities between them, hence the specialist companies enter into the relationship. One of the most common activities that these types of companies undertake within the supply chain are logistic activities.

Hertz & Alfredsson (2003) point to the fact that successful management of complex interfirm relationships up to the level of co-specialization serves as a prerequisite for co-utilization of resources and customer value creation in today's logistics activities. However, most of the studies focus mainly on studying logistics providers on standalone basis rather that as in intermediary in the context of their relationship (strategic and operational ones) with both supplier and buyer of products they carry.

The development path of logistics providers signals that closer integration with supply chain parties is increasingly the only pathway for successful long-term value creation by logistics partners (Wang et al., 2016; Hammervoll, 2014). Modern logistics providers have evolved through different phases of development to reach today's level of operations. Starting as mostly transport companies, they have expanded gradually through time the scope of services they offer to cater better to the growing logistics needs of industrial companies. As the scope of their activities grew, they have gradually transformed themselves into integral transport providers offering full scope of logistics services that industrial companies have previously undertook on their own and have now outsourced (Berglund et al., 1999). Next to growing in scope, advancing the quality of services offered also became a pressing issue for logistics providers. Often times, lacking the needed know how in a specific area, logistics providers have used specialized companies for specific tasks with the supply chain which marked the emergence of both 3PL and 4PL (Forth Party Logistics providers) companies.

Increased complexity of supply chains due to growing pressures for cost effectiveness and longer distances between the source and final destination of the goods, necessitated the need for closer cooperation (strategic level) and closer

integration (operations level) between the logistics provider and buyer and seller of goods in order to maximize value creation. Hertz & Alfredsson (2003) have specifically analysed logistics service providers with respect to two key dimensions: general problem solving capabilities and customer adaptation. Based on those two dimensions they differentiate logistics providers as: service developers, customer developers, standard 3PL providers and customer adapters. Last one being potentially most beneficial to supply chain parties but also most difficult to achieve considering the growing complexities within the supply chain.

Research points to numerous benefits of customized customer adapting approach in delivering logistics services. Tate (1996) pointed out many of the benefits of collaborating or establishing partner-like relationship with logistics companies. However, for those relationships to yield benefits they must be founded on a set of important pillars such as deeply understanding partner's needs, open communication and fairness and above all commitment and trust. Bowersox (1990) has listed similar benefits like previous researchers and has early on pointed to the need of constant management of partner relationship in order for the benefits to clearly materialize. Above other issues, he signalled out cultural factors as increasingly important for predicting success of the alliance. Management and advancement of alliance cooperation and alliance itself was recognized as another important goal that partners must devote resource to which means they must continually focus on two distinct goals within the relationship. One is to focus on partners' value creation and the other is to focus on developing partnership relationship with alliance partners. The complexity arises due to the fact that different set of resources and capabilities underpin successful delivery on each of the two goals.

Halldórsson and Skjøtt-Larsen (2004) focused their research exactly on the area of joint logistics solution generation between partners in the value chain and the competencies that need to be developed to achieve that goal. The essence of building the competencies for joint logistics solution generation and deployment is to manage relationship with a clear focus on development of learning processes as one of the key benefits of the customized deep-level alliance partner relationship. Development of specific expertise serves as a long-term base for value creation and the process of development of that knowledge will ideally contribute to building those much needed soft skills for managing partner relationships that will serve as a base for alliance management in the future (Sharma & Ghosh Choudhury, 2014).

Two important issues to recognize by analysing these foundation pillars of successful relationships are that they are relatively soft in nature. In other words, there is a need for the existence of types of skills that are more of inter-organizational and interpersonal in nature rather than technical. Additionally, for those type of pillars to develop it usually requires a long time through which partners assess the others side seriousness and trustworthiness in their approach.

Beyond the benefits resulting from the improvement in the dyadic relationship between the logistics provider and the industrial producer, research has identified that these benefits spill-over through the supply chain which make the entire supply chain more competitive. In the era of specialization and customization within the supply chain and between the supply chain partners, this means that external benefits accrue to other members of the supply chain as well. Using survey methodology, Kopaczak

(1997) discovered the potential for greater value creation by partners engaging in mutually dependent "restructuring" (in other words "customization") of their operations which results in streamlining activities across the entire supply chain. The biggest benefits identified by the study have been in reducing the logistics related costs and in improving the order cycle costs.

Bhatnagar and Viswanathan (2000) building on Kopaczak (1997) research provided the evidence of the benefits as predicted by Kopaczak through case study research of two large multinational firms' operations in Asia. Panayides and So (2005) have finally, from the position of the supply chain wide effects, established the case for benefits arising from the partnering relationship between an industrial (manufacturing) firm and logistics provider. They have shown that relationship orientation of supply chain partners (industrial firms and logistics provider specifically) which is conductive to organization learning, significantly positively influences the performance not just of the two respective firms but of the entire supply chain as well.

It can be concluded that the case for multiple benefits arising from strategic partnership between supply chain partners, namely industrial companies and logistics providers exist. Prerequisite for those benefits to materialize are facilitation of deep level of cooperation between supply chain partners which resides on soft skill based resources and capabilities and results in customizable solutions to unique logistics problems. Benefits of this approach do not accrue only to partners in dyadic interaction but permeate the entire supply chain and create positive external effects for other supply chain members.

Translating the practices aforementioned in previous paragraph in concrete benefits is practically not easy due to numerous external constraints, usually not directly related to the business partners. European space despite numerous integration processes is still characterized by significant diversity on national level that serve as a barrier to development of Europe wide partner generated solutions in logistics, national culture being one of them. Carbone & Stone (2005) provide evidence for prerequisites emerging among European economies that are conductive to implementation of partner like relationship in multinational supply chains with potential to create aforementioned benefits. Logistics industry in Europe is gradually but steadily through mergers and acquisitions reaching the level of consolidation where companies establish Europe wide national presence, which eases the implementation of cross-nation Europe wide partner based logistics solutions.

3. RESEARCH DESIGN

As the literature review revealed, partnership between suppliers and their clients is a complex construct significantly relying on both inbound and outbound logistics optimization. Due to each industry's specifics and various internal and external constrains, there are no universally applicable formulas for the supply chain optimization. However, even customised solutions can provide contribution to the overall body of knowledge within this area.

This paper tries to provide an insight into very specific logistic solution developed within the glass industry. Therefore, a qualitative methodology and case study method were selected to yield a high level of detail (Golic & Davis, 2012). The study presented in this paper is based on the findings collected over a sustained period of time through a series of in-depth interviews with the sales and logistics managers employed by a mid-sized glass packaging producer (i.e. a supplier) in its Croatian and Austrian subsidiaries. The data collection was followed by a qualitative analysis of the interview transcripts. Due to the complexity, the research findings are elaborated in the form of a case study, which, as a research method, represents an empirical inquiry that analyses a phenomenon within its own environment (Yin, 2009).

4. THE CASE STUDY

4.1. Background: An Overview of European Glass Packaging Industry

For centuries, glass has been considered as a traditional packaging material. However, the production of glass containers remained manual until 1903 when Michael J. Owen presented the first automatic bottle-making machine, which represented a significant advance in glass manufacturing (Doyle, 1979; Yam, 2010). From the early 1900s until the late 1960s glass packaging dominated the market for liquid products (Berger, 2005). Since then, due to its disadvantages like weight and fragility, glass has been replaced in many applications by more modern packaging materials (Rexam Group Marketing, 2008). Today, glass packaging accounts for 10.5% of the European containers and packaging market value (Marketline, 2014).

Container glass manufacturing is an energy-intensive industry, using natural gas and electricity as main energy sources (Today in Energy, 2013). Taking into consideration an increasing trend of energy cost, glass packaging industry's cost structure is under high pressure. Another restraining factor for the industry is the bulkiness of both raw materials and finished products. Consequently, glass packaging industry in Europe formed clusters in locations that have deposits of raw materials (i.e. sand and alkaline), were near forests that used to provide firewood for furnaces, and were not far away from their clients (ECORYS, 2008).

Since the glass industry mainly supplies food and beverage industry, the demand for glass packaging is severely influenced by the overall economy, threat of substitutes (i.e. other packaging materials) and consumption trends (Alfirevic et al., 2013). The production of glass packaging in Europe dropped by around 10% between 2008 and 2014 as a result of the global crisis and demand decrease (Wintour, 2015). Consequently, the industry became even more competitive. According to some forecasts (Lucintel, 2013), glass packaging industry faces challenges due to availability of different substitutes (e.g. carton, plastic, and metal). Furthermore, volatility in feedstock prices, energy inputs, and transportation are also expected to be major challenges for the industry in future.

4.2. An Overview of the Company

The subject of this study is a mid-sized glass packaging producer with eight production plants within Europe. With over three thousand employees, the company sold almost 4.9 billion units of glass bottles and jars in 2016. Due to its strong customer orientation, the company strives to offer innovative packaging solutions and high-quality products, together with on-time deliveries. The company has a strong and well developed customer care comprising services prior delivery, services related to delivery and after sales services, together with the technical support focused on product development. To retain valuable customers, the company's priority it to develop and maintain long-term relationships and business partnering through multilevel communication (i.e. direct and indirect communication between various company and customer's departments).

The company's customer base comprises international key clients, key clients limited to a single country or a region, medium-sized clients and small or occasional clients. In order to maintain sustainable operation, the company developed different relationship strategies for different categories of customers. Obviously, more emphasis is put on key clients, since in some subsidiaries they account for up to 80% of the total revenue. In overall, the importance of key clients within the company's revenue structure increased in past decade due to mergers and acquisitions within food and beverage industry that took place across Europe. With this development, loyal customers increased their annual orders and, consequently, increased interdependency with their glass packaging supplier. However, due to excess supply and high level of competitiveness within the industry, there is a high pressure on prices and commercial terms. To maintain its competitiveness, the company has to improve the control of cost structure and improve processes that could potentially lower cost or provide more value for the customers.

4.3. Outbound logistics optimization

Due to its weight and bulkiness, glass packaging is not suitable for a long-distance transportation. As a traditional industry constrain, this is the main reason why glass packaging industry is mostly a locally-oriented industry. According to a rule of thumb, transporting glass packaging by trucks on distances over 500-600 kilometres significantly reduces cost-effectiveness. In other words, company's competitiveness sharply declines with longer distribution routes due to high freight cost. The company manages its profitability by delivering roughly 80% of its products to the customers within this distance, while the remaining deliveries are directed to more distant and, consequently, less profitable customers. Although railway, due to lower cost, increases the transportation distance constrain, its biggest disadvantage is that it cannot qualify for the just-in-time deliveries.

In order to improve outbound logistics process, the company analysed the whole process and detected some improvement potential. Firstly, the company developed an optimum transportation packaging solution. While the company offers a number of various transportation packaging options to suit customers' needs and wants (e.g. different pallet types, variable pallet size, five interlayer options), it could result with

low load utilisation of a truck. Therefore, the company proposed an optimum transportation packaging based on DIN pallet (1200 x 1000 mm), plastic (reusable) interlayers and height around 2.3-2.4 meters, together with an optimised palletisation plan that minimises empty space within a pallet. According to calculations, transportation packaging optimization could result with 5-10% better load utilisation and decrease of freight cost per unit.

However, the packaging optimization project was not completely successful due to some real-life limitations. First, some trucks were not capable of carrying pallets with height over 2.2 meters. However, this was easily solved the specification change for the transportation companies. More challenging were the customer related limitations. For the majority of customers a shift from EUR to DIN pallet was simply impossible due to limitations of the installed de-palletisation equipment. Same limitations also affected the intention to increase the overall pallet height. The proposed solution in this case was the switch to lower pallets. This way, a single pallet space can contain two pallets of goods, one loaded on top of the other. This has negative impact on the loading and unloading time because it requires more time, but it can improve the load utilisation.

An improvement with higher acceptance rate among customers was the switch from one-way carton interlayers to plastic reusable interlayers. While plastic interlayers are mandatory when packaging is being pushed to the discharge table during the de-palletisation, they proved to be functional also in case of gripping and manual de-palletisation. For the full utilisation of returnable interlayers, the company also improved the reverse logistics processes (i.e. plastic layer collection and cleaning).

While transportation by road is an industry standard and mandatory requirement for the just-in-time deliveries, the company also tried to re-introduce transportation by railway, especially where there was not just-in-time delivery requirement. While some customers embraced the alternative, the majority of customers did not accept this potentially cheaper mean of transportation with lower carbon footprint. In most cases, the main reason was the lack of infrastructure and cost related to additional loading and unloading of pallets before reaching the final destination.

4.4. Long-Distance Transportation Exercise (or moving outside the comfort zone)

While maintaining economic sustainability, the company also delivers to customers at greater distances. With the transportation cost escalation, long routes has negative impact on performing just-on-time deliveries. However, when it comes to international key customers, the company has a strategic goal to improve cooperation and increase annual deliveries. Sometimes, the only way is to start delivering to some very distant location.

Few years ago, one of the top clients requested deliveries to their UK plant. With the distance well over 1000 kilometres, the company has to provide just-on-time delivery, while the overall sourcing cost has to be at the level of local supplier, or just slightly higher. Without doubt, this was really a great challenge for the company.

Prior the delivery, the company discussed all the requirements with the customer, especially the just-in-time delivery requirement. Since it was almost impossible to deliver at specific time, taking into consideration both the distance and road conditions, the requirement for a logistics partner (LSP) or a 3PL provider was obvious. The client also shared some of its previous experiences with the supplier from Saudi Arabia that also utilised services of a logistics partner. In their case, the bottles were transported by sea and stocked in a local warehouse until the client requested delivery to its filling plant.

After few weeks of searching, the company managed to find a logistic partner owning a warehouse near the clients filling plant. The LSP offered warehousing and visual inspection of shipments, which is an important service in case of long-distance glass packaging transportation. Due to material specifics, long-distance transportation causes high stress for glass containers, so there is a certain risk of breakage. By visual inspection of the pallets, the LSP ensures that, after a long-distance transportation, the client will only receive defect-free products.

The company offered two transportation options – by railway and by road. Since the logistic partner's warehouse had no direct railway link, the railway option also includes short transportation route by truck, why this option was between 3% and 5% more expensive, depending on the container size. However, the client choose the railway option due to its lower overall carbon emission.

5. CONCLUSION

Although this research study has some obvious limitations due to being focused on just one company and very specific industry, there are certain findings that may provide benefits for both academic researchers and professionals. While in case of the former, this study provides a good starting point for further research of logistic aspects of developing competitiveness within the packaging industry; in case of the latter, this study may sparkle creativity in the supply chain optimization process. Although solutions presented in the case study are being present for a long time within various industries, their application within very traditional and rigid industry is relatively new and represents certain improvement over the long-lasting industry standards.

The case study revealed some good practices of a mid-sized European glass packaging producer. In order to improve its competitiveness, the company conducted a series of activities in cooperation with both the client and the logistics service provider. This resulted with the development of two levels of partnership within the supply chain. The most important is obviously the long-lasting partnership between the supplier and its client. The second partnership is the one developed between the supplier and the LSP, which actually enhances the partnership within the supplier and its client by providing value for both sides. The supplier improved its competiveness by optimising transportation packaging and eliminating certain constrains related to the long-distance shipping of glass containers, such as not being able to offer just-on-time delivery. On the other hand, the client successfully minimised the risk of relying solely on the local suppliers and extended the level of cooperation with its supplier.

This study contributes the growing body of literature focused on European logistics and industry practices by establishing a case of emerging benefits arising through developing and nurturing partnering relationship between a supplier and its logistics partner through generating customized solutions whose impact is noticeable across the entire supply chain. The findings and implications of this research are even more important due to the fact the industrial company analysed is positioned in the mature industry and this research could point to new cooperative strategies available in mature industries that could change the stale industry dynamics of those industries.

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