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## OUTSOURCING OF TRANSPORT SERVICE – PERSPECTIVE OF MANUFACTURERS

**Abstract:** In case of manufacturers, outsourcing of logistics functions is a very popular tool. In contemporary market conditions, like high time pressure, transport service quality is especially important. Low costs, short time of transport and accepted level of risk are crucial for logistics managers. There are also some instructions how to proceed during logistics service provider selection and evaluation.

**Keywords:** outsourcing, transport, logistics.

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### 1. Introduction

Logistics performance usually involves the typical trade-off relation between cost and quality. This opinion is parallel to the assumption that service quality must be maximized at the lowest logistics costs. For many companies cost of transport is the highest logistical cost. Transport cost is usually defined only as freight charges. Apart from freight charges, costs arise from carrying inventory in-transit, from numerous operations connected with frequent and small deliveries resulted from just in time deliveries. During a production plan preparation, it is vital to know exactly when material will be delivered. Focus on customer needs' satisfaction, order fulfillment, short transit time, on-time delivery, gives transport costs a new dimension. Unless considerable buffer stocks are kept, the production plan relies on accurate estimated delivery dates. Delays, lacking or inaccurate delivery information can be extremely costly as the consequence could be production down-time (Holter *et al.* 1993). Risk is connected with a basic assumption in the resource-based perspective that a company is highly dependent on resources controlled by others (Halldórsson, Skjøtt-Larsen 2004). Transit times affect the cash-to-cash cycle for most companies. Long transit times means later payment and negatively affects the cash flow. Cash is tied up in inventory in-transit that could otherwise have been employed elsewhere, contributing to further revenue generation (Holter *et al.* 1993).

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Transport is needed throughout the whole supply chain being the link between supply chain members. Because demand and supplies have become international processes short lead time is especially important for companies that operate in international or global environment. Consequently quality of transport service affects the competitiveness of the entire supply chain. The challenge is to achieve competitive advantage in the context of rapid and unpredictable changes of markets. Over the past years it had place a growing focus on service quality improvement and reduction of inventory. The highly competitive environment along with customers' demands for tailored products and services has forced companies to continuously evaluate, improve and reengineer their logistics operations. These operations have a noticeable contribution in companies' efforts to meet customers' expectations (Gotzamani *et al.* 2010).

Managing companies in this increasingly demanding environment has made many firms to look for logistics service provider. They are used for many logistics functions, such as transport or warehousing. Logistics activity (purchasing, warehousing, transport and distribution, inventory management) can be realized more efficient than by manufacturing companies. The source of competitive advantage is the capability to adapt, integrate, and reconfigure internal and external organizational skills, resources, and functional competences to match the requirements of a changing environment (Teece *et al.* 1997). Manufacturing is the industry with the highest demands regarding logistics services and consequently it is judged as the most appropriate industry for comparisons within the logistics context (Gotzamani *et al.* 2010). Cooperation between manufacturers and logistic service provider has a leading role in supply chains. This factor has influenced the purpose of this paper, which is identification the drivers that determine the outsourcing decision in logistics.

The paper contains four stages. In the first stage, a literature review on the logistics outsourcing was undertaken. In the second stage, survey was undertaken in Polish companies (manufacturers). The basic question concerned kinds of logistics activities which were outsourced in furniture, electromechanical and food industry. What decision-making criteria were considered by manufacturers when outsourcing these logistics activities? In the third stage, an exploratory survey was undertaken to identify the reasons and consequences of transport outsourcing and to specify other factors. In the fourth stage, there is a review of techniques and rules of starting the cooperation with logistics service providers. There are also methods of their selection and evaluation.

## 2. Literature review

Many definitions of logistics outsourcing can be found in contemporary literature. Logistics outsourcing is a process that involves the use of external logistics companies to perform activities that have traditionally been performed within an organization, where the shipper, forwarder or logistics service provider enter into an agreement with trade company or manufacturer for delivering services at specific costs over some identifiable time horizon (Hsiao *et al.* 2010). Outsourcing or third party lo-

gistics is generally defined as the provision of a single or multiple logistics services by a vendor on a contractual basis (Razzaque, Sheng 1993).

A 3PL company provides at least transportation management and warehousing (Holter *et al.* 1993). For most manufacturers, the delivery of raw materials and shipping of products is not a part of the core competencies. Therefore, it is a natural area for outsourcing. To distinguish third-party logistics from traditional sourcing of transportation and/or warehousing, it should be noted that by using this definition we distinguish between single activity outsourcing and outsourcing of a more complex character (Laarhoven van *et al.* 2000). Conventional transport purchasing versus third-party logistics discussion leads to an assumption that certain types of transportation outsourcing are referred to as third-party logistics. It consists of the use of an outside company to perform part or all of another company's material's management or product distribution. It can include all or part of a company's logistics function (Logan 2000).

Freight forwarder is another term for a logistics service provider. Freight forwarders are intermediaries who facilitate logistics services, but do not necessarily own assets themselves (Holter *et al.* 1993). The term 3PL is now widely used. Freight forwarders, who have traditionally facilitated transport, are now being absorbed into the 3PL definition by offering extended services (Markides, Holweg 2006). Transport is for many companies the largest cost associated with their logistical activities and is a process that is repeated many times throughout the distribution channel (Ng *et al.* 1997). This is a serious reason for transport outsourcing. The desired outcomes from the outsourcing of transport may be (Holter *et al.* 1993):

- reduced costs through lower freight charges, less inventory in-transit and better production planning through increased transport visibility,
- reduced administration allowing more management attention on value-adding activities and focus on core activities,
- improved customer service through more accurate delivery information and on-time delivery performance.

Quality is a dominant driver that creates value in logistics. Logistics service quality is a crucial factor in case of customer satisfaction and loyalty. Outsourcing users may have very specific requirements. Some products may need special handling, specified climate conditions or tight delivery schedules. Their outcomes, such as place convenience, waiting time convenience, delivery time convenience, and after sales convenience, are easily visible and assessable by the final customer and consequently delineating its purchasing behavior (Gotzamani *et al.* 2010).

Transport management involves a series of activities (Holter *et al.* 1993):

- monitoring transport performance to agreed service levels,
- the handling of non-conformance and unexpected events, like delays, etc.

Realizing the benefits of a high quality logistics services system, companies evaluate their strengths and weaknesses. During this process a strategic decision to outsource logistics services is contemplated. Among others, quality is a criterion to

outsource logistics services and is more decisive when the main objective is to implement high quality corporate strategy (Gotzamani *et al.* 2010). A similar comparison was conducted by Rahman between Australian manufacturing/retail and logistics firms. The findings led to the conclusion that manufacturing/retail companies were ahead of logistics companies in the application of quality management practices in their logistics functions (Rahman 2008).

Two years later Rahman compared the logistics quality status in Australia between manufacturing and logistics companies and their findings indicated that quality practices are more extensive implemented in manufacturing companies than in logistics companies (Rahman *et al.* 2006). It is evident from the literature that quality is a salient criterion that determines both the logistics outsourcing and the provider selection decision. However, these decisions are not taken in isolation. It is rather unlikely that a manufacturing company will decide to outsource its logistics services if there is absence of a logistics provider that satisfies its quality standards. Moreover, it is unlikely that a manufacturing company will choose to outsource from a logistics provider that has a lower quality performance status (Laarhoven van *et al.* 2000).

### **3. Research methodology**

#### **3.1. Survey instrument**

The data for this study were collected through a questionnaire. The questionnaire comprised three parts. The first part included basic information about particular company (type of industry, product portfolios, brand, and number of employees). The second part included questions about logistics outsourcing (fields of activity that had been outsourced). The third part included questions about reasons and effects of logistics outsourcing. The survey form was conveyed to manufacturers in Poland. A number of supporting interviews with logistics managers working in plants were undertaken.

#### **3.2. Research sample**

Number of companies that took part in the research was as follow: 55 from electromechanical industry, 43 companies from furniture industry and 90 companies from food processing industry and. All these companies are located in Western Poland. The research was carried out between 2007 and 2009. Due to the definition used by Eurostat small companies have less than 50 workers, large more than 250 and medium companies between 50 and 250 workers (Bałk *et al.* 2001). In the group of 55 companies from electromechanical industry there were 21 large companies, 23 medium and 11 small ones. In the furniture industry sample contains 17 small, 18 medium, 8 large manufacturers. From the group of 90 companies in food industry, 20 were small companies, 20 were medium, and 50 were large enterprises.

### 3.3. Findings of the survey

The target of research was to show the declared benefits, resulted from logistics outsourcing. The other target was to check the reasons of staying by insourcing. The scope of research was focused on transport outsourcing.

#### Outsourcing in electromechanical industry

In the group of 55 companies from electromechanical industry there were 20 large companies, 24 medium and 11 small ones (Tab. 1).

**Table 1.** Number of companies in electromechanical industry that use outsourcing of logistics activity

	Insourcing	Outsourcing
transport	23	36
distribution	45	10
warehousing	47	8
consignment and shipment	50	5
purchasing	54	1

Four companies use both external and internal transport. The effect is higher flexibility and shorter time of response. Benefits of transport outsourcing (declared by representatives of these 36 companies) are as follow:

- cost reduction – 14 (number of nominations)
- higher quality and logistic service performance – 10
- shorter time of reaction – 10
- higher flexibility – 7
- bigger possibilities of expansion, for example in case of export – 7
- lean – 3
- focus on core competency – 2
- higher effectiveness in cases of frequent small deliveries and shipments – 1

Arguments pros transport insourcing are as follow: strict regimes and standards, security and certainty (producers of equipment for gas installation), risk of damage during transport (producers of equipment for power industry, servomotors, accumulators, sensors, detectors, power transformers). Set of manufactured goods is the best answer for a question about reasons of such a decision. The basic aim is the reduction of risk connected with handling with these goods.

**Table 2.** Degree of logistics and transport outsourcing implementation in electromechanical industry

	Only insourcing	Only transport outsourcing	Other logistics activities without transport	Transport and other logistics activities
small	4	4	0	3
medium	12	6	0	5
large	5	7	0	9

Data presented in Table 2 shows that there were no companies in this part of sample which used outsourced logistics without transport. Some companies used outsourcing only in transport (5 of them use only international transport outsourcing), some in cases of more logistics function (one of them was always transport service purchasing).

**Logistics outsourcing in furniture industry**

In the furniture industry sample contains 17 small, 18 medium, 8 large manufacturers (Tab. 3).

**Table 3.** Number of companies in furniture industry that use outsourcing of logistics activity

	Insourcing	Outsourcing
transport	24	19
distribution	39	4
warehousing	40	3
purchasing	41	2

Benefits of transport outsourcing (declared by representatives of these 19 companies) are as follow:

- cost reduction – 12 (number of nominations)
- bigger possibilities of expansion – 10
- higher quality of service and logistic performance – 6
- lean (also employment reduction) – 5
- higher flexibility – 4
- focus on core competency – 3
- less investment – 2
- shorter time of response – 1

**Table 4.** Degree of logistics and transport outsourcing implementation in electromechanical industry

	Only insourcing	Only transport outsourcing	Other logistics activities without transport	Transport and other logistics activities
small	11	3	0	3
medium	9	6	0	3
large	4	4	0	0

Data presented in Table 4 shows that there were no companies in this part of sample which used outsourced logistics without transport. Some companies used outsourcing only in transport (7 of them use only international transport outsourcing), some in cases of more logistics function (one of them was always transport service purchasing).

#### Outsourcing in food processing industry

From the group of 90 companies in food industry, 20 were small companies, 20 were medium, and 50 were large enterprises (Tab. 5).

**Table 5.** Number of companies in food processing industry that use outsourcing of logistics

	Insourcing	Outsourcing
transport	53	42
distribution	79	11
warehousing	81	9
consignment and shipment	86	4
packaging	87	3

Among 42 companies that use external transport, 9 use only international transport, and 5 of them use both external and internal transport. Benefits of transport outsourcing (declared by representatives of these 42 companies) are as follow:

- cost reduction – 15 (number of nominations)
- bigger possibilities of expansion – 14
- higher quality of service and logistic performance – 12
- focus on core competency – 11
- higher flexibility – 7
- lean (also employment reduction) – 7
- shorter time of response – 5
- higher effectiveness in cases of frequent small deliveries and shipments – 4
- lack of maintenance – 3

Transport insourcing in food processing industry was declared mainly by producers of very specific goods like: meet (8 companies), bread (6), milk and milk products (5), ice-cream (5), fats and oils, cheese, salads, cakes, juice, seasoning, fish, chocolate, mushrooms. The main reason is fear of wrong way of transport, reloading and unloading and lack of trust to 3PL operators (Tab. 6). Transport of meat and milk products needs refrigerator trucks. Transport of oil needs special tanks, which not always are available on the external market.

**Table 6.** Degree of logistics and transport outsourcing implementation in food processing industry

	Only insourcing	Only transport outsourcing	Other logistics activities without transport	Transport and other logistics activities
small	14	2	1 (warehousing)	3
medium	12	5	0	3
large	17	20	3 (2 packaging, 1 warehousing)	10

The bigger size of the company (connected for example with a number of plants located all over the world or continent), the more likely a food firm will outsource logistics functions. Different distribution channels and features of products in food industry need special transport conditions. To deal with such sophisticated expectations, a universal logistics service provider usually cannot be contracted for the outbound transportation activities. There are several other reasons for not outsourcing. First of all, closer logistics function is to the core business, the less likely is that a food company will outsource this function. Many logistics activities are then kept in house. It may be warehousing, transportation, packaging and inventory management. Each of these functions for its own reason. Warehousing is not outsourced because food products are very perishable. Some of them may be stored for a few days before they are to be delivered. In many cases warehousing is not outsourced because the production heavily depends on it. It won't be outsourced even if it could be cheaper when done by external company. Another logistics activity which is rarely outsourced is packaging. It is rarely outsourced because recipe of product and technological know-how are often involved in this process.

Regarding transport outsourcing, this process is especial important because food quality and on time deliveries have the highest priority. For example, one kind of fresh juice is requested direct distribution to retailer shops every day within 24 hours lead-time. If logistics service provider fails, manufacturer risks losses or damage of the transported goods. When transport is outsourced, the logistic service provider becomes responsible for the planning of deliveries to many customers. In some cases, scheduled delivery time to retailers could not be accepted by some of them. Therefore, there were manufacturers which took back this activity in house again. The reason was a lack of individual approach of logistics service provider to each customer.

The influence of human skills on outsourcing decisions is also very important. Each logistics activity needs experienced staff, with specific knowledge on how to handle with a particular product. For example, transportation of bottled products or other goods vulnerable to damage, requires special driving skills. Decisions about logistics outsourcing are also influenced by assets and resources of particular company, like facilities or current investments in vehicles or warehouses. Generally companies maintain internally these functions in which their capabilities or knowledge assure efficient and expected logistics performance. Outsourcing decisions might depend on a function's closeness to core business. The core business of manufacturers is most often production and product development, not logistics.

#### 4. Rules of cooperation with an outsourcer

The strategic reason for manufacturers which are interested in outsourcing their logistics activities is a need to reduce costs or amount of invested capital for development of specific resources like dedicated facilities, which involve investments in staff and equipment. In the same time an increased price competition between retailers incurs lower gains or even losses to many manufacturers. Therefore, a cost reduction is then necessary. Cost reduction is also connected with short time of transport and flexibility. Time of delivery affects the cash-to-cash cycle. Long time of delivery gives later payment and negatively affects the cash flow. Cash is tied up in inventory in-transit that could otherwise have been employed elsewhere (Holter *et al.* 1993). It also leads to other aspects of logistic outsourcing that are better quality of service, the need for flexibility and a focus on ability to quick response. Customers' requirements and expectation on traceability, flexibility and level of logistic services are still increasing.

A huge challenge is the time pressure from customers. Contemporary customers place orders in the last minute, still requesting the same delivery performance level. Improved customer service through having more on-time delivery performance gives better quality of a whole distribution process. Therefore time and quality of a service are critical for manufacturers in the area of distribution. To ensure speed and on-time delivery they often outsource logistics functions to external companies. In case of many manufacturers the traditional structure of distribution systems often leads to high costs and too long time of reaction. When firms want to increase performances, they can redesign supply chain structure and shift part of the duties outside. The choice of an option based on an external logistics service provider may become the best way of reaching the efficiency target. The logistics supplier that has well developed structure and routes will help to save much time in achieving the goal as well as the opportunity to buy distribution at a variable cost with no investment (Laarhoven van *et al.* 2000).

Consequently, even small companies may develop an efficient distribution system based on an offer of logistic service provider. In such a case the outsourcer becomes responsible for scheduling all distribution routes to the scattered customers.

It is very important watching that demand and supply have become international processes. Short transit times are vital as the company operates a global supply chain. But even in smaller range, for example for serving the whole European market, it is necessary to have well organized distribution structure, sometimes based on the centralized warehousing system.

Manufacturer which has an intention to build up by internal means its own distribution structure for the whole European market, usually will meet opinions that it is too costly and too time-consuming. The volume, directions of trade (export or import) pattern and nature of a company's freight are decisive.

Moreover, a fundamental challenge for almost all freight consignments is the fact that they move in one direction, from point of production to point of destination. The efficiency of any transport operation is critically dependent on the degree to which vehicle capacity can be utilized in both directions (McKinnon, Ge 2006). This creates a serious logistical problem, how to find backloads for returning vehicles. In the absence of a backload (for manufacturers that send products to own distribution centers it is typical) the vehicle must return empty, increasing cost of the process. Consequently, logistics service provider, which have many clients, would achieve higher levels of backloads than own service of manufacturer. Decisions about outsourcing may be a result of a complexity of processes and functions. If demand for particular product fluctuates significantly, for example, juice products which have peak demand in summer, manufacturer is also more willing to cooperate with an outsourcer. To deal with such a situation, a food specialized logistics service provider may be contracted to operate both the tactical and operational planning (Hsiao *et al.* 2010). The main reasons for hiring the outsourcer is then its specific assets and competences for handling and managing such products. When it is outsourced, a manufacturer expects from logistics service provider the planning of stock level of ready products, efficient flow through distribution structure to the customers. It should be planned in such a way that its own logistical efficiency will be optimized.

Companies which use logistics service provider for more sophisticated tasks expect that outsourcer will be able to manage complex supply chain. Coping with logistics tasks with a high degree of complexity, manufacturer may require an experienced logistics operator to handle the managerial complexity. On the one hand supply chain complexity is positively related with outsourcing decisions, on the other risk is higher when the performance measuring uncertainty is growing.

Supply chain complexity (for instance, number of products, demand prediction, number of international customers and distribution channel variety) cause planning and control problems to firms which use logistics service provider (Hsiao *et al.* 2010). There is always a risk that a customer could choose the local supplier rather than source internationally with longer lead time. There is also risk that logistics service provider will not meet requirements of manufacturer.

When complexity of outsourced logistics functions is higher, the more likely that manufacturer will make a loss. When logistics complexity is high, firms that consider outsourcing of logistics to an external company must develop an efficient system of logistics service provider selection and evaluation. It may be done by specifying critical aspects of the service, which must be treated as obligatory. Performance measuring

uncertainty assumes including performance measurement uncertainty into the procedure and monitoring the contractual performance of outsourcer. Outsourcing may be inefficient when performances cannot be assessed in a clear way. Conditions such as transit time, on-time delivery, etc. may be added through a service specification. It may contain product handling rules with a special attention to stable conditions of cooperation with outsourcer which may offer security during transport and reloading. It is crucial for many manufacturers of fragile products.

Transport performance depends on quality of service which is offered. Transport management procedures ensure that the agreed service quality is fulfilled. Transport management involves a series of activities both internally in the company and externally towards logistics service provider.

They contain (Holter *et al.* 1993):

- the internal procedures include managing outsourced transport;
- creating orders and bookings;
- updating transport information on internal systems and other necessary procedures;
- monitoring transport performance to agreed service levels;
- the handling of non-conformance and unexpected events, like delays, etc.;
- communication of transport information within the company; there are many stakeholders involved in order fulfillment, so effective transport management must include the channeling of relevant information to the relevant stakeholders.

Sub-activities of transportation management include also route planning, scheduling and accidents control.

## 5. Conclusions

In many cases manufacturers purchased only transport services and did not consider outsourcing a wider range of logistical functions. In the electromechanical industry the question of company size is not adequate in trying to understand transport outsourcing. The distance of a company's freight and nature of shipped products are more important. High quality, bigger possibilities of expansion and low costs expectations were pointed as the most considered criteria.

It may be mentioned that outsourcing of basic logistics functions like transport is based on operational and cost-based reasons. In the food industry supply chain scale (international) is positively related with an outsourcing decisions. Companies with quality or flexibility priorities prefer to keep an activity in-house. They don't trust logistics service providers or shippers if they have sufficient knowledge of handling with particular goods.

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