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## OUTSOURCING OF LOGISTICS ACTIVITIES IN MANUFACTURING INDUSTRY

### ABSTRACT

*The external supply of logistics services is part of a trend toward outsourcing non-core logistics activities. The scope of third-party logistics may range from a relatively limited combination of activities (e.g. transportation and warehousing) to a comprehensive set of logistics services.*

*The authors first discuss the characteristics of business logistics in manufacturing industry, to be taken into account in logistics outsourcing. They particularly point out the motivations for logistics outsourcing, the possibilities of outsourcing, as well as supplier selection. Finally they analyze the outsourcing in the reverse logistics.*

### KEY WORDS

*outsourcing, logistic services, business logistics, supplier selection, reverse logistics*

### 1. INTRODUCTION

Outsourcing means transferring certain activities to specialized providers who can perform on a higher level. Central to outsourcing decision is the "make it or buy it" question. Outsourcing has become increasingly popular in recent years and is often quoted as a means of coping with rapid changes in technology and in the business environment.

The value added to services can take place through the efficiencies achieved by better cost management and through increased effectiveness brought about by value enhancement. A value enhancement activity may be adding value to the existing business – for example by better products and services – and adding value through innovation (Rothery and Robertson 1996, 189). It has been established that the logistics outsourcing improves the competitive position of the firm by rationalizing business activities and synergetic effects. Transferring the logistics activities to the outsource supplier – known as third party logistics – enables the firm to fully concentrate on its core competencies.

Five streams of literature relate to modelling the third-party logistics procurement by industrial buyers (Sink and Langley 1997): strategic decision-making, industrial buying behaviour, transportation purchasing, supplier selection, and logistics relationships.

Much attention in the transportation literature is focused on identifying the buyers' factors to reach mode and carrier selection decisions. Cost-service tradeoffs were of prime importance in the early literature in this field. Recent literature, however, examines the third-party logistics purchasing.

Recent research pays increasing attention to the overall topic logistics relationship, e.g. on the strategic benefits of logistics alliances, on several aspects of logistics outsourcing, and on the forces that have influenced the growth of logistics and supply chain relationship (Aertsen, 1993, Ackerman 1995, Ellram and Hendrick 1995, McGinnis, Kockunny, and Ackerman, 1995, Greaver 1999).

The working hypothesis can be defined as: *outsourcing of transport and other logistics activities improves enterprise's competitive abilities resulting in sales rise and gain in profitability.*

Objectives of the paper are:

- defining the reasons for outsourcing with the emphasis on business logistics;
- presenting the business logistics characteristics in manufacturing enterprises which are to be considered while implementing the outsourcing;
- presenting the possibilities for outsource supplier selection;
- analyzing the specific issues of the reverse logistics outsourcing.

We would also like to show some specialities of establishing alliances with the logistics outsource suppliers. This holds well for the logistics outsourcing management as well. At the same time, the article identifies some of the managerial issues that could prove beneficial for the development of an appropriate outsourcing management framework. The logistics outsourcing analysis has also shown that separating



business activities is much more complicated than had been presumed at first.

## 2. BUSINESS LOGISTICS CHARACTERISTICS IN MANUFACTURING ENTERPRISES

Preparing to use outsourcing effectively includes understanding the logistics management role in meeting the objectives of the firm. The business objectives of the firm may determine the extent to which the firm will use external partners. Logistics outsourcing ranges from handling a single activity through complete outsourcing of key logistics functions across the firm.

Goals of logistics management cannot be treated separately but in accordance with the goals of other subsystems. Looking only from the logistics point of view it is not possible to estimate what is, for example, an "optimal customer service". Optimising costs of logistics activities (as a goal) can decrease sales volume.

Specific goals must be formulated, as common ones cannot be used in practice. Operational criteria, that is service standards, according to the type of product, sales market etc. should be elaborated. Inside the given customer service the physical distribution must deliver goods to the buyer at lower costs; if the service level is not defined, the physical distribution will – its tendency being the decrease of logistics costs – extend the time of delivery (reducing the number of vehicles, low stock level and alike).

Failing to plan or to know logistics strategy in a firm are common reasons why good partners fail to make good partnerships. The next most common reason is the lack of communication. Partnerships sometimes fail because of inadequate research into the implementation issues related to individual customer needs.

### 2.1. Critical logistics interfaces

Among logistics activities in industrial firms some conflicts may arise. Knowing the conflicts and the so-called trade-off is of great help in strategic logistics management. Representative examples of trade-off as defined in standards of logistics services are:

- defining the level of customer service: transport and warehousing costs versus the costs that result from a lower level of customer service;
- choosing the mode of transport: costs (according to the mode of transport) versus stock (and warehousing) costs;
- defining the volume of safety stock level: costs of stock maintenance versus costs of lower level of customer service.

*The principle of total costs.* The principle of total costs in decisions about the choice of the mode of transport is often illustrated by air transport where we have quite high freight rates. If only the air rates are considered in the organization of logistics process the use of air transport will be limited to few kinds of shipment. Air transport is competitive when common logistics costs are considered: we must think about savings in packaging, lower costs of insurance of transporting goods, lower delivery costs to/from the airport (comparing to costs to/from the ports), less documentation, etc.

*Interfunctional clash of interests.* In firms there may come to disagreement among business functions. Different functional sectors have different interests in logistics. These contradictory claims cause difficulties in planning of logistics strategies as well as on the level of operational execution of logistics.

### 2.2. The importance of logistics in a manufacturing firm

First, the importance of logistics in business process should be analysed. This raises a set of questions: How do we estimate the importance of logistics in a firm? How do we express the importance? Is merely the subjective review enough?

Estimation of the importance of business logistics depends on (Ogorelc 1996, 54-56):

- (1) logistics costs,
- (2) customer service level,
- (3) type of production,
- (4) nature of material flows (raw materials, components and finished goods),
- (5) structure of logistics network, and
- (6) size of a firm.

*Logistics costs.* Logistics costs influence the sales level and profit, as well as the firm's assets. Therefore, logistics is very important for the return on investment (ROI) and the firm success in general.

Logistics costs are not easy to define completely as they are presented in different cost categories. We may get a rough but still accurate estimation about the importance of logistics activities by cost analysis. An analyst should know the logistics concept well; he should also have access to firm's finances. As a result of cost analysis we get the absolute sum of logistics costs, as well as the costs of different logistics activities. In order to understand better the importance of business logistics from the cost view we compare logistics costs with the costs caused by other firm's activities.

*Customer service level.* Customer service can be defined as the consistent provision of time and place utility. Customer service level refers to delivery times, frequency of delivery, stock availability, accuracy of in-



voices, delivery reliability, order completeness, emergency delivery when required, after-sales support and other elements required to meet customers' desires and needs.

Logisticians recognize that substantial competitive advantage can be gained through excellent customer service, and customer service becomes a powerful means of differentiating the firm from the competition. Customer service can help avoid cancellations and recover lost sales, and it can mitigate expense of wrong shipments and similar errors. Strong emphasis on customer service enables a firm to realize the importance of logistics activities and the need for careful management of material flows.

*Size of a firm.* Comparison of firms with similar production programs leads to a conclusion that problems of business logistics increase together with the firm's size. In larger firms the decision making in business logistics is much more responsible and demanding. When a new firm is founded the business logistics forms a more or less simple structure of supply and delivery relations and logistics activities seem to be less important. As the firm grows and develops the significance of logistics activities becomes more transpired.

It is not easy for a firm to fit in the field of logistics because of the complex interaction of logistics components and cost trade-off. Cost reduction in one area can involve some changes and increase many other logistics costs. This implies that in the process of rationalization, for example in production or in firm's distribution system, all the possible consequences arising in the whole logistics system should be studied.

*Type of production.* Production is divided into production by order and production by stock. A firm that decides only on production by order will have fewer problems in business logistics. A firm that practices production by stock will have to plan activities of business logistics more carefully.

*Nature of material flows.* Nature of material flows – raw materials, components (intermediate goods), and finished goods – must be analyzed. It is important to know, that the specific requirements that apply to intermediate goods (transporting inputs) may be different from those that apply to finished goods. That means that various requirement levels about packaging, warehousing, transportation and materials handling have strong influence on the importance of business logistics. Some materials require good knowledge of logistics and adequately to that more careful management of material flow.

*Structure of logistics network.* The firm's logistics networks can range from simple to very complex. Let us consider two extreme examples.

A firm can obtain raw material from one source only and it delivers finished goods to only one buyer. No external warehouse is needed. Management of

material flow in this example will not be too complicated. Another firm obtains raw material from various sources and delivers the material to many production facilities on different locations. After the manufacturing process has been completed a firm delivers finished goods to many distribution warehouses and from here on to thousands of users. In both examples (relative) logistics costs can be the same, but in the first example the situation can be handled by one person while in the other a well organized service of business logistics will probably be needed.

Therefore, where inputs are close to manufacture plant and production takes place close to market, the logistics network is likely to be relatively simple. Where manufacturing is distant from both sources of supplies and markets, the logistics network is likely to be more complex.

### 3. OUTSOURCING IN LOGISTICS

#### 3.1. Motivations for logistics outsourcing

Outsourcing is the common answer to the "make it or buy it" question being asked by manufacturing industry and the "do it ourselves or buy it" question being asked by service firms (Rothery and Robertson 1996, 5). The concept's main idea is that a firm should focus on production of goods and/or carry out those activities that make it competitive though there exists a risk that services done by external suppliers may not be in accordance with firm's expectations.

It is the core competencies that differentiate a firm from competitive firms. With outsourcing, firms want to increase their long-term competitiveness.

In practice, however, many outsourcing agreements have been structured in such a way as to inhibit, rather than facilitate change. It has been observed that outsourcing can have hidden costs in the longer term, arising from a reduced awareness of the changing environment. Outsourcing of any logistics activity is most straightforward when the requirements are well understood and easily described. We must also be aware that incorporation of external suppliers causes large changes of information flow. Therefore, the information system of a firm should be improved.

Obviously a firm will not leave to external suppliers those components or services that might jeopardize its existence. Therefore, a balance between potential competitive advantages of outsourcing and increased vulnerability of a firm should be found. Outsourcing should take care of those services and activities that would increase competitive advantages at minimal risk. Business transactions in outsourcing should also be protected by appropriate form of management structure.



Decisions about outsourcing are within the competence of the top management. After some time – these are medium – or long-term decisions – another thorough judgement is necessary. “Make or buy” dilemma is not solved only on the basis of cost estimation, an overall study from the point of view of all entrepreneurial areas is needed, and a study that also takes into account the indirect effects of decisions.

When defining advantages and disadvantages we use the theorem of transaction costs. Analysis of decisions about outsourcing is a result of teamwork. It is a cooperation of experts from the fields of purchase, production, marketing, logistics and controlling. One of the main problems, due to the non-operational analysis instruments is defining of the appropriate procedure of costing.

The motivations for logistics outsourcing are widely discussed in literature. For the majority of firms, these are a combination of:

- reducing or stabilizing costs,
- concentrating on core competencies,
- financial restructuring,
- overcoming of cultural and organizational problems,
- accessing world-class expertise.

Others may see them as fast changing and strategic to their competitive position. This will influence whether the first or the second half of the list is likely to predominate.

The achievement of these objectives depends, in turn, upon some combination of beliefs concerning the capabilities and behaviour of outsourcing suppliers. For example, advocates of an outsourcing approach may believe that an outsourcing supplier will

- undertake work at lower cost,
- have more flexibility in financing the service,
- be more flexible in accommodating varying levels of demand,
- be more competent, both technically and managerially,
- be better able to communicate in business teams and understand business needs,
- eliminate the need for specialized staff who do not fit the organizational culture,
- relieve in-house management of non-core tasks.

For each of these beliefs, however, there is a corresponding risk. For example:

- the supplier’s technical and management skills may prove less impressive than expected,
- the supplier may prove unable to relate to the customer’s business and its needs,
- the supplier may be unable to deal with the customer’s culture and internal politics,
- demand levels may not vary in the way anticipated,

- there may be a continuing need for specialist staff to monitor and direct the supplier.

It is quite understandable for a firm that has invested in logistics, to ask whether this investment might be shared with other firms to reduce the production costs. On the contrary, because of high logistics costs, a firm would collaborate with another one that has excess in logistics capacities.

### 3.2. Outsourcing partner selection

The main part of supplier selection research is oriented towards the purchase of products rather than services. It reveals that supplier evaluation and selection is employed routinely in industrial purchasing. Most evaluation methods used by industrial buyers could be classified into three basic types: (1) categorical approach; (2) weight-point plan; and (3) cost-ratio method (Sink and Langley 1997, 168).

Candidate evaluation begins with the establishment of selection criteria. Quality, cost, capacity, and delivery capability are used to evaluate distribution providers. In selecting an external logistics provider, however, the criteria are typically more rigorous. References provided by current customers, cultural compatibility, financial strength, depth of management expertise, operating and pricing flexibility, and information system capabilities play essential roles (Sink and Langley. 1997, 178).

Specialists in logistics prepared a process model of how to choose an external supplier. The process includes five steps:

- (1) Defining the need for transferring logistics services onto external suppliers:
  - perceiving the problem,
  - management’s agreement,
  - putting together the negotiating committee,
  - cooperation with management of business units.
- (2) Elaboration of alternative solutions:
  - inclusion of internal specialized knowledge and experiences,
  - inclusion of external specialists.
- (3) Evaluation of candidates and deciding on a supplier:
  - preparation of criteria for selection of potential suppliers,
  - collecting all the necessary data,
  - evaluating the candidates,
  - selecting the supplier.
- (4) Realization of services (transfer onto external supplier):
  - making a plan for transition to outsourcing,
  - education,
  - transfer of services onto external supplier.



## (5) Evaluation of external supplier's work:

- qualitative and quantitative evaluation of services level,
- controlling the realization and improvement of realized services,
- improving or changing the external suppliers.

Elaboration of criteria for selecting potential external suppliers in logistics is very important. An extra study has been made about the importance of parameters – features of logistics quality (Menon, McGinnis and Ackerman 1998, 122-133).

The research has been done on the American market. Although we can say the stated parameters in logistics' realization are true for other developed markets as well; the only difference lies in the importance that firms attribute to individual parameters.

The successful outsourcing partnership will depend on these characteristics: being open, building a relationship and working together, knowing where we stand currently in terms of productivity and profitability, understanding mutual needs, understanding mutual benefits, and sharing risk. These are the all important requirements of an outsourcing partner: credibility, commitment, cultural compatibility, continuous added value vs contract flexibility, and complementary skills.

### 3.3. Practice of outsourcing in logistics

The examples when logistics activities are outsourced to external suppliers are as follows:

- fast launching of a product on new markets;
- larger changes in incoming and/or outgoing logistics;
- changes in manufacturing;

**Table 1: Estimated outsourced logistics services**

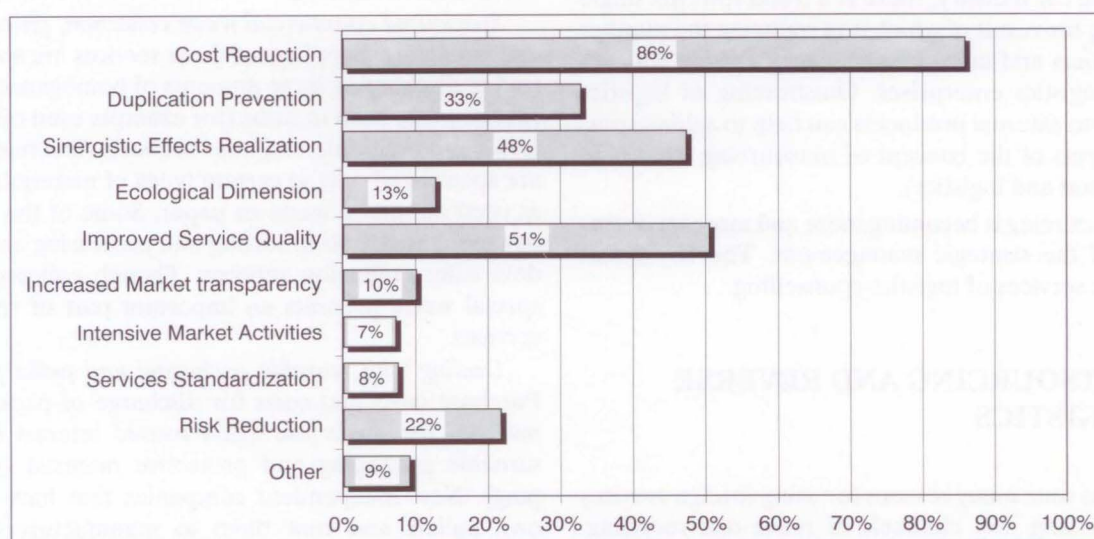
Service	Share (%)
Transport	85
Warehousing	53
Dispatch	47
Packaging	33
Commissioning	33
Reverse Logistics	32
Labelling	31
Customs Clearance	27
Clearing	12
Assembling	10
Quality Control	10
Financial Services	9
Organizing of Logistics	9

Source: Heiner 1996, 32-33.

- required quality of physical supply or physical distribution (e.g. reducing delivery time, changed incoming/outgoing quantity);
- adapting to the fast growth of sale.

Thus, some manufacturers estimated they would not be able to follow the logistics development. After a thorough analysis they decided to outsource it to the enterprises specialized in logistics. Enlarging the extent of outsourcing in logistics has led to a closer connection between manufactures and logistics enterprises. In incoming as well as in outgoing logistics there is a growing number of permanent services of outsourcing.

A German study on outsourcing in logistics tried to discover which logistics services of a firm should be



**Figure 1 - Estimated goals of outsourcing in logistics**

Source: Heiner 1996, 33



left to external suppliers and what goals we want to achieve with that (Heiner 1996, 32-33).

Logistics service providers (e.g. special logistics firms, especially forwarding agents) are changing their service profile: a shift from the traditional services with emphasis on transportation towards a complex offer of the logistics services is perceived. The trend of the growing outsourcing is clearly seen – besides the variety of services offer – in the offer of complex logistics solutions. Current emphasis of outsourcing lies in the outgoing logistics, but in the future a growth above average is expected in the incoming logistics as well. Optimistic anticipations prove that innovations in logistics sector will increase.

There are some interesting conclusions about the practice of outsourcing in logistics.

Logistics service providers (e.g. special logistics firms, especially forwarding agents) are changing their service profile: a shift from the traditional services with emphasis on transportation towards a complex offer of the logistics services is perceived. Though, the traditional services of forwarding agents, as for example quality control and warehousing, are still used.

Enlarging the extent of outsourcing in logistics has led to a closer connection between manufactures and logistics enterprises. In incoming as well as in outgoing logistics there is a growing number of permanent services of outsourcing.

The trend of the growing outsourcing is well seen – besides the variety of services' offer – in the offer of complex solutions. Optimistic anticipations prove that innovations in logistics sector will increase. Current emphasis of outsourcing lies in the outgoing logistics, but in the future a growth above average is expected in the incoming logistics as well.

In some branches of industry, the most important being the car industry, there is a trend towards single sourcing the result of which is in reducing the number of suppliers and more intensive cooperation with selected logistics enterprises. Outsourcing of logistics services to external producers can help to achieve positive effects of the concept of outsourcing (that is in production and logistics).

Outsourcing is becoming more and more an instrument of the strategic management. The key issues here are services of logistics counselling.

#### 4. OUTSOURCING AND REVERSE LOGISTICS

Firms state many reasons for using foreign services when making new channels of reuse and recycling. The most frequent reasons are (Kopicki 1993, 194-195):

- (1) Key ability orientation. If a firm is concerned with other activities besides its primary ones, this may cause too much dispersion of its resources and the flexibility of a firm when reacting on new market possibilities is jeopardized.
- (2) Keeping the equity capital. Use of foreign services often includes also use of external supplier's capital, which reduces the need for large initial investments.
- (3) Making good use of the best possible capacities. Some external suppliers try very hard to be the best in their field. If a firm does not engage these leading suppliers (but less capable ones), or if it tries to develop its own solutions in reverse logistics, the result may not be optimal.
- (4) Economies of scale. In waste collection (and consolidation of waste flows) there are important economies of scale. Individual manufacturers cannot reach these economies of scale, especially not in the initial phases of reverse logistics.
- (5) Integration of reversible chain. External suppliers that are in constant connection with all the participants in the chain can often better evaluate waste flows, and more easily assure claims for waste quality.

Foreign services, useful in reverse logistics, can be classified into five categories:

*Specialized high value product collection and consolidation.* External suppliers help at dismantling of equipment, consolidation and transport. Clients preserve the right to products and give instructions for removal.

*Commercial waste collection, sorting and marketing.* Numerous firms for reversing offer services in the form of collection and sorting for common commercial waste (for example corrugated and office paper, and drink containers).

*Specialized commercial waste collection, processing and marketing.* Suppliers of these services are specialized in discharging large amounts of homogeneous or special waste used in firms (for example used oil, batteries and accumulators, used rubber). As a rule they are specialized only in certain types of material, such as used oil, metal waste or paper. Some of the firms pay more attention to sorting and processing and seldom offer collection services. Though collecting of special waste presents an important part of reverse services.

*Dealing with reusable packaging and pallet pools.* Purchase costs and costs for discharge of packaging material for single use again roused interest in returnable packaging and protective material (wrapping). New independent companies that have their own pallets and rent them to manufacturers and distributors provide quality services very successfully.



**Table 2: External services in reverse logistics**

Service	Examples
Specialized high value product collection and consolidation	<ul style="list-style-type: none"> <li>- De-install computers and office and medical equipment</li> <li>- Consolidate used products into truckload quantities and ship disassembly points</li> </ul>
Commercial waste collection, sorting and marketing	<ul style="list-style-type: none"> <li>- Handle multiple material types (paper, glass, plastic, metals) from a variety of businesses</li> </ul>
Specialized commercial waste collection, processing and marketing	<ul style="list-style-type: none"> <li>- Recover used oil and solvents</li> <li>- Salvage and compact autos</li> <li>- Sort commercial waste paper</li> </ul>
Packaging and pallet pools	<ul style="list-style-type: none"> <li>- Operate reusable packaging system</li> <li>- Exchange or rent pallets</li> <li>- Recycle or reuse dunnage</li> </ul>
Green product validation	<ul style="list-style-type: none"> <li>- Validate recycled content, recyclability and other environmental claims</li> </ul>

Source: Kopicki 1993, 198.

*Green product validation.* Firms interested in production, purchase or sale of green products must overcome consumer's doubts about firm's motives, contradictory regulations on marking and diverse opinions about what characteristics a product should have to be categorized as a green product. Firms have been established that offer manufacturers of green products an independent validation of environmentally pleasant products. These firms use methods such as life-cycle-analysis and comparison of similar products for which manufacturers want to prove they belong to green products.

## 5. CONCLUSION

In the nineties the importance of outsourcing in logistics grew enormously. Industrial and service firms – users of logistics services – are aware that realization of logistics should be left to the firms specialized. On the other hand, logistics firms are interested in offering an overall realization of logistics services. Outsourcing is recognized as a vital mechanism for stimulating local employment.

Countries in transition need detailed studies of outsourcing. First the possibilities of outsourcing in manufacturing should be studied, especially regarding internationalisation of enterprise's operations and globalization of world production. Parallel to that we should also look at the possibilities in transport and other logistics activities.

In the future a research will be done in some selected manufacturing sectors. It should be studied whether the present institutional setup of logistics plan is appropriate for the economy. Does the current

economy situation encourage the development of logistics?

Enterprises will be selected from productive- and capital-intensive industries. The purpose of this research is to realize (1) whether the enterprises actually implement logistics outsourcing; (2) which logistics activities (transport, warehousing, manipulations, inventory control, etc.) are provided by an enterprise; (3) level of supply service, provided by external logistics enterprises; (4) what are their experiences regarding advantages and disadvantages of logistics outsourcing; (5) the distinctive features in selecting an external supplier in individual sectors; (6) the influence of outsourcing on enterprise's competitive abilities; (7) whether they intend to continue the outsourcing of logistics activities in the future or whether they want to begin with outsourcing; (8) the criteria for selection of external supplier; (9) what they think about the impact of globalization on outsourcing development; and (10) whether they are considering strategic logistics partnership. Further, we would like to find out in which sectors outsourcing is especially important from the aspect of internationalisation of small and medium businesses.

## SAŽETAK

### **VANJSKA OPSKRBA (OUTSOURCING) LOGISTIČKIH USLUGA U PROIZVODNOJ INDUSTRIJI**

*Vanjska opskrba (outsourcing) logističkih usluga predstavlja dio opće sklonosti tvrtki da prenesu pojedine aktivnosti na za to specijalizirane tvrtke, koje mogu te aktivnosti izvesti na visokoj razini. Ovo područje naziva se trećim dijelom logistike, a kreće se od relativno ograničene kombinacije aktivnosti (primjerice transporta i skladištenja), pa sve do sustavnog pristupa brojnim logističkim i inim aktivnostima.*



Autori u ovoj raspravi najprije posvećuju pozornost značajkama poslovne logistike u industrijskim proizvodnim tvrtkama, koje zavrjeđuju da budu uzete u razmatranje glade vanjske opskrbe logističkim uslugama (outsourcing). Posebice se prikazuju mogućnosti i motivi za odabir vanjskih opskrbljivača logističkim uslugama, kao i način selekcioniranja ponuđača. Na kraju se analiziraju osobitosti outsourcinga povratne logistike.

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