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## CREATING AND MEASURING LOGISTICS VALUE

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**Abstract:** *In the past, logistics has been mainly viewed simply as a cost that needs to be reduced. However, logistic is not only the sphere of rising costs, but the sphere of creating and increasing the value. Through logistic services and activities, in supply chain, added value of products is created. Two out of five primary activities in the value chain belongs to logistics. Logistics value is created through standard logistic services, value-added logistics services and specific logistics solutions. Consumption value, as well as shareholder value, is created in the logistics sphere. However, many companies are not aware of possibilities that logistics can offer regarding creation of value. Reality is that the majority of companies have millions of dollars hidden in their logistic operations. Their discovering would mean improved profitability. The value obtained through logistic activity should be measured and monitored, which is not the case in the most of real systems. The aim of this work is to present comprehensive approaches of creating and measuring values, different ones, obtained in the area of logistics.*

**Keywords:** *Logistics value, logistics services, logistics activities, value-added logistics services, logistics solutions.*

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### 1. INTRODUCTION

Harsh global competition is distinctive feature of contemporary markets. The logistics has become the key factor in a competitive struggle, as well as in distinguishing oneself in a unique and open market. Product Development Technologies are very similar or exactly the same for a long time, and therefore these companies are competing in improving both product performances and services by longing to provide superior customer added-value.

Logistics processes and supply chains are important sphere for creating product added-value. The more shortened product life cycle requires its fast and successful launching on the market. Within the existing product deployment and consumption on the worldwide market, this is not possible without the effective and flexible logistics and supply chain.

A significant part of the finalization of production process shifts from traditional manufacturing plants more towards the market, in related logistics centres and systems, where it is prepared for sale and adding value.

Secondly, logistic spheres have many hidden values and discovery of those values will achieve significant benefits. Most logistics systems work

with increased operational costs and unused labor capital, which are important resources of the value.

In order to conceive and utilize properly the possibilities that the logistics has to offer, literature and practice should pay attention more to the value gained through logistic activities and processes. This study aims precisely at the issue of creating and measuring the value in the logistics. First, this study deals with the role of the logistics in the value chain. Second, the study is related to creation. Third, attention is given to the measurement the value of logistics.

### 2. THE ROLE OF LOGISTICS IN THE VALUE CHAIN

The very term value initiates series of confusions and it is often unclear what that term represents precisely. It can be said that the understanding of this term has always been one of the questions that requires precise answer.

Socrates and his successors, Plato and Aristotle, where the ones who set root definition of this term. Their discussions were concerning the grasp of the term value as an integral part of human beings (concerning souls and virtues). Later, this term gained different meanings like: ethical/moral value, ideological (religious, political) value, social and

aesthetic value, economic value. A specific scientific field called Value theory was developed – it studies values and examines different approaches and ways in evaluating certain concepts, ideas, goods and products.

The concept of value has been in the center of trade and business marketing for a long time, where the primary focus is on the monetary or material worth and services products which delivered to the user and the customer. Michel Porter defined widely accepted instrument of competitiveness – the concept of value chain in [9]. Value chain describes an organized set of activities through which the product passes and with each activity it gains a certain value.

According to Porter, activities that create the value in chain, in a broad-sense, can be divided into two types – primary activities and auxiliary activities, as shown on Figure 1. Primary activities in the value chain are: inbound logistics, manufacturing, output logistics, marketing and after-sales service. These activities are included in a concrete design as well as in creating the product value. Auxiliary activities are: procurement, technology development, Human Resources management and systems infrastructure.

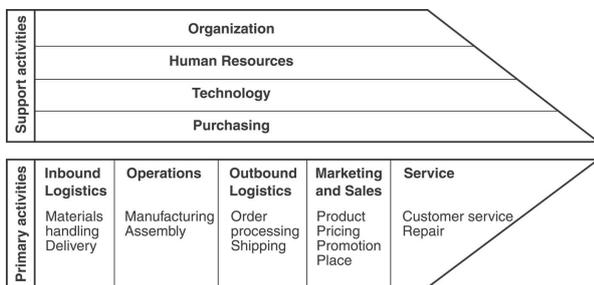


Figure 1. Value chain [9]

Two-out-of-five primary areas fall to logistics and logistic services, which clearly indicates the role and importance of logistics in creating a final value. Term inbound logistics relates to activities like procuring the company with raw materials, half-products and production services, and term output logistics relates to logistics activities like distribution and disposal of final products within commercial markets.

### 3. CREATING LOGISTICS VALUE

In the logistics sphere there are significant possibilities for creating value [6]. Logistics value can be created through: standard logistics services, additional logistics services and specific logistics solutions (Figure 2).

Standard logistics services which include transportation, storage, reloading, shipping services, etc. create spatial value and time value of the products. Spatial value is created by changing the location of the products. More precisely, by meeting customers need to find the products on demand locations (ready for sale, usage and consumption), a new product value is created. So, for example, the final products have one value when they are in a factory warehouse, another value when they are in stores, and the third one when they are in a consumer apartment.

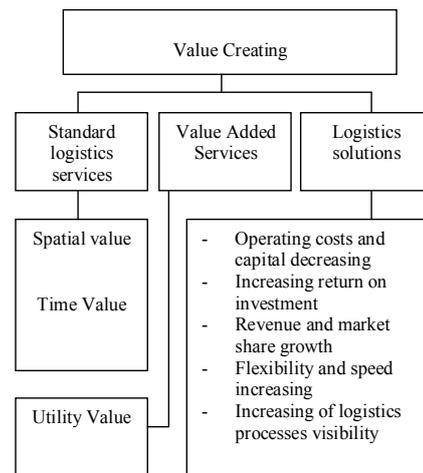


Figure 2. Different ways of creating values in the logistics

Time value is created by making the products available at a specific time and place. Spatial change, i.e. spatial adjustments to customer demands, is not the only thing that is important – occurrence time for this process is also important. The main point rests in the fact that customers receive their product at required time which increases the overall value of the product.

Additional logistics services (Value Added Logistics) contribute to creating and increasing utility value of a product. Logistics systems change the ways goods are represented (packaging, repacking, marking), product finishing (finishing touches, assembling, installation), product refining process, qualitative and quantitative transformations, quality increase, whereby the overall value of the product is changing significantly. Depending on the type of the product, in logistics systems, there are many processes like drying, ripening, cleaning, freezing, and product refrigeration are developing, whereby utility value certainly changes.

Specific logistics solutions that logistics providers offer can significantly increase the value by: reducing the operational costs and required working capital, improving the return on investment, increasing revenue and market share, increasing

flexibility and the speed of logistic process implementation, and also by increasing the visibility of logistic processes. Through the improvement of logistic processes operational costs, such as transportation, storing, inventory, transfer, administrative costs, etc. can be reduced significantly. By increasing the inventory turnover, reducing the safety level of inventory, improving the cycle time and striving for perfect deliveries, working capital requirement can be reduced. Reducement of working capital requirement is the primary interest in the company, as it is directly related to shareholder value increasement. Through better resource management, efficient flow of the logistics processes and better capacity usage it is possible to improve the Return On Assets (ROA) directly. This is very important because companies often have millions of dollars hidden in their logistics operations. High-quality logistics services and perfect procurement and delivery realization contribute to increasing market share and revenue growth, a time value and overall value. The need for flexibility, agility and the speed of logistics process implementation is greater than ever. By improving these attributes, the value increases significantly. Accomplishment of global visibility logistics processes in real time is powerful value creator through inventory reducement, that is, working capital and operational costs reducement, and customer service improvement.

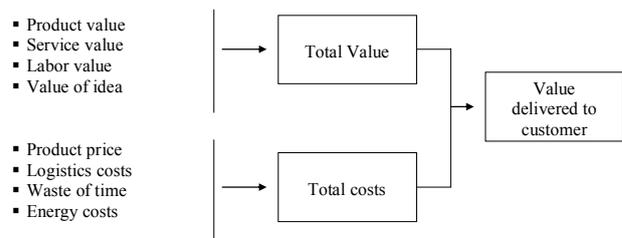
Creating the value of logistics needs to be viewed in two key perspectives – customer's perspective and shareholder's perspective.

### Creating value for customers

The determinants of customer delivered value means are differences between the perceived benefits of the purchase and overall costs relating to that purchase. Perception of the total value or benefits is a result of individual element assessment: product, service, staff and real idea, while the overall costs include the purchase price of product, logistics costs, resource cost and energy, as well as time-loss (Figure 3).

Obviously, logistics has strong impact on both components of value. High-quality logistics services directly attract customers and increase the perception of the purchase benefits. On the other hand, effective logistics strategies and technologies provide reduction of logistics costs, that is, the overall costs. For these reasons, logistics is considered to be very effective tool in creating and increasing the customer value.

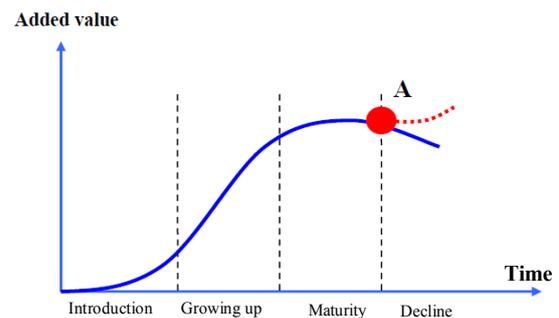
However, it should be considered that the perception of customer value is usually based on added-value services and specific logistics solutions. In principle, standard logistics services are granted. For these reasons, companies and provider that offer logistics services should long for providing services that give a value to a product, and to offer specific logistics solutions.



**Figure 3. Creating the total delivered value to customers (adapted from [3])**

It should be considered that the real value represents the dynamic concept, which changes a lot through the time. What is now considered to be an added value, tomorrow can be a standard service pack. For these reasons, creating the value within logistics services and solutions should be observed through service life (Figure 4).

New services, ideas or solutions create significant added value until the offer stays unique, that is, until it is copied and/or improved by competition – when that logistic package or logistics solution becomes the part of market offer, take the character of the standard offer and stops being the source of users' value perception.



**Figure 4. Creating an added value through logistics service and solution lifetime [13]**

In general, the greatest potential of creating added value lies in the phases of introduction and growth of new services, ideas and solutions. In the maturity phase, due to the diffusion of the identical or similar offer on the market, users question the relevance of added value. If a provider do not arrive at inovative ideas, logistics services and solutions, any potential of creating the added value will be lost. For example, Point A shown in the graph (Figure 4)

represents the moment when a company needs to make innovations in its offer and focus its business on other services and solutions.

**Creating value for shareholders**

In addition to creating and making value for customers, logistics and logistic service significantly contribute to increasing business value (shareholder value). Business value increment can be achieved by increasing profitability and/or reduction of working capital (Figure 5).

Better profitability can be achieved by increasing revenue and reducing the overall costs. Revenues can be increased by improving product quality and delivery service, that is, better product availability, and costs can be reduced through greater operational effectiveness, logistics process acceleration and savings on logistical subsystems. Reduction of required capital is achieved through reduction of working capital (reduction in inventory levels, faster working capital, etc.) and reduction of fixed capital (more effective capital usage, less investments in logistic systems and transfer the capital in other businesses).

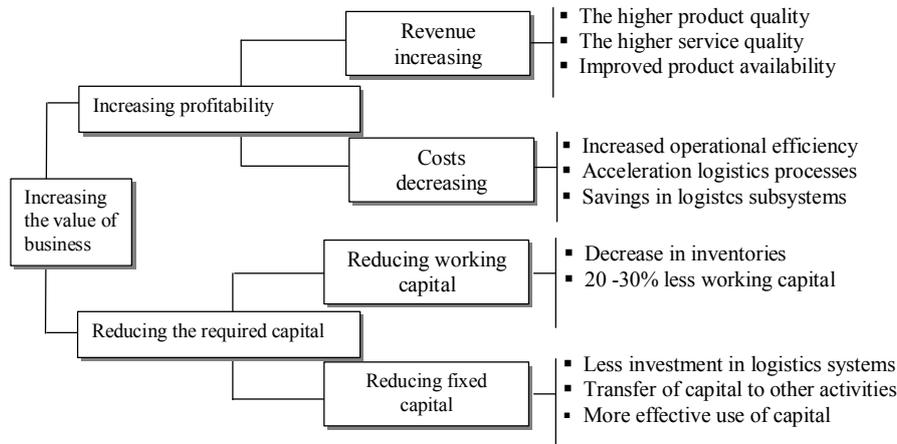


Figure 5. Improving shareholder value (adapted from [1])

**4. VALUE MEASUREMENT**

Logistic providers have to measure value offered to their customers in order to realize adequate profitability. The customers cannot be expected to analyse the offered value themselves and that they would be ready to pay for it. It is not enough just to list the superior attributes of quality, but the higher level of logistic service should be transferred into financial benefit. Besides the customers, the value realized in logistics should also be presented to the management of the company. It is easy for the management to ignore and underestimate the importance of specific logistic solutions when the logistics functions well. Everything mentioned above leads to the conclusion that the value created in the area of logistics should be measured both internally and externally, along the whole supply chain.

Marketing literature includes different approaches and methods of value measurement. Thus, for example, in [7] give the following key value measurements: customer satisfaction, Customer Value Added –CVA, total cost analysis, profitability analysis, strategic profit model, shareholder value analysis.

The value obtained through logistic activities can be measured in accordance to: spotted value and costs, quality, price and time; basic and added value; competition and stockholders value.

From the customers point of view, the value is, mainly, defined as the ratio between spotted benefits and total costs. In [2] author says that the customers value can be presented in the following way:

$$\text{Customer value} = \frac{\text{Benefits perception}}{\text{Total costs}}, \text{ or}$$

$$\text{Value} = \frac{\text{Benefit}}{\text{Costs}}$$

Naumann implies that the customer establishes the perception of utility and costs on the product and customer service [8]. When spotted utilities are divided by spotted costs and risks, the value expected by the product/service consumer is obtained:

$$\text{Value expected} = \frac{\text{Value perceived}}{\text{Costs}}$$

where:

*Value perceived = Product attributes + Customer service attributes*

*Costs = Transaction costs + Product lifecycle costs + Risks*

From the marketing point of view, the value presents the ratio between realized and expected quality and it can be presented in the following way:

$$\text{Value} = \frac{\text{Realized quality}}{\text{Expectation}}, \text{ or}$$

$$\text{Value for customer} = \frac{\text{Quality x service}}{\text{Costs x time}}$$

Gale also connects market perceived quality (the quality of both product and customer service) with the extraordinary value for the customer, where the value has been defined as the quality perceived on the market which is aligned with the product price [2]. According to this author, the value is equal the quality comparing the price, where the quality includes all the attributes, except the price. This author also says that both the product and customer service have relative quality, price and value.

According to [4] "customer value" (CV) is results of "core value" (CV) and added value (AV), as shown below:

$$\text{CPV} = \text{CV} +/- \text{AV}$$

Core Value, defined by Grönroos, is shown as the benefit of basic solution in accordance to the price paid. It can be said that the core value has been materialized through a product or an offer as per retail price. In [14] author defines perceived consumer value (CVP) as general customer estimate of benefit according to invested and profited, based on the offered product. basically, the customer estimate goes further than directly perceived satisfaction created by purchasing the product or service. According to [4], the relationship between the customer and service provider can significantly and indirectly influence the overall perceived value.

The added value, depending on the level of implementation into the product or service, can have positive or negative effect to the perceived consumer value. According to the logistics perspective, measurement of the added value resulting through the activities along the supply chain is particularly interesting. Authors in [5] derive the conceptual formulation of added value (AV) in the following formula:

$$AV = \frac{U \cdot A}{C}, \quad \begin{array}{l} U - \text{utility,} \\ A - \text{access,} \\ C - \text{cost.} \end{array}$$

The equation implies that the added value for consumers is diminished in the case when the product is not easily accessible when needed ( $A < 100\%$ ), and/or when the former scope is the same, even if the product has "perfect" utility ( $U = 100\%$ ). Some authors, such as Womack and Jones, present the added value as the ratio between the improved quality and the time with the price [13].

Since the value is the basic instrument for the competitiveness, it is interesting that the realized value is also measured regarding the competition. In this case, the CVA can be presented in the following way:

$$\text{CVA} = \frac{\text{Perceived value in actual company}}{\text{Perceived value in competitive company}}$$

The ability of creating values for shareholders is of key importance for company's surviving. Two most accepted opinions regarding the way the management connects company's performances with making shareholders values are: shareholder value analysis – SVA, established in [10], and economic value-added - EVA, established in [11]. The shareholders values are considered to be the most comprehensive measures.

Measuring of the added value created in the area of logistics is the precondition for improving the logistic processes and supply chain. It is important to mention that the measures and measuring can be connected with the company's goals and can be established via online logistic scorecarding system and reports, where the achieved results can also be easily connected visually with the achieved values. Thus, the measurements and results become easily available to the management and key participants in the logistic processes.

## 5. CONCLUSION

There are significant possibilities for creating the added value in the area of logistics. It is necessary for the logistics providers and the companies to be aware of this fact, to constantly monitor, follow and indicate the value realized through logistic processes and activities. However, in the real systems, there are various problems and obstacles regarding the creation and calculating the value. Such problems are most often the consequence of two facts. The first fact is that the great number of companies lacks

knowledge and experience in value analysis. The employees often have limited cognition of best logistics practice, or they have not the experience in introducing and applying logistic solutions and measurements. Operations and logistic management regularly lack the time for innovations, analyses and improvements. The other fact is that outsourced services offered by experienced experts and consulting companies, are both time and money consuming, such companies search for faster and cheaper solutions. Those solutions can provide short-term effects, but the added value should be observed through the whole life cycle of the specific logistic service or solution, and also of the customer.

It is important to develop methodological practice of discovering, creation and measurement of the value, that would include the specific things of the specific logistic system. It is better that the methodology results from the mutual work of consultants and logistic experts from the company. That way the chances for its comprehensive applying will increase, which would lead to achieving the expected results.

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