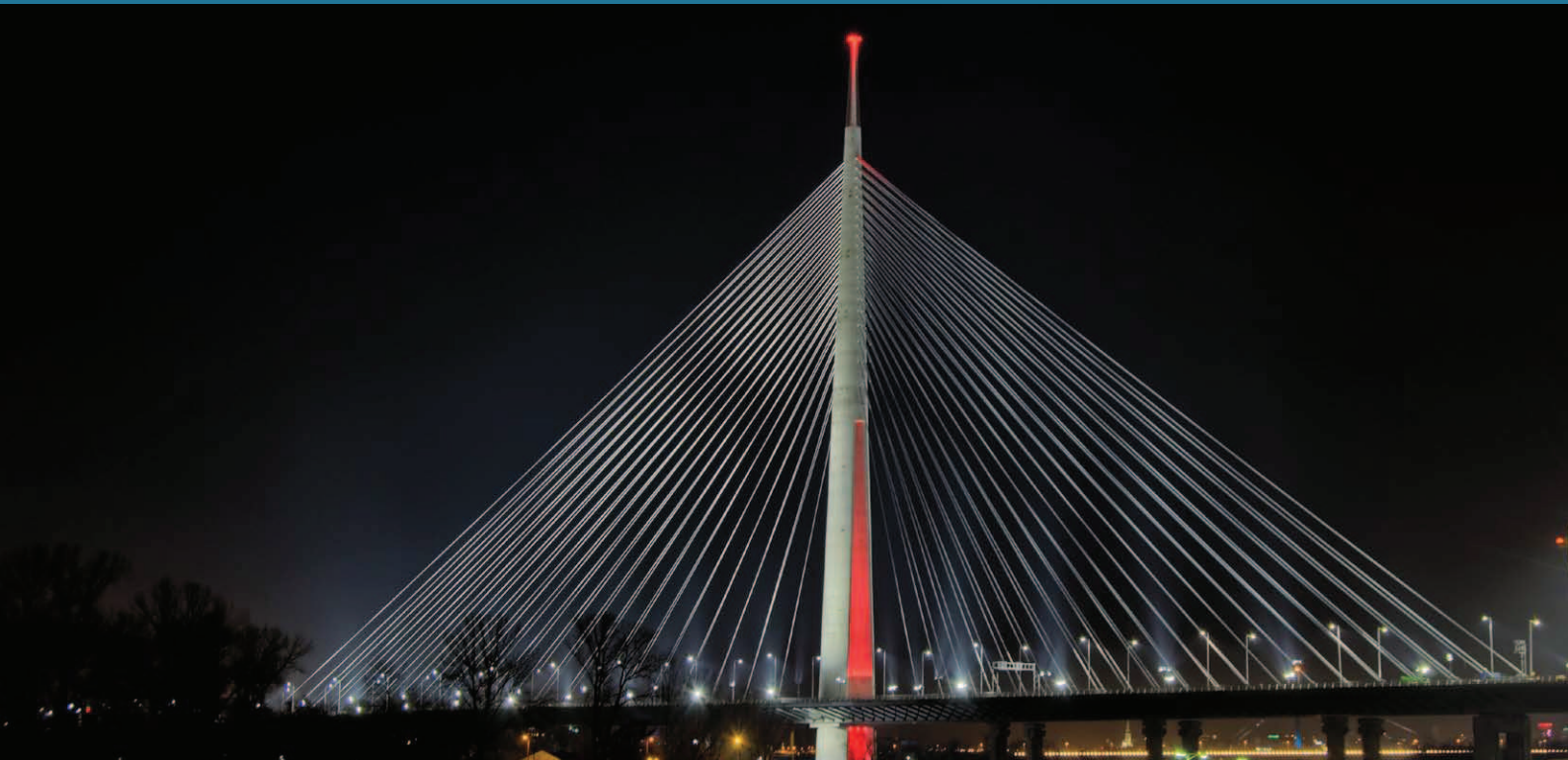


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## ICTTE Belgrade 2012 Conference Director's Speech

Ladies and gentlemen, distinguished speakers and guests, dear colleagues,

I am delighted to welcome you to Belgrade and to the International Conference on Traffic and Transport Engineering, 2012. It is a pleasure to be here with you today at the beginning of this two-day conference on traffic and transport engineering.

This conference presents the perfect example of globalization in transportation industry. Nothing illustrates this better than the number of papers from more than 20 countries worldwide. I hope that many conclusions made here will be the key drivers of future development in global transport sector for passengers, cargo and infrastructure.

Naturally, we are ready to share our experience of creating what we think is the world's largest and most successful example of transportation industry in all transport modes.

By providing essential transport links, between ourselves, our companies, universities and countries, we are vital part of global community for integrating and connecting regions all over the world.

International Conference on Traffic and Transport Engineering, ICTTE Belgrade 2012, will be the first conference organized by Scientific Research Center Ltd and its International Journal for Traffic and Transport Engineering (IJTTE). My special thanks and encouragement in their work go to our dear colleagues and friends, key speakers, as well as to our partners: City Net Ltd., South-East Europe Transport Observatory (SEETO), "Kirilo Savić" Institute and Innovation Center - Faculty of mechanical engineering, University of Belgrade. And finally, I would like to mention great support from Center for the promotion of science, and Faculty of transport and traffic engineering, University of Belgrade thanks to which we are jointly hosting this conference.

I wish us all fruitful exchanges during these two days; constructive, testing ideas and identification of the steps we will be taking in the future.

Thank you for your attention.

ICTTE 2012 Director

*Dr Olja Cokorilo*

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## LOGISTICS AS AN INSTRUMENT OF TRADE MARKETING

**Duro Horvat<sup>1</sup>, Marinko Jurčević<sup>2</sup>, Morana Ivaković<sup>3</sup>**

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**Abstract:** In the framework of the marketing mix, distributive marketing instrument has the basic task of allowing the consumer to purchase the product, in keeping with his wishes manifested through time and place of delivery. Logistics management is responsible for defining the optimum level of service offered to consumers with respect to the physical movement of goods. What this means is that the task of logistics today has become much more complex, since apart from being efficient, it must also meet marketing demands regarding the tailoring of services to individual consumers. Marketing-oriented logistics ensures delivery tailored to demands not only of a narrower consumer group, but of individual consumers. Integrated approach to supply chain management ensuring comprehensive control of products and services passing through the distribution channel is of special importance to commercial economic subjects. Economic development dynamics generates an array of new logistical concepts demanding that logistics, being an instrument of trade marketing, be sufficiently elastic to adjust itself to changes both on the market and in the domain of technological development, especially in the areas in which parts of consumer services are created.

**Keywords:** Consumer, Logistical Process, Logistics Marketing, Supply Chain, Trade Marketing

### 1. Introduction

The business foundation of any economic entity represents clearly articulated needs. Activation of goods and money in trade, as well as in other industries, seeking real needs which are regulated by purchasing power and demand and its activation alone is regulated by purchasing power. Physical gratification of total consumer needs to logistics and trading business entities decide to perform the operational logistics activities. Logistic activities of trading undertakings were pursued through the input (purchase) logistics and outbound logistics (consumers). Retailers have traditionally dealt Inbound Logistics because their liability was focused on the physical delivery of goods to their facilities. Constant changing paradigms, stronger competition and the application of new technology business retailers, logistics and marketing logistics appears in retail trade. This traditional logistics comes out of its narrow frame, and becomes an instrument not only for price competition but also a means of raising the quality of services to consumers especially as there is a tendency in the number of consumers who want a higher level of service. Service has become the basis for the creation of competitive advantage, since it allows an important advantage of the opportunity for differentiation of standard products as well as satisfying the specific needs of consumers. For the achievement of benefits and consumer goodwill, retailers must coordinate logistics with his other business functions, as consumers, as well as end users of the product, the only measure of success of all marketing activities undertaken.

Manufacturers of physical products and services have to decide on the logistics market - the best method of storage and transportation of products and services on the destination market, and coordinate activities of suppliers, purchasing agents, manufacturers, marketing professionals, channel members and customers. Improving the efficiency of logistics result of the progress of information technology (Kotler and Keller, 2007), as the quality of logistics services plays a very important role in the survival of the market and fight with their competitors.

Logistics management is responsible for defining the optimum level of service to consumers when it comes to the physical movement of products, because today has to meet logistics and marketing requirements to adapt services to individual consumers. This means that the behavior of consumers when buying is an impuls to the process of production and logistics (Segetlija, 2006).

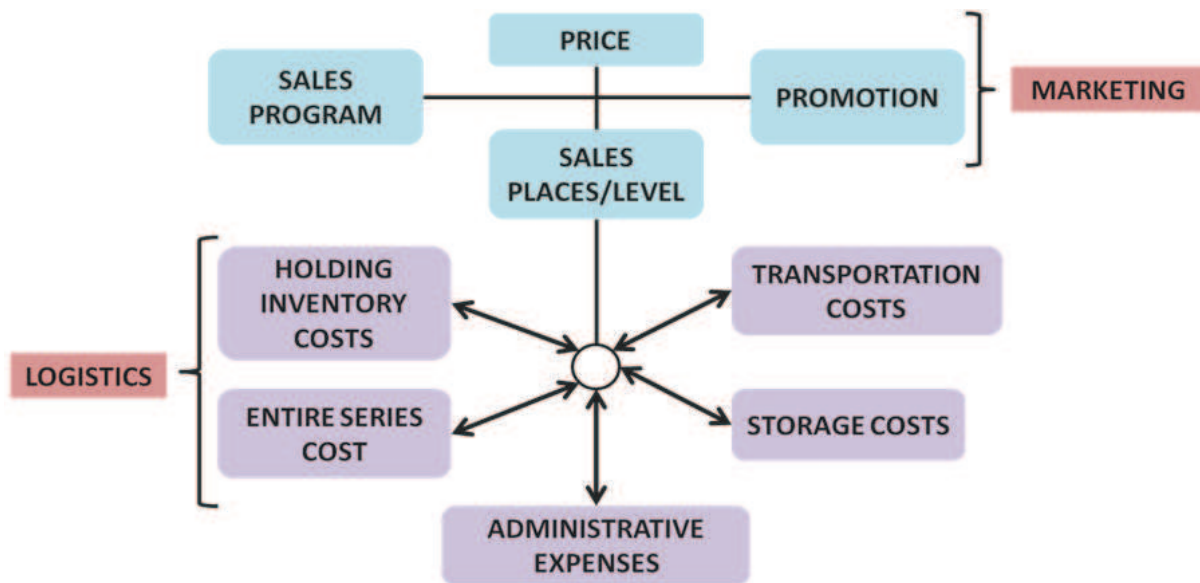
Logistics support for the traditional marketing mix. It encompasses a variety of activities that generate specific marketing costs, but also increase the value of the bid. Customer service defines its effectiveness in the distribution channel as 98% of the warehouse means that the requested product immediately available to the buyer in 98% of applications. This high level of logistics services marketing managers set to further increase penetration and market share. Therefore, the task of logistics calculates costs caused by this level of service in order to assess consumer response to deficiencies identified inventory levels. Logistics is in fact regulated system composed of a range of logical and interconnected subsystems. Structure and elements of logistics, to observe and study the different aspects - financial, economic, market, etc., and is therefore still necessary problems of economics, trade undertaking or issues of trade and the flow of the business process, the process under the conditions of market economy, ie an economic system that is based on other grounds (Segetlija and Lamza-Maronić, 1996). For this purpose, we have used with the literature from countries with developed market economies as well as the results obtained by our own research.

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## 2. Tasks of Marketing Logistics

The concept of marketing logistics in its content develops in relation to other aspects of logistics because it is traditional support to the marketing mix. It encompasses a variety of activities that cause certain marketing costs, but also increase the value of deals which can be seen in Fig. 1 (Lambert and Sterling, 1978).



**Fig. 1.**

*Costs and activities in the logistics system*

*Source: Made by Authors*

Combining all of these activities is operationalized in the process of movement of finished products and information related to product placement. In these circumstances, the consumer is provided the desired product with minimal costs incurred in connection with bridging temporal and spatial differences between its production and consumption. The logistic function helps bridging spatial and temporal disparity so that the product will be in place at the time when consumers are looking for. Therefore it can be concluded that it is unlikely that many consumers have no need or desire to buy umbrellas VIS K & G in June, July or August, but the manufacturer will concentrate on production during the year and store umbrellas to readily meet increasing demand, which usually occurs in early fall (Grbac, 2007). This means that the orientation towards consumers must assume the position of the consumer, in order to supply the market could offer proper service system. Logistics is critical to maintain relationships with customers; leading industry players recognize and acknowledge the contribution of user services running logistics. In many cases, the logistics service is the primary deciding factor that influences their buying intentions. However, the logistics do not work in isolation. Logistics activities must be coordinated and complementary with other functional areas, particularly marketing. In order to maximize the potential of these two areas must work effectively together. Marketing to create demand, in order to cater for logistics and meet demand. It follows that the fundamental task of marketing logistics needs of consumers turn to an order convenient for delivery. The realization of the task indicates that the fundamental task of marketing logistics marketing. However, one should bear in mind that the dynamics of economic development may set new demands on the marketing logistics. This means that marketing logistics must be extremely flexible because it necessarily has to adapt to the changes in the market and in the area of technological development. Based on this, we can conclude that marketing logistics sea, among other things, to ensure optimal implementation and market demanding logistics system, both in terms of prices and the quality of individual and total logistics services. This will be realized overall marketing fundamental role in the economic entity, and that's good and successful integration of the production and consumption of the products, which affects their market development.

## 3. Meaning and positioning of logistics in trade

The purpose of logistics is constantly improving the flow of goods and information through a business entity, or in the entire supply chain. As the fundamental objectives can be set (Segetlija, 2006): reduce inventory, shorten the time (e.g., on the order of customers), etc. Today, more single economic entity that is engaged in the production and / or trade cannot be successful if your work is not regarded as a distribution business. Also the long term will not survive another economic operators with second-or delayed distribution structure or marketing logistics or marketing talent.

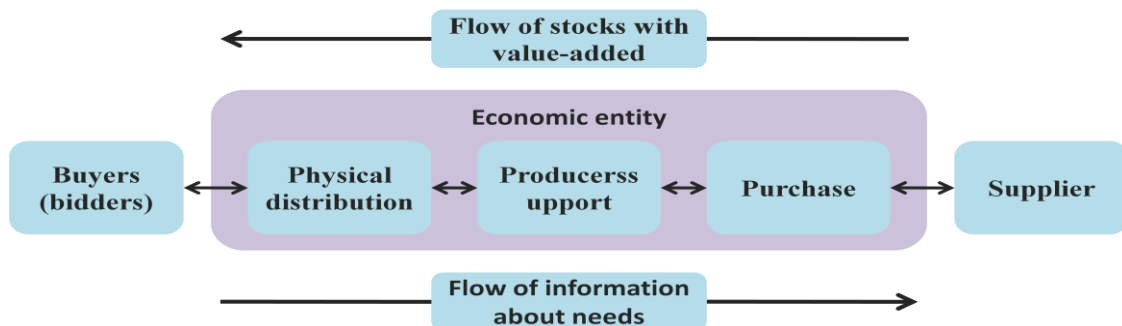
Therefore, it is its positioning within the store vital because only ensure its full implementation and includes all activities aimed at lifting the efficiency and effectiveness of trade and its entire system that is focused on customers and processes.

Large supplies, transportation costs and other logistical costs caused by the desire of management to store adequate logistics rationalization realize substantial savings, and thus achieving better business and financial results. Availability stocks will not always be a sufficient reason to make a purchase, but it is completely certain that the lack of supplies can often be a sufficient reason to change the place of purchase. Trade and logistics management must coordinate value of savings and sometimes excessively high service requests by customers. This means that logistics remains to be one of the underutilized areas for adding value to trade offers. Adding value through logistics ensures successful anticipation of the needs and desires of consumers and the development of such a business system that allows you to meet the needs and desires at the lowest cost. Therefore, the faster must end business process of procurement, production, realization and collection, and therefore just logistics is gaining importance and is equated with the other functions in the economic entity, So, I realized that the logistics can not only deplete reserves of rationalization, but to achieve and competitive advantages due to growing demand for shorter delivery deadlines, better flexibility, range, etc (Segetlija, 2006).

Control of management processes include planning, organization and control procedures for the target routing chain to create value with respect to quality, time, cost, and customer satisfaction (Gaitanides, et al., 1994). Optimal combination is achieved unhindered circulation of consumers as well as the maximum volume of sales per unit of retail space. Therefore, the obligation to coordinate store management functions, areas of action, decision-making and certain executives. So, logistically outputs should provide a competitive advantage in the market with more efficient to attract consumers, and thereby simultaneously creating additional time and space value to increase profits and increased capital values. Therefore, the goal of logistics as a marketing tool to increase the profitability of the trade that is based on customer satisfaction and integrating marketing efforts aimed at lifting the level of service to consumers. This means that the logistics marketing offensive weapon, or a field of potential competitive advantage in the marketplace. All this points to the maximum correlation marketing logistic functions, and this connection can be seen through the dimension of creating logistics value in trade economic entity. Such a strategy becomes a separate set of activities organized to give a specific combination of values of a selected group of consumers (Porter, 1985).

#### 4. Logistics process - adding value

Successful economic operators develop superior management capabilities fundamental processes, giving them considerable acuteness of Competition, where they are viewed and further from their value chain, observed in the value chains of its suppliers, distributors and, ultimately, customers and consumers. Specifically, once the suppliers and distributors regarded as sources of costs, but they are now carefully selected according to the principles of partnership. We would argue that the main goal of efficient management of logistics processes achieving consumer satisfaction, which is achieved by creating and providing added value to the consumer, which will be considered to be higher than the amount paid for it, or greater than the value of their pungent amount offered competitors. An important source for obtaining a relatively long-term competitive advantage early in this century is becoming more value-added delivery to consumers. It is acquired by discovering new ways out to meet demanding customer value. Economic operators must learn extensively about your market and target consumers. A good number of businesses who are trying to gain a competitive advantage in the market, based on the assessment of what makes the offer of competitive businesses and trying to do something better than that. The innovation of placing emphasis on the value of the innovation, because without it, there is no improvement value for consumers that can be supplied by added value. Because of logistics functions including integration of multiple products in bulk, storing and making available to consumers, and often shapes the program offers in smaller units and a form placed on retail shelves. So, it is a transportation, warehouse, and making contact with consumers (Grbac, 2007). Logistics adding value (Fig. 2) is through successfully meeting the needs and desires of consumers and at the lowest cost.



**Fig. 2.**  
Value-adding chain in logistics  
Source: Bowersox and Cooper (1992)

Adding value in the logistics channel involves optimization of the process and the establishment of efficient functioning of the logistics chain, which is achieved by running-in operations. The very effectiveness of the adjustment is accomplished by introducing new activities in the various steps of the process of logistics. Management value chain radically changes the organizational processes and the way in which the work is performed, and eliminates all activities that do not add value.

Tendencies that marked the end of the twentieth century in the distribution channels is making alliances between manufacturers and retailers. Commercial entities such as Dillard's (department stores), Kroger (supermarket), K-Mart (discount houses) and Target (discount houses a full-service) established alliances with manufacturers, with the idea that a shared crispum costs and upgrading the performance. This implies a common measurement techniques and efforts in sharing information, and it's all focused on linking logistics efficiency and marketing effectiveness. Thus, for example, Wal-Mart announced that it has invested \$ 600 million in information technology, which will allow access to POS data from a selected group of 2,000 suppliers (Borersox and Frayer, 1999). This activity has resulted in a better prediction of requests for products and services because of closer ties with customers and consumers and so the Wal-Mart and Warner-Lambert's Consumer Group collaborated on improvements to forecasting requirements for the product and the mutual efforts of partners increased sales of Wal-Mart for 6,5 million U.S. dollars (Robbins and DeCenzo, 2004). Also, the dynamic and competitive environment is facing the modern global corporation, requiring new solutions. Knowing about the dominance of the market-value of a consumer's economic subjects took the experiment with a new business model, or to the strategic design of how the economic operator is planning to benefit from its wide array of strategies, processes and activities. For example, IKEA, furniture manufacturer, has been transformed from a small Swedish manufacturer by postal orders in the world's largest furniture retailer, and design a new value chain. For consumers, it offers well-designed products at very low prices in exchange for those willing to take on certain tasks that have traditionally been in charge of manufacturers and retailers, such as delivery, installation, etc. (Robbins and DeCenzo, 2004).

Good value chain is the sequence in which participants work towards the principles of teamwork, where each adds some value, such as, for example, faster assembly, accurate information or to purchase a better response to consumer products or services. What is a better cooperation between the various stakeholders chain, better solutions to consumers. When the value to consumers when they are created and their needs and desires are met, everyone in the chain of benefit. For example, the Iomega Corporation, a manufacturer of storage devices for PC, manage the value chain begins to improved relationships with internal suppliers, and extends to external suppliers, customers and consumers. As the experience of the company with the management of the value chain strengthens and progresses, so increases their connection with consumers, which is finally paid to all partners in the value chain (Robbins and DeCenzo, 2004).

Special dimension to overcome inter-organizational boundaries is optimizing the total cost of the system. Functional intermediaries in this process is not cost efficient or not added to the otherwise overall value of the service consumer, a burden that other participants in the chain should be identified and removed.

However, apart from manufacturing operations, productivity can be increased and the rationalization of many other processes in companies. For example, the realization once received orders had already been operating a strategic character, and once with the delivery of the product could be delayed, without fear that they will lose existing customers, because the competition was of low intensity. In contrast, in the modern economy prompt delivery of products and services is one of the important elements of the overall productivity and competitiveness. Exact delivery includes horizontal integration and uninterrupted flow of information and material inputs and finished goods between supplier - manufacturer - distributor - customer / consumer. This is an integrated logistics process-driven sophisticated management techniques that today are constantly developing.

From this we can conclude that adding value includes all activities, functions and business processes that take place during the design and development, manufacturing, sales, distribution, and (after) sales service and support to consumers because the whole logistics process must ensure and generate added value for each participant in the process, which is a fundamental prerequisite of business success. Besides the possibility of creating new value-added, marketing logistics probably offers the greatest opportunities to improve profitability in companies.

## **5. Modern logistics concepts**

From the previous argument we conclude that logistics plays an important role in the formulation and implementation of services to consumers. Rising levels of service and adding value to the logistics service have contributed to many modern logistics concepts.

The concept of supply chain began to develop significantly in late 80-ies of the last century. There is no universally accepted definition of the supply chain, as well as many other concepts. Many supply chain used as a synonym for logistics, although the logistics of one of his constituents.

One definition of the supply chain says it's integration of business processes from end user through original suppliers that provides products, services and information that create added value for customers (Lambert, et al., 1998). The main objective of the supply chain is actually achieving extraordinary speeds in the realization of the needs of consumers, because the restrictions caused by the consumer, which means that there is a change in the needs, wishes and expectations of consumers.

Synchronization of what real consumers want with what retailers really cannot easily deliver and requires a systematic approach to defining the organization's quality and logistics concept.

Today, supply chain and his organization represent areas of opportunities to create competitive advantages and, therefore, holds strategic tool for positioning the business entity in the market. There are many examples of businesses that are just high-quality supply chain management could significantly improve its market position and to move away from the competition. Many senior decision-makers now recognize that the supply chain is making a key contribution to operational excellence. It has been documented many times, most recently in an international research team, which included researchers from Accenture, the business school INSEAD and Stanford University (INSEAD). The results from this effort indicate that the supply chain is very important or critical to almost 90% of the population research manager. By supporting these statements, almost the same percentage has increased investment in the supply chain in recent years (Anderson, et al., 2003). Therefore, supply chain refers to the manipulation of materials and processing of the classical economy where profits gained by lowering costs. Value chain is, however, a process in which the individual stages of production or service adds value by means of, for example, knowledge, innovation, design, quality and small improvement of the working environment and the employment service process.

This study classifies different approaches to economic entities in the supply chain intervals since 1995 to 1997 and since 1998 to 2000 year. The study included 636 businesses from 24 industries, and tried to determine whether a supply chain to influence the success of the undertaking. Interviews were conducted with employees and consulted industry analysts, academic experts and the like, and the results were compared with earlier surveys and studies Accenture,

INSEAD and Stanford University. The studies were four main findings emerged, including (D'Avanzo, et al., 2003):

1. Senior managers at leading business entities in the supply chain viewed as a critical driver of shareholder value and competitive differentiation (acknowledging this perspective, research shows a strong relationship between superior supply chain performance and financial success);
2. Leading economic operators supply chain incorporate into their business strategies and attention to the design of integrated operational model;
3. Leading industry players in the supply chain innovations built into their operating models, with particular emphasis on outsourcing, internal / external integration and customization supply and demand and
4. Leading industry players in the supply chain are working towards its strategy and capabilities and are constantly adapting to the changing needs of the market (easily implementable design processes that meet stringent performance standards).

Way of managing supply chain shows the fundamental difference between those who create their own through the chain's competitive advantage and those that do not. If the supply chain begin to deal with when something goes wrong, then your competitive advantage we will create in the management chain, because we have to actively pursue it before and seen it as an opportunity to improve business. So, those who care about the effectiveness and efficiency of intensive thinking about the structure of the supply chain and the organization, they collect more information from the environment, to carefully analyze this information and based on them make better decisions more quickly respond to the constant changes in the market and the environment, accompanied their performance and continuously improve operations regarding the creation of new organizational forms, methods and procedures. Global trends and creating strong trading partnerships accelerate the development process within the supply chain as a competitive local and global distribution channels require that all parties affected by the goods and services in accordance with the requirements of consumers. In order for the buyer or consumer, have added value products and services should be available when they wanted. This means that establishes a continuous process where goods and services are continually flowing through the channel, because if there is a delay in the delivery channel system breaks down, suffering the additional costs (Bloomberg, et al., 2006).

Therefore, we can conclude that the management of physical distribution business fields with the greatest opportunities for potential savings in operating expenses (Drucker, 1962). Furthermore, Coyle, Bardi and Langley (1996) placed in the context of the broader concept of supply chain management and sales and show that they are successful logisticians to identify potential opportunities for savings in logistical costs (efficiency in operations), or those who aspire to better serve the consumer setting (effectiveness in business).

### 3. Conclusion

Logistics as a marketing instrument to trade increasingly focused on creating value for customers, while marketing concern, develops, cultivates and supplies customers with better products and services. Consumers are better informed and organized and are seeking full value for their money as a new logistics concept and allows. Innovations in logistics allow members of logistic chains big savings and a noticeable increase in the quality of service to customers and consumers. So logistics is an activity that affects more firmly linking trade and consumers. This means that the sale of products depends not only on consumers but also on the mediators (distributor or retail chain), and because each of them has to have an interest - the value added to the segment and in the successful sale of the product to the consumer.

That is why the concept of modern logistics as important in industry and trade, because it is interested in closer interconnection of physical and information flows to optimize the logistics of forming a process that will result in increasing their competitiveness, reduce costs and increase the quality of services that meet the demands of consumers. The basic principle is that the companies are developing the ability to learn about the market, which leads to the learning experience and makes the assumption of competitive advantage in the marketplace. Innovation will continue to be the most important way to create a competitive advantage.

### References

- Anderson, D.L.; Copacino, W.C.; Lee, H.L.; Starr, E.C. 2003. Creating and Sustaining the High-Performance Business: Research and Insights on the Role of Supply Chain Mastery, Available on Internet: <[http:// www.accenture.com](http://www.accenture.com)>
- Bloomberg, D.J.; Lemay, S.; Hahha J.B. 2006. *Logistika*, MATE d.o.o. Zagreb
- Borersox, J.D.; Frayer, J.D. 1999. Marketing and Logistics, in Tompkins, A. J. and Harmeling, D. *Distribution Management Handbook*, NewYork: McGraw Hill Inc.
- Bowersox, J.D.; Cooper, M.B. 1992. *Marketing Channel Managemet*, New York: McGraw Hill.
- Coyle, J.J.; Bardi, E.J.; Langley Jr. C.J. 1996. *The Management of Business Logistics*, USA: West Publishing Co.
- D'Avanzo, R.; Lewinski, H.; Van, W.; Luk, N. 2003. The link between supply chain and financial performance, *Supply Chain Management Review*, November/December
- Drucker, P. 1962. The economy's dark continent, *Fortune*, 4.
- Grbac, B. 2007. Načela marketinga, Solutio d.o.o. Rijeka.
- Gaitanides, M.; Sholz, R.; Vrohlings, A. 1994. Prozessmanagement – Grundlagen und Zielsatzungen, in Gaitanides, M. Hrsg: *Proessmanagement*, München-Wien: Carl Hanser Verlag.
- Kotler, P.; Keller, K.L. 2007. *Upravljanje marketingom*, 12. Izdanje, Mate d.o.o. Zagreb.
- Lambert, D.M.; Stock, J.R. Ellram, L.M. 1998. *Fundamentals of Logistics Management*, McGraw Hill, Singapore.
- Lambert, M.D.; Sterling, J.U. 1978. *Customer Service* in Tompkins, A.J., Harmelink, D.: *Distribution Management Handbook*, McGraw Hill, New York.
- Porter, M.E. 1985. *Competitive Advantage Creating and Sustaining Superior Preformance*, New York: Free Press. Available from Internet: <<http://www.insead.edu>>
- Robbins, P.S.; DeCenzo, A.D. 2004. *Fundamentals of Management – Essential Concepts and Applications*, Pearson Prentice Hall, New Jersey.
- Segetlija, Z. 2006. *Distribucija*, Ekonomski fakultet u Osijeku, Osijek.
- Segetlija, Z. 2006. *Trgovinsko poslovanje*, Ekonomski fakultet u Osijeku, Osijek.
- Segetlija, Z.; Lamza-Maronić, M. 1996. *Marketing trgovine*, Ekonomski fakultet u Osijeku, Osijek.