

Logistics Concept Of Management : A Systematic Approach To Dynamic Optimization Of A Firm's Business Performance

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ABSTRACT

In today's turbulent times, in order to successfully solve the managerial problems faced while running a firm, the existing managing paradigms should be replaced with new ones. The mechanical, cause-and-consequence, linear and determinist understanding of today ought to be replaced with an organic, holistic and systematic approach focused on the synergetic processes of creating added value for all stakeholders of a given firm, which is perceived as a socio- economic system within the supra-system of its environment. Logistics, as a means of space and time transformation of goods, energy, information and knowledge, occurring through qualitative transformative processes of creating added value for all participants and oriented towards the optimal fulfillment of users' needs, becomes the infrastructure for managing the dynamic optimization of contemporary firm's operations. Namely, the holistic approach and activities founded on the flows of creating added value for users is the essence of the logistics conception of managing the firm's activities, i.e. the logistics concept of management. The logistics simulation models of dynamic optimization of business operations provide for a consistent system of managing variables, which are directed towards a processing harmonization of the firm's performance and the changes in the environment as an assumption of the optimal dynamic realization of the firm's success potential.

Keywords: Logistics, Logistics System, The Logistics Concept Of Management, Systems Theory, Adaptability, Flexibility, Intellectual Capital, Dynamic Optimization Of The Firm

JEL Classification: M29

INTRODUCTION

Technical and technological changes, as a materialized form of science, are constantly changing society and its segments. The contemporary firm, as a subsystem of the economic and social system, on the basis of the cause and effect principle, changes according to the changes in the economic structure of the society brought about by the recent IT revolution. Computerization, automation and robotization have enabled the maximum rationalization of production processes and have brought on changes in the firm's activities and organization as well as in factors contributing to their success and development. The increasing integration of the economic area and globalization of the firm's business, as a consequence of IT development, resulted in the ever more unified technological base of production, the ever more demanding consumers with their increasingly diversified needs, finally resulting in the more difficult achievement of competitive advantage in the market. The firms today, therefore, are only focused on the most profitable areas. They themselves participate less in creating product value and incorporate more outside components into their own, or rather, mutual products. The externalization of non-core activities and strategic alliances are a logical path towards achieving a more efficient production and increase in the efficiency of the contemporary firm's performance. The developmental factors of business success lie in the potentials of the effectively run processes of time and space transformation of goods, whereas logistics becomes the function through which efficient managing critically determines the firm's competitiveness. In the recent turbulent environment, the assumption of success is no longer in the optimization of the indicators of state, but in the optimization of the variables of the firm's functional dynamics. As logistics is an integrative function aimed at integrating all firms' business processes as well as the firm and its supplying markets and consumer areas, it promotes a holistic approach and a dynamic oriented management, i.e. management of flows. It thus represents the basis for the practical application of

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systems theory in managing the dynamic optimization of a contemporary firm's operations or, in other words, a logistics concept of management. The time period of the present study was from January 2007 - August 2011.

THEORETICAL FEATURES OF LOGISTICS

Since logistics is a relatively young scientific discipline, which is still gradually earning recognition, especially in the transitional countries, it is necessary to elaborate on, among many other theoretical features, the following characteristics of logistics:

- 1) Etymology of the term "logistics" and ;
- 2) Contemporary concept of business logistics.

❖ **Etymology of The Term "Logistics"** : In scientific and expert literature, there are many different points of view on the origin, i.e. the root of the term "logistics". All of them are correct due to the possibility of segmenting "logistics" as a multi-meaning term. The first known usage of the term "logistics" dates to 1670. It was first recorded in the military documents of Ludwig XIV (Ogorelc, 1996: 1). The term "logistics" encompasses the supply of military units with the required material resources, transportation support in the relocation of units, arms and equipment from one position to another. Relying on this source, some authors claim that the term "logistics" developed from the French word *loger*, which means inhabiting, bivouacking, settling and the like. In the military area, logistics is also used as a group term for assignments which serve as support for the military units and in this case the term "logistics" indeed derives from the French word "*loger*". The French word *loger*, as the source of the term "logistics", can also be translated as "making quarters." The term "logistics" entered the economic sciences' literature from the military domain. The first book in the field of business logistics was published as late as 1961, and was, in great measure, oriented solely towards the problems of physical distribution (Bowersox et al., 1961). Later on, during the second half of the 20th century, logistics, having a wider and more subtle meaning, expeditiously became recognized as a science and an activity in the civilian, or rather, economic area, especially as an interdisciplinary and multidisciplinary science applied and studied in all human activities.

In the '*Science of Logic*', logistics is used within the context of mathematical and symbolic logic. Mathematical functions, which can be defined as modified exponential functions are called *logistic functions*, applicable, for example, in the depiction of the product's (or service's) life cycle from market introduction to decline. Therefore, the contemporary approach to etymology and semantics of the term *logistics* is more correct and scientifically based if the root of the term derives from the Greek word's *logo* (reckoning), *logik* (calculated, sound (as in logical thinking)), and in the term *logistikos*, as a skill, experience and knowledge in assessing and estimating all relevant elements in time and space necessary for optimal solving of strategic and tactical exercises in all spheres of human activity (Zelenika and Pupavac, 2008 : 15).

In its beginning, logistics, as an activity, relied on skills and experience, which were replaced by science in the later phases of its development, i.e. scientific notions, principles and theories.

❖ **The Contemporary Concept Of Business Logistics** : The growing significance of logistics in the development of economy, brought on by technological development, imposes the need for increased scientific research of business logistics and its contribution to society's economic development. The economy is analyzed and studied according to certain specific segments, i.e. sectors of economy, providing insight into their specific features, growth, development, changes and role in social earnings and the differences among these segments, i.e. sectors. If logistics is studied and analyzed in this context of the society's economic activities, then the systems (sectors) can be segmented as follows: preparation of goods (production), allocation of goods, trade of goods, and usage of goods (consumption). In production, the goods are qualitatively transformed. Moreover, goods are also qualitatively transformed during usage, i.e. consumption, whether by the end consumer or for further processing. The connection between the production of goods and their usage is made through allocation and trade. This is accomplished through the transformation processes (movement and inaction) which do not change the goods in terms of quality, but in terms of space and time. The systems of space and time transformation of goods are logistics systems. There have been numerous definitions of logistics in literature, but all relevant attempts of defining logistics can be synthesized into three groups (Pfohl, 1996: 12).

The *first attempt* of defining logistics can be called the definition of logistics according to flow, or in other words, process, used by the American logistics society - Council Of Physical Logistics Management (CLM). The definition, which is widely spread in the U.S. reads: "Logistics is the process of planning, implementing and controlling the efficient, effective flow and storage of raw materials, in-process inventory, finished goods, services, and related information from origin to the point of consumption related to this from the point of delivery to the point of receipt, for the purpose of conforming to customer requirements."

Similarly, the definition of the central organization of the national logistics societies of Europe - European Logistics Association (ELA), is also oriented towards processes, and reads: "Logistics is the organization, planning, control and execution of the goods flow from development and purchasing, through production and distribution, to the final customer in order to satisfy the requirements of the market at minimum costs and capital use."

The *second attempt* of defining logistics can be characterized as a definition of logistics oriented towards products and services life cycles. The essence of the theory of life cycles of the product or service, i.e. the system in general, is based on the idea that the product comes into existence through the processes of planning, projecting, construction, upon which it is developed and used, but which, after a certain life-span becomes obsolete, wears off and "dies". Logistics activities are directed towards specific transformations within each single phase of the life cycle. According to the basic principles of the life cycle, the international logistics society - Society Of Logistics Engineers (SOLE) defined logistics as a supporting management, which, during the product's life-span ensures the most efficient use of resources and adequate realization of logistic elements in all phases of the life cycle, in order to be able to promptly act within the system and ensure effective management of resource consumption.

The *third attempt* of defining logistics can be defined in terms of logistics oriented towards the service. It is based on the idea that the service can optimally be put at customers' disposal only if all required activities involved in its production are coordinately realized. Accordingly, logistics is a process of co-ordination of all immaterial activities which need to be accomplished in order for a service to be rendered in an effective manner in terms of cost and in relation to users. All mentioned definitions, as well as numerous others that have not been mentioned, indicate the existence of the complicated problem of scientifically based defining of logistics as a general and/or universal term. At the current level of scientific and technological development, and the development of the overall environment, logistics can be defined as a managerial discipline which encompasses all processes necessary for the complex preparation and realization of the space and time transformation of goods and knowledge, including the corresponding informational and energy flows, in order to, through the use of human potential and resources within the system, place demanded goods at the disposal of the process users at the right place and time, in demanded quantity, quality and price, and accompanied with the accurate information related to these goods.

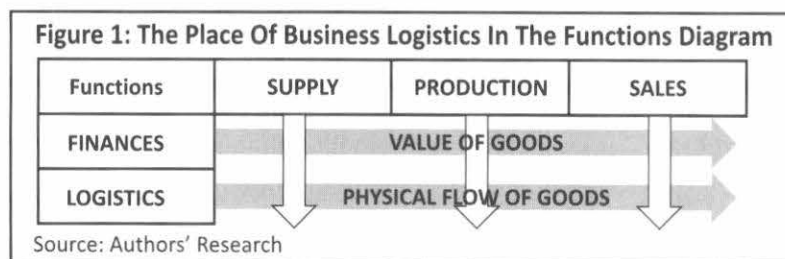
The growth in the significance of logistics in science and managerial practice is an objective process, which besides new economic demands contains strong impulses for the development of information and communication technology and the technology of management that enables logistics solutions for the development of the dynamic optimization of the business systems in the contemporary turbulent environment.

THE CONCEPT AND GOALS OF BUSINESS LOGISTICS

The task of business logistics is the organizational and technological design and time and space management of optimal flows and in terms of cost, favorable flows of goods and information from input suppliers, through the qualitative transformation processes of the firm, to the buyers of the firm's output. This is an integral concept of managing the flow of goods, information, energy and people (knowledge) with the aim to- through the interaction with other business functions - enable their synergetic activities and dynamic optimal functioning of the firm as a business system.

The objective of business logistics is constant improvement of the flow of goods and information through the system, in such a manner, that it eliminates, through coordination, the tendencies for realizing partial goals of individual subsystems and ensures the optimal attainment of the firm's goals as a system. The importance of this is seen in the fact that the average time engagement of the working capital in the processes of the qualitative transformation of goods in the contemporary firm is less than 10%, and that the remaining time of creating added value, that is, more than 90%, in the processes of space and time transformation of goods, i.e. logistics processes. Besides this, the production efficiency based on specialization is not possible if additional output does not find the buyer, and this will not be

possible unless it is relocated from the place of excess production to the places of unmet demand. Logistics contributes to the volume and diversification of goods available to consumers at places distant from the production location, and often long after the goods are produced. By expanding the market, both in terms of space and time, logistics enables the firm to decrease product and service prices, thus strengthening their competitive position and business success. The foundation for the integral analysis of business logistics is offered by Systems Theory, which has also offered the conceptual frame for the correct study and application of the logistics concept of managing the firm (Zekić, 2007: 99). The basic idea of Systems Theory in business economy is that the main problem is not in the optimization of separate areas of business, but the primary optimization of the business system as a whole, which functions in its environment, reacts to it, and thus maintains its dynamic balance. As an important characteristic of business logistics is that it does not satisfy itself by observing and studying isolated phenomena and elements, but that it observes and studies the phenomena and elements as a system, it is justified to conclude that logistics is nothing else but a practical application of Systems Theory in the area of managing flows of adding value to products and services in business systems. The concept of business logistics becomes even clearer if it is compared to business finances (Figure1).



Business finances solve problems that are related to cash flows (value flows) in the business system and environment relations, and are, therefore, intertwined with the classic business functions within the firm. The basic goal of business logistics is the optimal supply of the business system with the work material, energy and information, and the optimal supply of users with products in demanded quantity, quality, time and place. Business logistics, therefore, solves problems related to the physical flow of goods and is thus intertwined with the classic business functions in the firm. It differs from the classic economic disciplines as it does not only analyze individual segments of the business system, but the overall economic flow of adding value, from input suppliers, through the processes of qualitative transformation in the firm, to output users. Connecting logistic activities into a system is a foundation of introducing logistics ideas into managing business systems. In doing so, the goal is to reach an optimum of the logistics system which would also imply the dynamic optimization of the business system. Moreover, the logistics systems should not be observed in an isolated manner, as they are, in their essence, inter-systems, i.e. integrative subsystems which are included in the activities of other (sub) systems. The use of the systematic method, however, despite the obvious advantages, is still in its initial phase in business practices.

According to Rupper (1991: 8), business logistics presents the totality of tasks and measures that arise from the firm's goals, and that are related to the optimal insurance of material, informational and value flows in the firm's transformational process. Hence, the value flows can also be considered as an element of contemporary business logistics. Therefore, business logistics is the integrative subsystem of the firm's managing system, which manages quantity, time and place in transformation processes, in which it guarantees the productive flexibility, required supply terms and supply readiness for the market. However, the firm's interest, as well as the cognitive interest of economic sciences is not solely directed to the transformation of goods, but, before all else, to the creation of value features of profit making goods. The goal of the business system is (through its activity) to create profit, which basically consists of five categories i.e. profit segments (Pfohl, 1996: 21), which are as follows :

- ❖ Formed profit,
- ❖ Ownership profit,
- ❖ Informative profit,
- ❖ Place profit and,
- ❖ Time profit.

❖ **Example:** A product produced at place X (formed profit) can satisfy the needs at place Y if the potential user is informed that the product exists at the place X (informative profit), if it is sent to place Y (space profit) and in time when needed (time profit), and if the ownership of the product is transferred in the appropriate manner (ownership rights). As can be noted, only the formed profit is the result of the process of quality transformation of goods (production), while all others are the result of the process of their space and time transformation (logistics). The task of logistics management is to find the optimum between the cost of logistics and the logistics service. The costs of logistics impose solving numerous optimization tasks, whereas the logistics service is measured by the level of providing the service to users through the following components (Lucke, 1990: 23):

- ❖ Time of delivery,
- ❖ Character/complaisance of delivery,
- ❖ Reliability of delivery and,
- ❖ Flexibility of delivery.

Adaptability and flexibility are, therefore, basic managing variables of the logistics concept of management. The role of business logistics is not limited solely to the ways of managing the processes of space and time transformation of goods, but also includes the support to the firms in terms of noticing the constantly changing situation of the environment and rightful adjustments.

THE ROLE OF LOGISTICS MANAGEMENT IN THE DYNAMIC OPTIMIZATION OF THE CONTEMPORARY FIRM'S BUSINESS

In search of the new ways of achieving competitive advantage, many contemporary firms recognize the unique type of value that can be created through the logistic concept of management, as a model of the integrative participative processing management of the firm. The fact that five types of economic utility create added value of a product and service (formed, ownership, informative, place and time), and that only the formed utility is related to production, while all others are the result of logistics activities, already indicates to the potential of logistics management in the dynamic optimization of the contemporary firm's business activities. If we analyze the structure of a product's value creation in an average industrial firm, the research shows that ca. 57% of its value is made up by the "temporary items", while ca. 43% of the value is "added" in the firm. If this adding of value is determined at 100%, the logistics activities still hold a ca. 22.5% share (Pfohl, 1994: 47). It can be perceived that about two-third of the activities of value creation in a typical contemporary industrial firm are under the direct control of logistics management. The situation of the companies involved in commercial, transport and other services certainly demonstrates an even more significant share of logistics management in the process of creating product's or service's value. The application of the logistics systems thinking and acting has already yielded success for many firms. Successful companies see additional possibilities of increasing their business efficiency through the logistics concept of management. Logistics management creates value for the user, which directly increases the success of a contemporary firm's business activities through effectiveness, efficiency and differentiation.

Effectiveness is related to performance and the degree to which the logistics function takes into account users' demands in terms of product availability, time needed to meet the demand and the sales service, i.e. its adaptability. The coordination among all activities within the supply-chain results in organizational efficiency in satisfying users' demands. This directly leads to the improvement of the firm's competitive position and results in an increase in income from realized products and services. The advantages of these changes have transformed many organizations, which improved financial visibility, streamlined supply chain processes, and minimized Human Resource (HR) processes and overheads (Kumar, 2009 : 1).

Efficiency relates to the organizational ability in ensuring the desired product or service is available for the user at an acceptable price, which implicitly demands for a logistics based management of resources and activities in order to limit the firm's costs. Companies are looking at innovative ways to improve efficiencies (Pallavi, 2011; 1). Logistics management achieves rationalization through better planning of capacities, higher level of cost-efficiency of factors used in the logistics process, substitution of logistics factors, i.e. their flexibility, which directly impacts the success of the overall firm's performance.

Differentiation is seen as the logistics ability to create value for the user through the uniqueness and recognition of the logistics service. The uniqueness of delivery, logistics services, replacement of old products with new ones and similar services result in a stronger and longer users' loyalty to the firm's products, which creates the product's and firm's "name" or in other words, creates the basic assumptions for the firm's long-term success.

Recognition of the role of logistics management within the process of product and service creation of value results leads to its implementation in a contemporary firm's strategic management. The integration of attributes such as adaptability, flexibility, innovation and quick response results in the highly valued levels of service created by logistics management and so sets new standards for achieving competitive advantages in the market. The focus of a contemporary firm's logistics management is directed towards continuous monitoring of users' needs and demands, based on which, it defines the firm's goals and develops a process-based organization, which by implementing logistic strategies achieves greater flexibility in meeting the needs and thus, results in a dynamic optimization of the contemporary firm's business activities. The mission of logistics begins with users' needs and demands and is completed with delivery and the meeting of users' needs. Therefore, logistics management should develop a networking model of organizational collaboration, first of all, with production and marketing management.

The potentials that define the goals of further development of logistics management and, which cannot be precisely quantified by the rate of profitability and other indicators of business success, indicate even higher potentials of logistics management in the future development of the contemporary firm's competitive abilities.

The cost potentials that exist in many areas of logistics management arise from the fact that for most goods, the share of production costs decreases with the development of technology, and therefore, in the future, the reserves of business rationalization will primarily be found in the "service", i.e. the logistics area of a firm's functioning. In the field of material operations, based on logistics systems thinking, new forms of inter - and intra -organizational supply and customer service management are offered, which result in a decrease in supply costs and capital binding, as well as in the improvement of liquidity and overall success of business performance. In order to make the firm's business activities more flexible and rational through the substitution of material production factors and reduction of the time needed for process completion and in accordance with the need to adapt to market trends, the great cost and market potential that logistics management should be mostly focused on, nowadays and in the future, is the faster introduction of a "new" production factor within the logistics processes information. The potentials of logistics are becoming more and more apparent in environmental protection. Logistics management can offer the possibility of environmental protection in all phases of the product's life cycle, from the extraction of raw materials to waste disposal, in which the technological possibilities of reusing products and packaging rationalize business processes. The ability to timely balance goals, structures and processes according to the original information, regarding different users' needs and demands, determines the role of logistics management as the catalyst of the firm's adaptability and flexibility, which become the foundation for its dynamic optimization of business activities. In today's turbulent environment, the desirable managerial goal is not to optimize the state, for example, profit, but to optimize the potentials for achieving a dynamic harmonization of a firm's activities and changeable market demands, i.e. a continuous growth of profitability, or in other words, continuous development.

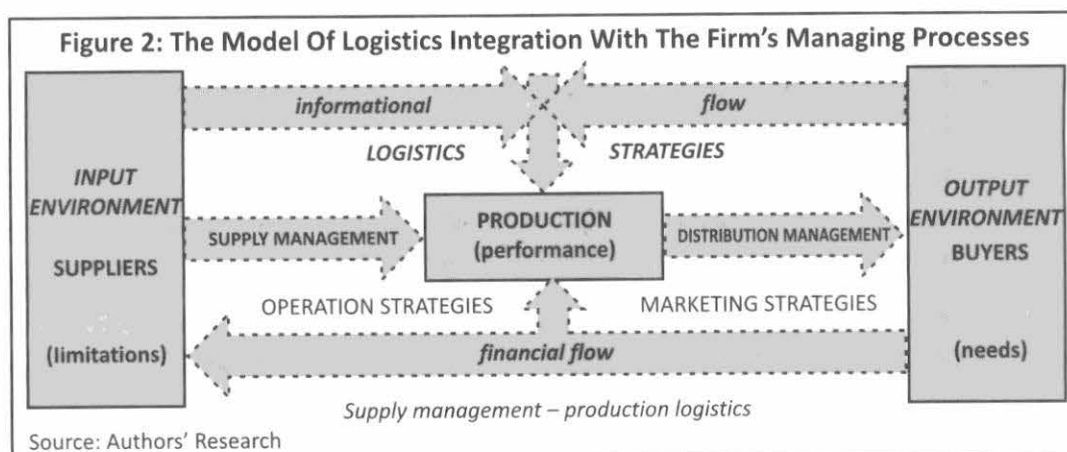
ANALYSIS AND MANAGEMENT OF A CONTEMPORARY FIRM'S LOGISTICS SYSTEM

Successful managing of the contemporary firm's logistics processes through adequate methods implies effectiveness in planning, organizing, managing human resources and control i.e. entrepreneurial technology of management. The logistics concept of management by way of a logistics system integrates all logistics processes and subsystems within the firm into a cooperative, dynamic, target oriented entity - a contemporary firm as a socio-economic subsystem of the environment. As a result, every approach in the analysis of the logistics systems should begin with the contemporary firm's goals, which are, at the same time, the goals of its logistics system, and should be aimed at their dynamic optimization. The logistics conception is in its base founded on the dynamics and goals of the firm as a whole, and therefore, the systematic analysis of the logistics system presents an adequate instrument in choosing the logistics system which dynamically optimizes the contemporary firm's business activities. The analysis of the correlation of logistics and other business subsystems, and different approaches in analyzing individual segments of the logistics system may serve as a useful accessory in the systematic approach of the logistics concept of

management. Analysis of the logistics system, as a background for managing the dynamic optimization of a contemporary firm's business activities is elaborated within the following topics:

- 1) Correlation of logistics and other business subsystems ;
- 2) Systems approach of the logistics concept of management.

❖ **Correlation of Logistics and Other Business Subsystems :** Logistics, by its nature, addresses the processes which intertwine with the traditional functions in the firm, particularly in today's environment, which demands an ever growing integration of the supply chain (Fey, 1989: 32). The logistics system of material and information flows integrates the processes of the qualitative transformation of goods - the firm's production and elements of its environment in a complex, dynamic business system of creating added value. The value flows of the financial system follow the material and informational flows of the logistics system and enable its uninterrupted activities and the most complete analysis of its functioning. These three flows, as a three-dimensional system, represent the contemporary firm's dynamics and ,therefore, their analysis and management serves as the base for analyzing and managing the dynamics of the contemporary firm (Figure 2). The alteration of one of the system's components generally results in an array of changes through the firm's logistics supply chain.



The tendency of the logistics concept of management towards short term production, in which the product is produced as a response to the demand, insists upon simultaneous efficient management of input supply and flexibility of production lines. As supply management is responsible for the internal movement and storing of materials which will be used in production, logistics determines production management. Absence of certain supply materials may result in production delays and/or increase of production costs. Supply management ought to ensure that the quantities of all inputs of specified quality and competitive price are on time and are at the right place available to production demands, according to the demands of the distributional management for optimal satisfaction of customers' needs. Due to the demand for this type of coordination, many contemporary firms transfer the responsibility of *production planning* from production to logistics management. The final result is the expansion of the area of logistics responsibility covering the management of processes between suppliers and firm's production.

❖ **Distribution Management - Marketing Logistics :** Logistics also gradually takes over the part of marketing's traditional responsibility. The physical distribution, as a part of the logistics system responsible for the physical transfer and storing of products from production lines to customers, by developing additional services, often has a crucial role in the product sales. The ability to supply the product at the right time in corresponding quantities at the right place and with adequate services is often a crucial element of sales. Logistics and marketing collaborate, that is, logistics and marketing processes of the contemporary firm are intertwined in all traditional elements of the marketing-mix : product, price, place (distribution), and promotion. The most significant trend is seen in the fact that the merchants have started to note the strategic importance of the element of place in the marketing mix, and the

impact of the high-quality logistics services on the increase in customers' satisfaction and firm's revenues. As a result of this, many contemporary firms treat *customer service* as an activity which connects marketing and logistics, and aggressively promote it as the key element of the marketing-mix. Eventually, contemporary firms aim to place the *sales forecast* in the area of logistics, rather than marketing, which indicates the tendency of gradual logistics takeover of traditional areas of marketing's responsibility, that is, the management of the processes between a firm's production and its customers. The logistics concept of management purposely integrates the processes of supply and distribution management into a dynamic system of creating added value for a firm.

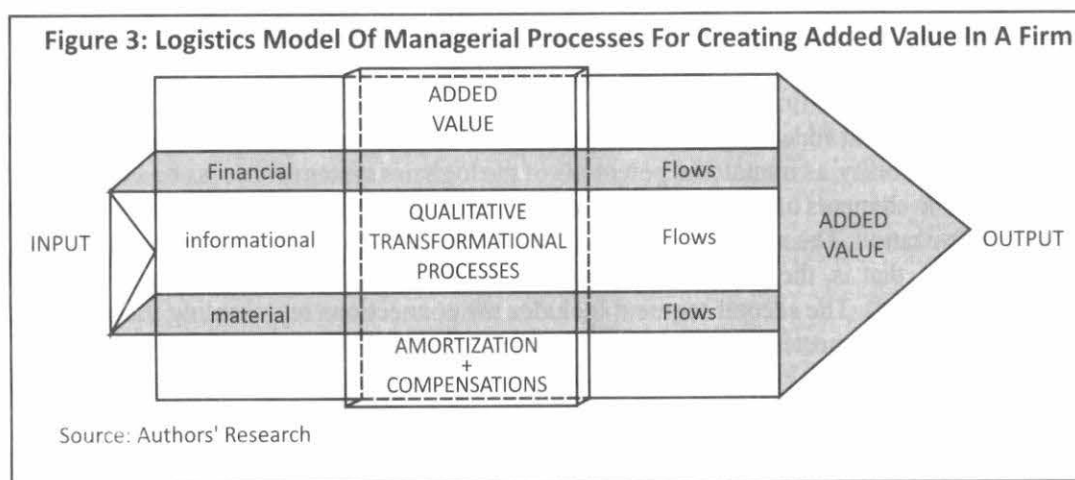
❖ **Financial Management - Financial Logistics** : Logistics and finance, as two crossing and integrating functions of a firm, coexist in a specific interrelation. Parallel to the flow of logistics material and informational flows are the value financial flows. All three flows mutually influence each other, incite each other and direct towards the final goal - the increase of the firm's business success. The logistics system of a contemporary firm is optimized by means of financial indicators. The optimization of the logistics and financial systems represents the dynamic optimization of the contemporary firm. As integral functions, they are being optimized starting from the firm's goal, which is coincidentally also their fundamental goal. Logistics and finances also differ from other traditional business functions in that they are not directed towards individual business process segments, but the entire business process of the contemporary firm. Their common goal is to improve the flow of materials, energy, information, knowledge and capital between the firm and its environment, i.e. through the firm, by combining logistics strategies in managing the supply chain and the compression of time cycles (Zekić, 2000: 99), in order to increase competitiveness and the profitability rate of the contemporary firm. The financial processes are plastically described, the reverse side of logistics material processes, that is, their logistics, which leads to the conclusion that they, too, can be considered logistics processes. The financial flows are the lever of the logistics concept of management and indicators of the firm's business success. Modern technological development enabled customers to access information regarding the possibilities of a fast fulfillment of their demands in different ways and from different sources, which also implies the need to change the firm's managerial concept to be orientated towards dynamics, flexibility and adaptability to market demands as a condition for survival. The substitution of production based with the logistics concept of management becomes *conditio sine qua non* of contemporary firms' functioning. The integrated logistics information system, which integrates customers and suppliers in the firm's logistics system, directs the focus of strategic management towards the firm's environment, so that it could, by combining logistics strategies of managing the supply chain from suppliers to customers, i.e. consumers and by compressing time cycles, dynamically optimize the business and ensure the firm's competitiveness.

❖ **Systems Approach of The Logistics Concept Of Management** : The general principle of the logistic systems thinking and functioning is that it should not focus on individual variables, but on the fact of how they act as a whole. The goal is an efficient functioning of the entire system, and not only individual subsystems. In other words, the firm is a system that should be dynamically optimized. The logistics system, as an integrative subsystem of the contemporary firm focused on the flows, should sub-optimize its own internal subsystems and the subsystems of the firm in order to optimize the firm's performance. The optimization of the contemporary firm's logistics system is coincidentally also the optimization of the firm, i.e. the optimization of the contemporary firm is the optimization of its logistics subsystem. The development of the logistics concept of a contemporary firm's business results in the fact that until now, isolated parts of the firm enter into relations in a new and reinforced manner. This occurs through the integration in which these elements amalgamate in such a manner as to create a system of higher mutual efficacy and cooperation, which through a joint functioning of elements increases efficiency and effectiveness of the contemporary firm's functioning. In the past, in order to improve the supply chain, it was necessary to focus on cost reduction, effectiveness and quality through the process of Total Quality Management (TQM), Just In Time system (JIT) and six sigma initiative. In order to stay competitive in today's environment, it is necessary to additionally include agility, innovation and partnership in the supply-chain system (Eisman, 2005: 1).

Organizational binding of internal and external logistics factors into the logistics system merely allows for the management of logistics processes towards implementing dynamic optimization of the contemporary firm's business success. Effective and efficient managing of the logistics system, which is like all business systems - complex, dynamic and stochastic- is possible by applying appropriate models. The management needs such simplification in

order to reduce the realistically complex and complicated state of the logistics system to its fundamental structure, the abstract system - the model, which enables its understanding, and therefore, its management (Figure 3). For the majority of the problems present in management, the mathematical models, unfortunately, cannot offer the best solutions; management knowledge is more efficient.

Dynamic modeling elapsed a few phases over the last couple of years. In the initial phase, the focus was placed on oscillations, and later, on trying to find answers to problems related to efficiency, market share and growth. These values imply a detailed analysis of all activities which lead to optimization (Graham and Ariza, 2003: 20). Optimization models and computer solutions developed for managing complex logistics systems do not ensure efficient managing of the contemporary firm. New models and methods are chiefly based on mathematical programming with the addition of research (heuristic) methods (Shepard and Gunter, 2006: 513). Identification of the crucial cause-and-consequence associations of potential success variables and simulations in real space and time represent the foundation for successful modeling of the dynamic optimization of a firm's business in the recent turbulent environment.



A firm is a relatively open system of the environment (supra-system) which, through transformational processes, adds value to inputs taken over from the environment, and thus creating outputs to satisfy the needs of users from the environment. The achieved added value in a certain time period is an indicator of the dynamic harmonization between the firm's operations and the changes in the needs and expectations of its influencing environment i.e. its business adaptability.

Adaptability (A) is the indicator of the effectiveness of the firm's logistics adjustment to the new changes in the environment, or in other words, the effectiveness of generating changes in the environment as the indicator of its innovativeness, expressed through the changes of the realized added value (AV) in time dynamics.

(1) Firm's Logistics Processes - Environment: $ER - EE = AV^{*1}$

(2) $\frac{AV_1}{AV_0} = A > 1$

The added value which is created by the firm in its interaction with the environment in different time periods is the result of the flexibility in managing current and past materialized labor within the logistics processes of adjustments to the demands from the environment, expressed through personnel costs, i.e. compensation and amortization of material resources in different periods of added value realization.

(3) Logistics Processes Firm: $\frac{\text{Added Value (AV)}}{\text{Compensation (C) + Amortization (A)}}$

¹ ER-External revenues; EE-External expenditures; AD-Added value

Compensation (C) and Amortization (A) together are the indicator of the firm's usage of intellectual capital (IC), contained in the minds of its people and machines.

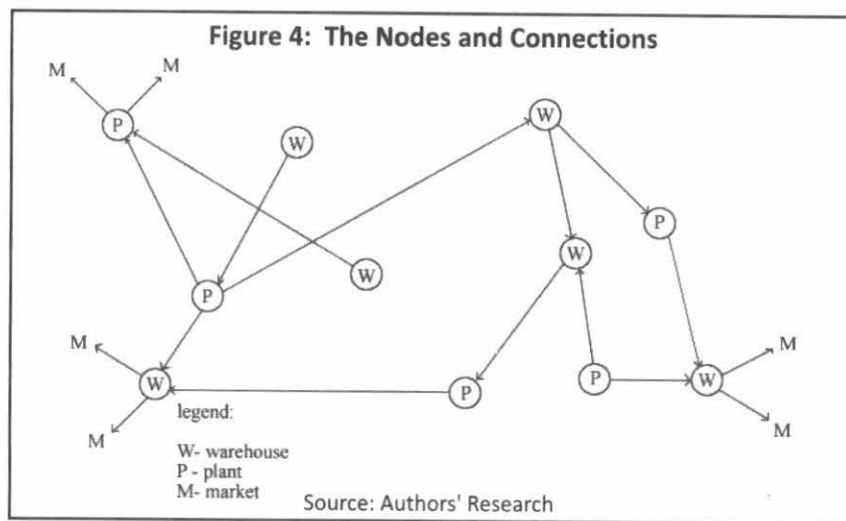
(4) C + A = IC

Flexibility (F) is the indicator of effectiveness of the combining of internal success potentials (IC) in creating the added value (AV), or in other words, the speed and harmonization of logistics flows according to the changing demands of the environment.

$$(5) \frac{\frac{AV_1}{C_1 + A_1}}{\frac{AV_0}{C_0 + A_0}} = \frac{AV_1 * (C_0 + A_0)}{AV_0 * (C_1 + A_1)} = \frac{AV_1 * IC_0}{AV_0 * IC_1} = F > 1$$

Compensation and Amortization, as managerial variables of success potentials in creating added value are the indicators of the effectiveness of investing intellectual capital i.e. the firm's organizational knowledge. Labor, whether current or materialized (past), is not a classic external expenditure cost which decreases added value. On the contrary, as shown by the logistics model, current and past labor represent investment of intellectual capital whose goal is increasing added value. The firm creates the preconditions for the dynamic optimization of its business if, in the long run, it achieves growth in added value through the increased investment of intellectual capital.

Managing adaptability/flexibility, as immaterial potentials of the logistics system's success based on the analysis and simulations with two basic elements of the logistics system - nodes and connections, represents an adequate base for the firm's dynamic optimization. The nodes are the established points in which the resources are held back either for storing or further process, that is, the points where the finished products are held before delivery to buyers (for balancing supply and demand). The second segment includes the connections representing the transport, energetic and informational network of connected nodes within the logistics system (Figure 4).



Instead of a precise measuring of past, individual, irrelevant values and events in managing the firm's future business, the logistics model of management shifts its emphasis towards future, relevant, measurable potentials of success, to which it, by means of simulation, adjusts individual flow values and events. The firm is a system that should be dynamically optimized in order to bear interest to its stakeholders. Synergism, as the foundation of every organization's existence and vitality, clearly indicates that this cannot be achieved by optimizing its subsystems. The firm is, in fact, more than just a sum of subsystems, and therefore, it is necessary to sub-optimize the subsystems in order to dynamically optimize the firm as a system within the supra-system, i.e. the environment. The logistics system as the final integrative subsystem of the firm, i.e. the logistics concept of management, represents a good background for managing the dynamic optimization of the contemporary firm's business activities.

The complexity of the logistics system is dependent on different time and space interrelationships between the nodes and connections, as well as on the category, volume, regularity and predictability of the resources entering, leaving and moving inside the system. Informational integration is recognized in scientific research as the key dimension in the integration of the supply chain (Kollberg and Dreyer, 2006: 289). The Critical Path Method (Zekić, 2010: 120), as a project management technique, represents an adequate instrument for a systematic management of complex logistics processes in the manner that dynamically optimizes the business activities of the contemporary firm seen as a subsystem within the supra-system of the recent turbulent environment.

CONCLUSION

In today's global market, the increasing equality in the technological base of production and higher differentiation in customer demands are forcing management teams to simultaneously develop specialized production and organize supply chains - forming of strategic alliances in order to develop operational flexibility and adaptability as prerequisites of survival and development of a contemporary company's competitiveness. Production efficiency, based on specialization, is not effective unless additional output finds additional customers, which is not possible without the transfer from places of surplus production to places with unmet demand. Logistics, as a means of place and time transformation of goods from the sources of raw materials - through the company's transformational processes - and finally, to the product's end user in conditions of developed information technology and globalized market, is becoming the management's focal point in managing flexibility and adaptability as the leverages of the dynamic optimization of contemporary companies' business operations.

Flexibility and adaptability, as control variables within the logistics concept of management, indicate potential success of today's company in creating added value by harmonizing company's operations and the environment's changing demands.

Intellectual capital, seen as organizational efficiency of current (people) and past (machinery) labor involved in the continuous creation of new added value underlies the potential success of the modern logistics-based concept of business management. The logistics concept of management is based on a holistic approach and management of the system of integrated supply and distribution logistics flows directed towards satisfying users' demands by supplying them with a product of specific quality, at the right time and place, at an adequate price, and it represents the new paradigm of a practical application of system theory in managing the dynamic optimization of the contemporary firm's business activities. In the contemporary turbulent conditions, the optimization of the firm's activities cannot be achieved through individual optimizations of the states of its subsystems, but through the optimization of connections between these subsystems in the functioning of the firm as a system, or in other words, through the optimization of its logistics system. A contemporary firm achieves success in the state of limited stability; that is, in the state of deterministic chaos. In such conditions, the goal is not to optimize the state of the firm as an isolated system, but to optimize the potentials of its success as a socio-economic system of the environment's supra-system. The logistics managing models, by optimizing the firm's indicators of flexibility and adaptability to the changes in the environment, based on its intellectual capital, dynamically optimize the management of reaching a contemporary firm's success potentials, which results in a dynamic optimization of achieving and realizing a balanced system of customer, employer, owner, and other stakeholder goals within the firm's functioning.

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