



QUALITY AND ITS PARAMETERS – A BASIC CRITERIUM FOR THE MOVEMENT OF THE MATERIAL FLOW IN THE LOGISTICS PROCESS

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Abstract: *The aim of the paper is to present theoretical principles and practical recommendations for management of the logistics system and the parameters of material flows quality. The main approach for research of this problem is a set of scientific knowledge and special methods which allow the identification of the basic trends and characteristics for control of the quality parameters of the material flows. The paper presents the idea for the creation of a system to control the material flows quality in the logistics systems in order to optimize the general expenses and quality improvement.*

Keywords: **Material flow , logistic process**

Introduction

In the present many companies strive to establish a constant contact and together with their suppliers to design and develop common standards for quality, as well as to harmonize the testing methods and to create ways for quality improvement and at the same time to decrease the general expenses. In this respect the problem is to find and apply the most effective methods for quality management in the companies, and these include the logistics methods for analysis, prognosis and optimization of the flow processes.

The research and development of scientists like O.N. Kurbatov, I.O. Protsenko & F.D. Novikov (2007), D. Novikov, E. Grebnev & A. Horn (2007), V.I. Sergeev (2009), D. Bowersox, D. Closs & M. Cooper (2012), R. Lambert & M. Douglas (2001), D. Waters (2009) have significantly contributed for the development of theories and practices like quality management and logistics, as

well as the elucidation of debatable concepts of the control system of the logistics parameters of the material flows.

Theoretical principles and practical recommendations for the logistics system for control of the parameters of material flows quality are being analyzed in the research, as well as the use of the logistics management for quality control of the material flows in order to increase the efficiency of the companies and to improve the competitiveness and adaptability to external conditions, especially in times of instability in the world economy.

Results and analyses

Due to the complexity of the functioning conditions of the industrial companies on the market, the importance of the logistics approach for the company management is increasing. This can be explained by a few factors: the variety of the goods and the increasing nomenclature of the sold products, the complexity of the production planning, the increasing requirements of the customers towards the quality level of the production and services. The logistics approach is extremely important for new and already existing companies.

From the perspective of theoretical and analytical research methods for research in logistics, the material flow can be characterized by parameters like start and end points of movement, trajectory and length of the travel, velocity and time of movement, midpoints, intensity, capacity, etc. A more precise definition for the material flow, presented in the logistics, is “integration and optimization of the logistics business processes in the supply chains” [7] and it means the condition of the material resources development, unfinished production, finished goods, and the types of activities which are applied to the physical movement in space: loading, unloading, packaging, transportation, sorting, consolidation, sales, etc. Therefore, according to the scientists, the existence form of the material flow should be the movement of concrete types of products (material resources, unfinished production, finished products) in the supply, production and marketing. Thus, if the product is not in a developmental condition, it goes to “reserve” which can be defined as an inert flow in a specific time period. In this way the material flow can be defined as movement in time and space, generalized inventories and logistics on its part researches and organizes the process of efficient movement management of the material and the accompanying flows in order to satisfy the requirements for the consumer products and services. According to scientists, the material flow is characterized by a specific set of parameters, among which are the following:

- nomenclature, assortment, and quantity (volume) of the goods;
- dimensions (volume, area, linear dimensions);
- weight (total weight, gross weight and net weight);

- physical and chemical characteristics of the freight;
- characteristics of the containers (packaging);
- conditions of the sale contract (transfer of ownership, delivery);
- conditions for transportation and insurance of freight;
- financial (price) characteristics, etc.

Each of these parameters is connected with a specific quantity connected information and a lot of options – financial indicators (expenses, prices, tariffs) and limitations, as a budget.

An important role from the point of view of the material flows optimization is the measurement of the flow intensity and it refers to the number of indexes of the volume or mass of the products (units), which are at the start of the logistics system for a unit of time. Table 1 presents a classification of typical quality characteristics and quality parameters of the material flow.

Table 1

Characteristics of the material flow		Probable characteristics (acquired)	
quantity	quality	quantity	quality
1. size 2. weight 3. timely	1. functionality 2. physical and chemical 3. organoleptic 4. ergonomics 5. aesthetic 6. packaging characteristics	1. expenses 2. flow intensity 3. capacity 4. timely (logistics cycle, deadline, etc.)	1. reliability 2. delivery flexibility 3. readiness to deliver (according to customer's demands)

The concept of total quality management is in a way a management philosophy which admits that the needs of the clients and the goals of the business go hand in hand. This approach can be applied equally to all the logistics elements. According to numerous researches, the best results are achieved by the companies which apply the concept for total quality management. Its importance for the logistics is defined by the fact that from the point of view of strategic planning of the competitive markets, the goals of the integrated logistics company coincide with the ideology of total quality management.

Figure 1 presents the structure of a logistics system for quality management. Management of the quality and the quality parameters means a process of impact not only on the production process but on the overall process of product distribution in order to ensure the desired quality level of the product. In this way the quality control and the quality parameters require a systematic approach which

includes all the steps from the life cycle of the product. The essence of the management is to develop managerial decisions and subsequent implementation on the condition that these decisions control activities for specific object of management. When managing quality products (goods and services), a direct object, as a rule, are processes which affect the product quality. These processes go through the stages of supply, production and distribution. The management of the quality parameters should be based on functions which impact different sides of the object and subject of management: interaction with the environment; quality of the policy and planning; training and motivation; organization of the work on quality; quality control; information support of the quality management system; the activities of development, adoption and implementation.

On the supply level (input) the material flow consists of raw materials, semi-finished products, components, etc. The basic tasks of this stage in the management process of the material flow of the quality is:

- to keep the requirements for the purchase of raw materials and components;
- to correspond to the number of supply and demand;
- to keep the quality parameters of purchased raw materials, etc.

On the production stage, when organizing the process of quality management of the material flow, it is necessary to solve the following tasks:

- make a decision on “what to produce” and to prepare technical specifications.
- develop production schedules for the production units;

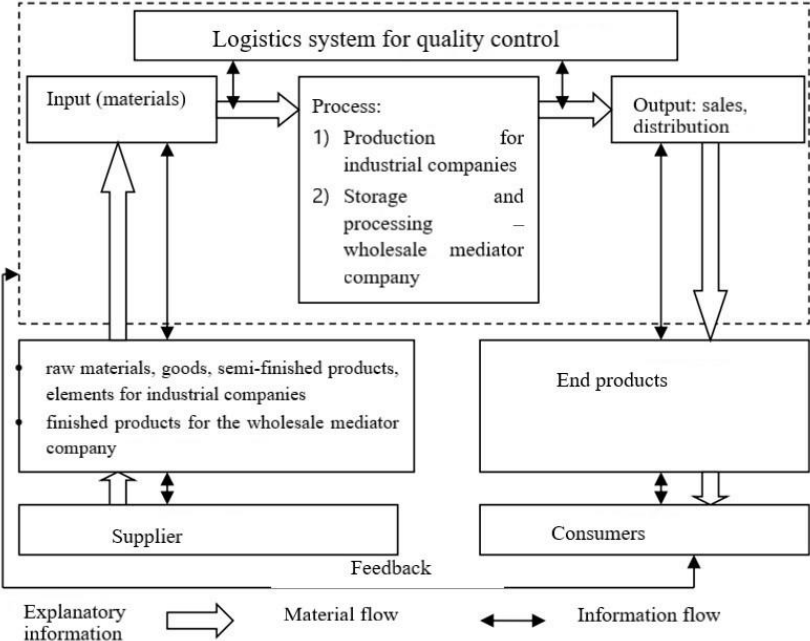


Figure 1: Logistics system for quality management

During the stage of distribution of the finished products, the following rules should be considered:

- ✓ To define the market demands, i.e. the quality choice of the consumer;
- ✓ To choose channels for distribution of the finished products;
- ✓ To evaluate the reserves of finished production and to organize their storage;
- ✓ To sign contracts for distribution to clients, to observe them, etc.

The last stage of the logistics and its utmost form is creating effective logistics systems. As a logistics result and the creation of working logistics system, the effective logistics creates a specific potential social structure from different forms of ownership and integration density which is able to successfully solve a set of interconnected logistics task in the given time period in order to ensure optimum organization of control of the quality parameters in the internal and external flow processes, using the newest logistics achievements. This approach of quality management can include a combination of logistics activities as parts of the organization and its partners and based on operational and strategic logistics.

One of the basic tasks of the operational logistics include: rationalization of the flow processes within the limits of a priori defined internal and external limitations in the management: organizational and structural, functional, procedural, personnel-related, judicial, infrastructural, connected with management of the installation quality.

In this way the formation of logistics system for quality management and its parameters, suitable for applying the logistics principles, include:

1. The preferred orientation of the logistics services towards specific events, trends, processes, activities and specific relationships of the subject and in conditions of market economy, based on the specific relationship among specific market consumers, competitors and other requirements and possibilities.

2. A system of integration structures, elements of flow processes in logistics services from the point of view of time, space, scale, rhythm and other appropriate, including organizational, economic, technological conditions and activities of the people.

3. Adaptation, interconnectedness and system hierarchy in the space and time structures of elements and their flow processes in the logistics systems.

4. The optimization in the logistics services is focused mainly on the interaction between the elements in the corresponding relationships between them and in this way the formation of the properties of the adaptive elements to all

aggressive activities in the environment are affected more purposefully and more intensively.

5. The optimal sequence and appropriate orientation of all types of resources, the consumption and their reserves which participate in flow processes in the logistics, serving to human activity.

6. The optimal usage of knowledge, developed techniques and technologies with their reserves in the process of logistics services for human activities.

7. Interrelationship, interpenetration, mutual enrichment of objects, including the environment, the ecological requirements and the logistics processes of management, without breaking their dependence from the conditions.

Conclusion:

The basic results from the research are the following: a grounded conceptional framework of management of the quality parameters of the material flows and business processes; it defines the relationship of the criteria for evaluation of the products and processes and underlines typical and set characteristics of the material flow.

Scientific and research analysis in the sphere of logistics and quality control generalizes the conclusion that at the contemporary stage of control of the quality parameters, the organization in material flows and business processes is plausible on the basis of formation of a system for management of the logistics quality in order to increase the maximum value of the product for the consumer and at the same time to minimize the expenses for both the consumer and producer.

Incorporating the logistics approach in the quality and the quality management in the parameters in the material flow and the business processes leads to the formation of an effective logistics system, capable of delivering the right product at the right time and place, with specific parameters of completion and optimal expenses.

The implementation of logistics concepts provides opportunities for development of constructive strategic program for company development, focused on the optimal organization of the flow processes and long-term success on the market and in this way the structural and functional process for the company future is being determined.

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