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QUALITY MANAGEMENT IN THE LOGISTICS OF COMMODITY FLOWS OF FOOD PRODUCTS

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***Abstract*—**This paper defines the entities that affect the characteristics of the material products. Categories of basic products that have value for the customer if they are available to him at precisely determined time and in determined place.

There has been analyzed the structure of quality attributes that are used to assess the quality of logistics services. As the dominant requirement is stated the reliability of logistics services, competitiveness of structure and price, frequency of delivery, as well as an efficiency of logistics management. Logistics processes that are taking place at different levels are measured by quality of service in logistics network, logistics chain and logistics system. As indicators of the quality of logistics processes are analyzed as: disposition, shipping, transportation, storage, delivery.

Analysis and improvement of quality is possible within and between logistics systems where the problem of quality involves difference between the projected and actual system. The quality of projected system is viewed through two groups of components: quality of management-business structure and quality of technical-technological structure of the system. From the social point of view, the quality of logistics services must meet the three analyzed functions: protection of environmental, life and health of people and protection of service users and consumers of the products.

***Keywords*—**Quality attributes: Logistics processes and systems.

I. INTRODUCTION

FOR the realization of complete logistics services and satisfaction of customer requirements is of crucial importance for the quality of the process at the level of logistics chain. High level of the quality chain processes involves a harmonious development of all activities, without conflicts, delay, deadlock and failure. However, the logistics chain is a very complex structure, which in real systems requires special approach to quality management, which is based on the decomposition and structuring of all relevant processes and activities in the chain. Logistics chains and processes are implemented in different networks and through different logistics systems which significantly complicates the process of measurement, monitoring and improvement of the logistics quality. The processes and activities mainly are related to the organization, management, implementation and control of material information flows [1]. These are, first of all, the processes related to:

- ordering,
- packaging,
- creation of loading units,
- handling,
- reloading,
- transport,
- storage,
- stock keeping,
- preparation of supporting documentation,
- mediation,
- forwarding and agency services, information,
- financial transactions.

Logistics processes are implemented with various technological, organizational, informational and economic solutions and for quality assessment is necessary to define more precisely [2]:

- place,
- costs and time of implementation,
- level of technology,
- hired manpower, tools and equipment,
- logistics performance,
- degree of capacity utilization.

Each logistics process in chain is characterized by a set of quality performance that indicate the various dimensions related to conduct of processes and activities. So, for example, in the chain of shipment and delivery of goods are included the following quality indicators of logistics processes [3]:

- Disposition – the quality of the behavior means: the rate of incorrect data reception, the degree of completeness of the information, the degree of accuracy of documentation, the rate of incorrect orders, the accuracy of the information, the rate of the complaints, etc.
- Shipment – the quality of the shipment means: the quantitative accuracy, the time accuracy, the

completeness and accuracy of documentation, the frequency of subsequent shipment, the degree of reclamation, the degree of damage of goods.

- Transport – the quality of transport means: the time accuracy, the frequency of transport, the frequency of damage of the goods, the frequency of accidents, the degree of reclamation;
- Storage – the quality of storage means: the rate of errors in the arrangement of goods, the rate of errors in picking, the degree of damage of the goods, the time accuracy.
- Delivery – the quality of delivery means: the accuracy of the delivery time, the rate of errors in delivery, the completeness of the shipment, accuracy of documentation.

Functional quality can be achieved by continually improving processes and activities as preventing non-compliance, irrationality and deficiencies in complete logistics chain. In addition to the quality of ordering, transportation, storage, delivery and other individual processes, it is necessary to take into account the interdependence of these processes in the chain. The low level of quality and problems within a single process, in principle, cause consequences and problems in the area of another or more other processes.

II. THE QUALITY OF THE LOGISTIC PROCESSES AND SYSTEMS IN COMMODITY FLOWS OF FOOD PRODUCTS

Logistics processes and activities are carried out within and between certain logistics systems, and that's why the overall logistics quality and satisfaction of the customers are of crucial importance to the process of quality at the level of logistics systems, as seen in Fig. 1. Analysis and quality improvement processes within and between logistics systems takes place at the micro level with a very high degree of details. It's concerned about a highly complex procedures that are consequence of the fact that one subsystem realizes several processes, but also one logistics process can be realized across more subsystems [4]. It is essential that each logistics process takes place at a certain quality level and to better meet the requirements of external and internal users. The processes and activities cause additional costs, time losses and technological reserves. Due to these reasons, in projecting and designing of logistics processes, it is necessary to strive to achieve maximum quality with lesser investments and losses. After the implementation of the projected solutions and measures must be implemented process of measuring and monitoring the quality of the implementation process and functioning of logistics systems.

Quality measurement is the basic precondition for the improvement of logistical processes. It is a well-known fact that if something cannot be measured than it cannot be improved too. If there are no quality measures, very easily can be happened that either misleading or unimportant things be improved. Through a system of measurement it is necessary to identify quality problems in logistics processes and to focus on the solution of key problems. These are the most common problems which: significantly impact on satisfaction of the customers, are an essential part of the costs of poor quality, often appear, cause major negative consequences, etc. Under the problem in quality here means the difference between projected and actual situation of logistics processes. A comparative analysis of these situations leads to the detection of quality problems [5].

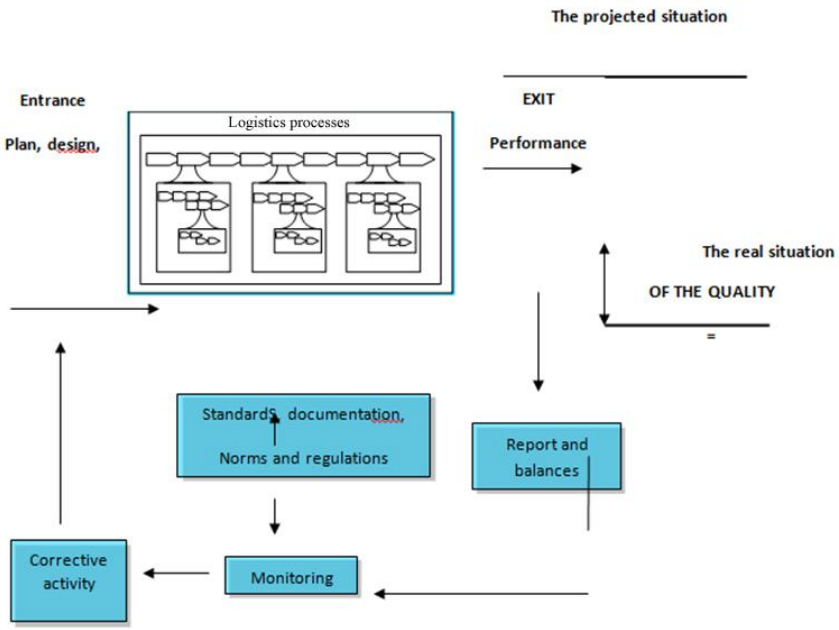

Fig. 1. Quality management of logistics processes

Once, it's determined the problem to be solved, it is necessary to identify patterns, perform their classification and identify causal-consequential relationships. So, for example, the low quality of the process may be due to a variety of f actors and reasons such as: the low level of technology, inappropriate location, poor information support, unskilled manpower, poor organization and the like, as can be viewed in Fig. 2.

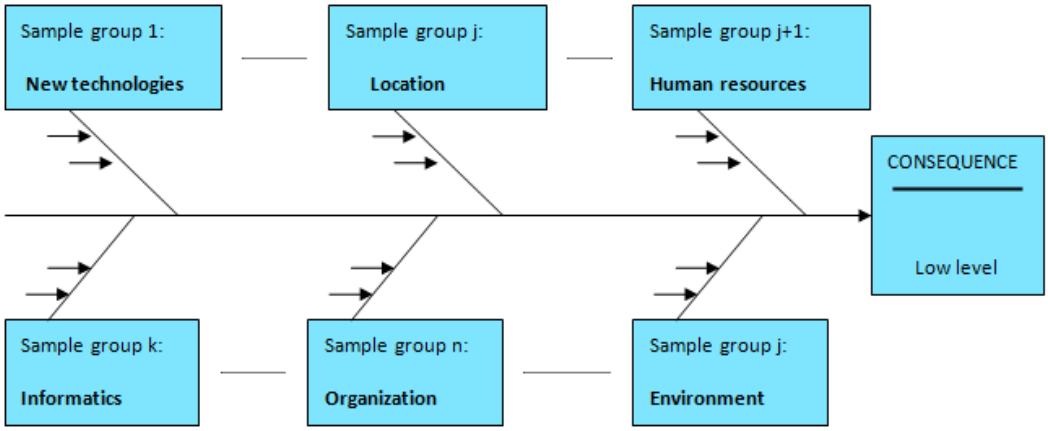

Fig. 2. The structure of cause-poor quality consequence of logistics processes

Elimination or mitigation of the influences of some causes lead to quality improvement of logistics processes and services. Improvement of logistics processes is mainly based on the following principles: appointment of responsible (owner) for the processes, defining the limits of the process with internal and external interconnections, defining the structure of the process, establishment of control points, measurement of performance of the process, taking corrective measures in case of deviations in the process and its constant improvement.

The quality of logistics systems can be viewed in two groups of components, or we can talk about: the quality of managerial and business structure and the quality of the technical and technological structure of the system (Figure 3).

The quality of managerial and business structure of logistic system involves components related to management, organization, business structure and employees [8]. This is the so-called "soft" structure of logistics system whose quality is difficult to identify, measure, describe and monitor. The assessment of quality of the managerial and business structure is mostly referred on the basis of the: quality management; style of management; organizational structures; methods, techniques and management methods; adopted and implemented standards; references and image; introduced certificates; business processes; behavior of management and employees; developed quality culture; business communications; power structures; leadership; motivation and reward system; skill and training of human resources; level of integration, etc.

The quality of technical and technological structures of logistics system is related to the so-called "hard" system and involves: quality of the location; structure and quality of logistics and business networks; quality of traffic and transportation and technical infrastructure [6]; quality of storage facilities, equipment and space; quality of transportation, overloading and handling of assets; quality of information and management systems; equipment and layout of business facilities, space, living and working environment; quality of supporting and auxiliary services; implemented level of technologies; technical and technological equipment of subsystem, etc. Unlike the managerial and business structure, the quality component is much easier to notice, measure and monitor. To a large extent, it's about the quantitative data that indicate the quality of certain structural elements, or physical dimensions that can be observed, measured and evaluated. The interconnection of structural elements is extremely important for the quality of logistics services and processes is directly related to the compliance of the relationship between: man-asset, goods-asset, asset-building, etc. Also, important is the quality of business, transport and information links between logistics system-environment.

Each logistics system possesses certain managerial-business and technical-technological structure and the quality of the subsystem and structural elements are directly dependent on functional capability and quality of the entire system, as illustrated in Fig. 3. It should be borne in mind that the quality of the logistics systems greatly influences to the perception of users, related to the quality of logistics services. That is to say, due to the absence of physical dimensions of logistics services, it is very difficult to directly observe and assess its quality.

Therefore, the user takes certain attitudes and forms expectations on the basis of the "tangible" elements of the logistics system [7].

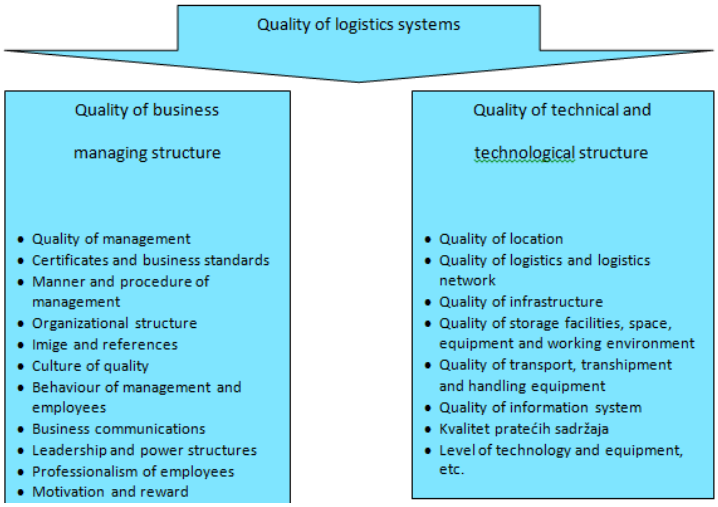

Fig. 3. The quality of logistics systems.

III. CONCLUSION

Researches show that, from the marketing point of view, the quality of logistics services is a set of attributes whose values correspond to the demands and expectations of the users that they are ranked and evaluated. As the dominant quality attributes are listed delivery reliability, competitiveness of structure and price, frequency of delivery, modality of delivery, packaging and quality of goods.

The quality of logistics processes involves a harmonious development of all activities without conflict, delay, deadlock and failure. The processes and activities are related to the organization and management, implementation and control of material and information flows. These are the processes for studying, packaging, formation of loading units, handling, overloading, transport, storage, keeping of inventory, preparing of documentation, mediation, financial transactions.

The quality of logistics system is analyzed through the components of managerial-business structures and technical-technological structures. As the main components for the quality assessment of the managerial-business structures are considered: quality of management, certificates and business standards, organizational structure, business communications, professionalism of employees. For the quality assessment of technical-technological structures serves: quality of location, infrastructure, storage facilities, equipment, space, quality of handling assets, level of technologies and equipment.

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