

ECONOMIC MONITORING IN LOGISTICS SUBSYSTEMS IN ENTERPRISES

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Abstract: One of the most creative tools for management which allows for creation of new information and decision-related resources is provided by economic monitoring. Monitoring system supports operation in companies through early warning and assessment of threats to the whole company's operation and its individual areas. Application of the concept of monitoring in functioning of companies allows for separation, from its whole business activity, of an area of monitoring of investigations for logistics subsystems.

Keywords: distribution subsystem, economic monitoring

1. Logistics System and its Economic Monitoring

Logistics system in companies is formed by an integrated set of elements, i.e. factors of production, actions and regulatory standards with interactions between each other. These relationships are involved in the processes of flow of materials, raw materials and final products and information associated with these flows [1.].

H. Ch. Pfohl defines logistics system in enterprises as a system of spatial and time-related transformation of goods. Logistics systems can be divided into the following subsystems: [2.]

- subsystem of procurement, focused on raw materials, auxiliary and usability materials and parts,
- subsystem of production, which encompasses all the activities connected with supplies for the process of production in terms of suitable goods and with passing semi-finished goods and final products to warehouses,
- subsystem of distribution, encompassing all the activities and processes aimed at providing customers with final products,
- subsystem of spare parts logistics, i.e. parts which are meant to exchange all faulty parts in final products,
- subsystem of reverse logistics, which relates to waste in order to cause their economically and ecologically efficient flow.

Logistics system is aimed at achievement of integrated goals into a complementary entirety. The goals of logistics systems encompass general goal, customer-oriented goals and enterprise-oriented goals.

General goal means realization of the demand in the market at optimal costs. The enterprise-oriented goals of logistics system include: formation of optimal structure of value and level

of costs through logistics chain and the system of value generation, creation of new potentials of efficiency and creation of the base for enterprise's success, striving for achievement of the assumed profit on a strategic scale, achievement of the goals in companies under conditions of market fluctuations and striving for strategic alliances. Customer-oriented goals for logistics system encompass offering customers suitable products and information, achievement of long-term customer satisfaction and realization of rational flows adapted to customer expectations [3.].

It should be concluded that logistics system comprises a new quality in consideration of the relationships between elements that form this system. Complexity of these relationships causes that logistics system is not limited only to a set of organizational units but it is interrelations between these units which are of essential importance.

Properly structured economic monitoring for efficient management of logistics system calls for unequivocal definition of: [5.]

- monitoring entity, authorized to observation and further processing of the results,
- monitoring object being observed,
- subject of monitoring i.e. tasks which are subject to observation and their measures,
- deadlines and frequency of observations,
- sources of information about the results of execution of the tasks,
- methods of collecting and processing of information,
- methods of presentation of information about the realization of tasks.

In order for full realization of the concept of economic monitoring to be carried out it is necessary for enterprises to have interrelated structures for execution of the set goals. The structure is a methodological category, which characterizes the way different types of sets are built, including logistics sets.

According to J. Kisieliickiego [6.], economic monitoring structure is formed by inputs (feed), database, normative database, analyzers and output.

Structure of economic monitoring, according to Z. Leszczyński, comprises mechanisms of selection of the objects of observations, standards and indicators, sources of information, mechanisms of information processing and technical infrastructure [7.].

Detailed characteristics of structural elements can be presented after determination of the functions of economic monitoring. The authors of theoretical fundamentals of economic monitoring point to a variety of its functions. S. Kowalczyk argues that monitoring has a two-phase nature; first phase concerns the processes of collection and processing of information; second phase is connected with distribution of this information [8.].

J. Oleński emphasizes three functions of monitoring; they are responsible for: formation of normative models, formation of empirical models and evaluation of information and information processes [9.].

Z. Leszczyński introduced four functions of monitoring: selection of key areas of activity subject to monitoring, determination of standards, criteria for these areas, selection of principles for response to deviations and creation of organized forms of information feed [7.].

Based on the abovementioned definitions, one can determine fundamental components of the structure of economic monitoring, including:

- objects and sets of objects of economic monitoring with their attributes,
- sets of rules (relationships) between objects,
- economic monitoring services and products,
- economic monitoring organization and techniques.

The scope of components of economic monitoring depends on the monitored research area.

2. Monitoring of Distribution in Enterprises Based on Indexes – Case Study

In order to assess the subsystem of distribution, the indexes which mainly encompass warehousing management and transport were used. They include: average time for order execution, average lead time, supply readiness, security of supplies, share of improper deliveries, share of product returns, share of renewed supplies and share of complained deliveries [4.].

The results of empirical investigations in the investigated enterprise are:

- average time of order execution, as a time from opening of the order until the delivery is sent from the investigated distribution point amounts to 24 hours,
- average lead time, as a time from acceptance of order until the delivery to the customer (from the moment of placing a delivery until the moment of unloading at the customer's place) in the investigated distribution point amounts one day,
- supply readiness (quantitative aspect) as a ratio of a number of immediately processed orders to total number of orders amounts to 27%,
- supply readiness (size aspect) as a ratio of size (weight) of immediately processed orders to total number of orders amounts to 27%,
- security of supplies as a ratio of number of deliveries within the expected deadline to total number of deliveries amounts to 93%,
- share of delayed deliveries as a ratio of a number of delayed deliveries to total number of deliveries amounts to 7%,
- share of improper deliveries as a ration of a number of improperly delivered goods to total number of deliveries amounts to 10%,
- share of returns of goods as a ratio of a number of returned deliveries to total number of deliveries amounts to 3%,
- share of renewed deliveries as a ratio of a number of renewed deliveries (resulting from distribution errors) to total number of deliveries amounts to 3%
- share of complained deliveries as a ratio of a number of complained deliveries to total number of deliveries amounts to 3.3%.

The results of empirical investigations point to low level of index of immediately executed orders and size of immediately executed orders, which point to necessity to maintain optimal level of inventory in order to increase index of supply readiness. The investigated warehouses has a capacity to cover, within the expected deadlines, 93% of all the orders, which proves high level of satisfaction from this distribution point among the customers. Security of supplies is high (93%), share of delayed deliveries at the level of 7% is low. Delayed supplies might result in recipients' costs of complaints to the distributor and for producers, a necessity of bearing costs of immediate involvement in all the corrective measures. The supplies are properly realized in 90%. Improperly executed orders (10%) force customers to place another order, on conditions that they do not change the supplier. Share of renewed deliveries and a number of complained goods is low and amounts to 3%. Sending final products to customers is properly prepared (93% for the index of security of supplies within the requested deadline), which allows the enterprise to enjoy confidence among potential customers and to avoid huge financial loss.

In order to analyze distribution activities in the investigated company, SWOT analysis was performed. Opinion poll, interviews with customers and observations were the basis for determination of strengths and weaknesses in the investigated enterprise.

The strengths in the enterprise (external factors) include:

- adaptation of the farm to EU regulations,
- large distribution network, reliability of supplies,

- advantageous location of headquarters,
- continuous cooperation with big customers,
- high quality of the offered range of products,
- commitment of employees,
- modern technologies of production,
- very efficient motivation system for employees,
- recognizable trademark,
- very good financial liquidity,
- strong position in domestic market.

The weaknesses in the investigated enterprise (internal factors) include: seasonality of sales, increase in competition, poor protection for a range of products delivered to customers from damaging during transport and lack of internet shop.

The opportunities (external factors) of the company include:

- continuous demand for products,
- opportunities for extending the offer over additional range of goods,
- high market potential,
- working on internet shop,
- rise in demand,
- delivering of high-quality goods at attractive prices.

The threats (external factors) include:

- dependence of purchasing on the price,
- a number of new competitors,
- growing costs of transport caused by increase in fuel prices.

The presented assessment of distribution in companies concerns past events which have already taken place. It is remarkable that, although previous states were correctly reproduced, anticipating of new states must take their changeability into consideration. Decision making is becoming very difficult, independently of the prepared decision material. Evaluation of all the indexes for assessment of the process of distribution does not necessarily mean that in the future period, similar in terms of scale, the assessment will also be positive. As results from this fact, analysis of actual economic events in the enterprise in different periods of time must be accompanied by continuous adaptation of particular measures, which will be capable of capturing of occurring changes and proper interpretation.

3. Arrangement of Indexes in Economic Monitoring for Distribution System in the Investigated Enterprise

Making decisions, especially strategic ones, on the basis of the abovementioned indexes analyzed in separation, is of insignificant observation-related importance and might lead to making erroneous decisions. In processes of monitoring of activities, including distribution, one can use a variety of models (arrangement) of indexes.

An index model possible to be used for economic monitoring of distribution processes, which provides information on finance and production in a fast and reliable manner, is provided by a model with three indexes, i.e. costs, production and sales in dynamic approach. It is remarkable that each of these indexes, in global approach, has certain field of observation and provides information about an area of phenomena in non-decisive way, i.e. it does not take into consideration a direct reason for such behaviour.

In economic monitoring, which provides information for the purposes of current and strategic management of distribution operations within a company, this model of indexes should be employed. A number of variables used in this model is critical, as well as order of observations and analysis of these variables. Order of variables in index model “costs, production and sales” results from priority of appearance. The costs are primary in relation to production and sales and production is prior to sales; there are also different dependencies between these variable in static and dynamic approach.

In static approach, a dependency between costs (K) and sales (S), i.e.: $K < S$, occurs, whereas in dynamic approach, these relations are different depending on the considered time.

In short time, necessity of maintaining of relation with rise in sales greater or equal to rise in production is emphasized, while rise in production greater or equal to cost rise: $K < P < S$.

In long run, relations between the analyzed indexes might be as following:

- increase in costs is equal to rise in production and this rise is equal to rise in sales,
- distribution indexed previously verified in the investigated enterprise can be systematized and selected for the proposed set of indexes; they might include, in order:
 - rise in share of improper deliveries (10%), determining costs,
 - rise in security of supplies (93%), determining production,
 - rise in the level of immediately executed deliveries (27%), determining sales.

Structuring of a model of the level of the abovementioned indexes, according to the proposed arrangement, decision-makers obtain information about management in distribution. The dynamics of sales in the investigated company is lower than dynamics of production. As results from them, warehouses are full of final products while a weakness of the enterprise is operation in the area of immediately processed orders. This area of operational activity in companies is a weakness of distribution and calls for improvement-related decisions.

4. Summary

In consideration of the model of indexes for the purposes of monitoring of distribution activities in the investigated company, it is assumed that these events in the future will occur according to the adopted criteria adapted to the conditions assumed for the strategy of operation. If, during realization of the adopted index model, the conditions will change, strategic decision-maker will first modernize properties of other objects of strategic management rather than the model of indexes. Such behaviour is a precondition for being successful in the investigated area of business activity and it leads to development of the enterprise. Moreover, the presented models of indexes considerably extend capacity of the investigated indexes and the scope of observations of the monitored activities.

The concept of economic monitoring, taking particular arrangement of indexes into consideration, has high opportunities of implementation and high flexibility of the solutions. These features cause that both small and large companies can make use of information systems using economic monitoring.

Bibliography

- [1.] MARCINIAK-NEIDER, D., NEIDER, J.: **Podręcznik spedytora** (Forwarders Handbook). - Polska Izba Spedycji i Logistyki. Gdynia 2006.
- [2.] CIESIELSKI, M.: **Logistyka w biznesie** (Logistics in Business). - PWE, Warsaw 2006.

- [3.] NOWICKA-SKOWRON, M.: **Efektywność systemów logistycznych** (Efficiency of Logistics Systems). - PWE, Warsaw 2000.
- [4.] TWARÓG, J.: **Mierniki i wskaźniki logistyczne** (Logistics Measures and Indexes). - Instytut Logistyki i Magazynowania. Poznań 2003.
- [5.] NOWAK, E.: **Rachunkowość w zarządzaniu zdecentralizowanym przedsiębiorstwem** (Accountancy in Management of Decentralized Companies). - PWE, Warsaw 2001.
- [6.] KISIELNICKI, J., SROKA, H.: **Systemy informacyjne biznesu** (Information Systems in Business). - Placet, Warsaw 1999.
- [7.] LESZCZYŃSKI, Z.: **Monitoring finansowy w zarządzaniu małym i średnim przedsiębiorstwem** (Financial Monitoring in Management of Small and Medium Businesses), [in:] Zarządzanie małym i średnim przedsiębiorstwem. Uwarunkowanie europejskie (Management of Small and Medium Enterprises. European Conditionings.). (edited by) M. Strużycki, - Difin, Warsaw 2002.
- [8.] KOWALCZYK, S.: **Informacja w monitorowaniu otoczenia organizacji** (Information in Monitoring of Organizational Environment), (in:) Monitorowanie otoczenia. Przepływ i bezpieczeństwo informacji. W stronę inteligencji przedsiębiorstwa (Monitoring of Business Environment. Flow and Safety of Information. Towards Intelligent Enterprises). (edited by) R. Borowiecki, M. Kwieciński, - KW, Zakamycze 2003.
- [9.] OLEŃSKI, J.: **Ekonomika informacji** (Economics of Information). – PWE, Warsaw 2001.