THE EFFECT OF LOGISTIC CONTROLLING ON BUSINESS PROCESSES

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Abstract: The increase in the significance of logistics can be attributed to two major reasons: the increasing cost sensitivity of companies and the necessity for the higher fulfilment of customer needs. Logistic controlling is a tool of management used to coordinate logistic activities and to reach logistic managerial decisions by providing information through the analysis of the system. The up-to-date and precise information that can be gained from the logistic controlling system helps the management in the preparation of decisions, and the adaptation to environmental conditions. With these activities, logistic controlling makes the enterprises more efficient and successful. Taking the above into consideration, I carried out a survey on why commercial entities decided on the introduction and application of a logistic controlling system, what conditions are necessary for the introduction of a logistic controlling system, and what experiences the users gained by the application. Positive effects of logistic controlling were proved on operations, and the introduction and application of logistic controlling were analysed.

Keywords: logistics, controlling, flexibility, efficiency, success

Introduction

The centralized position of logistics is an essential condition for the operation of modern enterprises due to competition. Logistics can reach its final objective only if it enables an ever quicker and higher level of customer service. At the same time, companies can become ever more efficient in minimizing their costs without a decrease in the quality of their production or service (*Vántus* 2012). The ever increasing market competition requires greater organizational and operational efficiency, and flexible adaptation to the new situations generated by external-internal environmental changes.

The system approach, the significant cost reduction and profit increasing effect coupled with scientific methodology are the main characteristics of well-designed and functioning logistics.

With the complex approach of logistic systems, organizations can get feedback enabling them to overview and coordinate their activities and making them more adaptive to the environment. These conditions ensure that business organizations can continuously control their activities, possess up-to-date information, and respond to changes.

One of the great disadvantages of big systems is their complexity; it is not easy to have precise and up-to-date knowledge about the system's processes to focus the organization in a good direction. The periodic review of systems provides operational safety, which is essential for smooth management.

Logistic activities can be considered successful if the implementation of individual sub processes are adequately and professionally synchronized, and the flow of materials and information is clear (*Cooper* 1994). Without control and feedback, a system does not operate as planned, and the organization can become defunct. Adaptation to the competition makes the continuous review and reorganization of the enterprise indispensable (*Méhesné* 2011).

Logistic controlling is a management subsystem built on the integrated logistic system of organizations which provides feedback and control for the management. The characteristics of corporate controlling and relevant definitions are discussed hereinafter. The market of logistic controlling software is developing significantly; only the reluctance of enterprises inhibits the faster spreading of these technologies (*BusinessFlex* 2013).

Controlling is a method for obtaining information, which promotes reaching the enterprise's objectives through the leadership, control and feedback based on the results of plan-fact comparisons." (*Schwalbe* 1990). Controlling "is a subsystem coordinating planning, control, information supply; the connection of planning and accounting from the point of view of management, cost and result management" (*Maczó* and *Horváth* 2001). Controlling can greatly increase the ef-

ficiency of business activities (*Boda and Szlávik* 2001, *Boda and Szlávik* 2005).

A subsystem of "the organizational 'Internal Management System' based on cost sensitivity, which synchronizes the environment, strategy and structure of the organization. A tool and philosophy providing an integrated system for planning, reporting and information supply" (*Nagy* and *Galántai* 2010).

The above concepts make it obvious that the task of corporate controlling is to reach the organizational objectives defined by the management. It is a management subsystem which, through its information supply, enables the knowledge of corporate processes and their results, thus ensuring that the management reaches the right decision regarding operations, future planning and the occasional review (*Vántus* and *Hagymássy* 2014).

Based on the above, it can be stated that efficient organizations cannot lack the the data feedback and control of the logistic system. The compliance with these requirements is provided by logistics controlling, whose objective is two-sided:

- permanent control, plan-fact comparison of costs and performances, and
- obtaining, organising and providing information for decision support (*Francsovics* 2005).

Logistic activities are characterised mainly by the cost data, performance data and logistic parameters.

A questionnaire survey was conducted to know the reasons and results of the application of logistics controlling, and to investigate its significance as a managerial support tool in decision making.

Materials and methods

The scope of the research is comprised of Hungarian enterprises which have a significant controlling and logistic controlling system in their organization. The sample of the examination, 124 enterprises, includes enterprises from agriculture, industry and service supply sectors based on national economic classification.

An important aspect in sample selection was that organizations were chosen independently from their size; the selection was based on their logistic characteristics.

The examination is based on the questionnaire designed specially for this research containing both closed and open questions (*Rubin-Babbie* 2010).

The questionnaire is built upon three main topics:

- the first contains the data of the person filling out the questionnaire;
- the second contains questions describing the organization, while
- the third part presents the logistics and controlling data related to the enterprise; this is the interview itself.

The questionnaires were filled out via Internet or through personal interviews. I attached a letter of invitation to the questionnaires sent via Internet and e-mail. I collected 87.9% of the questionnaires via Internet, while in 12.1% of cases a personal interview was conducted. The low ratio of personal interviews is due to the territorial deconcentration of the firms.

In the research, co-workers of the organizations employed in the area of controlling or other closely connected areas took part to ensure that their answers would be relevant to the survey.

Results and discussion

The organizations taking part in the research were organised into three main groups based on their industrial classification and the purpose of their main activity. In this way companies of agriculture, industry and service industry were distinguished.

Approximately, half (50.8%) of the examined organizations carry out industrial activities. These are followed by organizations operating in the service industry, whose ratio is 46%, and the agricultural enterprises with 3.2%. Taking the size of the organization into consideration, the percentage of medium-sized (57.2%) and large enterprises (26.6%) is relevant.

In this case, the percentage of organizations with agricultural profile in the examined sample is not relevant, as there are no large enterprises; only micro-, small- and medium-sized enterprises are in the sample. Because of their ratio being negligible from the point of view of the research, agricultural enterprises were taken out of the sample and only the organizations active in the industrial and service sectors were examined.

The examined enterprises are active in four counties. 38.4% of the enterprises are in Pest County. This is not surprising, since most of the organizations active in the Hungarian industrial and service sector are concentrated around the capital. The overwhelming majority of large enterprises could also be found in this area. Jász-Nagykun-Szolnok County is in second place with 21.6%; Hajdú-Bihar County contributed 20.9% and Békés County 19.1% of the examined organizations in the research.

The presentation of the location of organizations is significant, because besides the well-developed Pest County, underdeveloped areas from the countryside can also be found in the research. The positive effect of logistic controlling on organizations is not localized in an enterprise as a separate entity; it also affects the external environment through products, connections and employees. According to this, positive results are not only sensed by the organization but also its environment, through which the certain development of a given area can also take place.

In the research, the features of logistic controlling might indicate generalization, through which the consequences can be considered true even in a wider sphere. Accordingly, the results of the research support the widespread application of logistic controlling systems.

The size classification of the examined organizations based on the number of employees:

- Micro enterprise: –9 people,
- Small enterprise: 10–49 people,

- Medium-sized enterprise: 50–249 people,
- Large enterprise: 250– people.

The main aspect of defining the sample was the presence of controlling activity, so organizations were chosen from all size categories.

One of the fundamental requirements of a logistic controlling system is flexibility. Software developers did not put together a template, but a system that can be easily tailored to the needs of the organization. Due to this flexibility, logistic controlling systems are widely used among enterprises, regardless of the organizational profile. A much more crucial point of the introduction of the system is the existence of the adequate IT background, since it ensures the smooth application of a logistic controlling system (*Andrews et al.* 2003). Due to the flexibility of the logistic software, logistic controlling can be applied in all organizations. The question is thus: what is the size of an organization from which the application of a logistic system is feasible?

Correlation analysis was performed to determine the relationship between the size of the organization and the usage of the logistic controlling system. The accepted guidelines for interpreting correlation coefficients are the following: zero indicates no relationship, values between zero and 0.3 a weak relationship, values between 0.3 and 0.7 a moderate relationship, and values between 0.7 and 1.0 indicate a strong linear relationship between the two factors.

The age of the examined organizations differed greatly; companies founded from 1950 onward can be found in the survey. The distribution of the examined organizations based on their age is as follows:

- 1950–1960: 5.0%
- 1961–1970: 11.7%
- 1971–1980: 7.5%
- 1981–1990: 20.0%
- 1991–2000: 45.8%
- 2001–2010: 10.0%

From the above it is well visible that the overwhelming majority of the organizations taking part in the research were founded after 1991, but it can also be observed that the sample contained elements from all age groups. There is no relationship between the age of an organization and the application of the logistic controlling system ($r=-0.08$). Accordingly, it is proven that the logistic controlling system is available for every business organization regardless of its age, and the usage of the logistic controlling system depends on the intent of the management.

Regarding the reasons for application of logistic controlling systems, some factors are to be highlighted. Logistic controlling systems penetrate into the whole organization. With the increasingly complex development of logistics, enterprises would like to trace these complicated processes, as the up-to-date and precise knowledge of logistic processes of the organizations become important. A multidisciplinary approach is needed for successful application of logistic controlling (*Illés* 2011).

Logistics can have a stimulative effect on organizations if the management is able to trace the activities of the enterprise. Accordingly, enterprises cannot lack the traceability of complicated processes affecting the whole organization.

The organizations participating in the survey mentioned the followings as reasons for the introduction of logistic controlling:

- gaining information, becoming informed about processes occurring in the organization,
- the necessity of up-to-date information for efficient operation,
- correction of problems through the precise knowledge of processes,
- providing opportunity for intervention, adjustment, and elimination of wastes in processes.

In order to carry out efficient and successful work, the management has to possess information about all details of the organization's processes to solve the problems. To ensure efficient operation, the management has to be provided with up-to-date and adequate information (*Kaplan* and *Atkinson* 2003).

The application of a logistic controlling system enables the management to intervene and correct processes. Before the application of a logistic controlling system there was no alternative to intervene in the process, the problem became obvious only after the operation. As a result, the organization suffered serious damages because of not responding on time. The introduction of a logistic controlling system enables intervention during the process, as well as mitigation and abolishment of damages caused by possibly arising problems (*Horst et al.* 1993).

A logistics controlling system transfers its up-to-date and exact information to the users in the form of reports. Reports can be queried by the appliers at regular intervals, but getting ad hoc information is also possible. The significance of frequency of queries depends on the profile of organizations. In production, queries are more frequent since there is a greater chance for problems arising during the process; thus, a higher level of control becomes necessary.

The data content of queries can also change depending on for what purpose the user wants to use the report. The flexibility of a logistics controlling system becomes proven also in cases, in which through a wide inspection into the system of organizational processes, data is ensured.

A fundamental criterion for successful business operation is the accessibility, quantity, quality and utilizability of the information, which is defined by its data content. Efficient business – as I already mentioned before – requires "informatics, which extremely quickly collects, evaluates market, customer feedback and their data through its software, thus enabling the flexible adaptation of the company" (*Knoll* 2002). Various ITs provide access to information, which are fundamental preconditions for the introduction of controlling systems. 89.7% of the organizations examined applying controlling systems adopted logistic controlling. The aims of the information system from the management's point of view are: management of the companies' information assets, increase in efficiency, and improvement of competitiveness (Némon et al. 2006). A well managed information system increases the level of customer

service, decreases expenses, makes processes faster and more efficient, enables leaders to focus on long term problems instead of operative tasks, and increases flexibility (*Hajós et al.* 2007).

The introduction of the system may result in problems, which have to be corrected within the shortest possible timeframe, so that the logistics controlling system can have a real positive effect on the operation. After introducing the logistic controlling system, 35.1% of the enterprises experienced difficulties. They faced problems with the following tasks:

- finding the key performance indicators for relevant feedback,
- producing a database necessary for the establishment of indicators, and
- utilizing the gained information efficiently.

The establishment of key performance indicators is an important part of the introduction of logistic controlling systems, since the formation and reaching of strategic objectives requires information. The adequately created indicators can transfer information to the management, enabling them to understand and control the processes in the organization. The analysis of the obtained information can lead to new ideas, resulting in continuous improvement of logistic processes. If the indicators are not formed properly, the obtained information cannot be used efficiently because their data content is not significant.

About a quarter of the examined organizations (25.8%) changed their controlling systems. The reasons to introduce a new controlling system are the following:

- controlling system not adequately operated,
- lack of synchronized operation between the organization and the applied controlling system,
- choice of a better, more modern controlling system.

The introduction of the applied controlling system is a process beginning with the precise definition of strategic objectives. This is followed by the creation of the right indicators and the planning of the process of strategic and operative controlling. After this, the target software is chosen and incorporated into the organization. Should any of these steps be left out, there will be hardships even during the selection of the suitable software.

However, the overwhelming majority of the enterprises applying the system (64.9%) could introduce logistics controlling system without any errors. Those applying logistic controlling systems have realized numerous positive effects since the introduction. The most typical effect of the application is that feedback resulted in increased level of organizations' logistic performance by 87.4%. The operation of enterprises became more cost efficient for 77% of the users. Better adaptation to the market (62.1%), faster logistic operations (13.8%), and more flexible organizational operations (26.4%) were the main outcomes of the logistic controlling development.

Logistic controlling has a complex effect on organizations. It was realized that 74.4% of organizations experiencing an improvement in operations through its application are active in industry, while 25.6% are in the service sector. The examined organizations had significant positive changes in three areas. The introduction of the logistic controlling increased the revenue (88.4%), decreased the value of inventory (58.1%), and reduced the cost (65.1%). Based on the previous results, logistic controlling has a greater effect on the industrial sector than on the service sector. The logistic controlling has positive effects on many areas of the organization, improving the efficiency of the whole system.

The rate of positive changes due to logistic controlling differs across the sectors of the economy. The organizations active in the industrial area experienced a higher increase in revenue (5–10%), and decrease in inventory value (20–25%) than the service sector.

The rate of improvements is the same in industry and services in cost reduction, since both sectors realized a 10–15% cost decrease as a result of the application of logistic controlling system. The decrease was in the level of direct variable costs linked to production and services. The sum of logistic costs amounts to approximately half of these costs (52–55% in the industry, 40–45% in the service sector).To get a more precise picture about the positive effects of logistic controlling systems, the development of unit logistic costs was analysed. After applying the logistic controlling, 35.8% of the organizations reported positive changes in unit costs, while 36.7% did not realize improvement. Enterprises experiencing improvement decreased their unit logistic costs by 23.3%, while the others' logistic costs stagnated. In the industrial area 20.0%, in the service sector 3.3% realized a decrease in their unit logistic costs, the rate of which was fluctuating between 15–25% in industry and 10–15% in services.

The above can result in contradiction, since approximately half of those applying logistic controlling did not experience improvement in cost data. All the organizations realized numerous positive effects as a result of feedback: improved level of logistic performance of the organization, more cost efficient operations, better adaptation to the market, quicker logistic operations and more flexible organizational operations. The reason is the complex effect of the logistic controlling system, which does not obviously or primarily affect logistic and other costs. It primarily improves corporate operation since, based on its feedback, it enables the management to review, improve and correct the processes.

In order to get a complete picture about the logistic performance of the organizations, the logistic costs of those not applying logistic controlling at all were also investigated. At the moment, 27.5% (48% industry, 52% services) of the organizations do not apply logistic controlling at all. The development of unit logistic costs of these companies fluctuates widely. In the industrial sector these costs increased in the case of 43.6% of organizations, stagnated in the case of 43.6% and decreased in the case of only 12.8%. Regarding service, the stagnation of these costs was the highest, in the case of 58.0%. 30.0% of those not applying logistic controlling decreased these costs, while in the case of 12.0% the unit logistic costs increased. The specific logistic cost, at the organizations without logistic controlling, stagnated in 52% of the enterprises, increased in 27%, and decreased in 21% of the organizations.

Conclusions and recommendations

It becomes more and more evident for managers that the importance of logistics is increasing. In order to maintain the long term success of organizations – because of the complicated material and informational processes – there is demand for transparent, easily queryable, quickly answering information systems that serve precise information. Transparent management, profit maximization and cost minimization are expected from the competitive enterprises.

Based on the research it can be stated that an overwhelming majority of the organizations taking part in the survey (72.5%) have applied logistic controlling system, which greatly contributed to the decrease in unit logistic costs and inventory, giving continuous information to the management and ensuring the opportunity for intervention.

One of the fundamental requirements of a logistic controlling system is flexibility. Software developers established a system which can be easily incorporated into the organization, and thus can be easily adapted to the needs of the enterprise, taking structural features into consideration. Due to this flexibility, logistic controlling systems are widespread among enterprises regardless of organizational profile.

Upon examining the possible connection between the age of companies and the application of organizational controlling systems, it can be concluded that there is no connection between the two factors. Accordingly, the application of the system can be adapted into any organization where a need for this appears.

The need for the application of logistic controlling occurred in different forms among the examined organizations. Logistic controlling systems provide precise information about production and service processes, enabling the management to control, intervene and correct operation.

Based on the obtained results, logistics controlling systems lived up to the expectations of managers. Their positive effects on organizational operation and more efficient management were experienced by all users, but differences were found in the development of the unit logistic costs. About half of the organizations that applied logistic controlling decreased unit logistic costs. The cost reduction in the industrial sector was more significant than it was in the service sector.

According to the results, the application of logistic controlling system contributes to efficient operations, and it supports the management in reaching long-term success.

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