
The IT Tools Supporting Controlling of Logistics in Polish Process-Oriented Production Companies

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Abstract:

Purpose: The main purpose of the article is to present the essence of controlling of logistics and the results of own research on the use of IT tools supporting controlling in Polish process-oriented production companies. The results presented in the study constitute a fragment of a broader study, also including, conditions of controlling of logistics processes and cost analysis in the assessment of logistics processes.

Approach/Methodology/Design: The undertaken research issues and the set goal determined the choice of research methods, such as, critical literature review and questionnaire research of Polish production companies.

Findings: Decisions made by process-oriented production companies in the area of logistics are aimed at using the potential of the organization and assessing the effectiveness of logistics processes.

Practical Implications: A helpful tool is logistics controlling, supported with IT tools. The most frequently used IT solutions supporting the controlling of logistics processes in Polish production companies are spreadsheet, own programs and databases.

Originality/Value: The proposed solutions are to contribute to the development of Polish production companies.

Keywords: Management of logistical processes, logistics management, enterprise management, controlling as a management method,

JEL classification: M0.

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1. Introduction

Business management is a set of decisions and activities, very complex and difficult, which is to ensure the proper functioning of the enterprise and generate profit from its activities (Bełch, 2020). One of the methods supporting company management is controlling. On the other hand, due to the specific nature of the activities carried out in process-oriented production companies, logistics plays a key role.

The traditional organization of an enterprise based on the functions it carries out is not adequate to the changes taking place in economic units. Increasing competition, transforming product markets into customer markets have a significant impact on the behavior of enterprises. Transformations occurring not only in the area of manufactured assortments, but also in the organizational issues of production companies. It is moving away from function-based fossilized organizational structures while focusing on processes and activities (Szydelko, 2018).

The main purpose of the article is to present the essence of controlling of logistics and the results of own research on the use of IT tools supporting controlling in Polish process-oriented production companies. The undertaken research issues and the set goal determined the choice of research methods, such as: critical literature review and questionnaire research of Polish production companies.

The results presented in the study constitute a fragment of a broader scope of research, also including: conditions of controlling of logistical processes, difference between controlling of logistics and controlling of logistics processes and cost measures in the assessment of logistical processes in Polish production companies from the Podkarpackie Province (Bełch and Bełch, 2020; Bełch, 2021).

2. Controlling of Logistics

Controlling of logistics is part of the company, which provides necessary tool in achieving its objectives. In the literature many definitions of controlling of logistics can be searched. Their original review in terms is presented in Table 1. Review of the definition of controlling of logistics indicates problems in its characteristics. The heterogeneity of approaches results from the lack of a universal definition of both logistics and controlling. In this regard, each author highlights other, in his opinion, important aspects. A common feature of the controlling of logistics definitions presented in the literature is: decision support for people and a tool to improve processes. Logistics-oriented enterprise information system should be characterized by (Szymczak, 2010):

- reliability, defined as the probability of meeting it within a specified period of time the requirements set for him,
- performance as the ratio between the value spent on the system and that obtained from the system,

- flexibility, which makes it possible to ensure the two above-mentioned features in all of them operating conditions of the enterprise, which means the ability to adapt to the changing environment and development opportunities,
- openness, allowing for interconnection of information systems enterprises, which ensures the exchange of information between them and allows for taking into account interconnectedness in the decision-making process – ma it is essential for logistics,
- economic efficiency, which takes into account the cost aspect in relation to for the system to meet the above conditions.

Table 1. Summary of controlling of logistics definitions in chronological order

Author	Definition
S. Nowosielski, K. Nowosielski (2001)	The concept of controlling of logistics should be understood as the implementation of controlling tasks in the company's logistics system. The scope and content of controlling tasks logistics may differ in different controlling concepts. Controlling of logistics supports the implementation of the company's logistical processes
G.B. Ihde (2001)	Takes over the task-oriented coordination of planning, command and control chain of services and to provide an information.
J. Piontek (2003)	Logistics management support by preparing and providing information as part of planning, coordination and control.
H. Pfohl (2004)	Application of controlling tasks in the area of enterprise logistics. Controlling of logistics is a functional controlling subsystem that supports logistics management.
B. Śliwaczyński (2007)	Controlling of logistics is a logistics management support system which, through management coordination, control and control as well as control and management, provides the tools to achieve the set logistics goals, to obtain strategic information as well as to search.
H.U. Küpper (2008)	Controlling of logistics supports coordination management tasks in the area of logistics.
J. Weber, C.M. Wallenbrug (2010)	Controlling of logistics is manifested in the application of the concept of controlling in logistics, the effect of which is the creation of an information base so that it is possible to plan, control and control logistics processes in accordance with the intended goals.
P. Ceniga, V. Sukalova (2011)	All activities in the area of enterprise logistics, which aim is to optimize logistics costs.
R. Kowalak (2011)	Controlling of logistics is a part of controlling which is responsible for planning and controlling the effective flow and storage of raw materials, goods and finished products, as well as ensuring appropriate information related to their delivery and collection in order to meet the clients' requirements.
S. Krawczyk (2011)	The scope of controlling of logistics tasks is the narrowing of controlling to ensuring the correctness of logistic processes.
D. Janczewska (2014)	Controlling the company's logistics activities is not limited to monitoring selected measures of logistics processes. On the basis of the observed changes in the obtained parameters of the efficiency of logistics processes, it is possible to determine the progress in the implementation of strategic goals of the enterprise and earlier identify disruptions in the implementation of individual goals.

P. Bełch (2016)	A tool supporting management in functional terms in the implementation of logistics processes, including projects from the acquisition of raw materials, through technological processes in the area of production logistics, to the delivery of finished products to the final customer.
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Source: Own study based on (Ihde, 2001; Kowalak, 2011; Ceniga, Sukalova, 2011; Piontek, 2003; Janczewska 2014; Krawczyk 2011; Küpper 2008; Weber, Wallenbrug, 2010; see Bełch, 2016).

The information system of logistics controlling will fulfill its role in the process of managing a production company only if it is fully computerized. The basic approaches to computerization of controlling information systems include (Leszczyński and Wnuk, 2000):

- Implementation with the use of extensive financial and accounting systems with a certain superstructure, most often organized in the form of spreadsheets,
- Development of independent IT systems with a specific user in mind (i.e. taking into account his specificity, information needs and already used domain systems),
- Implementation of MRP II or ERP class integrated enterprise management systems in the environment.

IT systems are designed to support controlling in various areas. In the light of literature research, the catalog of these tasks should include, inter alia, budgeting, strategic planning, deviation analysis, balanced scorecard, advanced financial analysis, advanced statistical analysis, activity costing, time-controlled activity costing, management reporting (Bełch, 2016; Drażek and Hajduk-Stelmachowicz, 2018; Szydełko, 2015; Nieplowicz 2018; Nowak 2018; Kes, 2018).

3. Research Methodology

The project of goal-oriented empirical research required the use of research instruments. Therefore, a questionnaire (in electronic or postal form) was used. The research sample consisted of production companies with an implemented quality management system compliant with the PN-EN ISO 9001: 2015 and PN-EN ISO 9001: 2009 standards, whose headquarters or branches are located in the Podkarpackie Province. The group was selected in a non-random, purposeful manner.

The research tool was sent to companies that have a valid quality certificate. This assumption was aimed at reaching those enterprises which should, in accordance with the requirements of ISO 9001, adhere to the rules of the process approach. According to this standard, enterprises should "establish, implement, maintain and continuously improve a quality management system including the necessary processes and their interactions".

Questionnaires with cover letters were sent to 128 companies. The data collection stage was carried out from November 19, 2018 to January 19, 2019. Finally, completed questionnaires were obtained from 44 companies, which gives a response rate of 34.38%. After initial verification of the completed questionnaires, it turned out that not all of them were complete. Consequently, 42 questionnaires completed by the companies were ultimately accepted for the analysis of the results, representing 32.81%. Taking into account the criterion of the size of the studied entities, it should be pointed out that the majority (54.8%) of the participants of the conducted research were large enterprises. This fact results from the non-random, deliberate sample selection. The structure of the respondents, taking into account their size, is presented in Table 2.

Table 2. Structure of the surveyed enterprises in terms of size

The size of the enterprise	Number of enterprises	% of enterprises
Large enterprises (over 250 employees)	23	54.8
Medium-sized enterprises (51-250 employees)	18	42.9
Small enterprises (10-50 employees)	1	2.4
Micro enterprises (1-9 employees)	0	0.0

Source: Own research based on the results of research in enterprises.

The next criterion was the organizational and legal form of the enterprise. In this case, the majority were limited liability companies (73.8%) and joint-stock companies (19%). The distribution of research participants according to their organizational and legal form is presented in Table 3.

Table 3. Structure of the surveyed enterprises according to their organizational and legal form

Organizational and legal form	Number of enterprises	% of enterprises
Limited liability company	31	73.8
Joint-stock company	8	19
General partnership	1	2.4
A partnership	1	2.4
A sole proprietorship	1	2.4

Source: Own research based on the results of research in enterprises.

As part of the research, participants were also divided according to the degree of internationalization of economic activity. In this way, four categories of entities were distinguished: domestic, international, multinational and global enterprises. The distribution of the surveyed enterprises according to the degree of internationalization is presented in Table 4. The research participants were dominated by international (45.2%) and domestic (38.1%) enterprises. Global enterprises accounted for 11.9% of respondents, and multinational enterprises for 4.8%.

Table 4. Structure of the surveyed enterprises according to the degree of internationalization of economic activity

The degree of internationalization of economic activity	Number of enterprises	% of enterprises
International enterprise	19	45.2
National enterprise	16	38.1
Global enterprise	5	11.9
Multinational enterprise	2	4.8

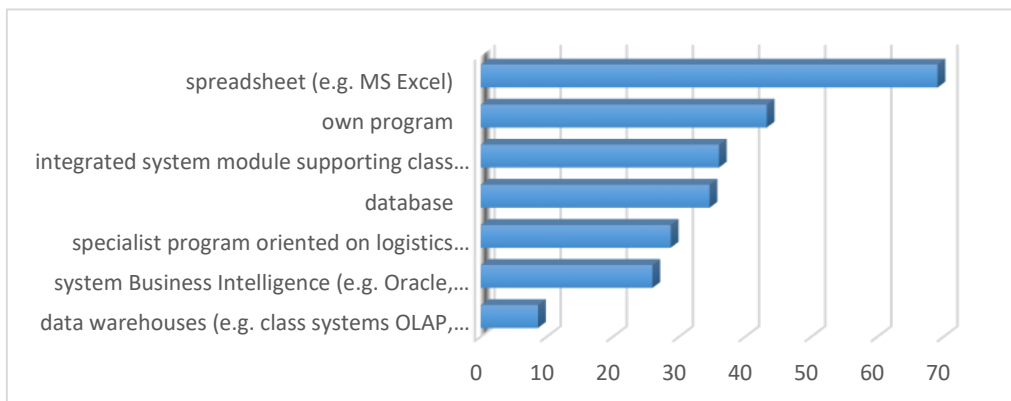
Source: Own research based on the results of research in enterprises.

Summarizing the characteristics of the surveyed production companies, it can be stated that, most often in the surveyed sample, there are large or medium-sized enterprises, which are limited liability companies or joint stock companies. They were most often represented by top management or the middle management level.

4. Research and Findings

According to the respondents, the most popular areas of controlling in terms of functionality are, finance (57.6%) and logistics (51.5%). The percentage of respondents who chose these two areas is significantly higher than the percentage of respondents who chose the next most popular sphere. It should be emphasized that research and development (6.1%) are indicated the least frequently, followed by quality (12.1%) and HR (15.2%). According to the research carried out in the analyzed production companies, the controller reports directly to the management board (60.6%). In 36.4% of the surveyed production companies, to the financial director. Chief accountant in only 3% of the surveyed companies. Another aspect of the research was the IT solutions used in the controlling of logistic processes. IT tools supporting logistics controlling in process-oriented production companies are presented in Figure 1.

Figure 1. IT tools used as part of controlling of logistics - research results

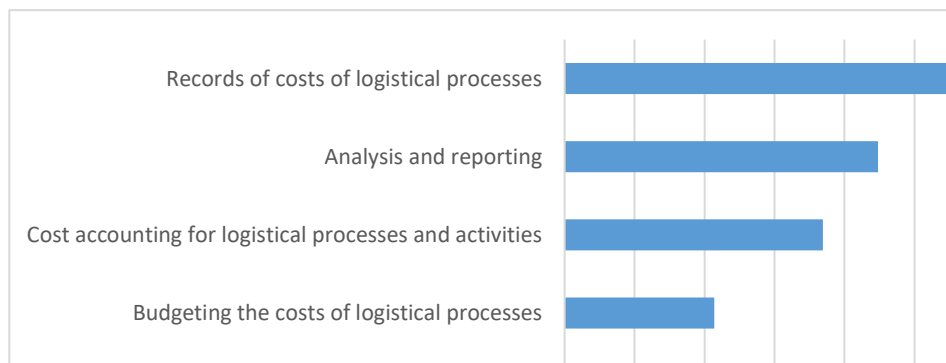


Source: Own study.

The most frequently used IT solutions supporting the controlling of logistics processes include a spreadsheet (it was indicated by 69.1% of enterprises participating in the survey). Another tool indicated by the respondents (43.2%) is the own program. The next positions include databases (34.6%), Business Intelligence system (25.9%), an integrated system module supporting ERP / MRP class management (21.2%), a specialist program (12.1%) and wholesalers data (9.1%).

Respondents were also asked about IT modules supporting logistics controlling in the analyzed companies. The results are shown in Figure 2.

Figure 2. IT modules supporting controlling of logistics in Polish process-oriented production companies - research results



Source: Own study.

Over 87% of respondents indicated the cost records of logistical processes - this is the only module that most of the surveyed companies decided to use. There are other places indicated by the respondents: analysis and reporting, cost accounting for logistical processes and activities, budgeting the costs of logistical processes.

5. Conclusions

Decisions made by process-oriented production companies in the area of logistics are aimed at using the potential of the organization and assessing the effectiveness of logistics processes. A helpful tool is logistics controlling, supported with IT tools. The most frequently used IT solutions supporting the controlling of logistics processes in Polish production companies are spreadsheet, own programs and databases.

In the light of scientific research, IT modules supporting controlling of logistics in Polish process-oriented production companies are: the cost records of logistical processes, analysis and reporting and cost accounting for logistical processes and activities.

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