

CHAPTER 6

LOGISTICS CONTROLLING IN ENTERPRISES

Bogusław Śliwczyński¹, Adam Koliński²

¹ Institute of Logistics and Warehousing, Estkowskiego 6, 61-755 Poznan, Poland
boguslaw.sliwczynski@ilim.poznan.pl

² Poznan School of Logistics, Estkowskiego 6, 61-755 Poznan, Poland
adam.kolinski@wsl.com.pl

Abstract

The main objective of economic activity of each company is to generate profit. When the economy is highly competitive most companies limit their strategy for survival, which means preserving themselves on the market through limiting costs and setting short-term goals. Controlling is a system tools and methods supporting the effective management of the enterprise in conditions of the dynamically changing market. Logistics processes management plays one of the key roles in Score-Driven Management of enterprise related supply chains and require support of controlling system. For this reason, in this chapter, the authors have attempted to comprehend define and present a role of logistics controlling in the enterprises.

Keywords: logistics controlling, operational controlling, logistics management, process

6.1. Introduction

It is a common knowledge that controlling is a tool which increases the efficiency of enterprises functioning. It also serves improvement of enterprises' results and increases competitive dominance of a enterprise. Controlling is constantly being improved. That is why it is difficult to find a complete definition of its importance in a enterprise. Controlling is often treated as a part of

management or a subsystem of the management process. From the literature on the subject we can infer that controlling is (Sliwczynski, 2007, p. 9-10):

- a system which supports management,
- enterprise management, which is oriented on its financial result,
- a process realised through planning, control and reporting,
- a general tool supporting a traditional management process,
- a modern method of enterprise management concentrated on realising assigned strategic goals.

The basic task of controlling is to enable a enterprise, its long-term existence. Because of a hierarchy of enterprise management and a time horizon, we can identify operational and strategic controlling. Strategic controlling is based on strategic planning which ensures achieving long-term results, whereas operational controlling is treated as a system of managing a enterprise's result during a short period, which is intended to achieve present goals regarding generating a profit thanks to the tools designed by strategically controlling.

It needs to be pointed out that the idea of controlling is very often mistakenly associated with already known concepts of management. The idea of controlling is to compare the real state of things with the plans and aims of a enterprise and to implement necessary corrections whenever any abnormalities occur in those plans (Powell, Kelley, 1981, p. 291). For this reason, controlling is very often wrongly associated with control only, whereas controlling processes deal not only control but with also with disposal, governing, planning and navigation. As there is a lack of a clear-cut definition of controlling in the literature, controlling processes have not been treated seriously by the management board of a enterprise. Nowadays we can observe an increasing interest in controlling tools but mainly in the aspect of financial controlling. Controlling is a management support system which by means of coordinating the processes of planning, organizing and control, as well as information gathering and processing, ensures effective business management to achieve the planned objectives (Sliwczynski, 2010, p. 30).

Controlling integrates and coordinates the following in an enterprise (fig. 6.1):

- management functions - planning, organization, management and steering, control, response and correction,
- activity areas - sales, distribution, manufacturing, purchasing and supply, marketing, research and development, client support, warehousing and inventory, transportation, human resources management, outsourcing,
- management levels and stages of developing management decisions (strategic, tactical and operative) in the long, medium and short term,

- value chains - integrating the needs of the market and the customer, products, processes and resources, as well as business performance (financial and operational), affecting the improvement of efficiency and eliminating waste (including bottlenecks).

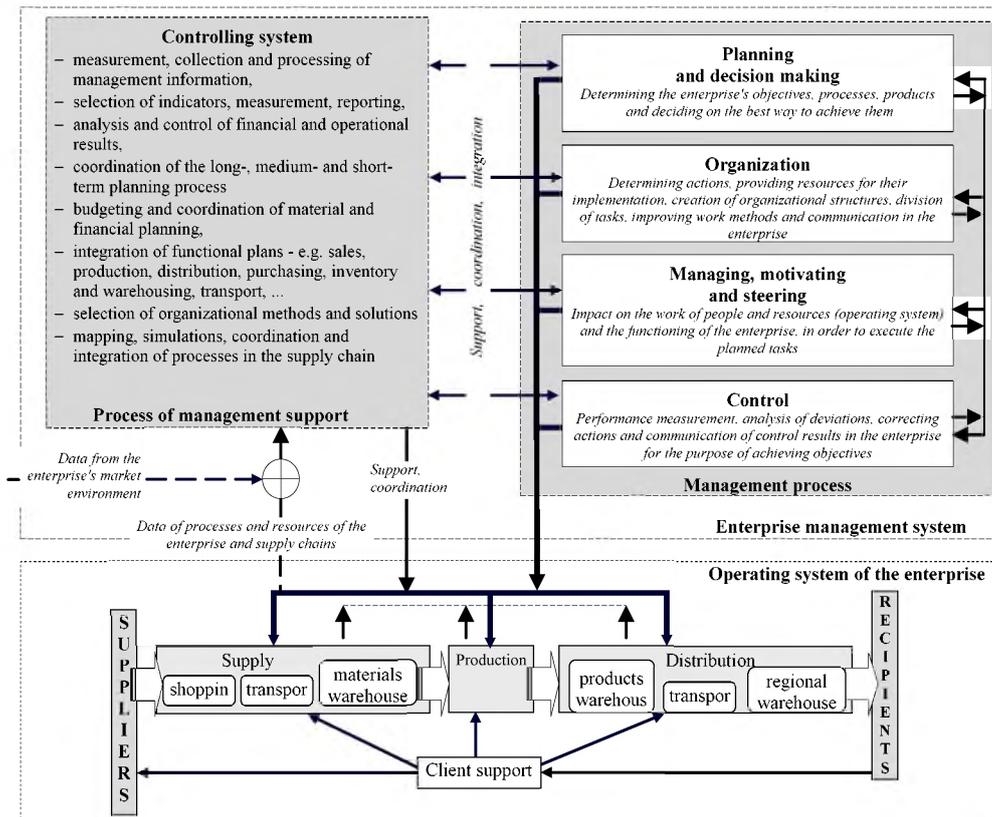


Fig. 6.1. Controlling system in process of supporting decisions

Source: own study

In a complex enterprise operating system processes integrate the work of many organizational entities and their resources, as well as suppliers, buyers and subcontractors in the supply chain. The ability to raise the value and competitiveness of a product depends on the possibility of the complex connection (operational and economic) of performance analysis and selection of methods for steering processes and resources in the chain.

6.2. Operational controlling in logistics processes

The basic difference between logistics and controlling in the aspect of coordination is that logistics play a sectional part in the service system and controlling plays the same part in the management system (Pfohl, 2004, p. 200-204). Due to the complexity of the process of logistics management in a enterprise's logistics controlling applies to a very expanded area of activities. Figure 6.2 shows the place of logistics controlling in a controlling system of a enterprise allowing for the basic area of logistics controlling activities.

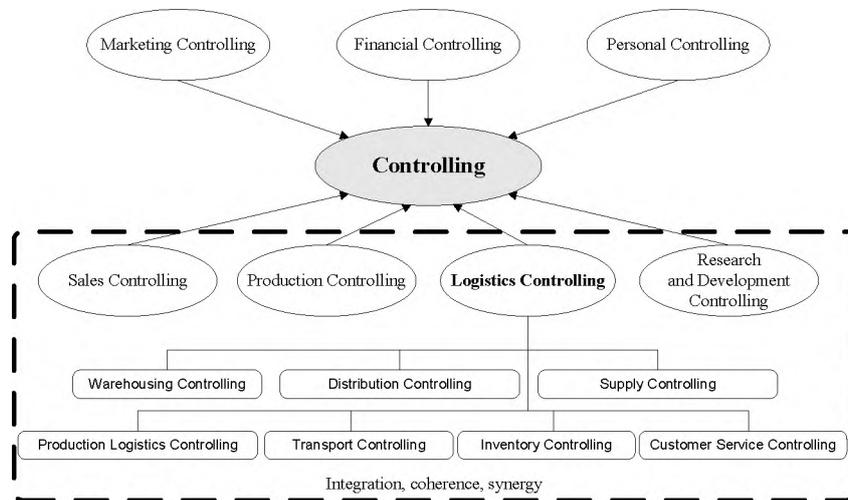


Fig. 6.2. The place of logistics controlling in a enterprise's structures
Source: own study (Kolinski, Trojanowska, Pająk, 2010, p. 73)

Logistics controlling, which is an important tool in supply chain, is becoming a real determinant in managing these multi-subjective structures. In this respect, the range of controlling is reaching far beyond the area of one particular enterprise. As supply chain is complex, logistics controlling integrates functions which are orientated on a product and technical processes and aspects of social integration. It is revealed in coordination and managing more and more participants in the process of creating value (Weber, 2002, p. 19). Implementing controlling in a supply chain helps to share the risk minimize the level of engaged funds and application of sustainable development doctrine. It is done through perfecting one's qualifications with the help of business partners' qualifications. Strong cooperation and information exchange during each phase of the process of creating a value allows

for generating long-term profits which are competitive not only for the whole supply chain but also for the enterprise.

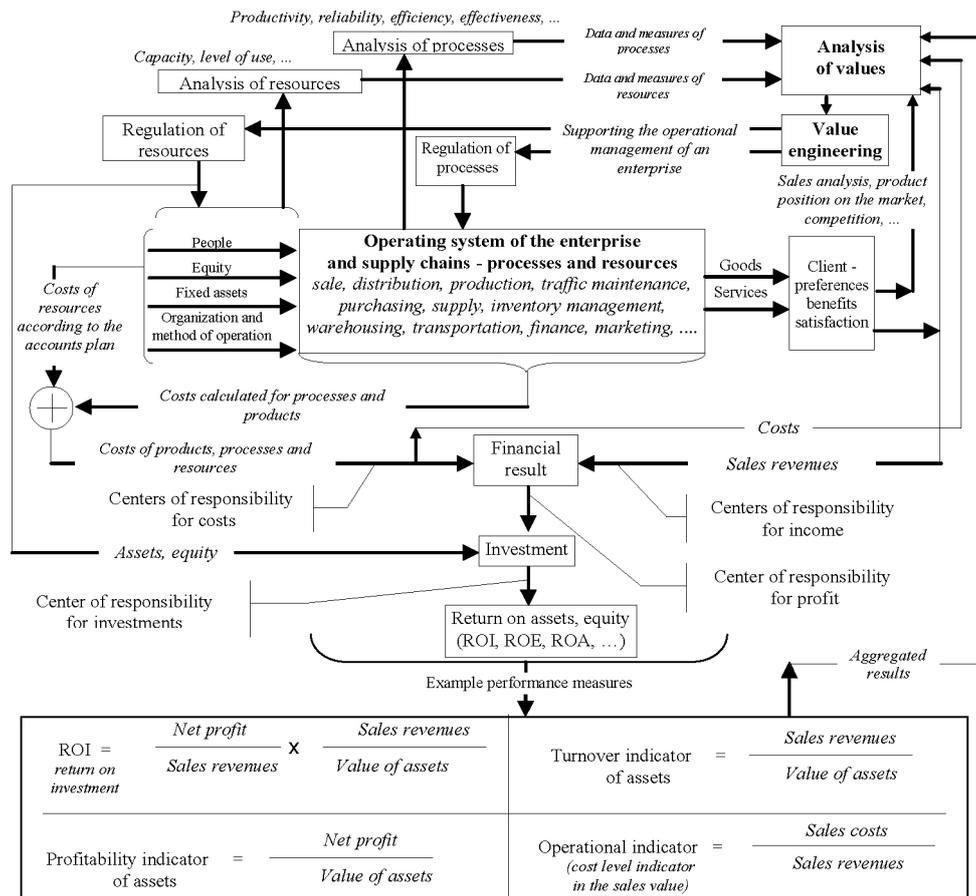


Fig. 6.3. System connection of financial and operating results in the controlling process of logistics management support
Source: own study

Systemic importance of controlling (Fig. 6.3) is due to the need for financial feedback (e.g. revenues, costs, return on assets) and operational feedback (e.g. performance, efficiency, level of utilization, reliability), and for shaping the factors of operational management - products, processes and resources - which determine the result achieved. Identification of the deviations from the target values within the values analysis creates a set of input data for values engineering - mapping the value of a product on the required characteristics of processes and resources in the

supply chain (e.g. productivity, reliability, flexibility, efficiency, capacity, response time). Shaping processes and resources and their control makes it possible to achieve the planned results, among others, sales revenues, the level of costs, profitability and asset turnover and return on invested equity.

Decisions and resources shaping processes in the supply chain are taken on the basis of the analysis of a number of financial and operational data (Fig. 6.3), among others:

- sales revenues - by analyzing the number and value of sales in relation to the product range, time and place of sale and markets and distribution chains,
- costs - by analyzing the direct and indirect costs, fixed and variable, costs of flow phases, resources and processes, and their calculation into products, orders and clients,
- result of an enterprise's activity - by analyzing the profit to the size/value of total sales (return on sales) and sales by individual products, clients, markets,
- fixed and current assets - by analyzing the structure and allocation of assets, the level of use and efficiency, turnover and return in relation to the flow of particular products, the value of sales and earnings achieved.

The processes and resources shaped by controlling in the supply chain result from the values of goals set for the enterprise and its potential and demands of clients, suppliers and subcontractors. Determining the methods of process management (e.g. purchasing and supplies, warehousing, transportation, production, distribution), takes place at the stage of planning operational measures (e.g. Sales and Operations Planning - S&OP) and flows (materials, semi-finished goods, cargo) in the supply chain. Continuous feedback (Fig. 6.3), taking into account the market response to the delivered product, is the basis for correcting the plans, norms, methods and parameters of steering processes, resource allocation, designing procedures and organizational structures and budgets (material and financial plans), etc.

Consistency in management in many areas and processes of an enterprise poses numerous and multidirectional tasks for logistics controlling (Śliwczyński, Koliński, 2016):

- collection of data relating to the objectives and the current situation of the enterprise for the needs of planning, organization, control and management of activities, and the development of multi-section management information,

- controlling financial results - e.g. revenues, costs, profits, effectiveness, liquidity, asset and equity turnover, cash turnover cycle and covering with operating capital,
- controlling the results of operational processes and resources, e.g.: productivity, reliability, efficiency, capacity, level of use,
- controlling the results of coordinating activities on the basis of total operating costs, labor productivity, productivity and resource effectiveness, and the effectiveness and reliability of logistics processes,
- controlling the results of centers of responsibility for costs, revenue, profit and investment,
- analysis of client needs, the demand profile and competitive position of the product in relation to the characteristics of the product and the level of support,
- transposition (mapping) the characteristics of the product on the processes and resources in the supply chain, process analysis and value chain analysis, and identification of needs for changes,
- multidirectional analysis of the operating environment (property, financial and information flows) for identifying signals of threats, problems, or needs to improve the supply chain and its development (including the simulation of alternative solutions),
- multidirectional analysis of the operating environment - suppliers of materials and services, subcontractors, raw material and material markets, production and warehousing technologies, etc. - for the improvement of cooperation scenarios,
- integration of plans of operational activities (purchasing, supply, inventory, production, distribution, warehousing, transportation, etc.) with other functional plans (sales, finance, marketing, human resources management, etc.),
- system planning of organizational solutions in the supply chain and development of infrastructure on the basis of balancing the current and projected needs with production and supply potential (including variant analysis of the profitability of investment and outsourcing),
- harmonizing the planning of material flow between component processes (e.g. supply with warehousing or production, production with distribution and sales),
- analysis of material flow (raw materials, sub-assemblies, products, cargo) for the elimination of bottlenecks and queues,

- developing and updating norms of operational activities and use of resources,
- controlling procedures, instructions, methods and rules of operation, planning tables, calculation formulas and other instruments of operational management,
- support in the development of the budget and coordination of activities in the budgeting process (developing, implementation and control of the budget),
- analysis of deviations from the values of planned operational activities in the supply chain and their multidimensional causes,
- developing scenarios of steering activities and correcting deviations, setting the operating parameters of steering and their relationships between processes in the chain,
- reporting including: results, method of carrying out activities, deviations and their causes, threats and risks, projection and simulations.

6.3. Logistics controlling in business practice

Research of business practice regarding the use of logistics controlling tools, indicates the increasing popularity of their applications. Research conducted by Authors includes both information of regards the use of controlling tools, as well as evidence of conceptual development of the controlling system in the enterprise and IT support for analyzes controlling.

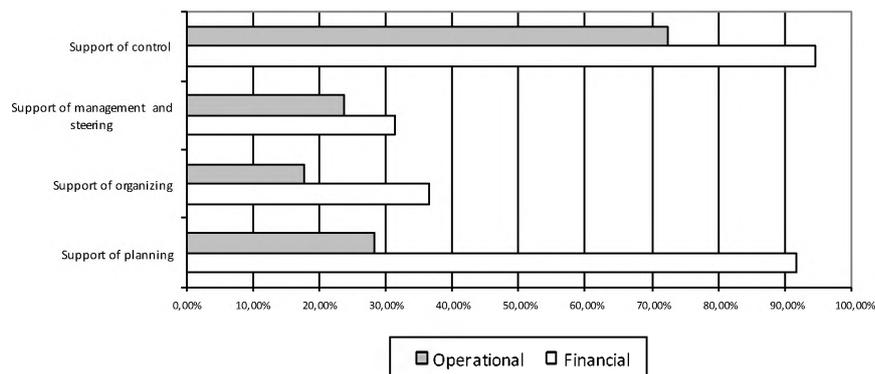


Fig. 6.4. The results of the analysis of support by controlling management functions
Source: The results of studies conducted on a group of 59 medium-sized and large enterprises, having controlling cells within the organizational structure

The audits of controlling processes in enterprises conducted by the authors show (Fig. 6.4) that the most frequently aided functions of management is controlling results and budgeting (material and financial planning). Commonly encountered in controlling are analysis and control of costs, liquidity and profitability ratios, cash turnover cycle and coverage with operating capital.

In contrast, the effectiveness of support in achieving the assumed results mainly depends on proper planning and organization of resources and processes, and the selection of methods for directing and steering processes. Managers of enterprises notice a shortage of practical solutions of controlling in terms of supporting functions of planning, organizing and steering in the area of operational management (Fig. 6.5). The needs of the system for analyzing the impact of adopted methods and scenarios of operations on the financial and market results of the enterprise, and the simulation of results of operations, have for many years been causing great interest in controlling tools (Weber & Schäffer, 2008), including controlling processes (Seuring, 2006).

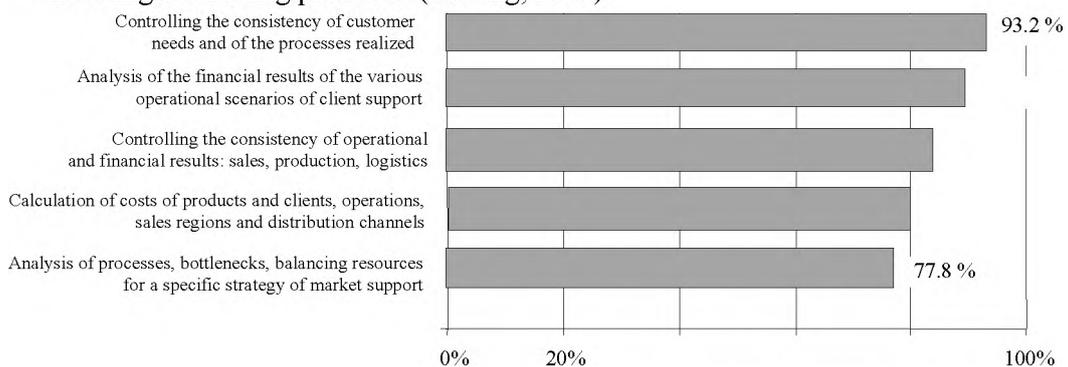


Fig. 6.5. The demand of enterprises for integrated analyses of market, financial and operational results, as well as controlling support of management
Source: Own study in 46 enterprises from the manufacturing industry, TSL and trade

When making a long-term study of economic practice, it was also found that the selection of operating scenarios, development of individual processes and resources (Fig. 6.6) affects the resulting effectiveness of the enterprise's assets and capital employed.

Logistics Management - modern development trends

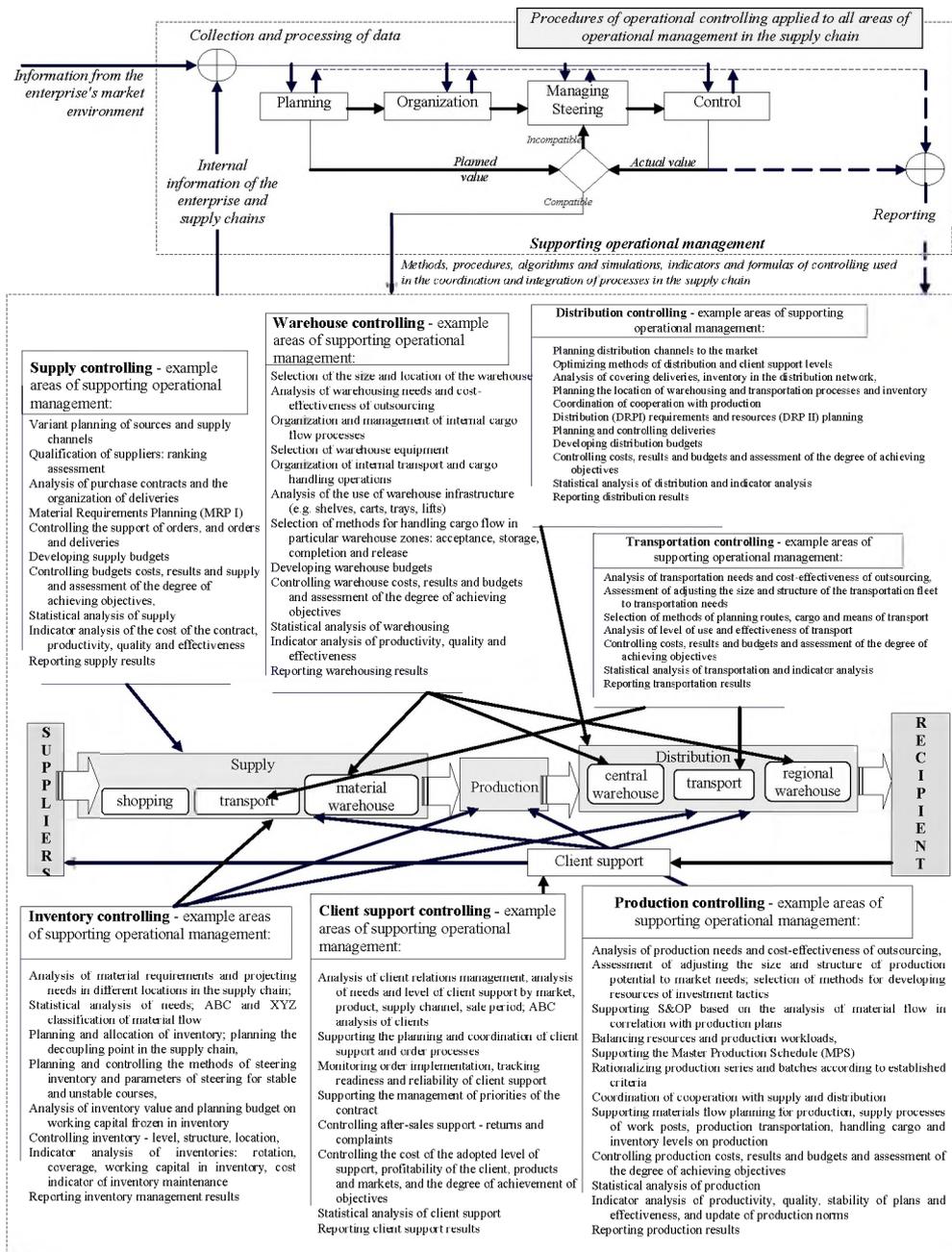


Fig. 6.6. Tasks of operational controlling in logistics processes - supporting business and operational processes management

Source: results of own studies

A tool for developing the supply chain is an analysis of the total impact of all factors of steering processes and flows (flow methods, parameters, place of execution, time, quantity and product range) on economic results and the operational management of the supply chain. The results of studies of the scope of functional and task operational controlling are shown in Fig. 6.7.

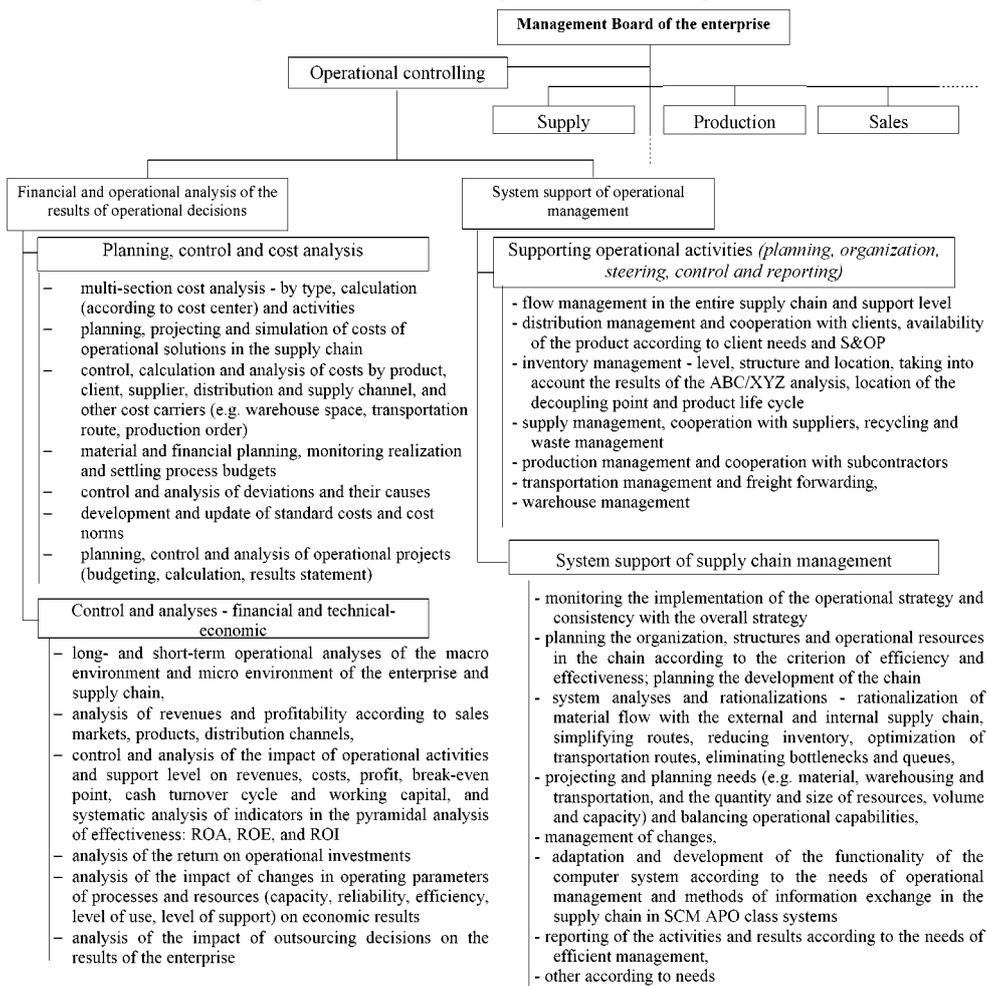


Fig. 6.7. Functional and task scope of operational controlling
 Source: own study based on the results of studies in a group of 78 enterprises

The scope of tasks of operational controlling includes two functional areas:

- financial and operational analysis of the results of operational decisions - which distinguishes the task areas: planning, control and cost analysis; control and analysis - financial and technical and economic,
- system support of operational management - which distinguishes the task areas: support of operational activities; system support of supply chain management.

The aforementioned considerations have urged Authors to carry out research studies to assess the extent of using IT tools supporting an analysis of logistics controlling. Preliminary results of research, which concerned only the tools to support the analysis of production process efficiency, Authors presented in the publication (Kolinski, Sliwczynski, 2015). The research study has been carried out using a questionnaire method and some of the studied subjects allowed to do make observations and direct interviews with the enterprises.

Using IT tools supporting analysis of logistics controlling is declared by as many as 90% of studying enterprises. However, it is worth noticing that most of managers base its analytical actions on using spreadsheet programs such as MS Excel. Especially when it comes to medium and large enterprises one can identify the wider use of ERP systems, dedicated systems or computing simulation programs. A detailed analysis of the extent of using particular IT tools supporting the analysis of logistics controlling is presented in table 6.1.

Tab. 6.1 IT tools supporting the analysis of logistics controlling

IT tools	Procent wykorzystania*
Spreadsheet programs (eg. MS Excel)	94,17%
ERP Systems	68,57%
Dedicated IT systems (eg. MES, WMS)	25,41%
Computing simulation programs	19, 83%
* Surveyed enterprises were able to choose more than one answer.	

Source: results of own studies

Analysing the research study results, can be stated that the most often used analytical tools are the spreadsheet program. Over 60% of enterprises also use IT systems of ERP class to support the analyses of logistics controlling. This group comprises of medium and large as well as micro and small enterprises. In case of medium and large enterprises the possibility to use the ERP system in realisation of complex logistics processes is dependent on the detail of a functional range of used IT tool, whereas in regard to small and medium enterprises, it needs to be noticed

that usually a low level of complexity of the executed process makes it possible to use the functionality of ERP system during an analysis of logistics controlling.

Observation of business practice, supported by scientific research allows to identify the basic difficulties in using the presented IT tools supporting an analysis of logistics controlling. A detailed identification of the basic difficulties in using IT tools supporting the analysis of logistics controlling is presented in table 6.2.

Tab. 6.2. Difficulties in using IT tools supporting the analysis of logistics controlling

Identified difficulties	Percentage of answers*
Spreadsheet programs are not sufficient for conducted analyses	68,09%
Performing computing simulations is complicated for employees	58,87%
ERP system does not guarantee receipt of all necessary data	48,27%
Dedicated IT systems do not include functionality of controlling analysis	35,73%
* Surveyed enterprises were able to choose more than one answer.	

Source: results of own studies

On the basis of identifying difficulties it needs to be concluded that IT tools which are now available on the market are generally not sufficient for the specific logistics processes executed in enterprises. Therefore, it is necessary to create a concept of a complex IT tool which would enable generating data from ERP systems and dedicated systems as well as using connections in a supply chain and making simulations which facilitate making management decisions.

Controlling in a supply chain which is supported by a computer should take into account specific requirements of all information recipients. An information technology system of controlling takes the information necessary to carry out analyses from a data warehouse, where all the transaction data recorded in a enterprise are saved. This transaction data contains: data concerning customer service (CRM), data for managing a supply chain (SCM), data concerning supply, warehouse, inventory, production, logistics, transport and shipping, distribution, finance and accountancy, sales, HR and payroll, and quality control. Combining all received information with the help of a controlling information technology system makes it possible to carry out cross-sectional analyses of a enterprise's activity. The functioning rules of an independent controlling information technology system are presented in fig. 6.8.

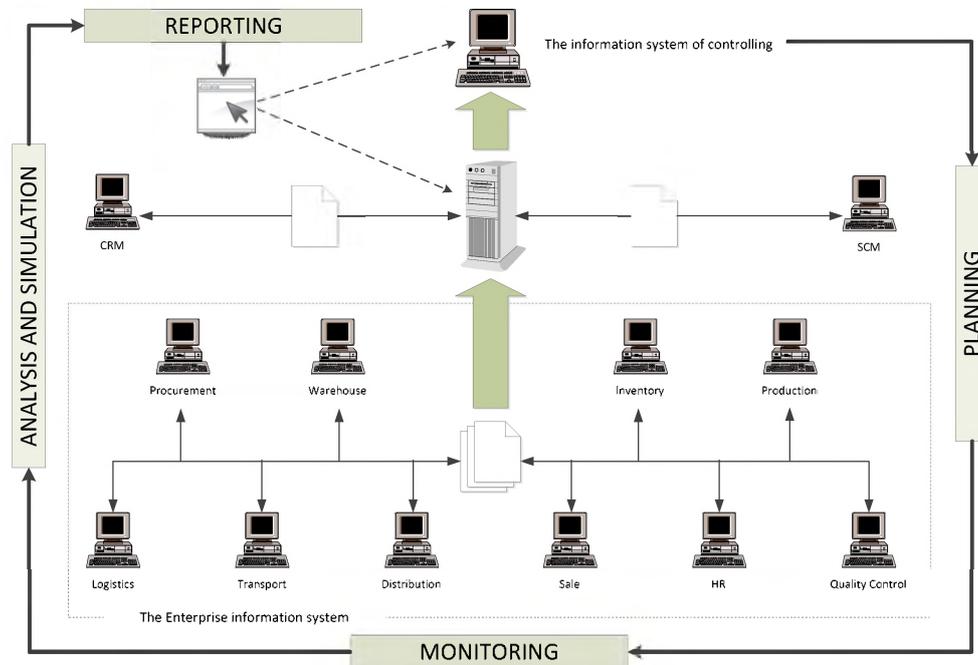


Fig. 6.8. Functioning rules of a controlling information technology system
 Source: own study based on research project¹

The main tasks of an independent controlling information technology system are planning (operational as well as constructive-financial), monitoring, analysis and simulations as well as reporting. The functionality of an independent controlling information technology system is compared to the functionality of a controlling module included in ERP class information technology system. Nevertheless, the independent system is much more detailed than the system of ERP class. For this reason it can not only single-handedly supervise all controlling processes in a enterprise but also serve as a tool supporting the work of an integrated information technology system. The controlling system makes it possible to use one, integrated database which contains all current and archival information generated by all processes taking place in a enterprise. The information obtained from a controlling system enable (Sliwczynski, 2007, s. 393):

- improvement in operational and constructive-financial planning (budgeting),

¹ Research project „Simulation of managing the flow of company’s material as an instrument of multivariant analysis of transport processes efficiency” no N N509 549940 is carried out from the financial funds for education granted by the Ministry of Study and Higher Education thanks to the decision No 5499/B/T02/2011/40.

- precise monitoring of logistics' plans realisation and their diversion from reality,
- state analysis and signaling a threat with the help of index analysis,
- plan and budget correction,
- reaction to diversions from a plan or a budget,
- carrying out analyses and forecasts of investments, projects and results,
- compilation of results of budget realisation analysis,
- reporting,
- determining the tools for analysis and control, which should be used in a enterprise's economic activity so as to increase its competitiveness on the market.

Using information technology tools of controlling entails many benefits of efficiency in a enterprise and a supply chain. The most important benefits are (Fajfer, Kolinski, Krajewski, 2014, p. 44):

- quick access to managerial information,
- obtaining more detailed analyses and, in consequence, obtaining better bases for making decisions,
- possibility to carry out data analyses single-handedly,
- monitoring planned task realisation from the area of logistics,
- possibility to make a simulation of the influence which made decisions have on a whole enterprise's result,
- possibility to carry out a comprehensive analysis and forecast of a enterprise's logistics functioning.

6.4. Conclusions

Managing the efficiency of processes taking place in a enterprise is a complex issue. Controlling, assuming decisional support of processes, should be treated as a useful tool for improving enterprise's efficiency. Considering the complexity of processes taking place in a enterprise it is necessary to concentrate on one of the basic processes so as to have the possibility to analyse it in a complex way. The system of controlling, if developed in detail, can facilitate rationalisation of the scenarios of logistics flows involving the criterion of the highest, or satisfactory, efficiency of a enterprise. The present chapter has defined the relation of enterprise's processes efficiency to the processes of logistics flow which together create a complex decisional system in accordance with the fundamental aim of this chapter.

The complexity of conducting a complex analysis of logistics controlling reveals a need to seek IT support. The present chapter shows an idea of using information systems assisting management processes in an enterprise and in a supply chain as well as computing, simulation which is aimed at analyzing all alternative solutions influencing the logistics process efficiency. Elaborated concept enables to improve the decision making process in business practice. The method presented in this chapter helps managers to take the right decision about the implementation of logistics processes.

The presented suggestion for building a complex operational controlling system includes an analysis of economic processes in the aspect of the following systems: a system of transposing an aim, a control system and an analytical system. The presented idea, however, should be made more specific by carrying out further analyses in a decisional and control system, which requires further literature research and confrontation in simulation studies. Literature research and observations of economic practice reveal that the management of enterprises incessantly searches for the tools which would support making decisions concerning the choice of sourcing variants in order to achieve the most efficient decisions at the stage of planning process, which only confirms the importance of research in this area.

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