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MAKING LOGISTICS DECISIONS FROM THE PERSPECTIVE OF CHANGES IN COMPANY'S IT SYSTEM

Abstract:

The paper aims to present the issues of making logistic decision with regard to changes in the IT system companies and their verification in practice. The area of research are customer service processes in the logistics center, which is characterized by service activities. The IT customer service system in logistics centers prevents the disruption in functioning the tested entity and improves the efficiency of the company. Due to the rapidly increasing amount of information processed in logistics centers, IT system affects the efficiency of customer service in the audited company. The applied method of research are literature studies and analysis of dynamic phenomena by using aggregate indices.

Keywords:

Making logistics decisions

1. Introduction

Decision-making has been defined in the literature as “*searching for data, formulation of the problem in detail, data processing, analysis of the results of this processing for the needs of a decision-maker, communication and implementation of the decision*” (Pomykało, 1995). The decisions made are right if the decision-maker has an ability of *ex-post* and *ex-ante* thinking and using both of them (Einhorn, Hogarth, 2006). This means that the decision stimulates the phenomenon of feedback, which allows for verification of the rightness and effectiveness of the decision in light of current events (Drucker, 1994).

Decision-making includes pointing to the solution that meets all specific conditions that allow for a compromise where a decision becomes possible to be accepted. According to P. F. Drucker, an essential component of decision-making is not only to realize that the problem is of general nature and can be solved only with the decision that establishes a rule but also definition of specific conditions the problem solutions must meet. With respect to the above statements, it is accepted that the process of decision-making is a transformation of information into a managerial decision (Wanielista, Miłkowska, 1998), which is aimed at “...producing a desired result at minimum effort and disturbance” (Drucker, 1994). Decision-making is an information and decision process which consists in processing information into the instruction. The basis for effective decision-making is transfer of ideas (Pentlanda, 2014), which might face a number of barriers. The barrier for effective decision-making is not only lack of information but also excess or useless information (Rausch, Anderson, 2011). Therefore, information systems which allow managers to obtain information necessary for management processes are becoming more and more important.

The environment of contemporary enterprises is characterized by high rate of changes. Therefore, the managers are focusing on reduction of disturbances and adaptation to changes, which causes that this reaction deepens the organizational gap (Romanowska, 2010). Furthermore, the information needs differ depending on the level of management and details of the available information. Therefore, it is essential to create effective information system for customer service in the enterprise, organized and coordinated by proper supervising level. The process of management in the enterprise necessitates efficient operation of the IT system, which should be located within an integrated system of management in the enterprise and constantly deliver filtered, high-quality and useful information (Rojek, 2001). The aim of the paper is to present the problems of decision-making in the area of logistics processes with regard to changes in the information system in the enterprise and their verification in practice.

The area analysed in the study is the IT system for customer service in the logistic centre which is characterized by service-providing activities. I. Fechner defines logistics centre as ‘...*a spatial object with specific organization and infrastructure which allows certain independent enterprises to perform activities using goods, connected with warehousing and transportation of the goods between the sender and recipient and performing the activities in the resources used for the purpose....*’ (Fechner, 2008). The research methods used for achievement of the aim of the study was literature study and aggregate indices analysis.

Aggregate indices for absolute values

Aggregate indices were evaluated in order to investigate aggregate qualitative and quantitative changes that occur in operation of information systems in the logistics centre studied. In the case of the analysis of the dynamic of the whole set of phenomena which are usually non-homogeneous and non-standardized (e.g. consumption of various goods), the aggregate indices are used (among the aggregate

indices for absolute values are “*aggregate value index, price index, aggregate quantity index*”, Suchecka, 2003), which illustrate total changes that occur in the whole sample. The specific information collected in one of the logistics centres studied was used. The analysis focused on a logistics centre where applications present within modules of information system take part in the processes of input and output of goods from the warehouse of the logistics centre. The enterprise studied uses four main WMS modules of the information system, for which functions performed and frequency of their use within individual transactions were determined (with all the costs involved).

The tables below present WMS modules of the information system and the most frequent applications in individual modules which participate in the activities during input and output of goods from the logistics centre. The use of individual applications during input and output of goods will be denoted in the tables with the sign “+”, whereas not using them will be denoted as “-“.

The first module used in the logistics centre is **Warehouse**, also termed, depending on the software provider, Records (see Table 1).

Table 1. Applications of the Warehouse module used at the input and/or output of goods from the warehouse in the logistics centre

Type/name	Share in the transaction	
	System input	System output
1. Module: Magazyn		
1.1. Viewing the customer database	+	+
1.2. Viewing the database concerning products in the warehouse	-	+
1.3. Definition of logistics parameter of goods	+	-
1.4. Order processing and warehouse receipts	+	-
1.5. Qualitative and quantitative inspection of goods in a delivery	+	+
1.6. Orders from customers and dispatches	-	+
1.7. Stocktaking	+	-
1.8. Viewing the history of selling services for a specified customer	-	+

Source: author's own elaboration based on the data obtained from the enterprise X

Another most frequently used module in the logistics centre is **Searching for information**, with its important characteristic being flexibility. This modulus is responsible for generation of reports and analyses necessary to manage goods in the logistics centre. Consequently, a system user (employee of the logistics centre) is able to obtain information contained in Table 2.

Table 2. Applications of the module „ Searching for information” used at the input and output of goods from the warehouse in the logistics centre

Type/name	Share in the transaction	
	System input	System output
1. Module: Wyszukiwanie informacji		
1.1. Orders from customers and dispatches	-	+
1.2. Reports and analysis with respect to customers	+	+
1.3 Reports connected with settlements concerning logistics services	-	+
1.4 Displaying/ Checking the dispatch number	+	+
1.5 Delivery	+	+

Source: author's own elaboration based on the data obtained from the enterprise X

The third module used in the logistics centre studied is **Problem solving**. Capabilities of this module are presented in the Table 3.

Table 3. Applications of the module “Problem solving”, used at the input and output of goods from the warehouse in the logistics centre

Type/name	Share in the transaction	
	System input	System output
1. Module: Rozwiązywanie problemu		
1.1. Automatic identification (AI)	+	+
1.2 Automatic or manual allocation of warehouse locations	+	-
1.3 Task management	+	+
1.4 Automatic generation of orders from customers based on the sales history, fully automatic information about critical events throughout the transport process	-	+

Source: author's own elaboration based on the data obtained from the enterprise X

An exceptionally important module for the logistics centre with regard to contacts with customers is **CRM**. It helps perform the functions listed in Tab. 4.

Table 4. Applications of the module „CRM”, used at the input and output of goods from the warehouse in the logistics centre

Type/name	Share in the transaction	
	System input	System output
1. Module: CRM		
1.1. Orders from customers and dispatch	-	+
1.2 Reporting to customers	+	+
1.3 Viewing inventory levels by customers	+	+
1.4 Contact with customers on the platform	+	+

Source: author's own elaboration based on the data obtained from the enterprise X

The above applications are used for establishing better relations with customers. Furthermore, they allow for better cooperation through fast flow of information about necessary inventory levels in the logistics centre.

All 21 functions performed by the logistics centre within the four modules of the information system helps provide proper services for customers as well as both efficient and effective management of the entity. These functions can be used: only at the input of goods to the warehouse, only at the output of goods from the warehouse of the centre or in both cases, which yields the results of 14 functions used during transaction at the input of goods to the warehouse and 17 functions at the output of goods from the warehouse. Therefore, information about the system in these terms allow for faster and more flexible responding to the demand and, consequently, increasing the value of the logistics centre as an enterprise.

It was observed that, over a single month, the logistics centre recorded 500 commercial transactions (*defined as a moment of introduction of goods in the area of the logistics centre and material release*): 250 transactions concerned the phase of input to the system while 250 transactions were connected with the output of goods from the system.

Interpretation of the results obtained¹:

1. $I_w = 112.59\%$

The result means that total value of all four modules in the IT system used in 2011 is by 12.59% higher than the value from 2010. The increase by 12.59% is caused by variations in prices and number of modules used.

2. $I_q^I = 112\%$ and $I_q^P = 112\%$

The aggregate quantitative index of Laspeyres type provides information that the use of the four functions of the information system in total increased by 12% in 2011 compared to 2010 with the assumption that the prices were the same as in 2010.

¹ Unit transaction cost was computed as and quotient of the total of costs and the number of uses of a particular application

The aggregate quantitative index according to Paasche formula shows that the combined use of the functions of the function of the information system increased by 12% in 2011 compared to 2010 with constant prices from 2011.

3. $I_p^L=100,527\%$ and $I_{pp}= 100,527\%$

The aggregate price index according to Laspeyres formula means that mean price of the functions of the information system used that constitute the aggregate increased by 0.53% in 2011 compared to 2010, assuming that the same quantities as in 2010 were used in 2011.

The aggregate price index according to Paasche demonstrates that the prices of the functions studied increased by 0.53% in 2011 compared to 2010 assuming that the same number of functions of the information system was used in 2010 compared to 2011.

Conclusion

A key importance for making logistics decisions by managers of logistics centres is from properly adjusted information system which performs specific tasks including the tasks of customer service. The use of the information system offers opportunities for obtaining quick information necessary for making decisions by managers. Managers' knowledge of the use of the system and the involved costs is also essential. Therefore, the paper focused on these problems. The analysis of the dynamics of phenomena using aggregate indices allowed for illustration of particular functions of the information system which are necessary for operation of the logistics centre. Furthermore, the use of aggregate indices helped obtain information on changes in prices, quantity and value of the information system by the logistics centre which directly impact on the level of customer service. Examination of the aggregate indices for absolute values showed that the total value of the total value of the four modules of the information system used in the enterprise increased. Furthermore, the increase in prices and more frequent use of the above modules was observed compared to the previous year. The study allowed for evaluation of changes connected with the system of IT customer service in logistics centres.

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