APPLICATION OF MODERN IT TECHNOLOGIES IN LOGISTICS ENTERPRISES IN POLAND

IGA KOTT[1]

Abstract: The aim of this paper is to demonstrate the need for utilization of modern IT technologies in logistics enterprises in Poland. Activity of logistics enterprises would be impossible if information technologies were not used to support, among other things, flow of information between the cooperating entities. Furthermore, application of modern IT technologies in logistics activity stimulates and points to new directions in development of these solutions.
Keywords: logistics enterprises, information systems, information technologies.

1. Introduction

Business entities are increasingly using the solutions offered by IT systems in order to improve the effectiveness of the processes of monitoring of the environment, obtain quality information and, if possible, acquire new knowledge about the present and expected changes [1]. Considering the above, E. Kram understands information system as *the wholeness of sets of formalized and non-formalized information, points of generation of this information, channels for transferring and points of collecting and processing the information* [2]. The task of technological solutions used in order to facilitate information flow is, firstly, making possible integration of all the entities throughout the supply chain and, secondly, connecting areas of activity of the entity so that the tasks performed in the entity were coherent, starting from supply through to distribution. This approach leads to the conclusion that the information technology implemented in the logistics system should meet the following functions [6]:

- customer service and supporting public relations: its aim is to improve relationships with customers;
- planning: function which is closely related with supporting the process of communication, oriented towards proper customer service. This function should focus on the areas of supply of materials and raw materials necessary for effective continuation of the basic activities. Additionally, planning should be strictly related to the procedure of sales forecasting;
- control: which consists in monitoring of logistics processes in the system in order to reduce possible errors and deviations that result from implementation of physical and information flows;
- coordination: the function which is essential from the standpoint of the IT technologies used for logistics systems. Successful functioning of the supply chain and individual entities included in the chain largely depends on the effectiveness of the performed tasks and information flow between each other. From this point of view, the aim of information technology is integration of individual logistics activities into a single system.

[1] PhD, Czestochowa University of Technology
igakott@interia.pl
42-200 Czestochowa, ul. Armii Krajowej 19b, Poland

Implementation of information system improves the positive image of the enterprise in the market. Application of these technologies is inherently connected with having suitable computer hardware and software. The elements of modern technology used in logistics enterprises include:

- "multimedia, computer networks,
- user-friendly interface and graphics,
- fast and spacious memory, databases and data warehouses,
- object environment of programming languages, databases and operating systems, integration of technology that forms high performance systems,
- optical scanning and electronic publications, integration of teams that prepare documentation" [3].

Table 1 presents example division of the systems used in logistics.

Table 1

Division of systems used in logistics. Criterion of designation

Name	Description
EDI (*Electronic Data Interchange*)	Opportunities of data transfer in a particular format.
Electronic platforms	Opportunities of placing requests for particular goods in electronic manner.
SOA (*Service-Oriented Architecture*)	Set of services and elements which allows for carrying business functions.
Web Service	Web Service is a particular case of SOA. This means program components which present business functions and are available to other applications by means of a public network and using opportunities of data exchange.
Workflow	Systems of workflow where information and tasks are assigned to process participants in order to perform the activities according to particular principles.
Web 2.0/Web 3.0	Web-based services with contents created by users. Furthermore, recent years have seen development of Web 3.0, which features the functions of intelligent prediction of user behaviour.

Source: [4]

The table above presents the division of the systems used in logistics according to the criterion of designation. Particular attention should be on electronic platforms, which are used by logistics enterprises to enter into contacts with customers. Fast advances in development of IT solutions in enterprises results from the dynamic development of information and communication technologies as well as creation and implementation of modern concepts and methods of management [5].

If the phases of information flow throughout organization are considered as a classification criterion within functionality of information technologies, the functions performed by these technologies include [6]:

- collecting information from the external environment,
- conversion of information into data structures,
- processing and recording data,

- decoding information and conversion of information into transparent information for managers,
- visualisation of information that allows for improved decision-making.

Informatization, innovativeness and cooperation are elements that support achievement of strong position in the market. However, it is only efficient transfer of information that makes it actually effective [7]. Therefore, firstly, information technologies successively retrieve information from the logistics system and, secondly, they efficiently process and analyse the information, thus supporting the customers in choosing optimum decision variants for a particular problem-oriented area. Flow of information in logistics enterprises is supposed to ensure the flow of information in right time and in right amount i.e. ensure the conciseness and quality of information. The degree to which the flow of information is consistent with their actual state translates directly into the whole logistics activity in the enterprise [8].

Market globalization forces the entities to meet the most individual needs of the customers and offer additional benefits through e.g. increasing the quality of the goods and services provided. These activities caused that the enterprises started to analyse their standards of logistics customer services and show their importance to the employees [9]. Logistics enterprises need advanced information technologies in order to quickly respond to customer needs [11]. Therefore, recent years have seen development of information systems that support management of this type of entities.

2. The need for application of modern information technologies in Polish logistics enterprises

Logistics enterprises make decisions on purchasing information systems and bear the related costs, connected with e.g. training employees in this area and are aware of the need for using these solutions. Statistical data were analysed in the study in order to demonstrate the reasons for utilization of information technologies in logistics enterprises. Support from modern technologies in transport and warehouse management allows for efficient performance of the tasks in logistics enterprises.

The customers of logistics enterprises require presentation of commercial offer, which is also available in websites (Table 2). Logistics enterprises are forced to make sure they are distinguished among competitors through specific design and functionality of their websites. It is computer networks such as the Internet which ensures that the logistics enterprises have better access to information and thus are more attractive.

As results from Table 2, more and more employees in the enterprises that deal with transport and warehousing use computers with access to the Internet when performing their tasks.

Table 2

Number of employees that use the Internet and enterprises
that have their own website (in %)

	2009	**2010**	**2011**
Employees that use computers with access to the Internet at least twice a week in the enterprises	31.8	32.9	34.5
Enterprises with their own Internet website	50.6	62.1	58.3

Source: [10]

Logistics enterprises implement internal automated data exchange and utilize information sent electronically and automatically for maintaining and placing orders concerning sales in terms of managing inventory [12], accounting and broadly understood distribution (Table 3).

Table 3

Application of automated data exchange in enterprises according to the aims
of utilization of the information delivered electronically and automatically (in %)

Years	Obtaining orders concerning sales connected with:				Sending orders connected with sales	
	management level of inventory	accounting	management production or services	management distribution	management level of inventory	accounting
2009	4.8	18.1	16.0	8.4	3.2	9.4
2010	7.8	20.5	13.2	9.0	6.7	13.1
2011	6.7	22.6	16.7	9.7	6.2	13.8

Source: [10]

The data contained in Table 4 show that obtaining orders concerning the sales connected with accounting, electronic management of distribution and services is steadily increasing.

Utilization of automated exchange of information with external organizations allow logistics enterprises to increase the rate of information transfer (see Table 4).

Table 4

Enterprises which utilize automated data exchange with external ICT systems (in %)

Years	The enterprises which utilize automated exchange of data with external enterprises where automated data exchange performed the following functions:		
	sending payment orders to financial institutions	Sending or obtaining transport documents (e.g. shipping lists)	data exchange with public administration bodies
2011	44.6	33.2	69.0
2010	39.0	25.4	49.6

Source: [10]

Enterprises utilize automated data exchange with external entities, which considerably improves sending payment orders to financial institutions, obtaining and sending transport documents and exchange of data with public administration bodies (see Table 4).

Electronic exchange of information in logistics enterprises consists in flow of information between the participants of the supply chain (see Table 5).

Table 5

Enterprises which utilized electronic exchange of information
concerning managing the supply chain in January 2010 (in %)

Years	Enterprises with electronic exchange of information by means of	
	Internet websites	automated exchange of information
2010	14.3	7.7
2009	10.8	4.1

Source: [10]

Table 5 shows that in recent year, more and more enterprises used websites for electronic exchange of information. Furthermore, the exchange contributes to cooperation between suppliers and recipients in the market (see Table 6).

Table 6

Enterprises that carry out electronic exchange of information
with suppliers and recipients (in %)

Years	Concerning inventory levels, production plans or demand forecast	
	with suppliers	with customers
2009	7.2	8.0
2010	15.6	16.6

Source: [10]

The above data confirm the need for using electronic exchange of information by the entities that provide logistics services and the cooperating enterprises.

3. Conclusion

On the one hand, application of modern information technologies in logistics enterprises plays a key role in improving information flow between the links in the supply chain. On the other hand, it considerably contributes to development of these solutions. Information technology allows logistics enterprises not only to provide basic logistics services in a fast and effective manner but also to offer customers additional benefits which make their cooperation more effective.

References

[1]   Jelonek, D. (2009): *Strategiczna harmonizacja monitorowania otoczenia i technologii informacyjnej w przedsiębiorstwie*. Studium metodologiczno-empiryczne. Seria monografie No. 167. Wyd. PCz. Częstochowa.

[2]   Kram, E. (2007): *Systemy informatyczne zarządzania*. Projekt koncepcji system. Wyd. Towarzystwo Naukowe Organizacji i Kierowania Dom Organizatora. Toruń.

[3]   Biniasz, D.–Chwastyk, P. (2006): *Rola i znaczenie technologii informatycznej we wspomaganiu działalności przedsiębiorstw*. In: Strategie informatyzacji (ed.) Szyjewski Z., Nowak S. A., Grabara J. K., Wyd. PTI Katowice.

[4]   Kisperska-Moroń, D.–Krzyżaniak, S. (2009): *Logistyka*. Wyd. Biblioteka Logistyka Poznań.

[5]   Nowicki, A.–Sitarska, M. (2010): *Procesy informacyjne w zarządzaniu*. Wyd. UE we Wrocławiu Wrocław.

[6]   Nowicki, A.–Turek, T. (2010): *Technologie informacyjne dla ekonomistów*. Narzędzia. Zastosowanie, Wyd. UE we Wrocławiu Wrocław.

[7]   Chaberek, M.–Jezierski, A. (2010): *Informatyczne narzędzia procesów logistycznych*. Wyd. CeDeWu Warsaw.

[8]   Korczak, J. (2010): *Logistyka. Systemy*. Modelowanie. Informatyzacja. Wyd. BEL Studio Warsaw.

[9]   Mindur, L. (2008): *Technologie transportowe XXI wieku*. Wyd. ITEE Warsaw-Radom.

[10] www.stat.gov.pl (access on 20.03.2013)

[11] Skowron-Grabowska, B. (2010): *Centra logistyczne w łańcuchach dostaw*. Wyd. PWE Warsaw.

[12] Grondys, K.–Kot, S.–Szopa, R. (2011): *Theory of Inventory Management Based on Demand Forecasting*. Polish Journal of Management Studies Vol. 3.