

The Application of Computer Systems Used in Logistics Centres by Courier Companies

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In the era of pervasive computerization, the need for rapid and uninterrupted transmission and receiving information handling systems is an essential component of business operations. The use of information technology to use the full capabilities of systems supporting the implementation of the basic processes in the logistics centres ensures proper implementation of tasks. Hence, courier companies cooperating with logistic centres have the opportunity to use the information systems used in logistics centres for the execution of the courier business. The purpose of this article is to identify the impact of information systems used in logistics centres for courier companies services. The article presents a class of information systems used in logistics centres and the number of systems used by courier companies. Characterized the impact of information systems to improve the operation of logistics centres and assesses the extent to which the use of the information system of logistics centres affects the information flow in courier companies. The study showed that the use of the IT systems offered by the logistics centres streamlines the efficiency of information flow in the courier service. Research has shown which IT systems logistics centres are use and how their use by courier companies affects the information flow in courier services.

Key words: logistics centre, courier company, computer systems, information technology

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Introduction

Technological advancement has an impact on all domains of social life by creating opportunities previously unavailable and unknown (Kromer 2008, 93). Courier companies which operate in logistics centres offer new solutions to customers and communities, this way giving them new prospects and opportunities to familiarise themselves with innovative concepts and ways of using them (Kauf et al. 2016, 67). Implementing the latest technologies is both a challenge for courier companies and an opportunity for them to operate more efficiently and be of a greater interest to potential customers and business partners (Witkowski and Bąkowska-Morawska 2011, 75). The introduction of new solutions in the design, construction and operation of management information systems is the key to greater efficiency of logistics operations in logistics centres (Bitkowska and Weiss 2016, 44), as well as a way to avoid the effects of the economic crisis (Kauf 2010, 2–8) or enhancing the competitiveness (Sitko-Lutek, Phusavat, and Comepa 2011, 812). These actions are the result of established strategy (Stachowicz 2006, 59).

The dynamics of technological development and its practical application can be examined on the example of IT systems that ensure the efficient functioning of courier companies.

Computer Systems Used in Courier Companies

The key aspect of the courier company management is to ensure the seamless flow of information, which enables an immediate exchange of information both within the company and with the external environment, which includes local communities, suppliers, business partners and customers. The use of information systems helps transmit information during order fulfilment (Łęgowik-Świącik et al. 2016, 120). The computer system may be characterised as ‘an information system’ (Wrycza 2010, 76) which is a set of connected elements, whose function is to process data with the use of computer technology (Grandys 2000, 49). In practice, this means a system in which information is exchanged, processed and stored mainly by computers. ‘The information system used in the organisation building, providing the managing body with information necessary in management processes, is called the management information system’ (Nowicki and Turek 2010, 183). Information systems are created with the use of computer technology regardless of courier company size (Kisielnicki 2009, 50).

In the beginning, the courier company designs and implements

appropriate structures and organisational processes. It selects a set of methods and tools to use and defines their configurations and control parameters. That enables the launch of planning applications (Kisielnicki 2013, 30). Integrating information technology tools with logistics processes means that systems become an integral part of the logistics subsystems as well as being a platform for the rationalisation of logistics operations. All activities related to the computerisation of a courier company are aimed at integrating various subsystems in order to provide faster and more efficient flow of information (D'Atri, De Marco, and Casalino 2008, 32). For that reason, integrated information systems (Wrycza 2010, 345) have been developed and implemented in courier companies. They are to be the main source of information for managers supporting them in decision-making (Liu et al. 2013, 54). Integrated information systems are the source of innovation and organisational changes, enabling the performance of work in a new way. The evolution of those systems has allowed extending the scope of their functional area and, thus, providing information support for other areas of an organisation.

Among the trends in the development of integrated computer systems are (Łobejko 2005, 8–10):

- a wider range of business services (such as, ERP II, MRP II, ECR, WMS),
- better use of Internet technology in e-businesses,
- development of applications for mobile platforms,
- systems supporting knowledge management (e.g. Business Intelligence).

The progress of computer technology involves the rapid development of information systems used in the management of the organisation which has a broad range of software, often tailored to its individual needs (Ding, Guo, and Liu 2011, 133).

The courier company is required to use the entire range of IT solutions and complex IT systems to support the effective use of information (Prajogo and Olhager 2012, 135). This is done by Information and Communication Technologies (ICT). Those are the technologies involved in the collection, processing and transmission of information electronically (see stat.gov.pl). Information and communication technologies use mainly the Internet, wireless networks, fixed and mobile telephony and electronic mass media, which include radio and satellite TV (Pawełoszek-Korek 2009, 122). ICT technologies include IT systems enabling the use of information and IT solutions. There are two groups connected with ICT technology: the produc-

tion of communication equipment (including computer, communication, network and office equipment as well as the equipment for data transmission) and services (including software, telecommunications and IT services, see www.paiz.gov.pl). ICT technology provides hardware, advanced Internet services, electronic management, electronic commerce, security of networks and systems in addition to mobile Internet access. The impact of ICT on the functioning of a modern courier company and on the environment is huge. For the courier company this means the possibility of speeding up the information exchange, owning an organization virtual database, having access to Internet services and online marketing through social media (Bartorski 2011). The use of ICT technology and the optimum application of available resources like electronic communication tools have a positive effect on the performance of courier companies by using programs to manage accounting modules, human resources, and enterprise resource planning (Uwizeyemungu and Raymond 2012, 13) (ERP) (Huang and Yasuda 2016, 4–5), and to update the database on the Internet (ERP II) (Beheshti 2006, 184–93) as well as optimising property resources and providing planning and financial management of the company (MRP II) (Monk and Wagner 2006, 69). The use of systems provided by logistics centres allows courier companies to improve services of courier deliveries. Also, the use of channel distribution strategies integrating the supply chain of manufacturers, distributors and traders (e.g. the e-commerce market) in order to build a cost-effective system that responds to the specific needs of the consumer (ECR) (Wojciechowski 2011, 151–2), allows organisations to integrate modern management methods and assistive technologies in order to improve the level and quality of customer service while reducing inventory and costs throughout the supply chain. WMS systems for coordinating storage and streamlining all the processes are often the technology supporting the managing system.

Information Systems in Logistics Centres for the Needs of Courier Services

The logistics centre which wants to provide logistics services of high quality using modern solutions, is forced to use the IT system. Using this type of modern technology is inseparably connected with the possession of appropriate hardware and software. Logistics centres offer comprehensive service to their customers thanks to the high level of specialisation and complexity of services (Kott 2012, 78). They include services related to transportation, storage and handling, formal and legal services and associated assistance (Skowron-

TABLE 1 Use of IT System to Managing Logistics Centres

Statement	Yes (%)
Is the system essential to manage the logistics centre?	100,0
Does the IT system meet the expectations of the logistics centre?	100,0
Does the logistics centre provide courier companies with the IT system?	100,0

Grabowska 2010, 31). The competitiveness of courier companies nowadays requires businesses to use multiple solutions to meet customers' expectations. Quality and delivery times are the priority (Bela 2016, 49). Therefore, it is necessary to use the IT system for the efficient service. The logistics centre, which has implemented the system, is seen as a positive influence, which results in the improvement of its image.

The research task was realized by conducting a survey among courier companies operating in logistic centres in the European Union. Due to the large area of the surveyed area, the survey was addressed to companies located in the European Union countries, which exceeds 250000 km² such as Germany, France, Finland, Sweden, Spain, Italy and Poland. The survey questionnaire was distributed to 90 logistic centres with courier companies and 90 courier companies located in these logistic centres, which received 58 questionnaires completed by logistic centres and 53 questionnaires completed by courier companies. The study was designed to investigate the pairs of logistic centres associated with the courier service; therefore, questionnaires were rejected from the questionnaires that were filled out. Hence, the survey sample consists of 44 logistic centres and 44 courier companies. The survey was conducted from October 2015 to February 2016 through questionnaire survey. The activities of the surveyed logistics centres were classified according to different criteria.

Studies conducted in the logistics centres allowed us to assess the impact of the system application on managing the logistics centres.

Table 1 shows that all examined logistics centres admitted that for the management of the logistics centre the IT system is essential. The information system provides quick access to databases, easy communication and a range of tools to improve the operation of logistics centres. The data obtained in the study allowed determining the class of information systems used by the logistics centres.

Table 2 shows that all the logistics centres surveyed used ERP and CRM systems. 79.5% of the respondents used WMS, while 31.8% used ERP II. The survey also made it possible to determine whether the

TABLE 2 Class of IT Systems Used in Logistics Centres

ERP	100,0
CRM	100,0
ERP II	31.8
WMS	79.5



FIGURE 1 Number of Systems Offered by Logistics Centres Used by Courier Companies

applied information system met the expectations of the centre. The data received in the survey is presented in table 1. As shown in table 1, 100% of logistics centres are satisfied with the systems they use. That means adjusting those systems to the needs of logistics centres and logistics services. Figure 1 contains information specifying the impact of information systems on improving the functioning of the centres.

Figure 1 shows that 63.64% of the respondents believe that the impact of information systems on improving the operation of logistics centres is big. 36.36% of the respondents think the impact is very big. All logistics centres admit that the role of information systems in improving their performance is big or very big. It was also examined whether logistics centres provided courier companies with the system. Table 1 shows that all logistics centres enable courier companies the use of their system. That means that the logistics centres provide courier companies with information systems in order to ensure proper handling of logistics processes. The study allowed determining how many systems offered by logistics centres were used by courier companies. The data obtained is presented in figure 2.

31.82% of courier companies declared that they used 1 system offered by the logistics centre, 50% of the respondents used 2 systems, and 18.18% of the courier companies surveyed used 3 systems. The questionnaire allowed examining the impact of the computer system used in logistics centres on increasing the efficiency of information flow in courier companies, as shown in figure 3.

Figure 3 shows that 72.7% of courier companies said that the use of information systems offered by logistics centres affected the efficiency of information flow in courier companies to an average degree, and 27.3% of the respondents thought the influence was big. Using the computer system offered by the logistics centre improves

The Application of Computer Systems Used in Logistics Centres

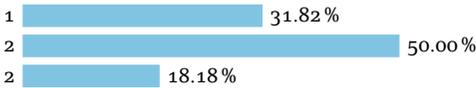


FIGURE 2 Number of systems offered by the Logistics Centre used by the courier company

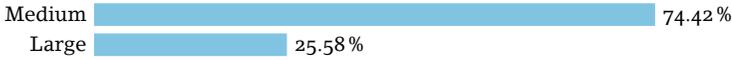


FIGURE 3 The Extent to Which the Use of the Information System of the Logistics Centre Affects the Efficiency of Information Flow in the Courier Company

the flow of information in the courier company allowing the efficient performance of courier services.

Summary

Conducted research shown that courier companies need increasingly advanced IT systems supporting the management processes. The application of IT systems in logistics centres contributes to improving business processes of courier companies (Mesjasz-Lech 2014, 94–103). The equipment of logistics centres and their infrastructure are the main elements to be taken into consideration when choosing the location of the courier company. Crucial for logistics centres and courier companies is the fact that the logistics centres are trying to tailor their services to courier companies should try to align as closely as possible based on mutual benefits. As a result, the development of courier companies depends on the logistics centres. The relationship between the logistics centre and the courier company relies in the effective implementation of logistics services. The current activity improves not only the flow of goods and information, but also the implementation of the financing strategy of logistics processes. Although a courier company is an economic entity for which logistics is the basis for action, the cooperation with the logistics centre is not a type of outsourced logistics service. It is a thought-out strategy aiming at providing courier services of high quality.

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