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IT SUPPORT FOR 3PL OPERATORS IN LOGISTICS OF MODERN SUPPLY CHAINS

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ABSTRACT

Enterprises running their businesses in modern market economy, facing the developing globalisation, dynamically changing conditions of the political and economic environment, as well as ever-growing customer demands, are forced to constantly look for costs cuts, implementation of better organisational models, more efficient processes, modern manner of functioning on the market or more effective strategies. Integration of economic activities on global scale is the reality of the present global economic system (Chaberek 2002).

3PL operators, in order to properly coordinate and integrate logistics processes implement modern IT solutions that stimulate effectiveness, efficiency and competitiveness of functioning of the serviced supply chain.

The subject of this article are aspects referring to the use of IT solutions being an example of innovation of logistics providers (including 3PL operators) within the scope of logistics services for modern supply chains. The aim of this article is to define the nature and meaning of IT technologies and tools used by 3PL operators in the logistics of supply chains. To achieve this, a research method was used related to the secondary sources analysis based on the research of literature, articles and research published in Polish and foreign journals. Selected data from reports published by international organisations dealing with research and analysis of global outsourcing market of logistics were taken into account, as well as the activities of 3PL operators.

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INTRODUCTION

Enterprises running their businesses in modern market economy, facing the developing globalisation, dynamically changing conditions of the political and economic environment as well as ever-growing customer demands, are forced to constantly look for costs cuts, implementation of better organisational models, more efficient processes, modern manner of functioning on the market or more effective strategies (Wasielewska-Marszałkowska 2016). Integration of economic activities on global scale is the reality of the present global economic system (Chaberek 2002). There is no doubt that modern business, including also modern logistics management, cannot function well without the support of IT technologies, created with the use of software platforms (Ciesielski, Długosz 2010). IT support is a decisive factor when it comes to the increase of added value, it facilitates the management in all links of the chain, rationalises and optimises the supply chain in terms of costs and time (Dyczkowska, 2013). Without IT systems being the main element of information logistics system, there would be no information services for any logistics processes in the economic world (Chaberek, Jezierski 2010). Logistics operators (3PL), in order to properly coordinate and integrate logistics processes implement modern IT solutions that stimulate effectiveness, efficiency and competitiveness of functioning of the serviced supply chain.

NATURE OF IT SUPPORT

The integration of resource flow in time and space to ensure maximally possible, at a given costs level, service standard of entities implementing basics processes when it comes to meeting the human needs is the nature of logistics (Chaberek, 2002). A determinant influencing the functioning of modern supply chains is the proper coordination and integration of logistics processes (Wasielewska-Marszałkowska, 2016). The development of modern supply chains is possible thanks to the so-called logistics chains or logistics processes fulfilling fundamental functions for the economy: servicing and integrating ones (Chaberek, Trzuskawska-Grzesińska 2011). The integrating functions of logistics are the source of synergy effects, that occur in logistics chains. Logistics is characterised by overcoming all obstacles that occur in flow processes (Chaberek, 2002). Integration functions of logistics apply to the processes organisation sphere as well as to the technical and technological sphere (Chaberek, 1999). From the practical point of view, when analysing tasks related with logistics aims integration and, as a result, the very processes or resource flow, it becomes evident that this can be done only by significant improvement of IT resources with integrated processes (Wasielewska-Marszałkowska, 2014).

The development of logistics of key resources in economy without a doubt was and is the result of changes in the information supply system. Computer systems and computer networks created a very specific environment for information logistics (Chaberek, Jezierski 2010). Information logistics, when having the proper tools and techniques, taking into account methodology and the manner of economic entity management, should provide necessary information supply. Having defined how, when and where given information is to be supplied, it is possible to apply supply offer of

information to the objective information procurement. Information logistics deals with information distribution optimisation, that is used to run an economic entity, including: preparing plan of activities, registration of performance data, comparison of planning information with performance information (Chaberek, 2001).

Information is a resource in itself, and it needs to be available in the right place and time, must be of appropriate quality and in an appropriate form. Logistics defines information as one of resources that needs to be procured according to the *5R*[10] rule (Chaberek, Jezierski 2010).

Each economic entity has its own system of information flow. Similarly as in the case of material resources, where transport, storage and supply form the sub-systems of logistics system, also in the sphere of information supply we can define a number of elements of information logistics system of an enterprise, creating sub-systems of financial and accounting information, computer services of a company, arrangement of communication channels, IT network etc. (Chaberek, 2001). Information is a carrier, describing every status of resources, materials, raw materials, finished products etc. Information on needs and statuses of material resources, on the number of available material resources, place and time for their physical procurement is of interest for logistics (Chaberek, Jezierski 2010). Just like some systems of production organisation are not possible to be implemented without a suitable logistics system (for example just in time production for the purpose of a specific order), also modern ideas of deregulation and management are not possible to be implemented without having the right systems of information supply implemented (Chaberek, 2001).

Logistics in the process of developing management information systems can fulfil two important functions: creative and integrating one. The creative function is understood as a series of conceptual and organisational actions ensuring the creation of real elements of informational system of an economic entity. On the other hand, the integrating function emphasises the very nature of logistics that is expressed in such shaping of realistic information links that must take into account the interests of entities demanding information with the interest of the company as a whole, while an important role can be played by information supply cost in the enterprise. The integration aims to find balance between the implemented quality of information supply in the enterprise and the actual information needs of the implemented company management system (Chaberek, 2001).

Information (also IT) support undoubtedly influences the more effective and efficient logistics service of modern supply chains, determining the achievement of competitive advantage, both in relations between given entities and logistics chains (Chaberek, 2001).

[10] 5R rule according to M. Chaberek covers: right resources, in the right place, in the right time, in the right quantity, at the right price; the 6th element, the right quality, is included in the right resources element, M. Chaberek, *Logistyczne aspekty bezpieczeństwa,* in: ZN UG, No. 56, Modelowanie procesów i systemów logistycznych pt. XIV, Wyd. UG, Gdańsk 2015, p. 23.

IT TECHNOLOGIES AND TOOLS IN LOGISTICS OF SUPPLY CHAIN

Without a doubt, 21st. century is the century of IT implementation, and the use of technologies, IT tools for the purpose of management is the inevitable reality when it comes to servicing modern economic processes. IT technologies are ever-present and support nearly all forms of economic entities activity as well as supply chains. The growing customer demands, developing globalisation, time factors, costs reduction and the higher quality associated with the products are the evident determinants influencing the development of logistics service of supply chain.

From among IT technologies supporting logistics services of supply chains one can name several, for example integrated information system of ERP-class, electronic data interchange (EDI) or supply chain management (SCM).

The beginnings of integrated IT systems can be traced back to late 1950. Their aim was to control the warehouse stock (inventory) i.e. the Inventory Control. They covered one area of enterprise activity, therefore they could hardly be labelled as integrated (Ciesielski, 2006). The 1960s saw the breakthrough in the construction of IT solutions used for management support. The result was the introduction of MRP class systems meaning material requirements planning. These were the first systems that combined several functions of enterprises, even though they still covered significantly small area of their operations. At first, MRP systems were seen as a computing tool and a tool for inventory control – they could not be used to monitor the system and there was not place for feedback. The lack of monitoring resulted in the fact, that the system could not differentiate the plan from reality and was not compatible to deal with unexpected situations that may happen (Ciesielski, 2006). In consequence a static MRP model became dynamic, as thanks to the feedback one could react in real time to the changing production parameters. The result of the subsequent evolution were systems of MRP II class (Manufacturing Resource Planning) that year after year became more complex tools, covering multiple areas of enterprise activities (Kawa, 2011).

Another stage of integrated IT systems is ERP – Enterprise Resource Planning – which was developed in 1990s as a result of MRP II evolution. The ERP system is also known as MRP III – Money Resource Planning – which is the extension of MRP II system with the financial module (management accounting, Activity-based costing – ABC, cash flow) (Ciesielski, Długosz, 2010). ERP is often defined as a software package for planning the resources of an economic entity, that is ready set of modules (applications), servicing all business functions of an entity and possible for dynamic configuration (Kale, 2001).

It is worth noting, that traditional ERP systems that became available in early 1990s are now obsolete. ERP systems suppliers constantly develop them, mainly through modifications and by adding new functionalities. They also started to be integrated with sub-systems dealing with cooperation with the enterprise environment. The most important sub-systems are: Supply Chain Management (*SCM*), Customer Relationship Management (*CRM*), Supplier Relationship Management (*SRM*) (Kawa, 2011).

CRM is a technology supporting customer relationship management. Customer relationship management plays an important role in times of growing competition. It helps to shape the enterprise market by strengthening the ties between its current buyers and acquiring new ones. As a result, the enterprises focus on shaping the most

profitable – in the long term – relationships with customers and on creating additional benefits for customers and thus gaining advantage over competition. In the centre of activities and innovations, the usage of integrated information systems in complex management of all crucial and customer-oriented processes can be found. The desired order implementation and enhanced and optimal level of customer service make it possible to achieve and to strengthen the necessary relationship with customers and the market success of enterprises (Wasielewska-Marszałkowska, 2014).

On the other hand, SRM supports supplier relationship management. It covers complete cycle of supplies – starting from strategic definition of supply source, through operational procurement and including suppliers in the process of cooperation. It allows to integrate the operations stimulating cooperation between suppliers by the automation of processes implemented with the participation of all suppliers within the goods and services purchase and within the whole enterprise (Kawa, 2011).

The highest class of systems in the supply chain management are the SCM systems (Ciesielski, Długosz, 2010). SCM system covers a set of methodologies of procurement, production and sale processes implementation in a manner ensuring maximisation of revenue by optimisation of materials and sub-assemblies prices and maintenance of the status of inventories on the minimal level, necessary to ensure the continuity of processes (Adamczewski, 2001). One of the major tasks of SCM is above all integration of all links of supply chain in one coherent whole which thanks to the combined forces can be more competitive. Safe flow of important information related to specific business process is also of key importance for SCM. The idea of supply chain management takes into account constant evaluation of effectiveness and efficiency. Once prepared and implemented, a solution must be constantly improved. Assessment of given indicators, for example the speed of information flow, level of inventory in warehouses, time needed to implement an order, allows ongoing control over given supply chain links (Skuza, Bela, 2001, as cited in: Kawa, Wierzycki, 2006).

The system of SCM class mentioned previously was constantly developed over the last dozen years. The current stage of SCM evolution is based mainly on close cooperation between organisation and its business partners (suppliers and customers). The participants of the supply chain achieve tangible benefits which are the decrease of goods and materials rotation cycle, faster delivery of products for the market or more effective use of the owned current assets – all of this thanks to the use of advanced concept of business and IT integration. In the last years, more and more enterprises, especially from high-tech and chemistry industry, use advanced data warehouses, e-commerce and e-business applications and the techniques of cyber-communication (Ciesielski, 2006). The widely understood e-business more and more influences the strategy of enterprise competition and at the same time supply chains. From the operational point of view, given elements can be of eSCM nature – Electronic Supply Chain Management – closely related with the use of the Internet and IT technologies (Tundys, Sowa, 2010). Thanks to eSCM it is possible to create dynamically configurable supply chains, meaning temporary supply chains that are created for the purpose of even single transactions of individual customers. Such a configuration often becomes something more than just a simple supply chain – it is a network of connected suppliers and partners (Ciesielski, 2006). eSCM systems are composed of the following elements:

e-commerce, e-manufacturing, e-logistics, e-planning, e-procurement, e-design (Korff, Knak, 2001).

Electronic data interchange undoubtedly plays an important role for the development of the economic world. EDI is an electronic form of data/information interchange between IT systems of business partners with the use of defined forms and protocols of information exchange. EDI forms a part of e-commerce and management of supply chain (Wasielewska-Marszałkowska, 2014). Electronic data interchange brings together the links of supply chains in such areas as, for example, production, procurement, accounting, transport, marketing, sales (Długosz, 2009). The idea behind electronic data interchange (EDI) is that instead of exchange of paper documents, orders and invoices are generated by an application in an IT system of the sender and can be sent electronically to the computer system of the addressee, where they are automatically processed, without a human factor, by another application capable of interpreting the received data structures (Pędziwiatr, 2001). A huge importance of EDI in the history of global economics allows to name key features of electronic data interchange. The key features are (Długosz, 2009):

- Cost reduction;
- Information usefulness;
- Information integrity;
- Information being up-to-date;
- Information consistency;
- Processing huge amounts of business information.

The features of electronic data interchange generate benefits for the participants in the logistics chains resulting from the use of EDI, and these are (Stopczyński, 2011):

- direct benefits:
  - savings on paper;
  - lower costs of documents filling out;
  - lower administrative costs;
  - lower costs of data transmission.
- indirect benefits:
  - improvements of operation of inner systems of logistics operators as wells as other participants of the supply chains;
  - faster implementation of business transactions;
  - lower amount of material and raw material shortages;
  - lower inventory level.
- strategic benefits:
  - opportunity of faster expanse to new markets;
  - dynamic development;
  - more comprehensive communication between partners;
  - development of permanent strategic relations;
  - faster reaction to changes on the market.

Quite probably, without the Internet the electronic data interchange would be impossible. The beginnings of the Internet date back to 1960s. and are related to the beginning of Arpanet – Advanced Research Projects Agency Network – being the

initiative of the United States Department of Defense (Kawa, 2011). The services used in the Internet were among others e-mail, WWW (World Wide Web), FTP (File Transfer Protocol). Currently, the Internet allows us to access several other services, such as P2P (Peer-to-Peer), discussion boards, web communicators, IP telephony, internet TV, online shopping, platforms etc. (Kawa, 2011). New phenomena, particularly visible in retail, result from the change in the role of the Internet and e-commerce. Apart from shopping made via Internet channels, shopping done via mobile channel (for example shopping done via smartphones) is becoming more and more important. The usage of multiple channels for ordering and delivery in retail is defined as "omni-channel" (Brdulak, 2016). Internet technology and its usage for this type of shopping which mixes different channels, on the one hand requires other marketing activity (the customer experience of switching between different channels should be positive and homogeneous) and on the other hand it creates a new warehouse role, which acts in a more complex manner. There are no separate channels for given product lines, but all products are located in the "retail" channel (Brdulak, 2016). Internet as a technology is a new challenge for service providers dealing in logistics. It is worth noting that the development of Internet technology is called Internet of Things or the Internet of Everything. The term Internet of Things is currently used interchangeably with the term Internet of Everything. Some papers indicate, that the Internet of Things (combination of different systems and Internet based on technology only) is a more broader term included in the Internet of Everything (combination of everything, taking into account also humans and processes) (Brdulak, 2016). Here it is worth to note an important role of the system of Big Data collection system[11] directed to the processing and analysis of huge amounts of data to extract information values.

Without diminishing the important role of the IT technologies and tools not mentioned in this paper, it is worth to note also the use of devices of automatic identification, for example bar code readers, RFID – Radio Frequency Identification – scanners in the management of logistics processes. RFID technology is known for several years and is currently commonly used; it reduces the time needed for entering data into the IT system, making it possible to read hundreds and even thousands of labels if only they can be read by the scanners (Ciesielski, Długosz, 2010). Thanks to RFID technology it is possible to monitor the inventory statues in real-time (including controlling intra-warehouse processes), control of shipments before and after loading, or shipments tracking – Track & Trace (for example service rendered by courier enterprises).

The use of IT technologies allows to improve logistics services and supports optimisation of information flow in the enterprise and supply chains, at the same time improving the rational amount of costs contributing not only to the improvement of effectiveness of entities operations but also to the increase of their value (Olszak, 2007).

[11] M. Cox and D. Ellsworth (Cox, Ellsworth 1997) define Big Data as huge data for analysis, the number of which needs to be maximised in order to extract information values – this is an example of one of the first definitions of Big Data.

INFORMATION SYSTEMS SUPPORTING 3PL OPERATORS IN THE LOGISTICS OF SUPPLY CHAIN – SELECTED RESEARCH RESULTS

In the current economic situation, enterprises rendering logistics services (including 3PL operators) undertake to face many challenges determined by ever-growing customer demands, globalisation, strong competition, aimed at improving the organised logistics processes with the use of technologies and IT tools in the implemented processes.

Enterprises, when making a decision on entrusting logistics tasks and activities to professional entities, believe that logistics is not their key area of competence. When deciding to do so (outsourcing of logistics services) enterprises – customers of service providers – expect that they will benefit in the form of decrease of logistics costs, improvement of flexibility and reliability of delivery, reduction of response time to the placed order (Hanus, 2011).

The research on the global market of logistics services outsourcing as well as activity of 3PL operators has been conducted for over 20 years. This research is published by Capgemini Consulting, the research coordinator is PhD C. John Langley, professor of Pennsylvania State University. Reports present trends and areas of implemented logistics services, as wells as IT solutions implemented by specialised companies rendering logistics services together with the assessment of the service recipients. In this part of the article the key findings from the research conducted in 2014-2017 will be presented, published in reports of the global market of logistics services of 3PL operators outsourcing.

In the years 2014-2015 2163 respondents participated in the research. The findings from the research are presented in Table 1. Undoubtedly, importance in the logistics services emphasised by the respondents refer to the possibility to use the IT technologies of the 3PL operators as well as partnership relations resulting from the started cooperation. The respondents, recipients of the 3PL services, indicate, that an important factor are the opportunities, including availability of the IT technologies provided by the 3PL operators directed to the effective and efficient logistics services rendered by 3PL operators.

Report no. 20 from 2016: *2016 Third-Party Logistics Study, Annual Study on The State of Logistics Outsourcing*; *Results and Findings of the 20th Annual Study*[12], indicates key research results. For example, data resulting from the report are:

- 93% of 3PL services recipients and 94% of 3PL operators state that their relations and cooperation bring positive results,
- 70% of logistics services recipients and 85% of 3PL providers indicate that the use of 3PL services contributed to the general reduction of logistics costs,
- 83% of service recipients and 94% of 3PL providers confirmed that the use of 3PL operators services contributed to the improvement of customer service.

[12] Source: http: www.3plstudy.com/downloads/download-3rd-party-logistics-study/[access: 18/04/2016].

Table 1. Data from reports no. 18 and 19 "*Third-Party Logistics Study, Annual Study on the State of Logistics Outsourcing*"

Report data and conclusions	**Report no.18: "2014 Third-Party Logistics Study, Annual Study on the State of Logistics Outsourcing"**		**Report no.19: "2015 Third-Party Logistics Study, Annual Study on the State of Logistics Outsourcing"**	
	Assesment given by 1,389 respondents		Assesment given by 770 respondents	
	Recipients of 3PL Services	3PL operators	Recipients of 3PL Services	3PL operators
Clear and efficient partner communication	70%	69%	73%	77%
Relations and partnership cooperation	90%	97%	92%	98%
Possibility of IT services of 3PL operators, among others within WMS, EDI, Transport planning, SCM, CRM, RFID, access to mobile technologies etc.	75%	81%	73%	86%

Source: Own work on the basis of: http://www.3plstudy.com/downloads/previous-studies/[access: 11/12/2016].

These data emphasise the reference to the ever-growing customer demand (recipients of the 3PL services) in the scope of quality, effectiveness of the services rendered by 3PL operators.

Figure 1. presents key findings from the report no. 20 "*2016 Third-Party Logistics Study - The State of Logistics Outsourcing*". Moreover, majority of both groups, including 75% of service recipients and 88% of 3PL providers indicated that 3PL operators offer new and innovative means for the improvement of logistics efficiency.

In the report the issue of the use of IT solutions and possibilities is also emphasised – as being a key element for the efficient management of processes and activities of supply chain. As it was indicated, 93% of this year's respondents from among service recipients agreed with the statement that the IT capabilities are a necessary element of 3PL expertise and 59% agreed that they were satisfied with 3PL IT capabilities[13].

[13] *As indicated, 93% of this year's shipper respondents agreed that IT capabilities are a necessary element of 3PL expertise and 59% agreed that they were satisfied with 3PL IT capabilities.*

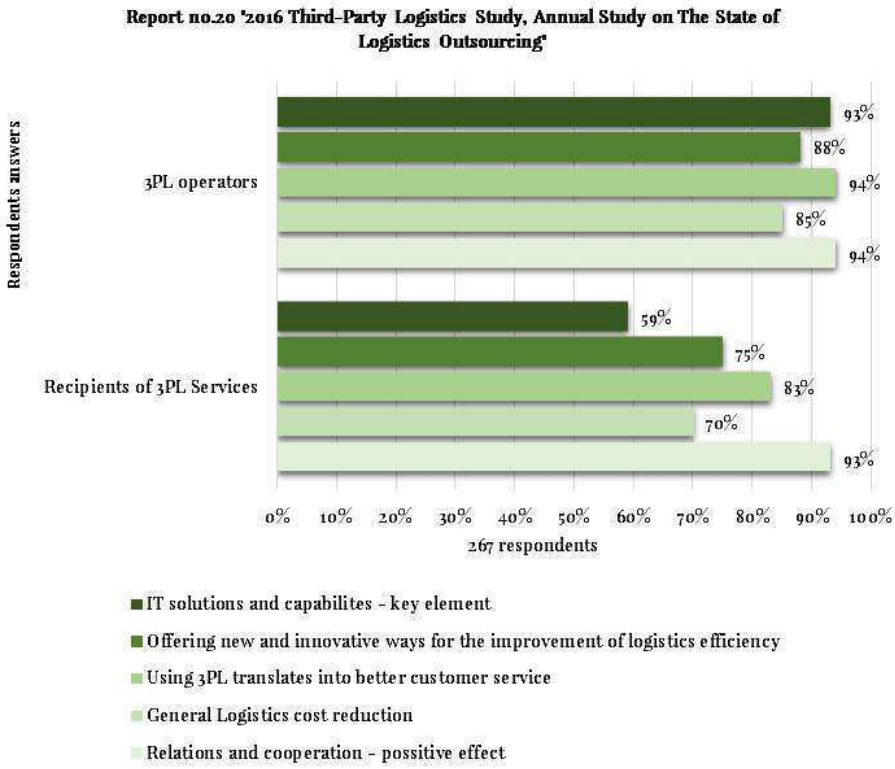

Fig. 1. Research conclusion. Data from report no. 20 *2016 Third-Party Logistics Study - The State of Logistics Outsourcing*", *Results and Findings of the 20th Annual Study*
Source: Own work on the basis of: http://www.3plstudy.com/downloads/download-3rd-party-logistics-study/[access: 18/04/2016].

Report no. 21 "*2017 Third-Party Logistics Study, Annual Study on The State of Logistics Outsourcing*[14]", *Results and Findings of the 21st Annual Study*, which covered 342 respondents reveals that recipients of services and their 3PL operators move away from transaction relations towards significant partnership relations. This year's report presents the following data and research conclusions (Fig. 2.):

- 91% of services recipients and 97% of 3PL operators stated that their relations and cooperation bring positive results,
- 75% of logistics services recipients and 93% of 3PL providers indicated that the use of 3PL services contributed to the general reduction of logistics costs,
- 86% of logistics services recipients and 98% of 3PL providers indicated that the use of 3PL services contributed to the improvement of customer service,

[14] Source: http://www.3plstudy.com/downloads/download-3rd-party-logistics-study/[access: 08/11/2016].

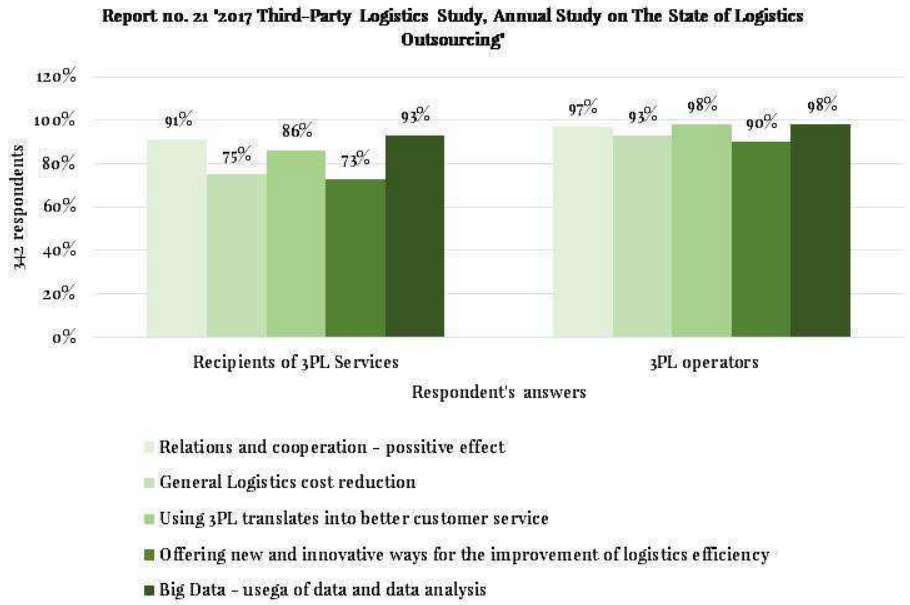

Fig. 2. Research conclusion. Data from report no. 21 "*2017 Third-Party Logistics Study - The State of Logistics Outsourcing*" *Results and Findings of the 21st Annual Study*
Source: Own work on the basis of: http://www.3plstudy.com/downloads/download-3rd-party-logistics-study/[access: 08/11/2016].

Majority from both groups, including 73% of service recipients and 90% of 3PL operators indicated that 3PL operators offer new and innovative means for the improvement of logistics efficiency. Key conclusions from the conducted research indicate, that 44% of recipients of logistics services and 86% of 3PL operators agree that the cooperation with other companies, and even competition, in order to reduce logistics costs and to improve the quality of rendered services is of value. This year's results indicate that proposals – offers of 3PL operators – mature, and the recipients of services use the expertise of logistics operators more and more.

Also this year, from among the most commonly ordered logistics services one can still find these which are the most transactional, operational and repeatable in their nature. In the report, data concerning the used IT tools and technologies in the logistics services rendered by 3PL operators were listed. Respondents, when answering the following question: "*which information technologies, systems or tools must a 3PL have to serve a customer successfully in your industry classification?*" named IT technologies and tools, listing among others:

- Applications for transportation management (planning) – 71 %,
- RFID – 18%,
- Yard Management Systems – 22 %,
- CRM – customer relationship management – 24%,
- Bar coding – 47%,
- Transportation management (scheduling) – 63%,

- Supply chain planning – 46%,
- Web portals (booking/order tracking etc. – 51%,
- Warehouse/distribution centre management – 66%,
- Visibility (order, shipment, inventory, etc.) – 66%,
- Electronic data interchange – 68%.

The research also pointed to the important role played by Big Data. It was emphasised that collection and analysis of this data becomes more and more important for 3PL and 4PL. In this year's research, almost all of 3PL operators (98%) and services recipients (93%) confirmed that data-driven decision-making is of importance for the future success of activities and processes in the supply chain. Both respondent groups: 86% of 3PL operators and 81% of services recipients stated that the efficient use of Big Data will become a basic skill in organisation of their supply chain. From among 3PL operators, 71% of them declared, that the most important value of data is the correctness of processes and efficiency, 70% indicated the improvement of logistics optimisation and 53% indicated the improvement in the integration along the whole supply chain. Recipients of services when asked to list attributes of Big Data use stated among others that: 60% of recipients indicated the improvement in the integration along the whole supply chain, 55% confirmed the improvement in data quality, and 52% confirmed the improvement in quality and efficiency of processes.

Frequently mentioned in the analysed reports the so called *IT gap*, meaning the difference between the possibilities of 3PL operators in terms of IT technologies and the customer expectations starts to increase slowly; in this aspect 65% recipients of services stated that they were happy with the IT services offered by 3PL providers, while for operators it was 91% (historically, in 2002 the recipients of services assessed the quality and possibilities of IT operators at the level of 27%).

In the report, huge emphasis is also paid to the role of 3PL operators in the transformation of supply chain, emphasising that transformation processes and changes are hardly ever easy and the experience of 3PL and 4PL operators can be useful for services recipients engaged in the supply chain transformation process.

In the conclusion, it was further stated that 3PL sector still develops globally, both in terms of revenue and scope, and 3PL operators improve and enhance their key competences to improve the scope of their offer. New needs of consumers and logistics services recipients will still drive the industry to evolve (develop).

To sum up the above conclusions, it can be stated, that the logistics services of modern supply chains rendered by 3PL operators determined by the ever-growing customer demands, growing competition, on the one hand faces 3PL operators with many challenges and on the other hand opens new possibilities to improve the implemented processes and the development of the offered services. 3PL logistics operators (logistics providers) faced with the developing e-commerce, IoT, production customisation and Big Data, need to provide logistics services that take into account solutions and IT technologies in their operation. From among the benefits resulting from IT support of logistics in the modern supply chains, one can list both for 3PL operators and services recipients the following:

- Reduction (and control) of logistics costs;
- Improvement of customer relations management;
- Improvement of resources flow (including information as a resource);
- Full integration with suppliers and/or recipients;
- Integration of logistics services based on partnership;
- Monitoring of operations in real time, including full control over the order implementation and placement;
- Information exchange on the course and shaping of logistics processes in real time;
- Integration of activity with other entities planning operation within the chain and/or managing supplies;
- Full integration of systems linked with the necessity to design solutions in supply chains for customers with the running of business and verification of proposed solutions for the customer (Hanus, 2011).

CONCLUSIONS

3PL operators, in order to properly coordinate and integrate logistics processes, implement modern IT solutions that stimulate effectiveness, efficiency and competitiveness of functioning of the serviced supply chain. IT support influences the increase in the level of added value, improves the management across all links of supply chain, allows cost optimisation, reduces order and supply execution times, and stimulates the rendering of logistics services on a high level. Logistics in supply chain is about providing current information in the right place, at the right time, in the right amount, and most importantly to the right recipients, maintaining the lowest cost of its procurement. Information flow in supply chain needs to provide protection to the procured, stored and transferred information between the logistics operators and enterprise. The use of IT technologies in logistics of supply chain with the use of the Internet, RFID technology, EDI or Big Data seems to be the natural consequence of modern development of civilisation.

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