

### **Piotr Hanus**

University of Economics in Katowice  
e-mail: piotr.hanus@ue.katowice.pl  
ORCID: 0000-0001-7765-2929

### **Marek Kasperek**

University of Economics in Katowice  
e-mail: marek.kasperek@ue.katowice.pl  
ORCID: 0000-0003-0378-3971

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## **COOPERATION OF ENTERPRISES IN THE SPHERE OF HUMAN RESOURCES IN LOGISTICS**

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## **WSPÓLPRACA PRZEDSIĘBIORSTW W SFERZE ZASOBÓW LUDZKICH W LOGISTYCE**

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**Summary:** Human resources are an important factor in logistics. Their lack of or gaps in competence development cause serious consequences. The aim of the article is to indicate the main factors that may shape the sphere of human resources in logistics, their importance and the need to develop cooperation between enterprises in this area. This study is exploratory (literature studies, internet resources). The subject matter is also the result of the author's research and the LOGOS scientific research project. The content of the article is based on analysis of the factors that have been identified in the source materials. The principle of comparing and searching for analogous subjects in the sources has been adopted. The most important conclusion drawn from the content is to ensure the development of human resources in logistics and to develop cooperation due to the emerging challenges of staff shortages and the development of new technologies.

**Keywords:** cooperation, human resources, logistics.

**Streszczenie:** Zasoby ludzkie w logistyce są istotnym czynnikiem. Ich brak lub luki w rozwoju kompetencji powodują poważne skutki. Celem artykułu jest wskazanie głównych czynników, które mogą kształtować sferę zasobów ludzkich w logistyce, ich znaczenia i konieczności rozwijania współpracy przedsiębiorstw w tej sferze. Przeprowadzone badania mają charakter eksploracyjny (studia literaturowe, zasoby Internetu). Podjęcie tematyki jest także rezultatem badań własnych oraz projektu badań naukowych LOGOS. Treść artykułu powstała na podstawie analizy czynników, które zostały zidentyfikowane w materiałach źródłowych. Przyjęta została zasada porównywania i poszukiwania analogii tematyki

w źródłach. Najważniejszym wnioskiem płynącym z treści jest zapewnienie rozwoju zasobów ludzkich w logistyce oraz konieczność rozwijania współpracy ze względu na pojawiające się wyzwania: brak pracowników i rozwój nowych technologii.

**Słowa kluczowe:** współpraca, zasoby ludzkie, logistyka.

## 1. Introduction

In the early stages of the development of modern logistics, the role of human resources was rather weakly emphasised. Descriptions of the role of human resources primarily concerned the knowledge and skills related to making management decisions, taking into account the principle of the systems approach and the principle of flows perceived particularly from the point of view of a given enterprise [Sołtysik 2003]. At that time, emphasis was put on the need to ensure the coordination of activities within the structure of a given enterprise and in relation to suppliers and customers (supply and sales markets). The aspect of ensuring an adequate flow of information in the sphere of the regulation of logistic flows was also important [Skowronek, Sarjusz-Wolski 2012]. The development of logistics knowledge and the emergence of global trade on an unprecedented scale led to the emergence of supply chains and the development of associated concepts, models and ideas. Firstly, however, there were perturbations related to the interpretation of the scope of actions taken in the supply chain, defining its essence and the objectives of individual links. Secondly, the creation of supply chains resulted in the emergence of specialist entities – logistics service providers – whose scope of activity went far beyond the traditional areas of service provision. In addition to traditional services (e.g. in the areas of freight forwarding, transport and warehousing), these entities began to take over part of the logistics activities of producers, trading companies (suppliers and recipients) and organise this for, or on behalf of these entities [Witkowski 2010; Blaik 2010]. These changes required the adaptation of processes and often organisational structures of enterprises (service providers and their clients), as well as ensuring real-time information exchange enabled by progress in the field of information technologies (development of IT systems and computer networks) and telecommunication. These solutions have been widely used in various spheres and functions of logistics (transport, storage, inventory, supply, production, distribution of finished products, etc.) [Wieczerzycki (ed.) 2012]. Currently, new phenomena and new conditions are emerging for shaping logistics systems and facing up to the resulting challenges related to the need for business cooperation, as well as the development and shaping of human resources in logistics. For example, the reports of The Polish Agency for Enterprise Development (Polska Agencja Rozwoju Przedsiębiorczości, PARP) from June 2019, which concern the situation in the labour market, emphasise the importance of factors such as: an increase in the number of people who take up work for higher pay, which, however, requires highly specialised

skills; plans of entrepreneurs related to the increase in employment and remuneration; and the simultaneous employment of foreigners due to staff shortages. Entrepreneurs are also aware that almost half of the current professions may disappear around 2030 [PARP 2019]. These phenomena are also accompanied by a potential threat associated with the increasing use of robotics and machines that replace human work. The use of artificial intelligence and automation in business, including logistics, is also being considered more and more widely.

All these phenomena interpenetrate each other. Continuity in transferring thorough logistic and highly specialised knowledge is therefore required. However, the very nature of contemporary phenomena in the area of business and logistics is currently unstable and temporary. With the emerging, sometimes drastic, staff shortages and the lack of relevant job candidates (with specialist knowledge, as well as so-called soft skills and competences related to behaviour and communication), it is important to develop employee skills in the field of logistics to keep up-to-date with new phenomena.

The article addresses these issues, and is based on previous research results obtained as part of the LOGOS research project.<sup>1</sup> The basic goal of this research was to identify the conditions and possibilities of implementing the concept of corporate social responsibility (CSR) in contemporary supply chains [Kasperek 2016]. The research tool was a nationwide survey. Inspiration also came from the authors' study on the shaping of cooperation of links in a supply chain, the development of operations by logistics operators in supply chains and changes in inter-organisational relations under the influence of innovative logistics solutions. The authors encountered many aspects at that time, including the social aspect of logistics in enterprises: staff shortages and gaps in employee competences. The article was created using the desk research method; a qualitative approach related to logical

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<sup>1</sup> Based on literature studies and previous research experiences on virtual supply chains and social responsibility in supply chains, a questionnaire form was developed. The interviews were conducted between May and June 2013 by professional interviewers from the Research and Expertise Centre of the University of Economics in Katowice. The method adopted here was direct interview, during which the interviewer together with the surveyed entity supplemented the answers to individual questions of the questionnaire. The surveys were not limited to just one region, but were conducted on a country-wide scale. The research involved 150 enterprises belonging to various industries and sectors of the economy. In this group there are 40 production companies, 45 trade companies, 63 service companies and 2 companies with a mixed activity profile. Quantitative analysis was performed using IBM® SPSS® Statistics (ver. 21) and Microsoft® Office Excel® 2007 spreadsheet. The second group of studies that inspired the writing of this article (indicating also new, not previously foreseen aspects) concerned the premise and barriers for the development of cooperation between supply chain participants. The research was conducted at the turn of 2015 and 2016, with the use of an electronic questionnaire. The research sample consisted of 50 entities conducting various activities on the domestic market. The sample was deliberate: 40% of the sample were logistics service providers, 34% were trade and production companies were 26% of the sample. Rather larger enterprises prevailed in this group (employing over 250 people). 40% of the sample were SME (including medium-sized enterprises – around 16%, small and micro enterprises – around 24%). Senior and middle managers associated with the sphere of logistics and trade in their enterprises took part in the study.

inference was included. This primarily applies to analysis at the material collection stage. By comparing the subject matters and identifying analogies in various studies through deduction, a problem related to human resources in logistics was identified and the possibilities of shaping cooperation between enterprises in this area were described<sup>2</sup> [Apanowicz 2002; Kawa 2013].

## **2. Cooperation in the sphere of logistics.**

### **The role of the human factor**

Cooperation in the sphere of logistics should be understood as activities implemented together by several companies, in a specific place and time, aimed at achieving a specific goal, which is usually associated with shaping, developing and improving the necessary resources and logistics processes. In general, it is about improving logistics services, optimising the costs of logistics activities, investing and developing infrastructure, determining appropriate standards for the functioning of a company (its logistics sphere) and, if necessary, creating appropriate procedures [Świtłała, Niestrój, Hanus 2017]. The concept of cooperation formulated in this way refers primarily to the implementation of all the so-called 'hard' elements in logistics (e.g. the course and sequence of logistics processes). Their proper selection, in accordance with the assumptions of the systems approach and flow principle, should contribute to achieving satisfactory economic results by a given enterprise and may also have a positive impact on suppliers and customers [Świtłała, Niestrój, Hanus 2018]. This should be achieved through the optimisation of processes and activities carried out from the point of view of the total cost of a company's logistics system. In order to undertake this type of optimisation activity and achieve an appropriate level in this area, it is necessary to have adequate information derived from data on logistics processes. Information makes it possible to plan deliveries in time.<sup>3</sup> It is also a significant factor influencing the assessment of the quality of logistic services by companies when these services are provided by external entities – logistics operators<sup>4</sup> [Bell et al. 2014]. The description does not exhaust the full complexity of logistics phenomena, such as shaping trade-off relations, but its purpose is to concisely characterise the classic approach to the implementation of tasks and activities in logistics [von Cieminski, Nyhuis 2007; Chopra, Meindl 2007]. This approach has little to do with the role of the human factor in this regard. Therefore, it should be

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<sup>2</sup> Based on the origin research, new research areas related to the topics covered in the present article were formulated. Secondary research was conducted mainly with the use of databases: EBSCOhost, Emerald Management 210, ProQuest and Internet resources (searching by Google). The following were formulated: human resources in logistics, (new) trends in logistics, cooperation in logistics, cooperation in the sphere of human resources in logistics etc.

<sup>3</sup> A physical flow and shaping its course are the essence of logistics. Information is related to regulating this flow and the sphere of making management decisions.

<sup>4</sup> Service providers providing basic and advanced logistics services to their clients.

emphasised that the main factors influencing logistics decisions can be assigned to several<sup>5</sup> or a dozen or so groups. However, knowledge of the processes and factors shaping them, including the logistics principles controlling them, are not the simple consequences of the classification of these factors. This is due to two factors, the first of which is the variable course of logistics processes over time. Due to changes in demand, operational activities change in a shorter period of time. In the long run, progress and knowledge development related to implementing innovations and changing customer requirements also contribute to change. Competitors' activities are also important. Any such change brings discontinuity [Rokita 2009]. New concepts and solutions are emerging, including those that were not known and used before.

All logistics activities are carried out by a company's employees at differing positions and levels<sup>6</sup> in various areas of the company's operations. Hence the role of the human factor and human resource development is so important in logistics. Namely, learning the rules of logistics and implementing them in an enterprise is associated with the acquisition of data and information on the functioning of the logistics system and processes and is also associated with the transfer of general knowledge on this subject. Their application requires the creation of an appropriate organisational culture [Mann 2014]. Firstly, this should be done to share knowledge and not to 'retain' it for oneself (e.g. unit, department, division).<sup>7</sup> Secondly, organisational culture should serve to improve logistics processes. Knowledge of the sphere of logistics, as well as the environment for its transfer and development can be created by the company's employees. Therefore an important issue is internal cooperation in an enterprise, which will contribute to the proper functioning of the logistics system. However, is this entirely possible? The question remains open. This is, however, an important aspect that must be met to create solutions to share knowledge with suppliers and customers. An important argument is that other entities are subject to the same principles as any enterprise. Collaboration on human resource development can therefore improve efficiency in the sphere of logistics in many entities [Rokita 2011]. At the level of performing individual operations, this collaboration should involve learning the principles that shape logistics flows. Knowing these principles does not necessarily mean understanding them. Namely, classic enterprise structures (vertical, hierarchical dependencies) and setting partial goals for individual departments can contribute to the sub-optimisation of decisions, most often in clear contradiction with the principles of shaping logistics processes. In order to prevent or reduce this kind of phenomena, it is necessary to shape the competences of logistics employees.

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<sup>5</sup> At least two groups; internal and external factors.

<sup>6</sup> Those related directly to the sphere of logistics, such as warehouse positions, planning positions in production related to determining the amount of inventory, etc., as well as those indirectly related to logistics (e.g. sales activities aimed at concluding transactions; this is related to forecasting and determining the amount of inventory).

<sup>7</sup> The purpose of this kind of action may be to receive a prize or individual benefits.

### **3. Logistics employees' competences against the background of contemporary phenomena related to the functioning of enterprises and their logistics**

Logistics employees' competences include a set of features related to education, communication skills and the ability to respond in extraordinary situations. Candidates' psycho-physical predispositions, including resistance to stress, are also sometimes taken into account. Companies are currently facing a shortage of employees in specific positions and the problem is in attracting the right number of candidates who would fully meet all criteria [Anastasiou 2014]. One of the solutions may be to employ foreigners. However, this sometimes causes turbulence and even problems related to management in a multicultural environment in the absence of knowledge of the working culture of people from a given country or region (e.g. different habits in a workplace). Sometimes there is also a language barrier [Capellan 2019]. This type of factor may prevent full employee involvement and affect the quality of work. Hence there is a demand for social, formal and legal assistance that can be implemented with the participation of a given enterprise and established institutions. This takes the form of consultation, courses and training. However, this does not immediately ensure the acquisition of competences in the performance of tasks and activities related to logistics processes. An interesting phenomenon may be a situation in which a given company encounters the problem of access to a qualified, appropriately competent workforce. For example, this problem was experienced by Toyota which noticed serious challenges in this respect when entering the US market [Griffin 2006]. These were related to the lack of an employee education system similar to the one that had been developed and used in Japan for years. This example shows how important it is to acquire skills related to the performance of a specific job and to shape the appropriate system in this area well in advance. These issues may also be related to the ability to identify and analyse phenomena as well as their interrelationships and effects.

Logistics employees' competences can be related to the sphere of management (making managerial decisions) and to specialist positions. Competency profiles may vary depending on the industry specifics, infrastructure used and specific requirements related to, for example, work organisation. However, in the case of managerial positions, first of all, the ability to identify trends and phenomena that will shape the conditions for the future functioning of an enterprise is required (Infuture Hatalaska Foresight Institute, Samsung 2019). In the case of specialist positions, the ability to analyse and draw conclusions is important, along with the simultaneous use and knowledge of IT solutions (specialised software).

The competences of logistics employees are related to the issues of creating a knowledge-based economy. To create and develop this, it is necessary to have access to information in real time (support with appropriate IT and telecommunication systems). In addition to applying the principles and shaping the aforementioned

processes, the aspect of responsible management of teams of people in various spheres of logistics is important in this case. Thus, management requires the continuous observation of changes in the environment and the functioning of the company. It is important to be aware of contemporary phenomena that may provide an opportunity for development but could also be a threat to the functioning of an enterprise in the event of their incorrect identification. The phenomena and factors that should be taken into account in the context of human resources in logistics are as follows:

1. Globalisation – it has an impact on the spatial scope of logistics activities. Therefore, it requires the appropriate design of logistics networks and supply networks and causes changes in the entire organisation of economic systems.

2. Multicultural work environment – as a result of globalisation and labour migration, new working conditions are created. The education and skills of employees from different countries can vary widely. Moreover, these employees perform tasks in accordance with their value system in the perception of work related to the culture of the region of origin [Jackson, de Vijver 2018].

3. Remote work – provided with the help of remote technical devices [Allen, Golden, Shockley 2015]. However, it requires knowledge of logistics principles and communication skills when solving problems or connecting data and information with processes (when making decisions).

4. The use of IT solutions and telecommunication – in addition to the use of appropriate software, analysing big data may become more and more important [Wang et al. 2016; Chen, Chiang, Storey 2012]. Systems called electronic twins are also being developed [Steliński 2019; *Digital Twins...* 2019]. Although not entirely new, solutions of this type can now, thanks to progress in the field of IT [Hanus, Zowada 2015], provide much more detailed information by mapping the real world in the digital world. Solutions of this type are currently considered to be among the five most important trends thanks to which the efficiency of processes can increase by about 10%. It is emphasised that the introduction of these solutions will change the relationship between people, processes and machines and will require a change in work culture. The use of IT solutions and the development of information exchange networks are also manifested in the concept of the Internet of Things.<sup>8</sup> Quite likely many materials supplies will also be supplemented with 3D printing. This phenomenon may have an impact on changes in supplier markets, which in turn will translate into the reconfiguration of supply sources.

5. Emergence of new technologies – this may relate to materials with new properties (futurological view), which may also be related to delivery and storage conditions. Moreover, replacing routine work with machinery is more and more often taken into consideration. However, work on artificial intelligence [Nowak 2017] is currently setting a new direction. In some cases it may take over the

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<sup>8</sup> <https://marketingbiznes.pl/biznes/internet-rzeczy/>.

execution, supervision and/or planning of logistics processes. At present it is difficult to predict the effects of this application (in addition to the necessity to acquire new qualifications and perhaps reduction of employment). In both cases it will be necessary to develop new knowledge of logistics employees, which may also require cooperation in the area of information exchange.

In addition to the above-mentioned phenomena, trends that are currently of great importance in the sphere of human resources in logistics are also identified. These are: ageing of employees, gaps in taking up work immediately after graduation by school graduates and the natural outflow of employees – looking for another job or retiring. All of these force the pursuit of wider applications of automation and IT solutions than before. The assessment of these factors and their impact on an enterprise is the responsibility of managers and specialists. Correct identification can ensure appropriate activities related to preparing for changes in the implementation of logistics activities and bridging potential causes of the employees' competence gap. The task for managers and specialists related to preparation for potential changes should focus on:

- 1) understanding and verifying factors that may affect the sphere of logistics;
- 2) determining the opportunities and threats that these factors bring;
- 3) formulating scenarios of activities in an enterprise with the participation of all its employees;
- 4) determining alternative activities if changes need to be made to activities;
- 5) undertaking long-term activities related to the observation of phenomena in the business environment that should be implemented in a continuous and planned manner; their purpose would be to correct the assumptions made.

After identifying these factors, it will be possible to determine if there is a gap in the competences of future employees, how to measure it, and how to shape and train human resources in logistics so that it can be eliminated later (anticipation). The solution may entail the adoption of the following assumptions. The first assumption is to develop guidelines for determining new employee competence profiles. The second one is to scale these guidelines and give them appropriate ranks. The third assumption is to define specific tasks for managers and specialists.

However, how can and should enterprises cooperate in the sphere of human resources in logistics and in shaping their competences? First of all, they should implement the aforementioned principles concerning the design of logistics systems and processes. They are fundamental due to the nature of physical flows in logistics. Yet it is necessary to constantly identify contemporary trends and phenomena and to characterise the factors that cause them. Cooperation in this case can involve an exchange of ideas through work talks, meetings with suppliers and recipients, and an interdisciplinary view of logistics processes and systems, or properly designed training cycles. These activities can complement and develop employees' knowledge regardless of their rank and position in an organisation.

## 4. Conclusions

People create reality, and the selection of appropriate solutions depends on this aspect. A given employee who achieves the ability to assimilate logistics knowledge at a high level (awareness and ability to perform tasks), is able to use modern tools and technologies and has the appropriate characteristics and so-called spatial imagination associated with logical inference becomes a valuable resource of a company. For managers, this may mean the need for change related to the performance of their functions based on hierarchy; they should act as leaders and mentors. Employees in specialist positions may need to acquire new knowledge at a faster pace and develop skills to work in an interdisciplinary and multi-faceted work environment.

The described factors and phenomena related to the future functioning of the sphere of logistics already determine (or will in the near future) the manner and scope of cooperation between enterprises in the sphere of human resources in logistics. Based on the presented premise, the following statements were made.

If the tendency to replace routine human work with computer technology and perhaps artificial intelligence solutions persists, the demand for employees will decrease. However, their knowledge and skills will continue to be useful in designing and supervising logistics processes and systems. This could create the need to teach and develop the skills of new employees and employees of other companies (leaders will teach other companies) and design systems. In this case, cooperation may relate to employee training to supplement knowledge and the use of specialists' knowledge by other entities (consultancy).

If access to employees is limited (noticeable shortages), it may be important to create business models and educate employees who will be able to successfully work for at least two entities, for example, a given company and its supplier and/or recipient.

If new technologies (artificial intelligence) and/or innovative solutions (the Internet of Things) are further developed, it will be important to standardise procedures and archive knowledge understood as a very valuable resource. A faulty process and teaching machines or artificial intelligence wrong behaviour can lead to a 'defect' due to an erroneous pattern. It cannot be said at the moment whether all solutions which remain at the initial stage of their development, will have a one-hundred-percent ability to draw conclusions and apply corrections after making mistakes. Therefore sharing specialist knowledge that people will have and cooperation in this area can be considered priceless. Only people may be able to improve a wrong pattern in the real world. This may also require the creation of new forms of cooperation [Kempny et al. 2010] in the sphere of human resources in logistics. This can be a good signal to identify and prepare for all kinds of changes, even broad ones, early enough in an enterprise. All this requires teamwork, and thus

cooperation in terms of human resources in logistics, which also means gaining new qualifications and skills in relation to the current ones. However, this does not always have to, or should, involve a reduction in the number of jobs.

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