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## DETERMINING COMPETENCIES REQUIRED FOR WORK IN THE LOGISTICS SECTOR

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**Abstract:** *This paper investigates the competencies required from the employees in the logistics sector in the Republic of Serbia. It first presents the results of similar research conducted in developed countries and then provides a detailed analysis of the competencies needed by logisticians to work in the Republic of Serbia. The basis for this analysis was provided through a survey among the respondents working in different areas and different positions in the area of logistics. Given the expected trends in logistics, in addition to the competencies required for work in the existing logistics management and supply chains, the competencies needed to work in the near future were also explored. The aim of this paper is to investigate and classify the knowledge and skills needed to work in logistics. The findings can be used to develop logistics education programs that will meet the demands of the economy in the Serbian market.*

**Keywords:** *logistics knowledge areas, logistics competency, education.*

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### 1. INTRODUCTION

By managing the flow of goods, logistics supports and connects the functioning of various economic sectors and is one of the key factors in the development of both individual companies and national economies. Technical and technological development, market globalization, customization of products and services and requirements for sustainability all contribute to the dynamic and turbulent character of modern business markets. In addition, company operations are affected by uncertainties and risks such as natural disasters, wars or epidemics. As a result, the already complex management of logistics and supply chains becomes even more complicated, a fact that is reflected in the knowledge and skills logistics professionals need for their work.

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Logistics covers a wide range of areas such as warehousing, material handling, inventory management, transport management, etc., with each of these areas developing its own specific knowledge and standards. In addition, logistics as an interdisciplinary field based primarily on technology, economics and information science, combines different types of engineering knowledge with economic and managerial knowledge and skills. In other words, modern logistics is understood as an interdisciplinary concept and as such, interfaces with other business functions, as well as with other areas of engineering are abundant (Niine and Koppel, 2014). In the logistics system an individual, the initiator of all activities, and his/her knowledge and skills play a central role. On the one hand, logistics encompasses a large number of tasks and the specialist knowledge required for their implementation. On the other hand, it is interdisciplinary in nature and requires the general knowledge of other business areas necessary to harmonize the functioning of different parts of the chain. Bearing in mind these two aspects it is clear that a logistics expert - logistician, should have interdisciplinary and multidisciplinary knowledge, which more than ever, needs to be constantly supplemented.

Different jobs (such as transport, warehousing, customer service and procurement) and positions in logistics and supply chain management (operational, middle and strategic level) require different competencies, most often confirmed by appropriate qualifications. The qualifications are recognized as tangible outcomes of training and document an acquired skill and are vital to starting a professional career (Smith and Ridoutt, 2007). In addition to university degrees, various national and international certificates of competencies and occupational standards have been established as a confirmation of the professional qualifications and competencies of logisticians and these differ from each other to a certain extent.

The aim of this paper and research is to identify the knowledge and skills needed to work in the logistics sector, with a focus on the Serbian market. The remainder of this paper is organized as follows: Section 2 gives a brief overview of the literature discussing competencies in logistics. Section 3 describes the methodology for researching the competencies needed to work in the logistics sector in Serbia and discusses the results obtained in this study. The last part summarizes the conclusions and gives directions for future research.

## **2. LITERATURE REVIEW**

Supply chains are becoming more complex, more extended, and more global every day, and for that reason logistics and supply chain management as well as the need for their adaptation to changes in business, require adequately educated professionals. According to early research on this topic, it has been determined that 25 scientific fields are involved in order to fully process logistics tasks (Muckelberg and Hille, 1997). This period is characterized by the differentiation of logisticians into two educational profiles: university degrees in business economics which should include the functions of market-oriented procurement, planning, management and implementation in the field of trade and administration; and, on the other hand, technical and logistical knowledge that covers the field of physical logistics and which is acquired at engineering faculties (Nikoličić, 1999). Today, in higher education of logistics, various curricular approaches exist from a “one-size-fits-all” style to a narrow specific focus (Niine and Koppel, 2014).

The demand for people in the field of logistics and supply chain management (SCM) is growing, and it is increasingly difficult to find qualified personnel for blue-collar work, white-collar work and knowledge work (Kotzab et al. 2018). The creation and implementation of educational programs, which in addition to traditional knowledge in the field of logistics and SCM include modern topics in this field (influenced by technical, technological and business changes), represents both an opportunity and a challenge for educational institutions to respond to economic demands. (Nikoličić et al. 2019).

Competencies in the field of logistics and SCM are the topics addressed by academics and professionals alike, which is confirmed by papers published in journals and presented at academic and professional conferences. Previous research has been conducted on limited geographical area, business focus, hierarchical level in management, etc. and all sought to identify relevant competencies for work in the logistics sector from their perspective, educational program and/or practice requirement. Here competency is understood as one's ability to combine knowledge, skills and attitude to show expected behavior when performing a professional task (Hofstra et al. 2020).

Establishing standards of logistics competencies can contribute to their harmonization, which is discussed in (Niine and Koppel, 2014). Based on six renowned international models of logistics competencies, an extended meta-model of knowledge areas needed by logistics professionals has been formed (20 knowledge areas, with each section containing 9-12 elements that should belong to logistician's training), with the idea to use it as a tool for benchmarking analysis of the existing curricula and programs of undergraduate studies in the field of logistics as well as for their further development. The model was tested by comparing curricula from five European universities, and it was concluded that differences between logistics curricula can be significant but that the key areas such as: transport planning, inventory, material handling and IT technologies, are generally present in all of them although to varying degrees.

The requirements for the competencies of logistics bachelor graduates in the Netherlands have been researched on the basis of current and expected trends and developments in logistics, and the research findings can be used to develop educational programs in logistics (Hofstra et al. 2020). A framework describing relevant competencies for logisticians developed in this research was also supplemented by findings from interviews with senior logistics professionals. As a result, relevant knowledge, skills (hard and soft) and attitudes have been determined for graduate logisticians, with each of the competency components explained in more detail. The research emphasizes that fundamentals of logistics such as knowledge on warehouse and inventory management, incoterms, customer service, trade law, forecasting, e-commerce and process optimization remain essential for young logisticians. In addition to this basic knowledge, logisticians need to: understand technological development and innovation and be able to work with new technologies and tools (digitalization, robotics, blockchain, internet of things, artificial intelligence, Big Data), gain general knowledge about business (e.g., finance, marketing and sales, operations management) and business processes. Regarding the skills of young logisticians, the use of foreign languages and MS Excel was especially emphasized, as well as personal attitudes: reliability, proactivity, curiosity and flexibility.

The requisite logistics and supply chain manager competencies have changed in recent decades owing to profound business transformations in the field, for example, the globalization of supply chains, continued outsourcing, and the widespread adoption of

lean practices (Derwik et al. 2016). The academic literature discusses more than 280 skills and competencies related to the job profile of logistics and supply chain managers (Kotzab et al. 2018). Logistics and supply chain managers use business managerial, generic, and behavioral competencies in practice rather than supply chain management expertise, where the level of competency in practice extends beyond the sum of individual competencies (Derwik et al. 2016). The following have been identified as very important areas of functional knowledge required for supply chain management: communications/negotiations; computers/IT; general experience; logistics/supply chain management and skill areas: analytical, interpersonal, leadership and change management (Mangan and Christopher, 2005). Given the social development, companies must constantly change, which means a changing set of knowledge and skills needed to perform logistics and supply chain activities, the fact which is also reflected in the recommendations of the European Commission for Lifelong Learning (Kotzab et al. 2018).

### **3. COMPETENCIES REQUIRED FOR WORK IN THE LOGISTICS SECTOR IN THE REPUBLIC OF SERBIA**

Given the continuous growth of the global logistics market over the past twenty years, experts expect that in the future there will be a significant demand for qualified logistics professionals, especially in management positions (Kotzab et al. 2018), which is further confirmed by the following facts:

- it is estimated that by 2030, the logistics sector will globally lack 16% of the skilled workforce in (3PL, 2019).
- In Serbia, employees in the area of logistics did not wait for their first job (50%) or waited up to six months (31%). In addition, in 2018, there were an average of 2.2 ads per day for management positions in the field of logistics (logistics managers, clerks, dispatchers), which further indicates the high demand for qualified logisticians (Kilibarda et al. 2019).

Research in this paper focuses on a skilled workforce in logistics, which implies a certain level of qualification that, through work experience, self-education or training, allows the acquisition and development of additional competencies needed in a rapidly changing logistics environment.

#### **3.1 Methodology**

In order to determine the competencies required for work in the logistics sector in the Republic of Serbia, a survey was conducted consisting of the following phases:

1. Based on the analysis of published papers, curricula and programs of bachelor's and master's studies in logistics as well as the experience of the authors of this paper, the areas of knowledge required for work in logistics have been identified. Development trends in the logistics sector were also taken into account.
2. Areas of knowledge (and skills) are divided into two basic groups: general-educational knowledge and technical-logistical knowledge, and the third group, which includes trends in logistics.
3. An online questionnaire was created which, in addition to general information about the respondent (work sector, position in the company, ...) contains a list of 63 questions related to the knowledge he/she needs to perform a particular job in

the company. The questionnaire was first tested on a sample of 10 respondents who were asked to complete it and then also give their suggestions and comments. After that, minor corrections (explanations) were made and when its validity was confirmed, the questionnaire was sent to other respondents via a web survey (the database of respondents engaged in various logistics jobs in various companies in Serbia was previously formed). The research was conducted in February 2022.

4. The obtained results were analysed and the main results are presented below:

It should be noted that this research is only a pilot study and will be extended to a wider sample of respondents.

### **3.2 Findings**

The selected sample consisted of a total of 150 respondents and a total of 63 completed questionnaires were collected, which represents a response rate of 42%. Respondents are engaged in various jobs in logistics & supply chains, ranging from operational to managerial. Of the respondents who completed the questionnaire, about 49% are employed in manufacturing companies, 26% in the logistics sector (freight forwarders, carriers, PL), 14% in distribution and domestic transport and 11% in retail companies. When it comes to the field of logistics in which they work, warehousing and distribution (32%) and contract logistics (32%) are dominating. About 11% of respondents are engaged in just in warehousing, 9% each are engaged in procurement logistics and production logistics, while the remaining respondents are engaged in all logistics areas in the company. All respondents have higher education and from the aspect of their position in the company, 41.5% are engaged at the operational and middle level and 17% at the top level. The majority of respondents (about 69%) are employed in companies with over 250 employees, in companies with 50 to 249 employees, 23% of respondents are engaged, and in small companies (up to 49 employees) slightly less than 8%.

Regarding general educational knowledge (where knowledges are classified by need in performing the logistics work but does not belong to basic knowledge of logistics, such as foreign languages, mathematics, economics, etc. ; this part of the survey contains a total of 5 questions), about 98% respondents (regardless of their position in the company) marked foreign languages as very important, but most of them (97%) had to learn further. Also, the field of information and communication systems and technologies was rated by 94% of respondents as a very important area for their work.

A broader set of areas covering physical logistics is classified as technical-logistical knowledge. This part of the questionnaire contains a total of 53 questions grouped into basic knowledge of logistics (such as knowledge related to: technologies and organization of various modes of transport, warehousing technologies and processes, forecasting, inventory management, freight forwarding, etc.), knowledge required for work with information technologies and systems (SAP, EDI, WMS, TMS, GPS, RFID, etc.), as well as social skills (such as: communication, teamwork, analytical reasoning and problem solving, etc.). In general, the most important knowledge for the work done by the respondents was the following: organizing and contracting road transport (94%), transport costs (91%), freight forwarding (91%), warehousing technologies (90%), modern information technology for identification, location and monitoring (90%) and project management and teamwork (93%). On the other hand, as knowledge that they do not need for their work or are not sure, the following are singled out: organizing and

contracting railway transport (55%), water transport (57%), air transport (54%), city logistics (43%), application of JIT tools (35%), kanbana (40%), lean principles (35%).

However, a more detailed analysis of the answers obtained in this way, primarily according to belonging to a certain sector and position in management, somewhat changes the conclusions about the knowledge needed to work in logistics. As an illustration, depending on the sector in which the respondents work, Figure 1 shows the summarized answers related to the two questions from this part of the questionnaire. As knowledges that are not needed or respondents are not sure, 35% of respondents highlighted the use of JIT tools, but in the manufacturing and retail sector over 80% of respondents pointed out this area as very important. For the second area in Figure 1, knowledge related to commissioning systems and technologies, 73% of respondents stated that it is important for their business, but in the retail sector all respondents (100%) rated this area as very important while in the distribution and domestic transport, 36% of respondents highlighted this area as important. For the same areas (questions) in Figure 2, the structure of answers according to the position in the company is presented. For 59% of respondents employed at the operational level, both areas are important for their work, while at the top level 91% of respondents emphasized the importance of knowledge related to order picking and technologies. This simple comparison has already pointed out the differences in the knowledge needed to work in logistics in different economic sectors and in different positions in the company, i.e. that in addition to basic knowledge of logistics, specific detailed knowledge within logistics areas is needed.

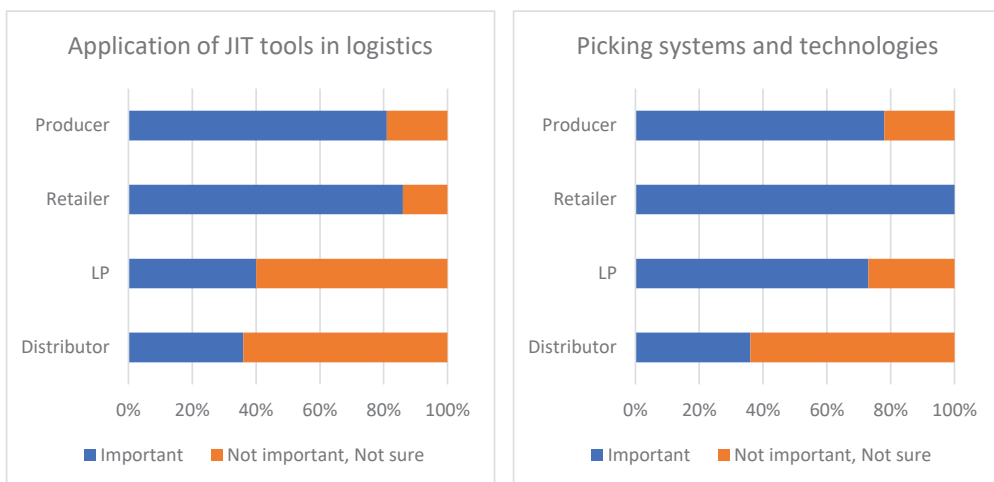


Figure 1. Importance of knowledge areas in different logistic sectors

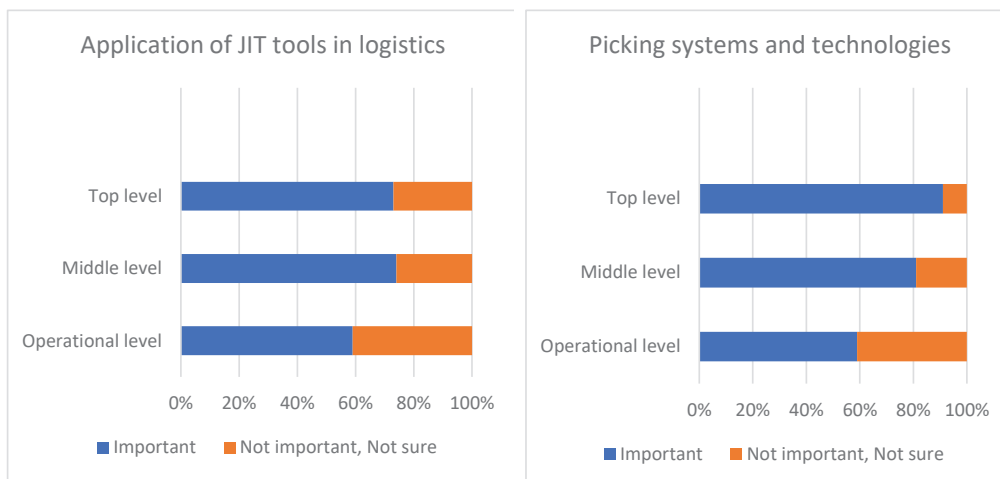


Figure 2. Importance of knowledge areas according to the position in the company

Trends in the field of logistics, which are already changing or will change jobs in the logistics sector in the near future, and thus the necessary knowledge of logistics, are highlighted in a special part of the questionnaire containing 5 questions. The answers of the respondents confirmed that the mentioned development trends in logistics are already happening in Serbia. The most pronounced changes are related to digitalization, ie about 81% of respondents did not say that they are already conducting partial or complete digitalization of business. On the other hand, the area where the least changes are expected is the application of data science and appropriate analytical tools in logistics, where 28% of respondents stated that they do not expect wider application.

Through their comments, the respondents especially emphasized the importance of good knowledge of foreign languages, work in Excel and more practical problems and practices during the study.

#### 4. CONCLUSION

Depending on the functional area of logistics and the level of management, different qualifications and competencies are required for the professional performance of tasks in logistics and supply chains. Qualifications play a vital role at the beginning of a professional career and the studied academic literature suggests that undergraduate education should enable students to understand the "bigger picture" in logistics management and supply chains, which, depending on the field of logistics, mainly includes knowledge of transport management, warehousing and inventory management, customer service, trade law, forecasting, e-commerce, logistics IT systems and the relations between these functions. Technological, business and social trends and developments are reflected in the context and content of jobs in logistics, which makes it necessary to regularly update study programs in logistics and SCM. It is expected that in the future, logisticians will take on a more supervisory role and that knowledge and skills related to technology and innovations, IT, software, data science, analytical and problem-solving skills, accompanied by a proactive and flexible attitude and good communication

skills, will become increasingly important. In other words, being a specialist and a generalist remains vital for graduate logisticians in the near future (Hofstra et al. 2020).

The competencies required from the employees in the logistics sector in the Republic of Serbia have shown similar results.

As the most important knowledge for the jobs they do, the respondents singled out the following skills: organizing and contracting road transport, transport costs, freight forwarding, warehousing technologies, modern information technology for identification, location and monitoring, project management and teamwork. Respondents particularly emphasized the importance of good knowledge of foreign languages and working in Excel. In addition, the results of the research confirmed that a logistician must be a generalist with detailed knowledge in certain areas. Such high demands for technical and economically - commercially oriented knowledge are difficult to connect within basic studies. As possible solutions for filling the gaps in the competencies of logisticians, the organization should be considered: modules within the basic studies in logistics, organization of specialist studies or seminars and courses for employees.

In a future work it is planned to increase the sample of respondents, in order to provide a basis for more reliable conclusions. As respondents work in different areas of logistics, it is very important to group them, and draw conclusions for each group about the relevance of knowledge and skills needed for their work in logistics. Drawing such conclusions is possible, among other things, only on the basis of a sufficiently large sample of respondents. For all groups of respondents, it is important to single out relevant identical knowledge (which makes the logistician a generalist) and relevant specialist knowledge for certain areas (which makes the logistician a detailist). As this research is primarily aimed at logisticians with university education. The results of the research can be used to create or improve a study program in logistics that would adequately respond to the needs of the Serbian economy.

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