

Biljana Cvetić, Dragan Vasiljević, Miloš Danilović  
University of Belgrade, Faculty of Organizational Sciences, Serbia

# Competence Requirements for Logistics Managers in the Republic of Serbia

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**Abstract:** This paper examines the competences that the employers in the logistics and supply chain management (SCM) field require most from employees in the Republic of Serbia. To identify these competences, we conducted a study of online advertisements of logistics and SCM jobs published in the renowned national job portal Infostud. We used a deductive content analysis and related quantitative indicators to process and analyse the data. The results, among other conclusions, indicate the most required professional and fundamental competences from the logistics and supply chain managers in the Republic of Serbia. When the results of this study are compared to several earlier studies done in the US, the United Kingdom and Germany, some similarities between these empirically obtained results are found. Several recommendations for educators that intend to improve study programmes and plans in the field of logistics and SCM are also offered. The results of this study can be valuable to interested educators, to individuals who are interested in logistics and supply chain career development, to human resource managers who are recruiting candidates for these jobs, and to other interested parties.

**Keywords:** logistics, supply chain management, managers, competences, study, job advertisements, the Republic of Serbia.

**JEL Classification:** M11, M12, M19.

## 1. Introduction

Today, logistics and supply chain management make a very attractive field for a professional career. The competences in this field are recognized as one of the ways to improve the market position of supply chain participants. Thus, these competences are increasingly gaining in importance and increasingly required in the business environment. At the same time, some research points out to the gap between the market needs regarding competences of logistics and supply chain managers and acquired competences of graduates – future candidates for these positions (e.g. Closs, 2000; Wong et al., 2011; Lutz & Birou, 2013; Sinha, Millhiser & He, 2016). Accordingly, the number of important questions can be posted in this sense, and here, we have tried to answer the following one: "What competences are most expected from the logistics and supply chain managers by the employers in the Republic of Serbia?"

The aims of the paper are to identify the most required professional and fundamental competences of logistics and supply chain managers in the Republic of Serbia and to derive general recommendations for improvement of the study programmes and plans in the relevant field. In order to achieve these aims, an empirical study of job advertisements (ads) in the field of logistics and SCM is designed and conducted. The study is based on the assumption that the contents of the published job ads in the field of logistics and SCM are a valid representative of employers' demand for the managers in this field (e.g., the assumption of this

type was used in the area of information systems and technologies (IST), see Todd, McKeen & Gallupe, 1995; Kennan, et al., 2007). The idea for conducting this type of study in the Republic of Serbia primarily came from similar empirical research done in the US (Sodhi, Son & Tang, 2008; Radovilsky & Hegde, 2012) and in the United Kingdom (Cacciolatti & Molinero, 2013). We wanted to offer relevant results related to domestic market and to draw comparative conclusions based on previous studies.

The remainder of the paper is organized as follows. In the next section, a review of studies on competences of logistics and supply chain professionals is given. In Section 3, the methodology of the study is presented, with attention regarding content analysis and two related quantitative indicators. In Section 4, the results of a study of job ads in the field of logistics and SCM conducted in the Republic of Serbia are presented. In Section 5, the results of the study are discussed and compared with the several empirical studies from the US, the United Kingdom and Germany. Finally, some concluding remarks are offered.

## 2. Literature review

A number of studies considered human resource issues in the fields of logistics and supply chain management. Some of these studies focused on developing framework, concept or model of competences of logistics and supply chain professionals, and/or their use for testing the importance of a wide variety of their competences. Thus, the well-known BLM (Business, Logistics and Management) framework originally developed by Poist in 1984 (Murphy & Poist, 1991) presents all skill requirements for logistics professionals under three main categories, namely business, logistics and management skills. The first version of BLM framework considers a total of 83 competences. Afterwards, Poist worked with Murphy on further development of this framework and its application in the US (e.g. Murphy & Poist, 1991; Murphy & Poist, 2006; Murphy & Poist, 2007). Some researchers like Mangan, Gregory & Lalwani (2001), Razzaque & Sirat (2001), Thai, Cahoon & Tran (2011) also used the BLM framework in their research. Gammelgaard and Larson (2001) identified 45 supply chain management competences that are required for logistics managers and grouped them under interpersonal/managerial basic skills, quantitative/technological skills and SCM core skills, with some overlaps in these groups. Giunipero and Percy (2000) described 7 key skill sets for supply managers and pointed to the most important skills for them. In further work, Giunipero with colleagues continued examining specific skill areas for the supply managers (Giunipero, Denslow & Eltantawy, 2005; Giunipero, Handfield & Eltantawy, 2006). Myers, et al. (2004) considered skill requirements for logistics managers through the following groups: social, decision making, problem solving and time management skills. Mangan and Christopher (2005) presented two key knowledge areas (general and logistics/SCM specific) and key competences/skills required by logistics and supply chain managers, without explanation for this division of terms. The famous organization APICS (Association for Operations Management) developed five competence models for professionals in the field of operations management, concretely for supply chain managers, materials managers, buyer-planners, distribution and logistics managers, and master scheduling managers (APICS, 2014). Cvetić (2016) presented the competence model for logistics and supply chain managers that were developed on the basis of several competence concepts and models for logistics/supply chain managers, available empirical studies of job ads in the field, and an overview of a few relevant occupational standards.

Up to now, several empirical studies were carried out with the aim to identify competences really required from the professionals in the field of logistics and SCM. These studies analyse the content of published job ads in the field of logistics and SCM. It is believed that the first one is conducted in 2007 by Radovilsky, Hegde and Kandasamy, in order to identify the required knowledge and skills for executing the jobs in the field of logistics and SCM, and their connection with the offer of study programmes and subjects in the relevant field in higher education institutions (according to Radovilsky & Hegde, 2012). Thereafter, Radovilsky and Hegde (2012) repeated their study and presented major changes in the content- and skill-based categories of the SCM job requirements in the US. Sodhi, Son and Tang (2008) analysed job ads for MBA graduates and derived lists of supply chain topics and broad skills required by employers. Further, they indicated how MBA-level SCM programmes of the top business schools in the US respond to that employers' needs. Rossetti and Dooley (2010) analysed job ads associated with the field of SCM and pointed out three major types of SCM jobs, namely sourcing manager, operations consultant and supply chain information manager. Cacciolatti and Molinero (2013) collected SCM job ads in the UK and after a detailed analysis concluded that all SCM jobs could be grouped into two main categories "managers" and "clerks". Additionally,

they identified the most preferred skills and personal characteristics required from employees and offered practically-oriented recommendations for designing logistics and SCM courses. Kotzab and Wünsche (2015) considered the primary and secondary qualifications for logistics jobs in Germany. It can be concluded that although the empirical studies of this type are very useful to understand the employers' real needs, there is a lack of them in some developed but especially in developing countries.

There are also a lot of other interesting papers that examine the competences of the logistics and supply chain professionals from different perspectives (Ellinger & Ellinger, 2013; Lorentz, et al., 2013; Lutz & Birou, 2013; Prajogo & Sohal, 2013; Sohal, 2013; Hohenstein, Feisel & Hartmann, 2014; Dubey & Gunasekaran, 2015; Cvetic, 2016; Derwik, Hellström, & Karlsson, 2016; etc).

### 3. Methodology

The study of logistics and SCM job ads was conducted in 2014 in the Republic of Serbia (Cvetic, Vasiljevic & Danilovic, 2015; Cvetic, 2016). The relevant job ads were collected from 1 April to 1 July 2014 in the renowned domestic job portal Infostud (<http://poslovi.infostud.com>). The total of 37 ads was collected and coded. Then, the two of them were excluded because of their sole focus on the provision of consultancy services related to specific modules for material management, production planning, and control of one known ERP (Enterprise Resource Planning) solution. Also, some doubts exist in relation to five more ads because of the names of the positions, but finally, they were included based on their contents. Finally, the ads were analysed by deductive content analysis.

Generally, the content analysis is used to systematically and objectively describe and quantify certain phenomena (Elo & Kyngäs, 2008, p. 108), and "precisely the deductive content analysis is used when the structure of analysis is operationalised on the basis of previous knowledge" (Elo & Kyngäs, 2008, p. 109). Some of the advantages of using this method for the analysis of job ads are (Cvetic, Vasiljevic & Danilovic, 2015; Cvetic, 2016):

- The contents of ads portray the real needs of a company. The main aim of listed data in ads is to satisfy the specific requirements of a company, without thinking about the needs of research.
- The limitations in terms of a sample size do not exist, because of use of the secondary data.
- The analysis during the time is easier with secondary data use.
- The changes regarding the required competences for specific jobs can be followed. (Derived from Todd, McKeen & Gallupe, 1995, p. 24).

On the other hand, the obstacles to using this method for the analysis of job ads are:

- The contents of job ads do not have a consistent structure, and they vary in detail. This greatly complicates attempts to compare some data. (Todd, McKeen & Gallupe, 1995, p. 24)
- The developing of coding scheme and/or the process of coding words, terms, and phrases require a lot of time and efforts from the researcher.
- The specific existing software solutions for content analysis have different characteristics, and they mostly enable processing of data expressed in the English language (see Lowe, 2002).
- The obtained data must be considered in relation to limitations such as the time period and place of collecting data.

The deductive content analysis of observed ads from the field of logistics and SCM was conducted by using the competence model for logistics and supply chain managers (previously developed by the first author and presented in Cvetic, 2016), based on which the job-ads database was made in MS Excel. In the end, two quantitative indicators were used in order to analyze and present the results (for example, more indicators can be viewed in Todd, McKeen & Gallupe, 1995, p. 27). These are:

- the percentage of ads in which the specified competence has at least one occurrence; and
- an average number of occurrences of the specified competence per job ad.

The percentage of ads in which the specified competence has at least one occurrence ( $P_k$ ) represents the relation between the number of ads in which the competence  $k$  ( $k = 1, \dots, m$ ) has at least one occurrence ( $A_k$ ) and the total number of ads ( $N$ ).

$$P_k = \frac{A_k}{N} \cdot 100 \quad [\%] \quad (1)$$

The average number of occurrences of the specified competence per job ad ( $M_k$ ) represents the relation between the total number of occurrences of competence  $k$  in all ads ( $C_k$ ) and the total number of ads ( $N$ ).

$$M_k = \frac{C_k}{N} \quad [1] \quad (2)$$

It should be noted that the comprehensive coding scheme was not developed because the software solution which enables conducting the content analysis for data expressed in the Serbian language was not available at the time when the analysis was performed (Lowe, 2002).

#### 4. Results

The study included a total of 35 ads in the field of logistics and SCM that were published by domestic and foreign companies operating in the Republic of Serbia. Some of the jobs offered by employers are: logistics manager, supply chain manager, procurement and inventory control manager, warehouse and transport manager, distribution centre manager, etc. More than half of jobs were offered in Belgrade (51.43%), followed by Novi Sad (11.43%), Ruma (11.43%), Kragujevac (5.71%) and seven other towns (each with 2.86%). The largest number of jobs was offered by international companies that do business in the Republic of Serbia (68.57%) compared to national companies (31.43%). The jobs were mostly offered in the manufacturing industry (57.14%), followed by those in wholesale and retail trade, repair of motor vehicles and motorcycles (17.14%), transportation and storage (17.14%), construction (5.71%), and agriculture, forestry and fishing (2.86%). A closer look at the manufacturing section shows that the largest number of jobs was offered in the following industries: manufacture of motor vehicles, trailers, and semi-trailers, manufacture of beverages, manufacture of textiles, repair, and installation of machinery and equipment, etc.

The job ads vary in structure, but generally, they include the data about the job title, job location, job description, competences required from candidates, and instructions on how to apply for the open positions. Also, more than half of ads included the main data about the company that offered a job. In connection with this, it is interesting that only 17.14% of ads contain the official website of the company. Next, the driving licence of B category was required for almost all open positions. The data about salary were not given in any of the ads. The number of ads published in English (45.71%) was a little smaller in comparison with the ads published in the Serbian language (54.29%).

The results show that, regarding education, at least a university degree is required for 60% of the observed open positions in the field of logistics and SCM. Secondary school qualification as a minimum requirement was present in 28.57% of ads and the possibility of having a two-year post-secondary school qualification or university degree was present in 2.86% of ads. The requirement for an eligible candidate to have a university degree from a specific faculty was not present in any of the ads. Generally, when the desirable faculties/study programmes were mentioned, the three or more possibilities were given (for faculties: Faculty of Organizational Sciences, Faculty of Transport and Traffic Engineering, Faculty of Economics, Faculty of Mechanical Engineering, Faculty of Electrical Engineering, and similar; for study programmes: logistics, operations management, industrial engineering or similar). Requirements regarding education were not explicitly cited in 8.57% of ads. When it comes to previous work experience, it was required for 80% of positions and desired for 14.29%, while for 5.71% of positions it was not mentioned. At least one year of relevant experience was required in 11.43% of total number of ads, a minimum of two years of experience was required in 20% of ads, a minimum of three years of experience was required in 17.14% of ads, a minimum of five to eight years was required in 14.29% ads, while in the remaining 17.14% ads the data were not given.

When it comes to the professional and fundamental competences, two indicators were used in order to analyze them. These are the percentage of ads in which the specified competence has at least one occurrence ( $P_k$ ); and the average number of occurrences of the specified competence per job ad ( $M_k$ ) (Tables 1 and 2). It was concluded that the five most required professional competences according to both of these indicators are: performance management, demand forecasting and inventory management, customer relationship management, supplier relationship management, and manufacturing management (Table 1). On the other hand, the most required fundamental competences are: communication, planning, and organizing of tasks, foreign languages, basics of IST (special focus on spreadsheets and databases), interpersonal skills, team-work, solving problems, business management, etc (Table 2).

**Table 1:** Indicators of professional competences of a logistics and supply chain manager

<b>Professional competences of a logistics and supply chain manager</b>	$P_k$ [%]	$M_k$ [1]
Performance management	74.29	2.23
Demand forecasting and inventory management	71.43	2.20
Customer relationship management	68.57	1.54
Supplier relationship management	48.57	1.51
Manufacturing management	45.71	1.49
Warehouse management	40.00	1.09
Transportation management	37.14	0.77
Distribution management	34.29	0.94
IST as a function of logistics support	34.29	0.71
Lean management	31.43	1.23
International logistics	22.86	0.31
Maintenance management	17.14	0.29
Reverse and green logistics	11.43	0.17
Product introduction into the market	5.71	0.14
Designing supply chain	2.86	0.03

Based on these results, several general recommendations can be derived with the aim to improve the study programmes and plans in this field. These are:

- Find proper ways how to enable students to gain relevant and possible work experience in the field of logistics and SCM and prepare them for a fast understanding of supply chain processes during their study days. Some of the potential ways could be: relevant internship, monitored and guided by a mentor from enterprise and a mentor from the faculty (e.g., this type of internship is applied in the institutions of higher education in France, such as Ecole Centrale Paris, Université Paris 1 Panthéon Sorbonne); working on different kinds of papers (like seminar papers, project papers, etc) in which the concrete processes/activities of some company or supply chains must be presented, among other things; organizing study tours of companies, etc. The importance of this type of recommendation for the institutions of higher education in the United Kingdom and Germany is also emphasized (Cacciolatti & Molinero, 2013; Kotzab & Wünsche, 2015).
- Analyze and improve the existing contents of study programmes and plans according to expected professional and fundamental competences from the logistics and supply chain managers by the employers in the Republic of Serbia. To this end, the focus should be on practically applicable topics with the adequate presence of strategy-oriented topics. Similarly, the recommendation in relation to an increasing number of practice- or process-oriented topics and the decreasing number of conceptual and strategy-oriented topics for institutions of higher education in the US is given in Sodhi, Son and Tang (2008), p. 482.
- Analyze and improve the existing combination of teaching methods in order to better prepare graduate students for effective and efficient communication, team-work, solving problems, etc. Therefore, behind the traditional teaching methods, the educators should use logistics and SCM games, simulations, spreadsheet applications, educational versions of ERP packages, case studies, etc.



**Table 2:** Indicators of fundamental competences of a logistics and supply chain manager

<b>Fundamental competences of a logistics and supply chain manager</b>	$P_k$ [%]	$M_k$ [1]
Communication	88.57	2.00
Planning and organizing of tasks	82.86	2.14
Foreign languages	82.86	1.09
Basics of IST (special focus on spreadsheets and databases)	80.00	0.91
Interpersonal skills	77.14	1.66
Team-work	77.14	1.17
Solving problems	62.86	0.91
Business management	57.14	0.71
Continuous learning	45.71	0.97
Decision making	42.86	0.49
Leadership	34.29	0.71
Integrity	22.86	0.31
Project management	22.86	0.31
Math and statistics	22.86	0.23

It is believed that the higher education institutions with the help of these recommendations can contribute to narrowing the gap between the market needs regarding competences of logistics and supply chain managers and acquired competences of graduates – future candidates for these positions. Also, other types of improvements of study programmes and plans in this field are not excluded.

## Discussion of results

According to the available data, this is one of the first empirical studies of job ads in the field of logistics and SCM which is conducted in the Republic of Serbia. The results of this study are interesting as they are derived from the real requirements of employers for the professionals in this field. However, these results should be considered in the light of the following limitations: one time period of collecting data in 2014, one job portal, and the Republic of Serbia as a geographic area where jobs were followed. Several other studies that will be used for drawing comparative conclusions (Sodhi, Son & Tang, 2008; Radovitsky & Hegde, 2012; Cacciolatti & Molinero, 2013; Kotzab & Wünsche, 2015) are also limited in the time period of collecting data and in a geographic area.

The results of this study show that what the employers in the Republic of Serbia always expect from the future logistics and supply chain managers, regarding education and work experience, are a university degree in the field of technical or economic sciences and relevant work experience. In some cases, they are open for candidates with a minimum secondary school qualification and extensive work experience that includes supervisory experience within a specific industry area. Two other studies that were done in the United Kingdom and Germany (Cacciolatti & Molinero, 2013; Kotzab & Wünsche, 2015) also emphasize the importance of relevant work experience and the ability of fast understanding of logistics and supply chain processes. Thus, Cacciolatti and Molinero (2013) have found that previous experience in a similar position and understanding of the job/industry processes are the most required skills from employees. Kotzab and Wünsche (2015) recognized relevant work experience as “the most important qualifier for an employment position in logistics” (p. 517).

As regards professional competences, the most demanded from potential candidates in the Republic of Serbia are: performance management, demand forecasting and inventory management, customer relationship management and supplier relationship management; while a reverse and green logistics, product introduction into the market and designing supply chain are the least demanded professional competences (see Table 1). These obtained data might be compared with findings of a study done in the US by Sodhi, Son and Tang, 2008 (p.474-475). That study, among other conclusions, found that sourcing and supplier management, and inventory and forecasting (that can be related to supplier relationship management and demand forecasting and inventory management) were clearly quite important skills to US employers. Furthermore, skills pertaining to marketing and channel restructuring, and metrics and performance (that can be related to customer relationship management and performance management) are very important to em-

ployers. On the other hand, product design and new product introduction, reverse logistics and green issues, and location and supply chain design are among the least demanded skills from candidates in the US. Accordingly, there are some similarities between these empirically obtained results.

When it comes to fundamental competences, a number of these competences are required for more than the half of job openings (see Table 2). Among all of them, the communication can be seen as the most important to Serbian employers. The findings of some empirical research in the US (e.g. Sodhi, Son & Tang, 2008; Radovilsky & Hegde, 2012) also point out the communication as the most demanded competence. According to Sodhi, Son and Tang (2008, p. 475), communication includes verbal, written and presentation skills, and is the most important category of broad skills to US employers. Radovilsky and Hegde (2012) longitudinally compared job requirements in SCM and found that communication remained the most required skill-based category. Other fundamental competences, such as planning, organizing of tasks, foreign languages, basics of IST (special focus on spreadsheets and databases), interpersonal skills, team-work and solving problems, are also very demanded from job candidates in the field of logistics and SCM in this country. Some of these competences are recognized as very important in the mentioned studies done in the US. Thus, broad skills from categories team (which includes interpersonal skills and team-related skills) and general analytical skills (which include analysis, general abilities and problem-solving skills) are highly in demand from candidates in the US (Sodhi, Son & Tang, 2008, p. 475), while the skill-based categories: team work, general analytical and problem solving, spreadsheet and database, and ERP and other software, follow category communication by relevance in a study done by Radovilsky and Hegde (2012, p. 176).

Additionally, it is interesting to comment on the importance of foreign languages for the employers in the Republic of Serbia, especially of the English language. Thus, good knowledge of foreign languages is required for more than 80% of positions, and especially knowledge of English for more than 70% of positions (precisely 74.29%). Knowledge of the Russian language is required for 5.71% of positions, the Italian language also for 5.71% of positions, while knowledge of German and French besides the English language is considered as an advantage for several positions. Only companies which exclusively operate on the domestic market do not mention the knowledge of the English language as a prerequisite for eligible candidates. On the other hand, in the English-speaking countries, the situation is completely different and the knowledge of foreign languages is not given great importance (e.g., Murphy & Poist, 2006; Radovilsky & Hegde, 2012). Therefore, the communication in the English language is implied in domestic/regional/global supply chains.

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## Conclusion

This is one of the first empirical studies of job ads in the field of logistics and SCM conducted in the Republic of Serbia. The importance of this study lies in an attempt to perceive the real market needs in terms of professional and fundamental competences of logistics and supply chain managers and to give general recommendations to institutions of higher education to address these needs. The results of this study can be useful to academics who are trying to improve programmes and/or subjects in the field of logistics and SCM, to professional associations that are providing training and certification, to individuals who are interested in career development, to human resource managers who are recruiting candidates from this field, and to other interested parties.

In future, the empirical studies of this type in this country should be repeated in order to follow changes in terms of required competences of logistics and supply chain managers and to reach a higher level of generalization of findings. It will be interesting to draw conclusions about employers' knowledge and preferences for candidates. Also, a new international empirical study of relevant job ads can be prepared and organized with the aim to compare the competence requirements for logistics and supply chain managers in the different business environments of selected developed, developing, and underdeveloped countries.

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## About the Author

**Biljana Cvetić**

University of Belgrade, Faculty of Organizational Sciences, Serbia  
biljana.cvetic@fon.bg.ac.rs

Biljana Cvetić is a teaching assistant at the Faculty of Organizational Sciences (FOS), University of Belgrade, Serbia. She earned her BSc, MSc and PhD degrees in operations management from the FOS, University of Belgrade. She also earned the MS in Industrial Engineering Systems from the Ecole Centrale Paris (France). Her research interests include logistics and supply chain management (SCM) as well as computer integrated manufacturing management.

**Dragan Vasiljević**

University of Belgrade, Faculty of Organizational Sciences, Serbia  
dragan.vasiljevic@fon.bg.ac.rs

Dragan Vasiljević is a professor of Computer Integrated Manufacturing and Logistics at the FOS (Faculty of Organizational Sciences), University of Belgrade. He received his PhD degree in the field of logistics and operations management at the same faculty. He published more than hundred papers in peer-reviewed journals, conference proceedings and industry reports. He is the author or co-author of four books: Computer Integrated Logistics: Models and Trends, Logistics and Supply Chain Management, Fundamentals of Operations Management and Kaizen: Japanese Paradigm of Business Excellence that are used as textbooks at the FOS' Department of Operations Management. His current research interests and areas of expertise include lean and high-performance manufacturing, logistics management and supply networks. Dr Vasiljevic has extensive experience in numerous consulting projects done for domestic and foreign companies and also serves on several editorial boards.

**Miloš Danilović**

University of Belgrade, Faculty of Organizational Sciences, Serbia  
milos.danilovic@fon.bg.ac.rs

Miloš Danilović was born in Belgrade, Serbia, on April 1985. He received his Bachelor's Degree (2009) and Master's Degree (2011) at Faculty of Organizational Sciences (FOS), University of Belgrade. Now, he is a PhD student in the field of Operations Management at the FOS. He currently works as a Teaching Assistant at Department of Operations Management at the FOS. His main research interests and areas of expertise include algorithms, combinatorial optimization problems, supply networks, scheduling theory, operations management and computer integrated manufacturing systems. He has published several papers as an author or co-author in leading journals such as Journal of Manufacturing Systems, International Journal of Production Research, Computers and Operations Research and more. He is a member of the technical committee of the International Symposium of Entrepreneurs and Scientists – SPIN.

