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PERSPEKTIVE HRVATSKE LOGISTIČKE INDUSTRIJE U PRIVLAČENJU MEĐUNARODNIH ROBNIH TOKOVA

PERSPECTIVES ON CROATIAN 3PL INDUSTRY IN ACQUIRING INTERNATIONAL CARGO FLOWS



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Authors	Papers	Page
1. Banović, B. Fiolić, M. Babić, D.	VALUE ASSESSMENT OF TRAFFIC SIGNS RETROREFLECTION IN THEIR LIFE CYCLE	1-9
2. Čefko, D. Šafran, M. Tomašić, D.	MULTI-ECHELON INVENTORY OPTIMIZATION	11-20
3. Dijanić, H. Šalamun, V. Ščukanec, M.	ANALYSIS OF TRANSPORT INSURANCE MARKET IN REPUBLIC OF CROATIA	21-27
4. Gotić, M. Ščukanec, A. Sokol, H.	ANALYSIS OF THE NORM HRN EN 1317-3: 2011 FOCUSING ON TRAFFIC SIGNALIZATION WITH THE PURPOSE OF PASSIVE PROTECTION OF ROAD USERS	29-40
5. Gregurić, M. Ivanjko, E. Korent, N. Kušić, K.	SHORT REVIEW OF APPROACHES FOR VARIABLE SPEED LIMIT CONTROL	41-52
6. Ivaković, M. Šolman, S. Jurčević, M.	ANALYSIS OF HUMAN RESOURCES STRUCTURE IN THE SEGMENT OF TRANSPORT	53-63
7. Kolarovszki, P. Tengler, J. Peraković, D. Madlenák, R.	IDENTIFICATION AND MONITORING OF THE CONTAINER AT THE POSTAL OPERATOR	65-75
8. Kučera, T. Hyršlová, J.	INNOVATIVE APPROACH TO INVENTORY MANAGEMENT AND WAREHOUSING: A REVIEW AND A CASE STUDY	77-88
9. Lopac, A. A. Rogić, K. Rožić, T.	THE ROLE OF INTEGRATED LOGISTICS SUPPORT IN ENHANCING THE RELIABILITY OF LNG IMPORT TERMINALS	89-102

Authors	Papers	Page
10. Maretić, D. Šafran, M. Šuljagić, N.	INFLUENCE OF MAXIMUM STOCK ON THE SUPPLY CHAIN	103-109
11. Marinčić, M. Stanković, R. Pašagić Škrinjar, J.	OPTIMIZING VEHICLE ALOCATION IN THE RENT-A-CAR NETWORK BY APPLYING MATHEMATICAL MODEL	111-118
12. Mitrović, A. Ščukanec, A. Babić, D.	IMPACT OF WINTER MAINTANANCEON RETROREFLECTION OF ROAD MARKINGS	119-127
13. Mostarac, N. Pavlin, S. Modić, A.	AIR SHOW AIRSPACE MANAGEMENT CONCEPT	129-136
14. Novačko, L. Ferko, M.	TRAFFIC FLOW MANAGEMENT IN EMERGENCY SITUATIONS	137-147
15. Rabadia, H. Sikora, I.	CUSTOMIZING RISK ASSESSMENT FOR OPERATION IN CHALLENGING ENVIRONMENT	149-156
16. Radonjić Đogatović, V. Radojičić, V. Marković, G. Kostić-Ljubisavljević, A.	DEPLOYMENT STRATEGIES OF FTTH TECHNOLOGY IN THE SERBIAN BROADBAND MARKET BASED ON PRICE AND MARKETING IMPACTS	157-169
17. Rihtarić, M. Klongsungsorn, P. Bajor, I.	REVERSE LOGISTICS WAREHOUSE PROCESS OPTIMIZATION	171-179
18. Short, J. Sikora, I.	HAZARD IDENTIFICATION IN PART-145 APPROVED MAINTENANCE ORGANISATIONS: THE MANAGEMENT OF RISK ATTITUDE	181-191

Authors	Papers	Page
19. Sikora, I. Patriarca, R. Di Gravio, G. Constantino, F.	MARS – A FRESH LOOK AT RISK ASSESSMENT MODELLING AND EFFECTIVE SAFETY DATA COMMUNICATION	193-209
20. Skoko, I. Jurčević, M. Lušić, Z.	OVERVIEW OF THE WORLD MARITIME FLEET AND FLOWS WITH REFERENCE ON THE FLEET AND PORTS IN THE REPUBLIC OF CROATIA	211-219
21. Špehar, T. Rožić, T.	POSSIBILITIES OF INTERCITY INTERMODAL DISTRIBUTION DEVELOPMENT ON SHORT DISTANCE	221-229
22. Švehla, A. Božić, D. Stanković, R.	ALLOCATING DELIVERY VEHICLES WITHIN THE TRANSPORT NETWORK BY APPLYING MATHEMATICAL MODEL	231-240
23. Vidović, A. Štimac, I. Zečević-Tadić, R.	OPERATIONAL RECOMMENDATIONS AND RESTRICTIONS FOR REDUCING NOISE AT AIRPORTS	241-251
24. Višnjić, V. Stažnik, A. Babić, D.	ANALYSIS OF CUSTOMS VIOLATIONS IN THE REPUBLIC OF CROATIA	253-262
25. Živković, M.	EUROPEAN TRANSPORT STRATEGIES AFFECTING REPUBLIC OF CROATIA	263-274

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ANALYSIS OF HUMAN RESOURCES STRUCTURE IN THE SEGMENT OF TRANSPORT

ABSTRACT

In the global environment activity companies use different means of transportation with transport process intermissions in ports, terminals and logistics distribution centers which to achieve a certain level of service quality within the supply chain requires professional and educated workforce.

Human resources management, according to referential author's researches, using different methods result in reducing the number of manipulations, fast and safe transportation of goods, reducing costs and optimizing the organizational aspect.

This paper provides recent research in the field, specified methods of human resource management, enhanced impact on the efficiency of the supply chain, and describes the analysis of the structure of human resources in the storage and transport segment.

KEY WORDS

human resources, supply chain management, human resources management, transport

1. INTRODUCTION

Human resources management in the supply chain represents commonly significant factor in the success of business companies. Competence and quality structure of employees directly influences the increased competitiveness of business, reduces costs and achieves lower price levels for services provided within the supply chain [1].

Successful and competitive qualified companies in the global environment give the increasing importance to human resources management with a variety of methods including the selection of employees, continuing education and training, professional seminars, training courses, team building and other forms of raising the level of knowledge and motivation of employees. From the foregoing it follows that the essential function of human resources in the supply chain is to quickly and efficiently find optimal solutions for connecting different transport modes in a continuous process of transport, storage and other operations from the initial to the final point of goods delivery [1].

Human resources management as a category in company's business gets more important because it encourages the development of production, distribution and marketing activities. Existing and planned level of employment should be managed in a way to achieve maximum effect in the business with minimum cost and a high level of satisfaction of all

participants in the production, transport and distribution process as well as meeting the needs and desires of consumers [2].

The aim of this paper is to review recent research of reference authors in the field of human resources management and models that are applied in this area at the global level. A review of research will include the territory of the Republic of Croatia, overview of terms and settings related to the specific characteristics and problems of managing supply chains primarily with technical and technological and organizational point of view, and will state the final guidelines for further research areas.

2. KEY FUNCTIONS OF HUMAN RESOURCES IN THE SUPPLY CHAIN

For the concept of human resource management authors in [4] used different terms, such as human capital, intellectual capital etc. According to [2] the link between human resources management and transport in the supply chain system, reflects in order to increase the total created value of the product or service while success in achieving this goal is the difference between the value that the product or service has to the customer and the value of resources spent.

Authors [3] state that in the supply chain system and connecting all its components and elements, human resources have one of the key roles because they realize the set tasks, and this affects the organization of the process, uniformity of procedures, level of education, motivation, teamwork, and a host of other factors. According to [5] and [6] in Republic of Croatia many companies give the increasing importance to human resources management because in line with scientific and technical research the quality staff contributes competitiveness and business performance.

The key functions of human resources in the supply chain according to [1] and [3] can be divided into several stages where in each of them the human factor affects the dynamics and the way the logistic processes work:

- Collection and processing of offers for transportation represents the administrative tasks of communication with various operators at local, regional or national level.
- Organization of transport requires knowledge of the capacity and performance of vehicles, and the choice of transport routes.
- Transport process requires highly qualified and trained staff for handling and managing the transport vehicles.
- Delivery of goods to the end user represents administrative chores and physical delivery of goods.

3. FACTORS OF HUMAN RESOURCES MANAGEMENT IN THE SUPPLY CHAIN

According to [1] and [4] one of the key factors for optimal performance of the transport operations, transshipment, storage and delivery of goods to the consumer are the employees who carry out these operations. The fundamentals of the management and planning of human resources are:

- well-organized supply chain
- uniformity of procedures
- recruitment
- level of education
- motivation

- remuneration for work.

3.1. Business Management in the Supply Chain System

Human resources planning in the supply chain is a complex process due to the dynamic and spatial dimension realization of transport process. In [7] it is stated that planning is an integral part of the overall business of the company, and it can be seen as a long-term (strategic), medium term (tactical) and short term (operational planning).

According to the same source on the basis of well-designed strategies and plans (Figure 1), human resource management in modern business is an imperative for managers in transport. In transport activities there is a high turnover of staff, occupational diseases are very common and legislative regulations, international conventions and EU directives as well as a number of other limiting factors have significant effect.

In order to obtain benefits in the supply chain process such as:

- transport rationalization,
- reducing the cost of transshipment and labor cost,
- better utilization of transport equipment and employees in transport,
- usage of standardized transport units (pallets, containers),
- in [7] and [9] it is stated that it takes a systematic approach to the management and optimization of the supply chain as a whole to realize plans and strategic goals of the company.

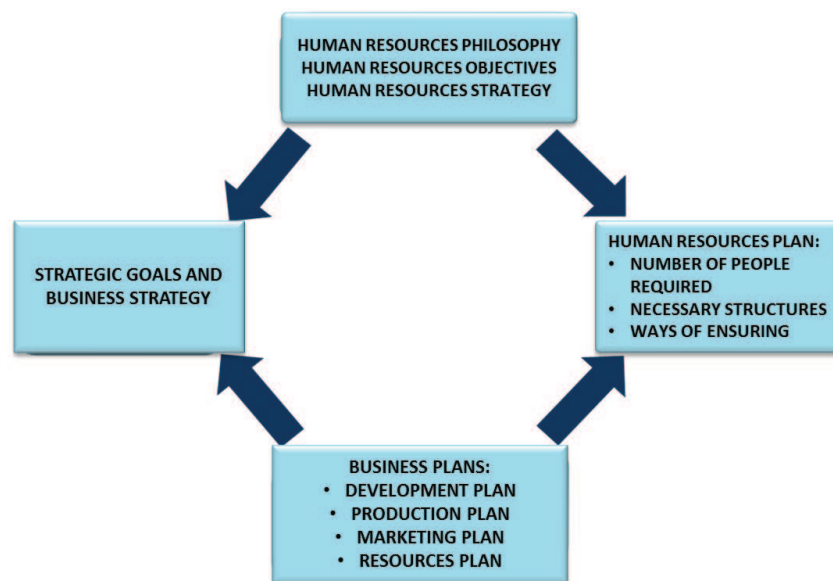


Figure 1 - The correlation between strategy and planning of human resources

Source: [7]

3.2. Analysis of the Role and Importance of Human Resources in Logistics Systems

Transport companies today have access to modern means of transport, loading and unloading equipment use or own warehouses, logistics and distribution centers, which requires a large number of operational workers of different professions and skills. The above shows and is stated in [9] that human resources must be satisfactory from quantitative and

qualitative aspects. Because of the relevance and definition of employees involved in the supply chain processes research was carried out, and some of the data collected are shown in this paper. According to Croatian Bureau of Statistics [8] until the date 31st March, 2014 in the Republic of Croatia in the sector of transportation and storage the number of employees was:

- in crafts and trades and free lances in transportation and storage: 13.295
- in legal entities in transportation and storage: 57.981.

These data show that the ratio of employees in crafts and employees in legal entities is about 1:5, while the structure of the employees shown in Chart 1 shows that the largest proportion of employment is in legal entities of private, then state ownership.

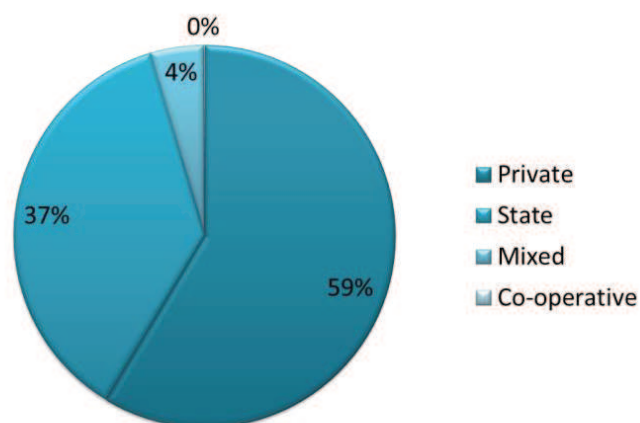


Chart 1 - Structure of persons employed in legal entities, by types of ownership, situation on March 31, 2014.

Source: [8]

According to the Statistical Yearbook of the Croatian Bureau of Statistics, made in 2015 in legal entities by educational attainment 53,645 employees were processed and the following structure is shown in Table 1:

Table 1 - The share of employment in the sector of transportation and storage after the qualification structure in relation to the number of employees in Republic of Croatia.

Educational attainment	Persons in paid employment in legal entities in Croatia	Persons in paid employment in legal entities in the sector of transportation and storage	Share of employment in the sector of transportation and storage in Croatia in %
University degree	223.427	4.979	2,2
Non-university college degree	87.446	4.185	4,8
Secondary school education	499.738	32.904	6,6
Basic school education	26.560	2.265	8,5
Highly skilled	14.212	1.101	7,7
Skilled	79.564	6.322	7,9
Semi-skilled	17.603	486	2,8
Unskilled	58.906	1.403	2,4
Total	1.007.465	53.645	5,3

Source: [8]

These data show that employees with a university degree, college and secondary school education participate in the total number of 53,645 employees with 78.42%, respectively with this degree there are 42,068 employees. It is also evident from the presented indicators that there is a relatively small proportion of employees with higher (7.8%) and high (9.3%) education. But from these data the structure of employees by occupation within the transport sector is not visible, which is necessary to thoroughly investigate and demonstrate because precisely the structure by profession is the basis for creating models of human resources management in the supply chain.

3.3. Human Resources Management

In modern business systems according to [4], [7] and [9] attention of management structures is focused on the creative potential of individuals who by solving problems and introducing changes and innovations directly affect the efficiency of resources, operating results and companies competitive position. In addition to encouraging creativity in human resources management, an important segment according to [7] is the construction of motivational methods and techniques, which adds to tangible and intangible compensation or remuneration as a result of work performance as a product of work activities (Figure 2).

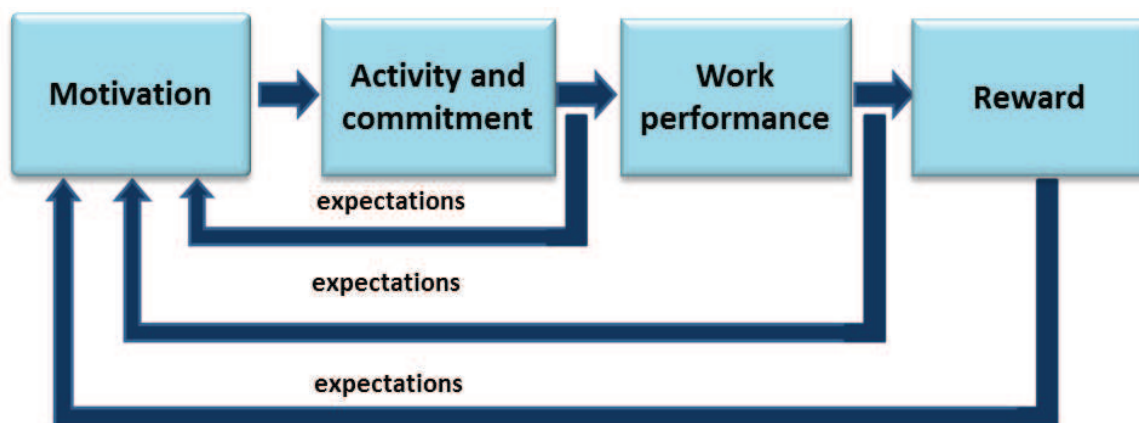


Figure 2 - General process model for work motivation

Source: [7]

4. APPLICATION OF METHODS FOR HUMAN RESOURCES MANAGEMENT IN THE SUPPLY CHAIN

At the global level specific research in field of human resources were carried out mainly in the industrial sector, while the research of these issues in the transport field were carried out as part of general research. For the research of the human resources problem different methods and models are structured with the largest portion oriented towards top management and managers. The authors in [13] describe the possible application of mathematical methods in companies human resources management. They propose business analysis based on the analysis of the dynamics and the existing procedures, and environment dynamic that continuously affects the business flow. The choice of mathematical models essentially depends on the input parameters and the narrow field of research and includes Markov chains, stochastic, linear and goal programming. Unlike purely mathematical modeling approach, the authors in [14] describe that human resources management should be observed from an organizational aspect, segmented into modules, and suggest the need

for measuring the outcomes in the various systems on the market. The proposed model of human resource management is viewed from two aspects, unique and pluralistic approach defined by interest groups.

Further studies included the proposal of the authors in [15] for the implementation of information systems for human resources management in the supply chain in the form of modules ERP (*Enterprise Resource Planning*) information system. ERP systems are information systems that consist of integrated software applications and include modules for planning, sales and production.

Research related to human resources management in businesses that are participants in supply chains include those of the authors in [11], which highlight the need for the identification and selection of qualified professionals in supply chain managing. They propose different methods of evaluating competence, optimization possibilities in organizing their own business structure and function within the supply chain, creating procedures, and development of criteria based on the analysis of the observed business structure.

Authors in [12] examine market changes in terms of the demand increase, and the impact and uncertainty of goods delivery from the suppliers. They expand the issues of responsibility of certain functions within the supply chain, and propose strategic and long-term relationships with subjects within the supply chain. The paper presents four case studies with the benefits of the application of human resource management on four levels, including the utilization of resources.

By using a comparative method, the authors in [16] represent the specificity of differently successful supply chains in different markets in terms of resource planning. Detailed studies were conducted with 913 business subjects within the supply chain and data used include data of qualitative and quantitative nature. Also, the authors pointed out the ways and the need for continuous measurement of logistics performances.

In addition, research was carried out in the form of professional studies such as research from 2005, ordered by the government of Canada, called *The Study of Human Resources Strategy in the Supply Chain Field* [17]. The modules processed: economic development, business and regulatory environment; the impact of technology on business; employment analysis; skills demand and prognosis; recruitment, training, development and retention; recommendations.

This Study processed the sector of transport and storage in the supply chain system, starting from the number of employees and their functions and duties. The main conclusions and recommendations of the Study are that in the structure of the supply chain it is necessary to define the skills and knowledge of employees, the ways of employment, training and advancement of human resources as well as their retention on their jobs in order to avoid excessive fluctuations. The findings of this Study suggest that this segment should also be further explored.

5. ANALYSIS OF THE HUMAN RESOURCES STRUCTURE IN THE SEGMENT OF STORAGE AND TRANSPORT IN CROATIA

Studies of human resources in Croatia, in particular those related to transportation systems exist, but they are made for individual companies or interest groups such as clusters in road transport. One of the largest studies which also processed the transport sector was conducted by The Institute of Economics, Zagreb in cooperation with the Croatian Chamber

of Economy, and was associated with greater project on the competitiveness of the Croatian economy [18].

Research goals of the segment of Republic of Croatia (the research was expanded to several countries of the European Union) were:

- to determine the status and development of certain functions (activities) and sub-functions of human resources in Croatian companies, and possible differences in the representation due to the size of the company, regional affiliation and activities branch;
- to record the heads of personnel departments opinion on the general meaning of each process;
- development of human resources activities for the near future.

The chart below indicates results obtained by companies in Republic of Croatia, divided into nine most important functions of human resources where the evaluation data of individual functions by the heads of the department of human resources were compared with the current state evaluated by expert evaluators.

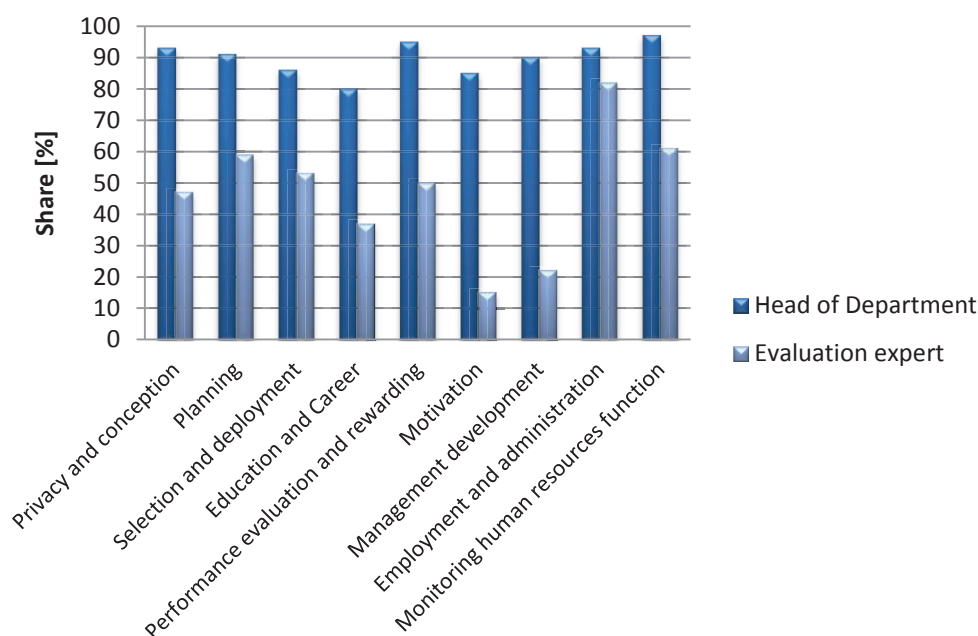


Chart 2 - The overall results by the group functions

Source: [18]

This extensive research of the human resource management is a basis for further studies that haven't been conducted since the global crisis occurred.

The issue of human resources management in Republic of Croatia is presented in several articles and book chapters, with the author's focus in [5], [6] and [19] placed on supply chains and logistics and distribution centers.

Further studies were carried out in January 2014 and included data collected by survey method, where the first part of the questionnaire was related to the activity of the company, organizational position of transportation, number of employees, staff qualifications in transport and the structure of the professions in transport. The second part of the questionnaire is related to the application of motivational methods, encouraging creativity and evaluating work performance of employees in transport. The questionnaire was sent to

seven companies with a significant market share in Republic of Croatia¹. Four companies responded to the questionnaire, which employ a total of more than 500 employees. In the first part of the questionnaire qualification structure in transport was analyzed where it is evident that the transport employs a total of 662 employees in all four companies out of which 478 or 72% are secondary school education and 104 or 16% are skilled workers, as shown in Chart 3.

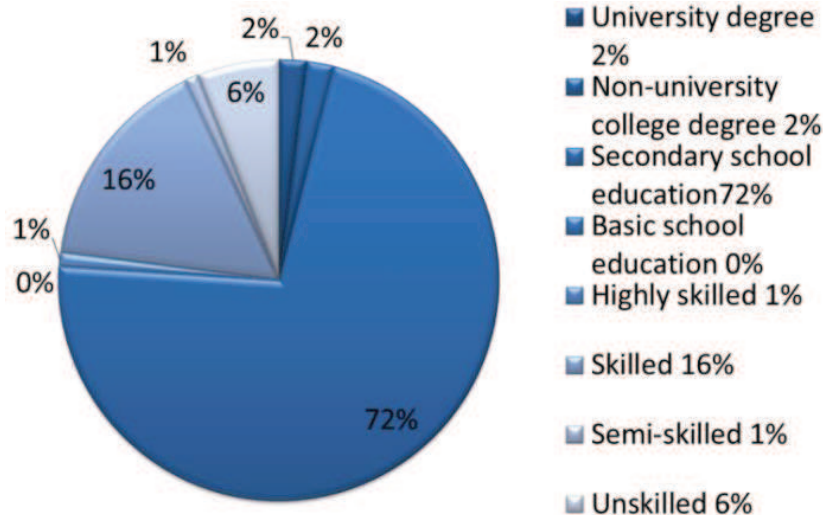


Chart 3 - Qualification structure in transport

By analyzing the structure of the professions in transport in Croatia predominant number of employees is of the transport profession and highly skilled and skilled drivers 44%. Also a significant proportion of employees occupy secondary school education technicians or 34%, while traffic engineers make up only 1% of the total number of employees, so it is necessary to investigate whether it would improve flow of the transport process and service levels in the supply chain by increasing the number of employees with university or college degree in traffic sciences as shown in Chart 4.

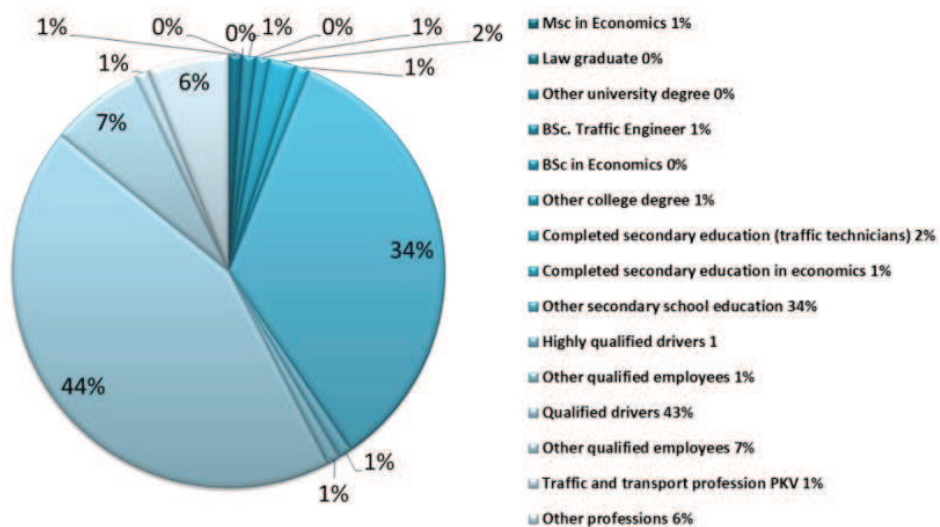


Chart 4 - The structure by occupations in transport

¹ Due to the signed non-disclosure agreement on data confidentiality obtained by the survey, the names of the companies are not included

These data show that the predominant number of employees in the surveyed companies make employees of transport profession, where secondary school education, highly skilled and skilled prevails, while there is a smaller proportion of graduate engineers and traffic engineers.

The second part of the questionnaire obtained data on the application of motivational methods, encouraging creativity and evaluation of work performance, which show that despite the fact that all four companies are privately owned, there are rules and regulations to encourage these activities.

6. CONCLUSION

In the global environment the business of the company requires certain approaches to management of processes in the supply chain, starting with the planning of each step in the transport realization of certain cargo to human resources management. Modern technologies condition the highest level of communication and implementation of information systems for the preparation and realization of transport in the supply chain, and this requires teamwork between experts and participants with the highest levels of education and acquired knowledge.

Research of human resources management in transport, with particular emphasis on supply chains were carried out mainly in the context of general studies in industrial and service sectors of the economy in Republic of Croatia. In order to achieve greater competitiveness and profitability of companies in the supply chain it is necessary to develop a strategic research demonstrating the adoption of development strategies and operational plans in the transport activities of the Croatian economy.

The general methodological approaches and methodologies that are accepted for research of human resources is necessary to adapt to the needs of the supply chain which features a number of different participants and where transportation can be realized with more transportation means of different modes of transportation.

Detailed analysis of the current situation in Republic of Croatia refers to the research of structures, level of equipment of transport and transshipment means, degree of organization, existing processes, uniformity of procedures, and measurement of the impact and engagement of employees in the supply chain flow. With systematic research it is necessary to separate the key parameters that directly affect the flow of the supply chain with the technological and organizational point of view, where technical and technological aspect includes establishing procedures and flows within the supply chains, processes and operations, employee involvement, transportation and manipulative means, and measurement of periods related to processing.

The organizational aspect involves defining the existing procedures, documentation, supporting information systems, and the level of employees education. In two of these aspects it is necessary to establish a direct and measurable impact of human resource management at the efficiency of supply chains.

Further research should include:

- Time intervals for the flow of goods in the supply chain
- Defining the procedures and operations and the division of labor of employees in the supply chain
- Defining the total cost of the transport process

- Availability of employees in the process of transport and capacity of transport equipment
- Measuring the impact of human factors on transport damages and losses
- The impact of human resource management practices to businesses related to supply chains.

Training of personnel involved in the supply chain primarily results with the optimal organization of the flow of goods and reduces the number of working operations, thus achieving efficiency of the chain system directly increasing profits.

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