IMPROVING THE HUMAN RESOURCE IN MARITIME INDUSTRY

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ABSTRACT: The 4.0 revolution industry represents a fusion of technologies that reduces the lines between the physical spheres, the digital and the biological ones. Its purpose is to transform industrial production through the digitization and exploitation of new technologies. The authors aim to determine, by conducting a literature review and also a primary research based on a questionnaire the need to improve the carrier development of maritime labor. The human resource gains a new dimension during industry 4.0, and the requirements for employees' competencies are higher and better delimited.

INTRODUCTION

An industry capacity of development refers not only to laws, norms, but also to strategies and projects for employee's development of the institutions and / or organizations that are part of the industry. The role of human resources is fundamental both for the efficient functioning of any public institution or authority, and for the development of an industry. Along with the other categories of resources needed to carry out any operational activities, human resources are an essential component, without which the development objectives cannot be achieved.

The orientation towards result and efficiency, a major change that the new strategic management has worldwide, can be achieved by streamlining the operations, and this can be done only by

developing and perfecting the employee's competences of each organization. Therefore, it is necessary for organizations to distribute the organizational tasks in relation to the competences of each employee and to establish very precisely both the skills needed to be acquired / improved in relation to the objectives and strategy of the company development, as well as the training needs for each direction. in part. Last but not least, the efficiency in each company within the shipping industry also means designing and developing a system of skills required at the industry level.

A secondary research is made by the authors in order to establish the importance of human resource in maritime industry and how industry 4.0 impacts it. New challenges are highlighted and the necessity of increasing the competences of employees is presented.

The results of the industrial revolution 4.0 also bring a need for a change in the labor force and its qualification in the maritime industry. Determining the skills needed for the new technologies adopted is a real problem. Cicek (2019) identifies and analyzes future competency requirements to narrow the differences between training and the market.

Torre (2019) wants to identify the consequences brought by digitalization and automation in the maritime field. A bibliographic research is also realized, which aims to present the challenges of managing human resources in the port environment due to the evolution of technology.

Industry 4.0 also impacts the requirements regarding the characteristics of the workforce in ports. Notteboom (2018) breaks down performance into three dimensions: quality of factors, cost efficiency and productivity. He investigates how the new requirements are met by implementing technologies and organizing the workforce.

A challenge in the maritime industry is represented by the competitiveness of the human resource, which depends on a complex range of factors such as environmental, organizational structure, technology, etc. Barsan (2012) identifies the key factors related to the competitiveness of the labor force in this field and presents the measures that can be taken into account.

Progoulaki (2016) follows the result of strategies on human resources management, resources and cultural diversity to bring value to human resources in maritime transport and guide the management of the crew in a direction in which a sustainable competitive advantage can be obtained.

Elements that define the job of navigator are analyzed, taking into account the gender of a person, due to the majority tendency of the women not to apply to the positions within this industry. There are presented ways in which this situation could be a balanced one, without any barriers, Stevenson (2015).

In his work, Tang (2018) realizes the importance of motivation in the learning process, as well as the positive or negative factors related to the motivation of the navigators. His study has relevance when introduced to use new equipment and the role that the organization plays in this process of technology adoption.

Pazouki (2018) analyzed whether people in the maritime industry can recognize unforeseen situations with negative impact and proposes a solution that could improve the pursuit of automated activities, thus determining opportunities in the human-machine relationship.

The way of training the navigators is learned at the workplace due to the practical part that they observe and apply. According to Emad (2017), between a skill, its application and the final result it is establishes a transparent relationship.

The components of the technical culture underlying the determination of the profiles of the navigation specialists are investigated by Musorina (2017). Engineering contributes to the development of worker skills and human-machine relationships.

METHODOLOGY

This study consists in a market research which was carried out in order to identify the purpose of inventory and analysis of the current situation regarding the categories of the trades in the port sector and of the demands of the labor market regarding the professional competences. The market research was conducted between 10.08-21.09.2019 and included both secondary and primary research.

The primary research consisted in collecting information based on a questionnaire addressed to the main organizations in the Romanian port sector. The questionnaire was built the online tool Google Forms. It was attended by Syndicate Port Docuri and Port New Galați basin, CNFR Navrom S.A Galați, TransEuropa Port, Romanian Naval Authority, ANOFM Galați, Unitrans Federation, CN APDM Galați. The response rate to the questionnaire was 50% given the fact that only 8/16 stakeholders have given answers. The questionnaire addressed to port organizations sector comprises four sections:

1. the first section requires general information about the employer;
2. the second section is intended for the categories of trades required for the port sector;
3. the third section refers to the competences needed for the operative personnel in the port sector;
4. the last section contains data and information regarding the strategic dimension of vocational training / career development in the port sector.

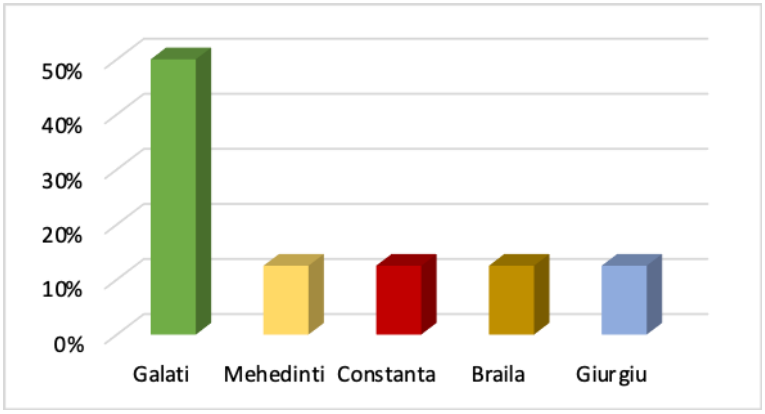

Figure 1. The location on the map of the respondents

In the primary research, 80% of Romanian respondents consider that all the occupations listed in the questionnaire are related to the port exploitation activity. 20% of the respondents in Romania (a

single port operator) consider that the following three occupations listed in the questionnaire are not related to the port operation activity: machinist to other fixed horizontal and vertical transport machines; transport agent; sorter.

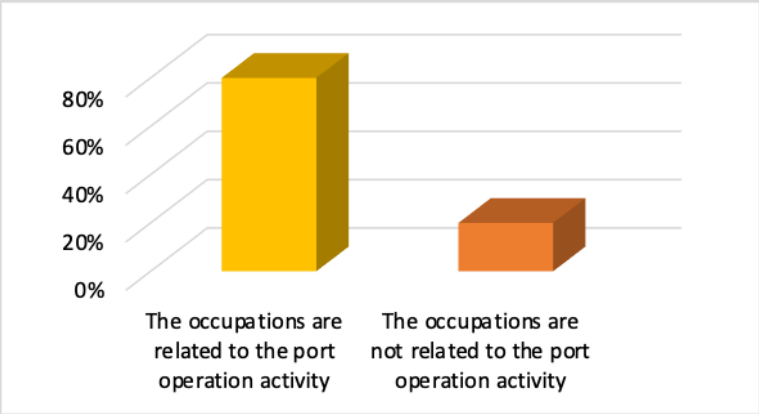

Figure 2. Linking occupations with port activity

In the primary research it was found that 80% of the respondents from Romania implemented a system of periodic evaluation for organization employees. Only one respondent (20%) does not have such a system.

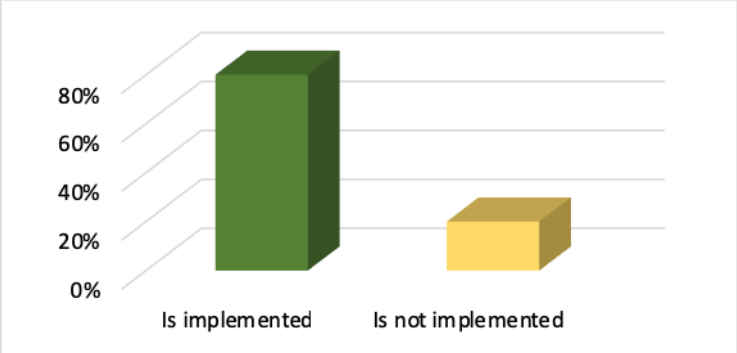

Figure 3. Existence of an employee evaluation system

Factors that contribute to the success of a professional training / development program / course in Romania are considered to be: the trainer's training and experience (6 mentions - 100%); interactivity (4 mentions - 70%); course support with useful and up-to-date information (3 mentions - 60%); location (2 mentions - 70%); objective final evaluation (2 mentions - 30%).

There is no consensus among the respondents regarding the optimal duration for a training / development course in Romania, the respondents giving different answers: 2 days (1 mention - 20%); 3 days (1 mention - 20%); 5 days (2 mentions - 40%); 7 days (1 mention - 20%).

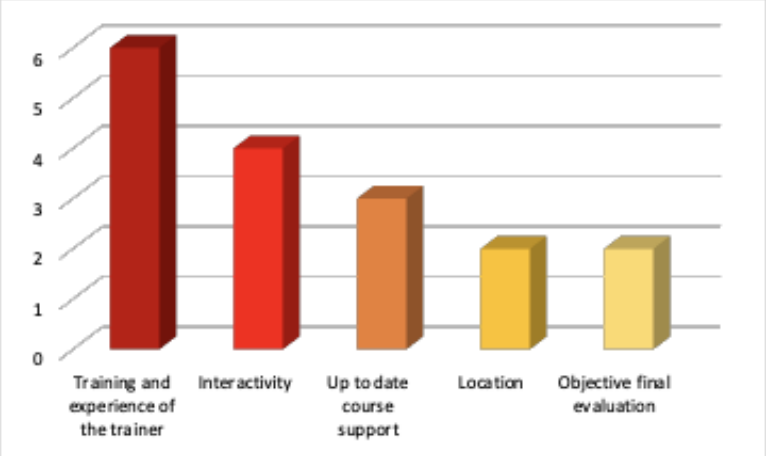

Figure 4. The key success factors of a training course

The optimal method of delivering training / development courses in Romania is: face-to-face (4 mentions - 80%); combination of e-learning (distance) course extended over a longer period with monthly face-to-face meetings (1 mention - 20%).

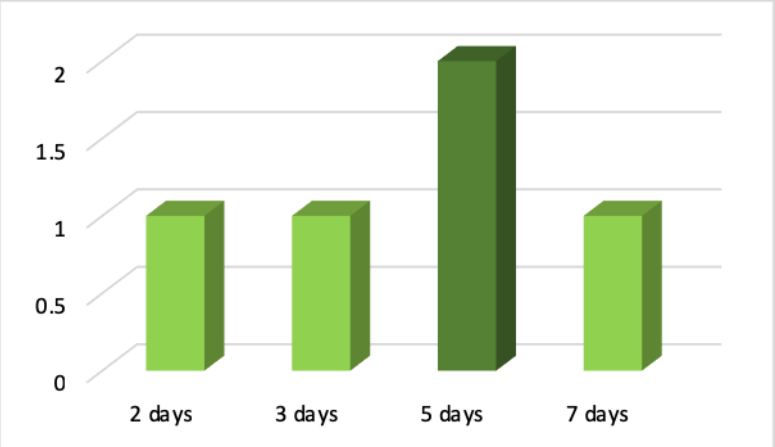

Figure 5. Optimal duration for a training / development course

The occupations for which the Romanian companies have accessed qualification / training services are the following: crane - 5 companies, forklift - 4 companies, crane floating cranes - 2 companies, and the rest of the occupations for which qualification services were accessed were mentioned only once: Danish operator, bridge mechanic, macaragio port.

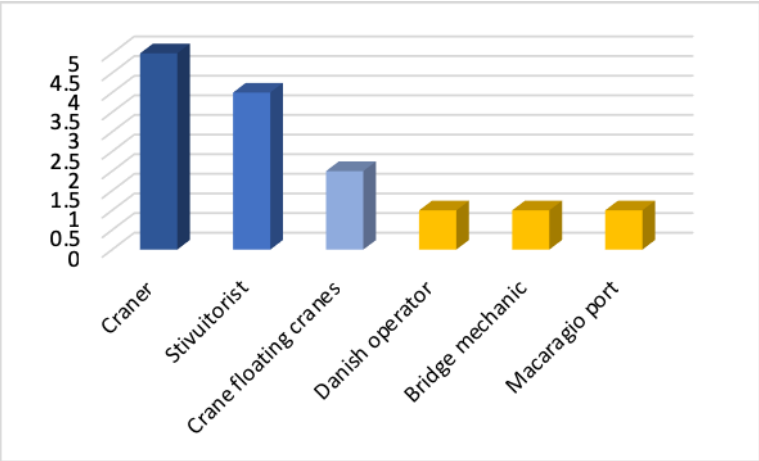

Figure 6. Occupations for which training services were accessed

THE CURRENT SITUATION REGARDING THE NEED FOR TRAINING IN THE PORT SECTOR

In order to analyze the stakeholders, information on service and training providers was gathered from the following Romanian ports: Bechet, Braila, Calafat, Calarasi, Cernavoda, Corabia, Drobeta Turnu-Severin, Fetesti, Galati, Giurgiu, Harsova, Isaccea, Mahmudia, Macin, Medgidia, Moldova Veche, Murfatlar, Oltenita, Orsova, Sulina, Tulcea, Turnu Magurele, Zimcea.

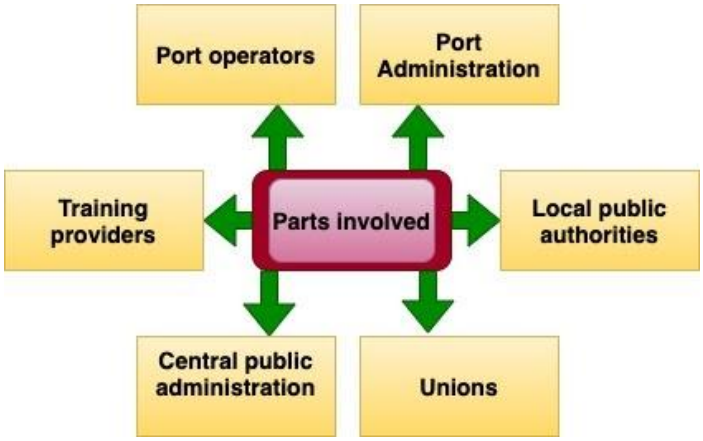

Figure 7. The main categories of stakeholders in the port sector

The main factors interested in developing a training system for the labor force in the port sector are:

- Port administrations on the Danube
- Service providers in the port sector (port operators)
- Providers of training services for personnel in the port sector

- Port workers' unions
- Central public authorities with impact in the specialized training for the personnel from the port sector (line ministries: MEN. MMFPS. ME, Ministry of Transport, Ministry of Finance, ANC authorities etc.)
- Local public authorities (mayors, county councils, county employment agencies, etc.).

In ports there is a significant demand for development of competences. Work in the port sector has recently been transformed by commercial growth, containerization and other mechanized forms of cargo handling, the introduction of new information and communication technologies to track the movement of goods throughout the transport chain, the vertical integration of transport companies providing services. Table 1 includes changes in the port sector. Taken together, these changes have transformed the skills required of a port worker, into a demand for a professional training system. These changes have led to a significant increase in the number of women employed in this sector, who drive vehicles, control goods, are involved in processes that require knowledge of information technology, occupy positions in operational control departments in all ports in the world.

Table 1. Changes in port sector

From	To
Worker with general skills	Specialized workers with multiple skills
Operations that require manual labor	Technological operations
Individual handling of goods that are not in containers	Specialized operations
Occasional employees	Permanent employees
Informal training in the workplace	Formalized training
Male labor force	Diversified workforce

A generic model for competency-based training in the port sector is detailed in Figure 8. At the heart of this model is the training policy. Every company that employs workers in the port should have such a policy of professional training of the employed personnel. In short, a personnel policy can be considered as a declaration of intent or commitment in the light of which a company can be held liable. With a high-level plan embracing the organization's objectives, the policy of professional training of the personnel in the port sector offers a guide with answers to the questions "what" and "why" that can appear during the training process in a given context.

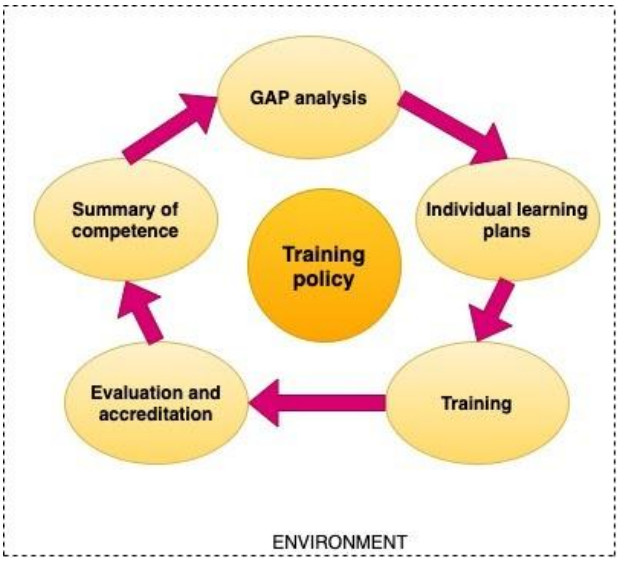

Figure 8. The cycle for skills-based training in the port sector

This cycle begins with the "skills summary" - this concept defines the skills required to perform a particular task and combines or packs skills to create a new recognized qualification that meets the needs and aspirations of the workforce, the demands of employers and the demands of clients. Competency profiling is a method of identifying the specific skills, knowledge, attitude and behavior required to perform a task, an activity. Once the skills profile has been established for all types of trades in the port, a Gap analysis must be performed to identify any deficiencies in the training program. Gap analysis consists in enumerating the characteristic factors (such as proficiency level, performance) of the current situation (what is at that precise moment), respectively the enumeration of the factors that should reach the future goals (what should be) and then highlighting the shortcomings and eliminating them (filling them). It is common for Gap (deficiencies) analysis to find deficiencies regarding the training policy of the employed personnel, both from the point of view of the employer and of the training services provider, regarding the competences needed to be acquired by the personnel employed or those to be employed in the port sector. The port workers may need new skills as a result of the technological changes that have occurred in the ports and therefore the training providers will have to adapt their training programs to the new skills and knowledge required in the labor market. The competency-based training model presented in Figure 8 represents "active learning", which combines theoretical and practical training with continuous assessment of learners' progress.

Through active learning methods it is admitted that the experience and ideas of the workers are the most valuable resources of a company. Active learning is actually focused on the learner and is seen as a process of interaction between participants / learners and facilitators / trainers.

The competencies required to perform a single task are usually presented as a "unit of competence". The unit of competence describes the scope, tasks to be performed, the performance standard and KSA (knowledge, abilities, skills) required. The units of competence are combined in

different ways to create recognized qualifications, which may or may not be part of a national qualifications system.

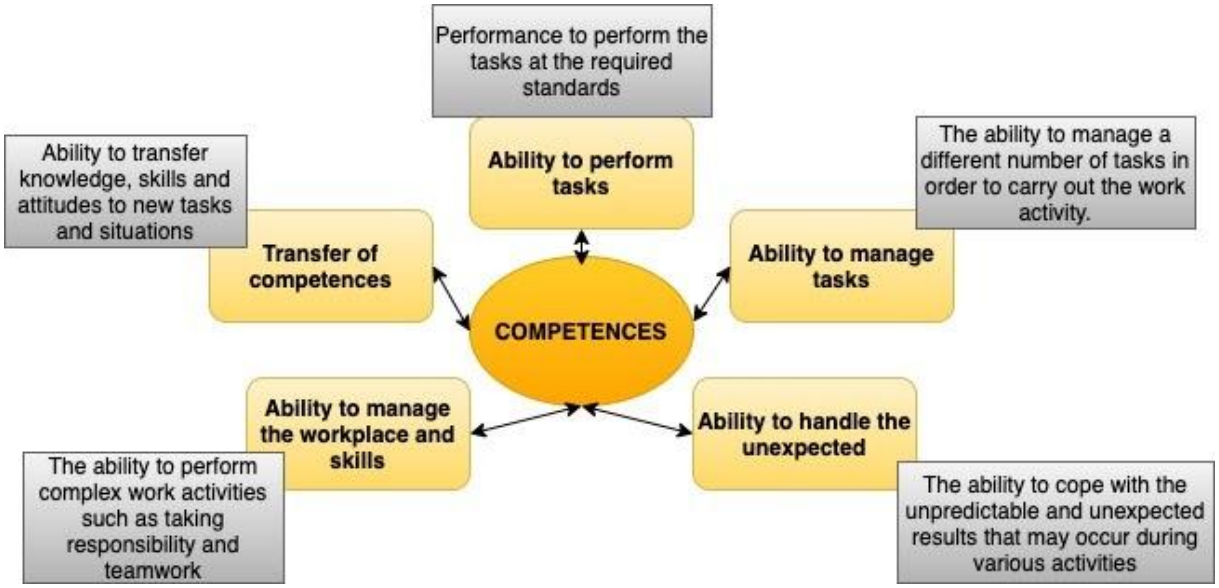

Figure 9. The 5 dimensions of competences

An organization can only grow and perform only by having employees involved, trained and motivated. In order to reach this goal, the employer must organize regular training and evaluation sessions for the skills of the staff, in order to measure the achievement of the objectives assumed, their involvement and motivation. The evaluation criteria represent "units of measure" for all aspects of an employee's activity, both at the level of practical skills and at the level of attitudinal and behavioral competences. It turns out that one of the performance criteria is the level of professional training of the employed personnel as well as the periodic updating of their skills and abilities, based on a training and evaluation system based on competences. Employers are required to communicate to employees, performance evaluation criteria, in accordance with the legal regulations in force.

CONCLUSIONS

Industry 4.0 allows the combination of technologies through artificial intelligence, data analysis or "the internet of things" to create new innovative products and services, with major implications for the society as a whole. All these changes certainly influence the labor market, and the identification of the requirements regarding the employees is adapted to the environmental changes, accepting the new paradigm. The technologies of the new industrial revolution have already begun to change the way people work and interact. The learning and training component will be one of the most important in the context of this new industrial revolution. Employees will need new skills, especially in the digital

area, while new jobs will appear, which will be filled by new or existing employees, who will complete a series of training programs according to new needs.

In this article, the authors carried out a research of the specialized literature of the last 5 years to collect data regarding the connection between industry 4.0 and the human resource in the maritime field. Following this, a questionnaire was distributed in the Romanian ports to determine the current jobs status and the importance of training programs through which employees can become specialized and improve their current skills in order to be aligned with industry 4.0.

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