RESEARCH ARTICLE

A HOLISTIC APPROACH FOR HR SELECTION AND PLACEMENT PROCESS: A MODEL PROPOSAL FOR MARITIME INDUSTRY

Alper ERTÜRK [1]*
Oğuz DEMİREL[2]
Mustafa POLAT [3]

[1] *Department of Management Information Systems, Düzce University*
* Corresponding Author: alpererturk@duzce.edu.tr
[2] *Department of Management Information Systems, Düzce University*
oguzdemirel@duzce.edu.tr
[3] *Department of Management Information Systems, Düzce University*
mustafapolat@duzce.edu.tr

ABSTRACT

Human resource management is one of the core functions and competences for companies operating in maritime transportation industry to enhance their sustainable competitive advantage in a dynamic business environment. Personnel selection and placement process considerably influences all areas and sub-functions of HRM regarding crew on board and thus it has been one of the most important topics in maritime HRM. This paper aims to propose a three-phase, integrated, comprehensible model that will provide an effective way and help the maritime companies in selecting the right person and placing him/her to the right job. In the first phase of the model, required and preferred skills and abilities of sailors are determined. In the second phase, how those skills and abilities are measured is established. In the third and last phase, a sound feedback and validation mechanism is established in order to validate the whole process, including developing a fuzzy complex multi-criteria mathematical model. This three-phase model based on a scientific approach is intended to be used by human resource managers as a decision support tool for choosing the right sailors.

Keywords*: Human Resource Management, Personnel Selection and Placement, Maritime Industry.*

Alper ERTÜRK, Oğuz DEMİREL, Mustafa POLAT

ÖZ

Denizcilik sektöründe faaliyet göstermekte olan işletmeler için, dinamik bir iş ortamında sürdürülebilir rekabetçi avantajlarını korumak ve geliştirmek için, İnsan Kaynakları Yönetimi en temel fonksiyonlardan biridir. Personel seçme ve yerleştirme süreci de, özellikle gemi tayfası dikkate alındığında İnsan Kaynakları Yönetiminin diğer tüm alt süreçlerini önemli derecede etkilemektedir ve dolayısıyla denizcilik sektöründe en önemli İKY konularından biri haline gelmiştir. Bu çalışmada, denizcilik sektöründe faaliyet gösteren işletmelere, doğru insanı seçmek ve doğru pozisyona yerleştirmek için yardımcı olabilecek, üç safhalı, bütüncül ve geniş kapsamlı bir model önerilmektedir. Modelin ilk safhasında, denizciler için gerekli olan ve tercih edilen yetenek ve becerilerin belirlenmesi yer almaktadır. İkinci safhada ise, bu yetenek ve becerilerin nasıl ölçüleceği belirlenecektir. Modelin üçüncü ve son safhası ise, tüm sürecin geçerleme ve doğrulamasını sağlayacak olan süreci oluşturmakta ve bulanık mantığa dayalı karmaşık çok kriterli matematik bir model içermektedir. Üç safhadan oluşan bu model, doğru denizcileri seçmek üzere insan kaynakları yöneticileri tarafından kullanılabilecek, bilimsel yönteme dayalı bir karar destek aracı sağlamayı amaçlamaktadır.

Anahtar Kelimeler*: İnsan Kaynakları Yönetimi, Personel Seçme ve Yerleştirme, Denizcilik Sektörü.*

1. INTRODUCTION

Maritime industry and especially the ship management is one of the most complicated business fields including a substantial number of decision-making processes [1]. The performance and reputation of the maritime companies heavily depend on the availability of well-structured management processes, as well as an effective management style. The complex structure of the maritime transportation industry puts profound pressure on the management decision processes in a dynamic business environment having rapidly changing technology, market strategies, risks and several challenges.

The managers in this industry need well-designed tools and methodologies to effectively manage decision-making processes related to all areas of management. Need for modification and re-designing of the processes and adaptation of new approaches has been addressed in recent studies [2] [3] [4]. Thus, innovative approaches need to be investigated and appropriately adopted to the existing processes and procedures of organizations to enhance the existing managerial processes.

Human resource management is one of the core functions and competences for companies operating in maritime transportation industry to enhance their competitive advantage in a dynamic business environment. In recent years, the shortage of maritime human resources has been highlighted by several researches [5] [6]. In addition to the tremendous shortage in manpower of maritime industry, the human-based errors are still significantly stated as the main causes of ship accidents [7] [8] [9]. As the human-based errors and consequent risks have been shown the dominant factors in maritime accidents, quality of the crew of a ship on board is considered the crucial aspect of ship management. Issues on human resources such as quality and competency of crew, safety-related precautions, and crew performance monitoring can be considered critical human resource processes for ship management companies. A maritime company determined to achieve excellence should consider leadership, team-work, collaboration and effective communication that significantly contribute to developing and maintaining commercial and risk management abilities of the human resources and provide a competitive advantage for the shipping business [10]. Among all the sub-functions of human resource management, personnel selection and placement considerably influences all of those issues regarding crew on board and thus it has been one of the most important topics in maritime HRM, as well as in general HRM literature [11].

In addition to the required certifications and standards in accordance with International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) mandated by International Maritime Organization (IMO), characteristics of the jobs on board itself enforce maritime companies for employing well-trained and competent personnel on board ships. However, research has yielded that certifications alone are not

enough to have a high-quality crew [2] [6] [12]. While emphasizing certifications are essential to prove a deserved level of knowledge, crucial value of skills and abilities of the crew are notably highlighted.

Thus, several studies have been conducted to help maritime organizations make effective personnel selection decisions. The personnel selection process generally deals with critical, yet complex issues. For instance, since all personnel attributes/characteristics are not equally important, thus properly setting the importance weights of different criteria to reflect the actual situations is important but so hard. Aggregating the measurement results and then ranking the applicants is another difficult area. Hence, significance and complication of the personnel selection process require effective analytical and holistic methods to provide a decision framework.

Most processes used in the maritime sector for personnel selection use regular personnel selection and placement models that are very common in other sectors. Selection and placement of new personnel are conducted based on current job descriptions and job characteristics. There are only a few models and approaches that has attempted to use some mathematical algorithms and computer-based systems [2]. However, to the best knowledge of the authors, none of them have integrated a validation phase integrated in the same selection and placement processes. Hence, this paper aims to close this gap and attempts to provide a sound and holistic approach to validate the process in order to increase the reliability of the system and to enhance the chance of choosing the most appropriate personnel.

Thus, this paper mainly concentrates on designing of a sound and comprehensive managerial process for personnel selection and placement for maritime companies. An effective skill and ability based personnel selection and placement process help the maritime companies in selecting the right person and placing him/her to the right job.

2. PERSONNEL SELECTION AND PLACEMENT PROCESS

In the recent HRM literature, several studies have been conducted on how resumes, interviews, job knowledge tests, proficiency tests, cognitive tests, and personality tests are used in HR selection and placement process to help HR managers make better personnel selection decisions [13]. Research has

also shown that measuring personality of candidates is a critical issue in the initial stage of recruitment process [14]. Moreover, assessments of knowledge, experience, job proficiency, performance, practice-based skills, and competencies constitute other important issues in recruitment process [15].

Although there are several effective procedures of the personnel recruitment models in literature, only a few have practically achieved to implement a process to validate their selection and placement process and methodologies. With a sound and well-designed validation process, the current approaches and practical applications can be enhanced in order to support personnel selection and placement in the shipping industry, which has a very specialized job environment requiring a particular expertise.

The proposed model in this study ensures an effective validation of the selection and placement process from a wider perspective, suggesting a sound and comprehensive three-phase process following a holistic approach.

2.1. First Phase: Determining Required Skills and Abilities

The first phase of the proposed process includes determining the required skills and abilities of the specific job on board ship. First step of this phase is to examine the outputs of the previous job analyses, such as job descriptions and job specifications. By doing that, it will be possible to learn the prerequisite personal requirements, such as education, job experience, and specific skill sets. It will also be possible to learn the tasks and responsibilities in the scope of the job. As each task requires different skills and abilities, tasks defined in the job descriptions will be examined in detail to understand what kind of skills and abilities are required for that specific job. In addition to determining the list of skills and abilities, examining the tasks in detail will also reveal the relevant importance of each specific skill for that job. This component is going to be determined by considering the weight of each task for that job and the weight of each skill for each task.

Second step of the first phase is to apply a questionnaire to the current crew in various posts of the ships. In the questionnaire, the crew will be asked which skill and ability is required to do his/her job and to what extent those skills and abilities are actively used. Although it is not a direct measure of

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how often those skills and abilities are actively used, as the survey will be applied to the crew who are currently practicing their written job descriptions, a valuable information about how much those skills and abilities are practically used can be retrieved. A sample list of tests and a sample list of skills and abilities for a specific job on board are presented in Table 1.

As the third step, a comprehensive literature search will be conducted to see what skills and abilities are determined in the HRM literature for specific jobs on board ships. Then, a list of required skills will be generated through this review. This information is going to be used to validate and enrich the list of skills and abilities that we will identify through the first two steps of this phase.

2.2. Second Phase: Determining How Required Skills and Abilities will be Measured

After the first phase, a validated list of required skills and abilities for each different job on board ships will be obtained. Second phase is related to determining how those skills and abilities will be measured by using various types of tests and test equipment. Thus, in the first step of the second phase, test methods and equipment to measure the level of each skill will be determined. In order to be able to measure the actual levels and to determine the required levels of each skill and ability, an appropriate test method will be determined. This method may be a written test, such as cognitive ability tests, or a test that can be conducted by equipment, such as psychomotor tests.

Second step of this phase is to identify the validity and reliability of the test equipment. Validity here means to identify if the test equipment measures the right skill and ability. Since validation process is somewhat complicated and needs further measurement, such as actual performance measures, predictive validity will be conducted in the third and final phase, which will be explained later.

Table 1. Sample lists of Tests, Skills and Abilities

Sample Job on board ship: Mass Communication Specialist		
Sample List of Tests	• Arithmetic reasoning, • Verbal skills, • Spatial ability (three-dimensional space) • Computational ability • Clerical (administrative) skills • Form perception • Motor coordination • Manual dexterity • Finger dexterity • Communication skills	
Sample List of Required Skills and Abilities	Knowledge	• Native language • Foreign language • Communication and media • Computers • Telecommunication equipment • Administration
	Skills	• Verbal skills • Writing skills • Reading skills • Persuasion skills • Time management skills • Coordination skills • Interpersonal communication skills • Organizing skills
	Abilities	• Understanding • Decision making • Problem solving • Dissemination of information • Categorization • Perception speed • Arithmetic reasoning • Computational ability • Spatial ability • Dexterity
	Working Style	• Attention to details • Reliability • Persistence • Endurance • Working independently • Taking initiative • Responsibility • Self-control • Working in harmony • Effort • Enthusiasm

Reliability here means to identify the test equipment correctly measures the intended skill and ability. Reliability is planned to be proved by test –retest methodology. Some tests will be planned to be conducted more than once in accordance with a pre-planned schedule, thus the results will be compared to support the reliability of the specific test equipment.

Third step is to determine the actual meaning of the measurement results. For example, if we assume that a candidate took a hand-eye coordination test and had a result of 48 seconds. The purpose of this step is to interpret this result and explain what this 48 seconds means from an actual performance perspective. By doing so, threshold values, as well as upper- and lower-level boundary values for each skill will also be determined.

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2.3. Third Phase: Designing a Predictive Validation Process

Phase three is probably the most crucial part of the whole process. This phase is actually designed to establish a sound feedback and validation mechanism in order to validate the whole process, including measurements and results.

First step in this phase, every sailor and candidate will be tested using the pre-determined test method. Measurement results will be recorded for each individual. On the other hand, real performance measures of all sailors on board will be assessed during actual operations using same variables.

Then, since we will have test results and actual performance measures, correlation and regression analyses will be used if there is any relationship

between test results and actual performance measures. Any association between those factors will provide a conclusion about the level of predictability and thus validation of the testing and measurement system of the proposed process.

Furthermore, a mathematical model incorporating fuzzy logic is going to be proposed as a tool for implementing multiple criteria personnel selection problem. In this method, identification of hierarchy and the importance weights of different criteria will be the key factors in using fuzzy logic. A fuzzy complex multi-criteria decision-making problem incorporating personnel selection process is going to be broken down and structured as a hierarchy of interrelated decision elements.

Once a mathematical model incorporating fuzzy logic is developed, it will be utilized to discover the nature of those associations among test results and actual performance measures. Once a validated model is developed, measurement system will be able to be rectified and further our whole selection process may be revised and corrected accordingly.

Proposed Three-Phase Personnel Selection and Placement Process is presented in Figures 1 and 2.
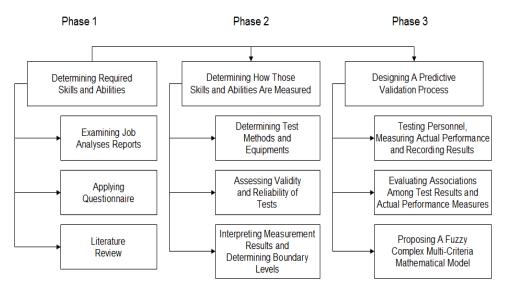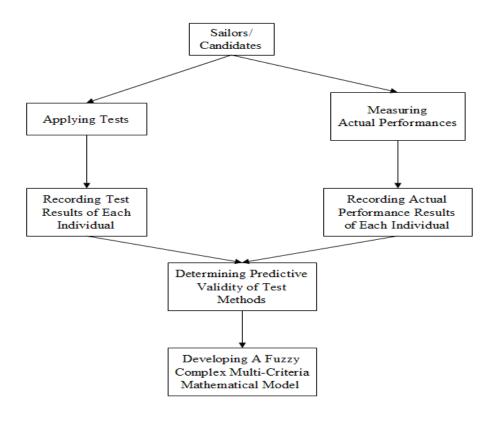

Figure 1. Three-Phase Model

Figure 2. Detailed Phase 3.

3. CONCLUSION AND DISCUSSION

Over the last decades, the amount of recruitment research and the variety of topics addressed has increased substantially. Numerous meta-analytic studies on skills/abilities – job performance relations have demonstrated that personality related measures and measurement of correct skills and abilities may significantly contribute to the prediction of job performance criteria and if used appropriately, may add value to personnel selection practices. Choice of a comprehensive and appropriate list of skills and abilities for use in predicting job performance should be based on careful consideration of

the expected theoretical or conceptual relations link to performance criterion of interest, as well as the appropriate level of analysis between predictor and criterion measures.

Different individuals possess a variety of skills, abilities and personal characteristics that might be useful in predicting who will be best suited for different types of maritime jobs or duties. The ultimate objective of this paper is to determine these skills and abilities by developing a profile of successful sailors to be used in the selection procedures to be used by maritime HR managers. Issues on human resources such as quality and competency of crew, as well as crew performance can be considered critical human resource qualifications for maritime companies. Among all the sub-functions of human resource management, personnel selection and placement considerably influences all of those issues regarding crew on board and thus it has been one of the most important topics in maritime HRM, as well as in general HRM literature [11].

Several studies have been conducted to help maritime organizations make effective personnel selection decisions. The personnel selection process generally deals with critical, yet complex issues. For instance, since all personnel attributes/characteristics are not equally important, thus properly setting the importance weights of different criteria to reflect the actual situations is important but so hard. Aggregating the measurement results and then ranking the applicants is another difficult area. Hence, significance and complication of the personnel selection process require effective analytical and holistic methods to provide a decision framework.

This paper mainly concentrates on proposing an integrated, sound and comprehensive process following a holistic approach for personnel selection and placement of maritime companies. Proposed three-phase skill and ability based personnel selection and placement process will provide an effective way and help the maritime companies in selecting the right person and placing him/her to the right job. The proposed model is designed to increase the effectiveness and efficiency of the selection procedure, and determines that incumbents have the necessary skills and abilities to handle the technical aspects of maritime training and job performance on board. Eventually our aim is to propose a more effective suitability profile, by combining the process with a fuzzy complex multi-criteria mathematical

model for better decision making. Hence, the objective is to increase the efficiency of the maritime human resource pipeline and reduce the burden of unproductive job performance by providing an opportunity for early detection of candidates who are and are not likely to perform satisfactorily as sailors.

The further research direction can be shifted to the performing of the proposed model under fuzzy environment to manage the impairment of decision-makers especially on qualitative assessment criteria as well. Future studies may also include comparing previous models with the one proposed in this study.

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