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Port personnel recruitment process based on dynamic capabilities: port managers' priorities vs customer evaluations

Umur Bucak, Mahmut Mollaoğlu and Mehmet Fatih Dinçer
Department of Maritime Business Administration, Zonguldak Bülent Ecevit University, Zonguldak, Turkey

Abstract

Purpose – Considering the human factor, the quality of the personnel is vital to ensure especially the value creation in the ports. Therefore, employee quality stands out for withstanding the pressures that stem from global trade on its operational speed felt by ports in recent years. Accordingly, the selection of the qualified personnel at the ports is very critical and a tool based on dynamic capabilities is needed to manage this process well. The aim of this study is to develop a model based on dynamic capabilities for recruitment process of ports.
Design/methodology/approach – Port personnel should have dynamic capabilities detected from the literature. These capabilities were approached as criteria. In this study, Buckley's proposed fuzzy analytical hierarchy process (AHP) method was employed for weighting the whole criteria. After that, weights of the criteria were used to prioritize alternatives with the fuzzy TOPSIS method.
Findings – This model reflects port managers' priorities and port customers' evaluations. Thus, the model can also reflect the level of integration of ports' related department managers into the recruitment process. The analyses allow the evaluation of the attitudes of the human resources department in the related port while fulfilling the personnel recruitment function. As a result of analyses, differences between perceptions of port managers and customers served as a feedback to the human resource management department of the ports.
Originality/value – One of the originalities of this study was derived from its customer-oriented perspective. This is a unique study that gathers common personnel capabilities related to the operation, planning and customer relationship departments and evaluates the success of these capabilities from the customer perspective.

Keywords Dynamic capabilities theory, Port personnel recruitment, Fuzzy AHP-TOPSIS method, Multi-criteria decision-making, Port management

Paper type Research paper

1. Introduction

Ports especially serve for international supply chain, and have become trade and distribution centers for the ship operators, traders, regulatory bodies, governments and so forth. Ports' enhanced roles made port management much more complex to serve international trade and compete with its competitors. Such global trends that acquisition competition for the mega vessels are increased share of maritime transport (especially beginning from the second half of 2020 during the pandemic process), etc. have shocked ports day by day in terms of its equipment, infrastructure and operational performance limits. The potential of qualified employees is very important in company performance, and the evaluation of the qualification potential of the employees can offer a competitive advantage to the company in terms of maintaining performance. Port areas need certain capabilities that should be obtained, and critical relations should be managed well, specific to the services provided. For this reason,

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it would be appropriate to adopt capability-based approaches in the personnel recruitment process at ports. Since ports operate in a complex and ever-changing dynamic environment (Karataş-Çetin and Cerit, 2014), dynamic capabilities theory would be appropriate for port transactions.

There is not only one definition of capability in the literature. However, most of the studies referred to the concepts like competency, skill and knowledge when they mentioned the capability concept. In some studies, the capability was used in terms of measurable skills and qualifications required for the job. In contrast, in other studies, it was used in meanings such as the behavior that the personnel should show, the acquisition and mastery that can be reached due to the experience gained and the development process. Buford and Lindner (2002) defined capability as an approved decision tool covering critical information, skills and capabilities to do a particular range of activities (Gangani *et al.*, 2006). Capability is related to skills, capabilities and professions and it is eventually the working capacity of the personnel (Fitzpatrick, 2000). According to Blancero *et al.* (1996), capabilities are the knowledge, skills and abilities required to exhibit expected behaviors in the future. Biçer and Düztepe (2003) identified capability as a guide used in describing the behaviors that organizations expect from their employees. The authors linked capability with behaviors, and they expressed that employees' behaviors should be measurable. Benner (2004) approached the capability concept as a process. The author defended that capability can be gained if the employee completes five phases: "novice," "advanced beginner, new graduate," "competent stage," "proficiency" and "expertise." Benner's definition is more valid considering the capabilities expected from employees working in today's companies, so capability should be considered a process today.

The basis of the capability-based management approach underlies the idea that the competitive advantage of organizations, in other words, the factor that makes them different from their competitors, is the capabilities of their employees (Tak *et al.*, 2007). Accordingly, capability-based management can help the organization develop talented employees, attract talent, determine the right employee for positions, make succession plans and implement training analysis and other human resources functions (Ünal, 2013). Capability-based management integrates corporate strategy with human resources management and standardizes human resources functions. Capability-based approaches can facilitate the identification of skills, knowledge, behaviors and feasibility that human resources need in the current and future regarding strategies and organizational priorities (Cengiz and Hisim, 2012). Capability-based approaches were deemed significant to improve the performance of the organization. Goals show where the company and employees should reach, while capabilities express how to achieve these goals (Biçer and Düztepe, 2003). The qualification of employees plays an important role in improving organizational performance. For this reason, it is very critical to express the expected capabilities and select personnel according to these capabilities. On the other hand, required capabilities for works in firms are ever-changing due to the dynamic environment of firms. At this point, the recruitment process requires measuring the qualification level of the candidates according to related capability. The traditional recruitment process used skill tests, psycho-technical tests, interviews and other techniques. The application of a capability-based recruitment process does not require the use of any additional technique. However, precision and accuracy are at the forefront when focusing on determining the presence and degree of the capabilities sought.

The study aims to reveal dynamic capabilities required from port personnel, to demonstrate perceptual differences between port managers and port customers on port employees' capabilities and to detect the participation level of department managers in the recruitment process. In this study, the recruitment process based on dynamic capabilities theory at ports was analyzed. Accordingly, dynamic capabilities required from port personnel were detected, and priority perception of these capabilities and qualifications of

port personnel were evaluated. The second part of this study clarified the methods employed and their application steps. And then, we identified the problem and introduced the experts who gave their expertise, and the results of the analyses were expressed. The final part of this study is the conclusion; we interpreted the results and gave suggestions for further studies.

2. Theoretical background

The resource-based view (RBV) explained how firms get a competitive advantage and protect their advantageous position. Firms with valuable, rare, inimitable and non-substitutable (so-called VRIN attributes) resources can protect and sustain their advantageous position against their competitors (Eisenhardt and Martin, 2000). Teece *et al.* (1997) extended RBV by adapting theory to dynamic markets (Eisenhardt and Martin, 2000). Dynamic capabilities theory was referred to first in the study of Teece and Pisano (1994). The term "dynamic" was defined as the capacity of firms to renew their competencies against the changing environment; on the other hand, the term "capabilities" referred to the management of firms to adapt, integrate and reconfigure organizational skills and functional competencies for matching requirements of changing conditions (Teece *et al.*, 1997). Core elements of the dynamic capabilities were revealed as coordination/integrating, learning and reconfiguring (Teece, 2007).

Peter Drucker attracted attention to specialized information for work to get a competitive advantage and stated that specific information for their work could increase demand (Drucker, 1959, 1999). Companies that can manage internal and external competencies and demonstrate timely responsiveness and innovation against changing situations are generally winners of their market (Teece *et al.*, 1997; Teece and Pisano, 2003). According to dynamic capabilities theory, firms cannot understand what kinds of capabilities may bring competitive advantage in the mid or long term; on the other hand, it is critical to adapt to changes (Teece, 2007). Having the right personnel to know when change is needed is essential (Hamilton and Davison, 2018). Rizzo *et al.* (2015) demonstrated that recruiting personnel have key knowledge that affects both the organizational and the dynamic capabilities of firms. Dynamic capabilities originate from the knowledge and skills of personnel (Barreto, 2010); with the help of tacit knowledge and experience, management can make a correct prediction when they should or should not adopt (Teece, 2007). Department managers are key to providing this experience and tacit knowledge.

Today, ports have a dynamic role in spreading trade to all countries; therefore, trade competition among countries, regions or companies was burdened on ports (Bucak *et al.*, 2020). Having personnel with specific information for doing works in a port area or office is essential to overcoming this intense competition. This process is twofold: training existing talented personnel or selecting the right applicant in the recruitment process. In the first option, department managers have a key role in training existing personnel via seminars, case studies, mentoring and so forth. Assuming that managers are the ones who know the changing environmental conditions best in terms of their departments, including them in the recruitment process will provide a competitive advantage. Although most of the studies in dynamic capabilities literature emphasized senior managers' capabilities (Bağış, 2018), Kuratko *et al.* (2005) and Wooldridge *et al.* (2008) underlined the entrepreneurial activities that mid-level managers do on the firm's resource/talent base by perceiving entrepreneurial opportunities. We believe that including department managers in the recruitment process may help in selecting the right applicant and enable managers to make first contact with their personnel before work. Thus, department managers will be able to form their team, considering the market's changing conditions or what the industry is evolving toward. Establishing the first contact with each other before starting the work will help managers introduce their roles and create the roles specific to the personnel in their team.

3. Methodology

Analytic hierarchy process (AHP) was first developed by Saaty (1980). This method has a significant role in solving complex problems and weighting criteria that affect decision-making. However, classic AHP may not fulfill the basic requirements of the method in critical and uncertain situations (Gul *et al.*, 2018; Liu *et al.*, 2020; Altay *et al.*, 2022). At this point, fuzzy logic gets involved. Fuzzy logic prevents sharp and subjective decisions that were given into the decision-making process (Demirel *et al.*, 2018). There are many different multicriteria decision-making applications in the maritime business literature (Lirn *et al.*, 2004; Çelik and Akyüz, 2018; Tseng and Cullinane, 2018; Mollaoglu *et al.*, 2019; Balcı, 2021; Soner *et al.*, 2021; Baştuğ *et al.*, 2022; Toygar *et al.*, 2022; Yucesan *et al.*, 2022). The first example for the fuzzy logic was given by Zadeh (1996). The first study on fuzzy AHP was applied by van Laarhoven and Pedrycz (1983). Afterwards, Buckley (1985) prioritized the criteria by using geometric mean. Chang (1996) applied synthetic extent analysis for extended values of pairwise comparisons using triangular numbers. This analysis appeared a new approach for AHP. In this study, Buckley's proposed fuzzy AHP was employed for weighting whole criteria. After that, weights of the criteria were used to prioritize alternatives with the fuzzy TOPSIS method. Fuzzy AHP-TOPSIS hybrid method's application steps are as follows.

3.1 Fuzzy AHP application steps

Step 1: Pairwise comparison matrices for criteria were constructed, and experts' evaluations using linguistic terms were collected. Each element of the pairwise comparison matrix $(\widetilde{a}_{ij})$ was a fuzzy number that corresponded to a linguistic term. Accordingly, pairwise comparison matrices are shown below:

$$\widetilde{A}^{k} = \begin{vmatrix} 1 & \widetilde{a}_{12} & \cdots & \widetilde{a}_{1n} \\ \widetilde{a}_{21} & 1 & \cdots & \widetilde{a}_{2n} \\ \vdots & \vdots & \cdots & \vdots \\ \widetilde{a}_{m1} & \widetilde{a}_{m2} & \cdots & 1 \end{vmatrix} \tag{1}$$

where $(\widetilde{a}_{ij})$ represents the expert's assessment on comparison of *the i*th element of *the j*th element.

In this method, linguistic variables and fuzzy triangular numbers were defined to make a comparison among criteria by using several different linguistic variables such as "equal importance," "weak," "moderate importance," "moderate plus," "strong importance," "strong plus," "very strong," "very strong plus" and "extreme importance." These fuzzy nine-level scales are represented in Table 1. Table 2 also showed the alternatives' fuzzy scores and linguistic variables.

Step 2: In this step, the geometric mean of each row of matrices was calculated for weighting the criteria and alternatives. First of all, the geometric means of the first parameters in each row's triangular fuzzy numbers were calculated in equation (2).

$$a_{1l} = [1 \times a_{12l} \times \ldots \times a_{1nl}]^{1/n} \tag{2}$$

Step 3: Fuzzy weights were assessed based on equation (3) as follows:

$$\widetilde{U}_i = \sum_{j=1}^{n} \left(\widetilde{W}_j \widetilde{r}_{ij} \right), \quad \forall i. \tag{3}$$

In equation (3), "$\widetilde{U}_i$" referred to utility level of ith alternative, "$\widetilde{w}_j$", which showed the weight of the jth criteria. Plus, "$\widetilde{r}_{ij}$" expressed the performance of the i th alternative for the j th criteria.

Step 4: In this step, fuzzy numbers were transformed into crisp numbers. $\widetilde{A} = (l, m, u)$ might be transformed into a crisp number by employing the following equation:

$$A = \sqrt[3]{(l * m * u)} \tag{4}$$

Step 5: After the defuzzification step (see equation (4)), *consistency index* (CI) was calculated in equation (5) as follows:

$$CI = \frac{(\lambda_{max} - n)}{(n - 1)} \tag{5}$$

The consistency index is calculated to find out the knowledge of experts on a related topic.

Step 6: The best alternative was ranked from the highest criterion to the lowest one in the last stage. After that, the TOPSIS method was applied for choosing the best alternative.

3.2 Fuzzy TOPSIS application steps

TOPSIS (techniques for order preference by similarity to ideal solution) method was developed first by Hwang and Yoon (1981) to solve multicriteria decision-making problems. According to this method, the best alternative is the one that is the nearest to the positive ideal

Table 1.
Triangular fuzzy numbers

Real numbers	Linguistic variables	Triangular fuzzy numbers	Reverse triangular fuzzy numbers
1	Equal importance	(1, 1, 1)	(1, 1, 1)
2	Weak	(1, 2, 3)	(1/3, 1/2, 1)
3	Moderate importance	(2, 3, 4)	(1/4, 1/3, 1/2)
4	Moderate plus	(3, 4, 5)	(1/5, 1/4, 1/3)
5	Strong importance	(4, 5, 6)	(1/6, 1/5, 1/4)
6	Strong plus	(5, 6, 7)	(1/7, 1/6, 1/5)
7	Very strong	(6, 7, 8)	(1/8, 1/7, 1/6)
8	Very strong plus	(7, 8, 9)	(1/9, 1/8, 1/7)
9	Extreme importance	(8, 9, 9)	(1/9, 1/9, 1/8)

Table 2.
Alternatives' fuzzy scores and linguistic variables

Real numbers	Linguistic variables	Triangular fuzzy numbers
1	Absolutely poor	(0, 1, 2)
2	Very poor	(1, 2, 3)
3	Poor	(2, 3, 4)
4	Medium poor	(3, 4, 5)
5	Fair	(4, 5, 6)
6	Medium good	(5, 6, 7)
7	Good	(6, 7, 8)
8	Very good	(7, 8, 9)
9	Absolutely good	(8, 9, 9)

solution and the farthest to the negative ideal solution. The following steps of the TOPSIS method are presented:

Step 1: Decision matrix was normalized based on equation (6)

$$r_{ij} = \frac{w_{ij}}{\sqrt{\sum_{j=1}^{J} w_{ij}^2}}, \quad j = 1, 2, 3, \ldots, J, \quad i = 1, 2, 3, \ldots, n \tag{6}$$

Step 2: The distance of each alternative obtained from FPIS d_i^* and FNIS d_i^- was calculated in equations (7) and (8):

$$d_i^* = \sqrt{\sum_{j=1}^{n} \left(v_{ij} - v_j^*\right)^2}, \quad j = 1, 2, \ldots, J \tag{7}$$

$$d_i^- = \sqrt{\sum_{j=1}^{n} \left(v_{ij} - v_j^-\right)^2}, \quad i = 1, 2, \ldots, J \tag{8}$$

Step 3: After step 2, the closeness coefficient (CC_i) of each alternative was calculated based on equation (9):

$$CC_i = \frac{d_i^-}{d_i^* + d_i^-}, \quad i = 1, 2, \ldots, J \tag{9}$$

Step 4: The alternatives' ranking was determined by comparing (CC_i) values.

4. Application

In this section, the research problem is defined, and criteria and alternatives that helped to solve the problem are introduced. After the definition process, the experts who evaluated the criteria and alternatives are presented. Their expertise levels are pointed out by the aspects of title, education level and professional experience. And finally, the application steps of this two-stage study are explained. Figure 1 depicts the research model for obtaining the outcomes of the study. First, 14 criteria are evaluated by the port managers to reveal the priorities of the port personnel selection process. Second, expectations on port personnel are scored by agency managers. Finally, the priorities of the port managers and agency managers' expectations are compared.

According to Figure 1, personnel selection criteria weights are obtained by fuzzy AHP. Afterward, agency managers are evaluated at each department of ports and are analyzed by fuzzy TOPSIS method. The discrepancy between the customer evaluations and port managers' requests gives feedback to human resources management in terms of the recruitment process.

4.1 Problem description

Staff recruitment is known as a multidimensional process and has a complex structure. This process requires a bit more attention when it comes to port business. Businesses done by port staff can be defined as technical, relational and cognitive. Therefore, the port staff recruitment process should be attributed to capability-based evaluations. On the other hand, each department of the port (terminal) operators carries out a wide range of works that are usually divergent from each other. In this study, the operations department, planning

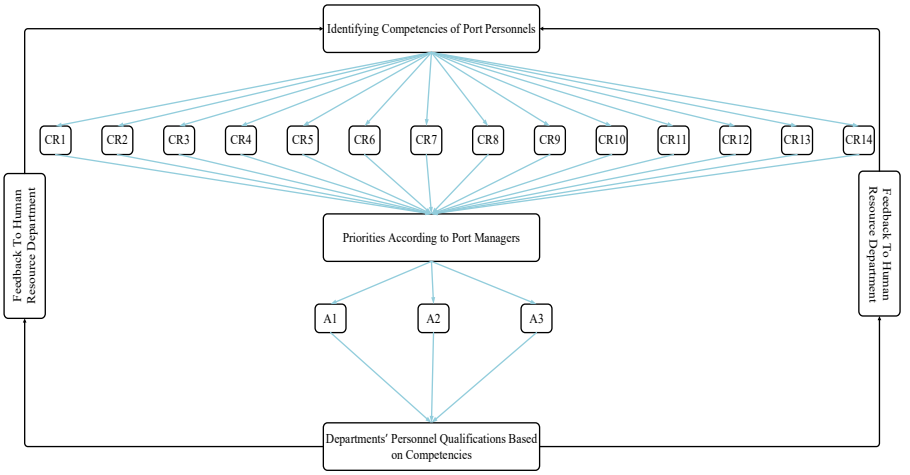

Figure 1.
Research model of the study

department and customer relations department of the ports are studied, and which department's staff served their customers more effectively than others in the context of capability-based perspective is determined. In this context, to solve this problem, recruitment based on dynamic capabilities specific to port staff are determined with help from literature (see Table 3), and these criteria and the alternatives (departments in the organizational structure of the port operators) are also defined in Table 4.

4.2 Proficiency levels of the experts

The recruitment process of the right employee based on its capabilities is qualitative, and taking expert opinions would be more convenient to evaluate this process at ports. One of the best ways to understand the recruitment process at ports would be to express the experts' opinions quantitatively on this qualitative issue. At this juncture, selecting the most appropriate experts is vital to reach valid and reliable judgments. For this reason, port managers are the most appropriate experts to determine priority levels of the capabilities required by the port staff. On the other hand, port customers can evaluate the capabilities of the port staff in the best manner. Therefore, in this study, opinions of the selected Turkish ports' planning, operations and customer relations managers were included in determining the priority levels of capabilities for each department staff separately. Moreover, the realization level of these capabilities by each department staff was analyzed with the help of the expert opinions of the agency managers who do business with these ports handled in this study. Seven planning managers, four customer relations managers, six operations managers and eight agency managers were selected as the experts of this study. Three of them have a bachelor's degree, while the rest of them are M.Sc. Selected experts also have an average of above 12 years of professional experience. Each expert's evaluations of consistency index is that the rate necessary for the AHP analysis (should be under 0.10) is under the rate of 0.10.

Consistency indices of expert 4 and 8 are above the rate of 0.10, but their inconsistency level does not affect the overall consistency index. On the other hand, consistency rates of the experts from number 17 to 24 are not calculated because these experts' evaluations are analyzed by fuzzy TOPSIS method. The fuzzy TOPSIS method does not require calculating consistency index. In Table 5, the detailed information about each expert of this two-staged study was presented. This study chooses our agency manager sample by considering Alphaliner's Top 20 companies. Furthermore, our sample contains sector professionals who

Criteria	References											
	Koutra *et al.* (2017)	Güngör *et al.* (2009)	Özer Çaylan and Yıldız (2016)	Ahn and McLean (2008)	Thai (2012)	Nasim (2017)	Tezcan and Kuleyin (2019)	Thai and Lim (2012)	Thai and Yeo (2015)	Anwar *et al.* (2012)	Thai *et al.* (2016)
Experience	✓	✓	✓			✓					
Knowledge of foreign language	✓	✓	✓		✓		✓	✓	✓		✓
Exercising information technologies	✓			✓		✓		✓			
Technical skills	✓		✓	✓			✓	✓	✓	✓	✓
Communication skills	✓	✓	✓		✓		✓	✓	✓		✓
Problem-solving	✓			✓	✓		✓	✓	✓		✓
Persuasion*					✓			✓	✓		✓
Time management skills	✓	✓			✓			✓			
Innovativeness*	✓		✓	✓						✓	
Taking initiative	✓						✓				
Analytical thinking		✓			✓		✓	✓			
Decision-making		✓					✓				
Team working		✓	✓		✓		✓	✓	✓	✓	✓
Intellectual capital on shipping trends*				✓			✓	✓	✓		✓
Agility					✓			✓	✓		✓
Customer-oriented							✓			✓	
Vocational motivation					✓		✓	✓	✓		✓

Note(s): *: Marked criteria were de-scoped as a result of semi-structured interviews

Table 3.
Required port staff competencies

Criterion code and name		Definition
C1	Experience	Having sufficient past experience in the related position
C2	Knowledge of the foreign language	Good speaking and understanding at least one foreign language
C3	Exercising information technologies	Effective use of information technologies required by the job
C4	Technical skills	To have technical skills specific to the tasks to be done or being appropriate to acquire these tasks
C5	Communication skills	Providing information to stakeholders in a complete, clear and rational form
C6	Problem-solving	Being solution-oriented, producing solutions within the framework of the rules against mishaps occurring during the work
C7	Time management skills	Allocating as much time as necessary for each job, using time effective
C8	Taking initiative	Taking responsibility for the work to be done
C9	Analytical thinking	Establishing a connection between the causes and variables related to the problems and processes
C10	Decision-making	Not having contradictions, not hesitating, determining the order of priority correctly
C11	Team working	Adaptability to group tasks and working in harmony within the group
C12	Agility	Easy to adapt to change of customer demands or business conditions
C13	Customer-oriented	Having customer perspective view and developing solutions and strategy accordingly
C14	Vocational motivation	Accepting the difficulty arising from the nature of the job, loving the job and not needing an extra motivation to do it
Alternative Name		Definition
Operations Department		Carries out cargo handling operations in the port area
Planning Department		Constitutes vessel and bay plan and warehouse layout forms
Customer-Relations Department		Manages communication with stakeholders who have commercial relations with the port

Table 4.
Definitions of the criteria and alternatives

have a manager title in container ship agencies. That is why we considered 8 agency managers were sufficient to improve our study.

4.3 Application steps

In this study, staff capabilities required to do work in the port area and port offices were determined with help from literature. The validity of these capabilities was queried by having semi-structured interviews with two-sector professionals. One of these professionals worked as an operations manager in a freight forwarder company in Turkey, and the other one worked as a port manager of a Turkish port operator. As a result of these validation interviews, the criteria "Persuasion," "Innovativeness" and "Intellectual capital on shipping trends" were eliminated from the criteria list, and thus the shortlist was structured. Subsequently, priority levels of the criteria were determined to be used as a weighted score in the hybrid method. Pairwise comparison-based questionnaire forms were provided to department managers of some of the ports operated in Turkey to determine the priority ranks of each criterion. However, three different analyses were carried out, and criteria weights reflecting each of the three department managers' perceptions were calculated separately. Accordingly, three separate weighting scores belonging to three separate departments for each criterion were found, and these ranks are shown in Table 6.

The selected departments of the administrative building at port facilities as the alternatives in this study are as follows: (1) Operations Department, (2) Planning Department and (3) Customer Relations Department. In this section, performance levels of these departments in terms of their staff capabilities were analyzed using fuzzy TOPSIS method.

Expert	Title	Background	Experience	Consistency index
Exp-1	Planning manager	Bachelor's	6 years	0.032
Exp-2	Planning manager	Bachelor's	8 years	0.002
Exp-3	Planning manager	Bachelor's	14 years	0.013
Exp-4	Planning manager	Bachelor's	16 years	0.101*
Exp-5	Planning manager	Bachelor's	10 years	0.015
Exp-6	Planning manager	Bachelor's	13 years	0.085
Exp-7	Planning manager	Bachelor's	5 years	0.029
Exp-7	C-R manager	Bachelor's	8 years	0.009
Exp-8	C-R manager	MSc	19 years	0.115*
Exp-9	C-R manager	Bachelor's	10 years	0.019
Exp-10	C-R manager	MSc	16 years	0.087
Exp-11	Operations manager	Bachelor's	7 years	0.021
Exp-12	Operations manager	MSc	7 years	0.023
Exp-13	Operations manager	Bachelor's	13 years	0.022
Exp-14	Operations manager	Bachelor's	10 years	0.025
Exp-15	Operations manager	Bachelor's	11 years	0.023
Exp-16	Operations manager	Bachelor's	16 years	0.068
Exp-17	Agency manager	Bachelor's	15 years	n/a
Exp-18	Agency manager	Bachelor's	10 years	n/a
Exp-19	Agency manager	Bachelor's	30 years	n/a
Exp-20	Agency manager	Bachelor's	8 years	n/a
Exp-21	Agency manager	Bachelor's	12 years	n/a
Exp-22	Agency manager	Bachelor's	9 years	n/a
Exp-23	Agency manager	Bachelor's	14 years	n/a
Exp-24	Agency manager	Bachelor's	22 years	n/a

Note(s): *Consistency index of the expert's evaluations is above 0.10, but its inconsistency level does not affect the overall consistency index
n/a: not-available (these experts' evaluations were analyzed by fuzzy TOPSIS method. This method does not require consistency index)

Table 5.
Detailed information of experts

CR	Fuzzy weights				Ranks			
	Opr.*	Pln.*	C-R*	Overall	Opr	Pln	C-R	Ovr
C1	(0.025, 0.024, 0.025)	(0.021, 0.021, 0.023)	(0.028, 0.025, 0.024)	(0.051, 0.051, 0.051)	0.02459	0.02131	0.02577	0.05123
C2	(0.043, 0.043, 0.044)	(0.045, 0.047, 0.052)	(0.064, 0.066, 0.069)	(0.062, 0.062, 0.062)	0.04301	0.04792	0.06640	0.06172
C3	(0.030, 0.030, 0.032)	(0.046, 0.046, 0.048)	(0.034, 0.032, 0.032)	(0.055, 0.055, 0.056)	0.03076	0.04628	0.03265	0.05520
C4	(0.042, 0.042, 0.043)	(0.030, 0.029, 0.031)	(0.044, 0.043, 0.044)	(0.061, 0.061, 0.061)	0.04222	0.02990	0.04394	0.06134
C5	(0.100, 0.103, 0.103)	(0.083, 0.083, 0.084)	(0.086, 0.084, 0.082)	(0.082, 0.083, 0.082)	0.10183	0.08323	0.08387	0.08226
C6	(0.104, 0.108, 0.109)	(0.110, 0.109, 0.104)	(0.095, 0.097, 0.097)	(0.083, 0.084, 0.084)	0.10678	0.10777	0.09617	0.08357
C7	(0.076, 0.075, 0.075)	(0.110, 0.108, 0.103)	(0.069, 0.067, 0.066)	(0.075, 0.074, 0.074)	0.07517	0.10669	0.06739	0.07435
C8	(0.080, 0.080, 0.079)	(0.093, 0.091, 0.088)	(0.075, 0.078, 0.082)	(0.076, 0.076, 0.076)	0.07965	0.09082	0.07818	0.07579
C9	(0.138, 0.135, 0.130)	(0.142, 0.141, 0.135)	(0.042, 0.043, 0.046)	(0.091, 0.091, 0.089)	0.13448	0.13924	0.04341	0.09025
C10	(0.066, 0.065, 0.064)	(0.066, 0.068, 0.072)	(0.040, 0.040, 0.042)	(0.071, 0.071, 0.071)	0.06507	0.06868	0.04048	0.07085
C11	(0.113, 0.112, 0.109)	(0.115, 0.116, 0.115)	(0.061, 0.060, 0.058)	(0.085, 0.085, 0.084)	0.11124	0.11556	0.05985	0.08472
C12	(0.067, 0.067, 0.068)	(0.038, 0.038, 0.041)	(0.095, 0.095, 0.095)	(0.072, 0.072, 0.072)	0.06735	0.03912	0.09487	0.07167
C13	(0.060, 0.060, 0.060)	(0.035, 0.034, 0.035)	(0.179, 0.181, 0.176)	(0.069, 0.069, 0.069)	0.06009	0.03465	0.17896	0.06900
C14	(0.056, 0.057, 0.060)	(0.067, 0.068, 0.070)	(0.088, 0.088, 0.087)	(0.068, 0.068, 0.069)	0.05762	0.06850	0.08782	0.06804

Note(s): *Opr.: operations, Pln.: planning, C-R: customer relations

Table 6.
Fuzzy weights and ranks of each capability

To determine which department staff has the highest performance level, perceptions of the managers who work at shipping agencies located in one of the biggest Turkish port regions were collected as an expert opinion. Table 7 shows the capability performance of the operations department staff who worked at this regional port was seen as the highest. According to the experts, the second-highest capability performance score belongs to the planning department staff in that region. Finally, it is seen that customer relations department staff showed lower capability performance than others in the regional ports.

Additionally, in consideration of the data collected, it was revealed that there were difference between each department managers' expectations from its staff in terms of capabilities and customer perception. Accordingly, the weights of capabilities determined by fuzzy AHP for each department separately (see in Table 6) were seen as department managers' expectations from its staff. Afterward, arithmetic means of the shipping agency managers' evaluations on the status of each department's staff based on each capability were accepted as customer perception. Finally, department managers' expectations from their staff regarding each capability separately and the capability rankings for each department are shown in Table 8. Moreover, port customers' perception of the status of the staff and the top-ranking capabilities and inadequacies of each department's staff respectively are also shown.

As seen in Table 8, perceptions of operations and planning department managers of selected Turkish ports on top-prior staff capabilities and also the fewest prior ones were determined similarly. Thus, according to its managers, "analytical thinking" was determined as the highest priority for becoming one of the operations or planning department staff. Furthermore, "team working' and "problem-solving' were seen as the other important capabilities to become members of these departments' staff. Similarly, again, having "experience" was seen as the fewest prior capability by Operations, Planning and even

Table 7.
The fuzzy analysis of the "CC" scores

Department	d+	d−	CC	Rank
Operations Department	1,224	1,331	0.521	1
Planning Department	1,265	1,240	0.495	2
Customer Relations Department	1,262	1,154	0.478	3

Table 8.
Weight rankings and evaluation rankings of each capability

	Department managers' expectations score			Ranking			Agency managers' perception score			Ranking		
Criterion	Apr	Plan	C-R	Apr	Plan	C-R	Apr	Plan	C-R	Apr	Plan	C-R
C1	0.025	0.021	0.026	14	14	14	8	8.125	7.75	4	3	5
C2	0.043	0.048	0.066	11	9	8	8	8.625	8	4	1	4
C3	0.031	0.046	0.033	13	10	13	8.375	8.625	8.5	1	1	1
C4	0.042	0.030	0.044	12	13	10	8.125	8	8.125	3	5	2
C5	0.102	0.083	0.084	4	6	5	7.75	8.125	8.125	6	3	2
C6	0.107	0.108	0.096	3	3	2	7.625	7.5	7.25	8	7	10
C7	0.075	0.107	0.067	6	4	7	6.875	7.375	7.5	10	9	7
C8	0.080	0.091	0.078	5	5	6	6.625	5.5	6	13	14	14
C9	0.134	0.139	0.043	1	1	11	7.75	7.5	7.125	6	7	11
C10	0.065	0.069	0.040	8	7	12	6.75	6	6.25	11	13	13
C11	0.111	0.116	0.060	2	2	9	8.25	8	7.5	2	5	7
C12	0.067	0.039	0.095	7	11	3	6.375	6.5	6.375	14	11	12
C13	0.060	0.035	0.179	9	12	1	6.75	6.5	7.75	11	11	5
C14	0.058	0.068	0.088	10	8	4	7.125	7.125	7.5	9	10	7

Customer Relations Department managers. On the other hand, customers (agency managers) of the ports located in a selected port region evaluated the status of the related staff's on related capabilities distinctively. Hereunder, according to port customers, "analytical thinking" capability of the Operations And Planning Departments staff were ranked as 6th and 7th best capabilities, respectively. In other respects, being "customer-oriented" was inherently determined as the highest priority for being one of the Customer Relations Department staff. Besides, having "problem-solving" and "agility" capabilities were seen as the other vital recruitment factors.

On the other hand, customers of the ports evaluated customer orientation of the Customer Relations Department staff as the 5th best capability. On the one hand, its customers determined the selected department staff's best capability as "exercising information technologies." On the other hand, the capability "exercising information technologies" was ranked as the 10th, 13th and 10th highest priority capability by Operations, Planning and Customer Relations Department managers.

5. Discussion

In the literature, many studies approached the personnel recruitment process and generated several models for various sectors. Among these, most of the studies specific to the maritime sector proposed models for or analyzed crew recruitment procedures. Apart from these, some of the studies specific to maritime business or maritime logistics (onshore activities of maritime business) kept the "port personnel recruitment process" in perspective of human resource practices as an element. Anwar *et al.* (2012) assessed Tanjung Perak Port's human resource strategic plan performance with the help of the balanced scorecard. Whole aspects of human resource management were approached in this study, and each aspect was involved in the model, which considered employees' satisfaction and expectations for high performance. Mira *et al.* (2019) concluded that human resource practices significantly relate to port performance and port supply chain integration. Some proposed personnel selection criteria for entire maritime businesses.

Koutra *et al.* (2017) developed a model that involves personnel selection criteria for the maritime industry. They conducted interviews with human resource managers employed in maritime companies to gain data and prioritized the personnel selection criteria they proposed. On the other hand, Tezcan and Kuleyin (2019) bore in mind a sustainability framework. They determined the capabilities of port managers for high sustainable performance in ports with the three-step Delphi technique. As an extent of this study, the capabilities of operation managers of the container ports were handled by 13 academicians with both academic and sector experience. After the determination phase, they also prioritized capabilities, so capabilities such as "safety management," "security management," "emergency practices" come into prominence for more sustainable port management. Finally, some studies determined the necessary capabilities for port personnel and developed models for the recruitment process. Ahn and McLean (2008) identified port and logistics personnel capabilities and generated capability clusters by interviewing experts. They also implemented a survey to determine each capability's expected and existing expertise levels. Thai and Yeo (2015) proposed a capability framework for personnel selection in container shipping after extensive literature review and interviews with maritime logistics managers. They classified these capabilities under subgroups such as business, logistics and management. After this classification, the perceptual importance of each capability was analyzed, and it was concluded that knowledge and skills are necessary to fulfill duties related to maritime logistics.

In our study, the common capabilities of the personnel working in the Operation, Planning and Customer Relations Departments of the ports were determined with help from literature.

Perceptual priorities of the whole capabilities and the capabilities' weights to do the business were determined separately for each department by interviewing the department managers. After prioritization, capability success levels of the personnel of each department were asked from customers of the ports (agency services managers). Thus, perceptual success levels of the container port personnel doing business in Turkey were determined in this study. One of the originalities of this study was derived from its customer-oriented perspective. This study is a unique study that gathers common personnel capabilities related to operations, planning and customer relationship departments and evaluates the success of these capabilities from a customer perspective. Accordingly, a strategic recruitment tool was developed for container ports' human resource department. The mismatch between department managers' priority perceptions on personnel capabilities and the customers' perceptions on whether these more primary capabilities were achieved would be a problem for the human resource strategies of the ports. Hereunder, this study also evaluated the level of coordination between the human resource department and related departments in which the candidate will be employed in. The other originality of this study is being a unique study that evaluated the success of the Human Resource Department's recruitment strategies in the container ports of Turkey.

6. Conclusion

The amount of cargo handled in a lump-sum manner at port areas increased due to the growth in ship sizes and capacities, and that it could be transported via maritime transport predominantly during the pandemic; these factors led to hub ports gradually reaching capacity saturation. The expansion opportunities were limited and exercised power over the ports in terms of operational speed. In this sense, working in a coordinated manner with customers and operational handling and planning are catalysts to accelerate workflow in the port area. Considering the human factor, which is vital in the execution of the works in the ports as in every business, the quality of the personnel in the Operation, Planning and Customer Relations Departments is very important to ensure the operational speed in the ports. In this context, while selecting personnel in ports, determining the capabilities required to do the business in the relevant department and employing potential candidates according to these capabilities would trigger the operational speed in ports. In this study, the required capabilities of the personnel working in the Operations, Planning and Customer Relations Departments in ports were revealed through the literature and the interviews with port managers. Then, which of these capabilities came to the forefront was determined by considering the departmental distinction. In the light of these priorities that were calculated separately for each department, the qualifications of the operation, planning and customer relations personnel in the ports was measured based on capabilities.

As a result of the analysis, it was revealed that the operations department personnel were at a better level in terms of the capabilities sought compared to the personnel of other departments; on the other hand, it was determined that this level of difference was not very distinct. However, significant differences were identified between the priority perceptions of department managers' and port customers' perceptions of the capabilities of the relevant departments' personnel. It was revealed that while the top priority capabilities expected from the personnel of the operations and the planning departments were "analytical thinking," "team working" and "problem solving," the top priority capabilities that the personnel of the customer relations department were "customer-oriented," "problem-solving" and "agility." Accordingly, "analytical thinking" was evaluated as the top priority competence of the operations and planning personnel, but this was seen as less priority for customer relations personnel. When the port system is considered as a supply chain, the planning and execution processes of the operations are linked to each other by a chain, and the result of each operation can be the reason for the latter. This situation might have brought to the fore the necessity of

having analytical thinking skills that will strengthen the cause-effect link between the processes for the operations and planning personnel. In addition, the determination of being "customer-oriented" as the highest priority for Customer Relations Department personnel by its managers strengthened the study's validity.

On the other hand, port customers determined the capabilities "exercising information technologies," "knowledge of foreign language," "team working," "technical skills," "experience" and "communication" skills as the most prominent capabilities of the relevant personnel. The fact that the capabilities other than "team working" cannot meet the common denominator in terms of priority perceptions and customer evaluations of these two groups represented the problems related to the personnel selection process of the relevant port. For example, there was a belief that port department managers in Turkey had least priority being experienced in terms of capabilities they were looking for from their staff. However, the staff employed by the port's human resources department, especially for the planning department, had been found to turn to experienced candidates. For example, while department managers of the selected ports in Turkey expressed that being experienced is seen as the least priority for their personnel, it was determined that the Human Resource Department of the ports preferred experienced candidates. Differently, it was seen that the port managers highlighted the "taking the initiative" competence in their evaluations, but in the evaluations of the customers, it was seen that the "taking the initiative" competence of the personnel of the Operations, Planning and Customer Relations Departments was 13th, 14th and 14th (i.e. the last) competence, respectively. At this point, it can be concluded that port managers, contrary to their evaluations, encourage their employees less to take the initiative.

Additionally, although the port managers prioritized problem-solving competence, the customers' evaluations on this issue emphasize that the relevant personnel should improve themselves in problem-solving. Including department managers in the recruitment processes will make the process more effective to ensure better coordination within the organization and to employ more suitable personnel for job descriptions. The Human Resource Management department can measure customer evaluations and requests from department managers by employing this model. In this way, direct feedback can be obtained from those who do business with recruited personnel.

Finally, the study made an important contribution to the literature in terms of comparing port managers' expectations and port customers' perceptions of personnel capabilities. In this sense, the research can be improved by increasing the number of ports dealt with. Thus, evaluations can be made regarding the personnel selection process in the relevant region or country ports to be researched.

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Corresponding author
Mahmut Mollaoğlu can be contacted at: mahmut.mollaoglu@beun.edu.tr