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**Natalia Grebennyk**

PhD (Economics), Associate Professor,  
Department of Entrepreneurship and Tourism,  
Odesa National Marine University  
34 Mechnikov Str., Odesa, 65029, Ukraine  
[nataly.grebennyk@gmail.com](mailto:nataly.grebennyk@gmail.com)  
ORCID ID: <https://orcid.org/0000-0002-1554-0697>



**Yuliia Navrozova**

PhD (Economics), Associate Professor,  
Department of Entrepreneurship and Tourism,  
Odesa National Marine University  
34 Mechnikov Str. Odesa, 65029, Ukraine  
[yuliana\\_docent@hotmail.com](mailto:yuliana_docent@hotmail.com)  
ORCID ID: <http://orcid.org/0000-0002-6106-2825>



**Oleksiy Danchenko**

PhD Student (Economics),  
Odesa National Marine University;  
Crewing Manager,  
Crewing Company «Global Odessa»  
34 Mechnikov Str., Odesa, 65029, Ukraine  
[lexdanuniversal@gmail.com](mailto:lexdanuniversal@gmail.com)  
ORCID ID: <https://orcid.org/0000-0001-7467-4866>



**Peter Jakubek**

PhD (Economics), Associate Professor,  
DTI University (Dubnica Institute of Technology)  
533/20 Sládkovičova Str., Dubnica nad Váhom, 018 41, Slovakia  
[kvestor@dti.sk](mailto:kvestor@dti.sk)  
ORCID ID: <https://orcid.org/0000-0002-3080-307X>

## Methodical approaches to the management of the crewing company efficiency

**Abstract.** Under the conditions of personnel shortage and access to the world market, the availability of an effective system for managing effectiveness is a decisive factor in the successful functioning of a crewing company. The purpose of the paper is to develop a methodology to enhance seafarers' efficiency for a crewing company. To do this, different approaches to managing crewing company effectiveness are examined in this paper, taking into account peculiarities of crewing and the conditions in the global seafarer market.

Unlike the existing ones, the approach proposed by the authors allows giving recommendations for improving efficiency of crewing companies. Therefore, according to experimental calculations provided by Global Odessa crewing company, the highest profit can be made with full crewing management (USD 416,220 per contract). According to the same scheme, the highest profit in USD per seafarer (USD 16,664.9 per seafarer) is also observed. The developed CUBE provides the opportunity to demonstrate different categories of seafarers, which further helps the crewing company identify those seafarers who meet its needs to achieve a specific goal in the management of its effectiveness. For example, with a base indicator of 4.25, there are two possible scenarios in performance management. With a minimum of investments, the most «profitable» employees for the crewing company will be those seafarers who, according to their characteristics, correspond to the «premium» group, have a normal or excellent ratio of the seafarer age and experience and receive positive reference with a high professional assessment from the previous employer-shipowner. The most promising with regard to training are those seafarers who get into a block with the following characteristics: the «standard» group with favourable «age - experience» and «Shipping company's references - characteristics» ratio.

The conducted research has shown that in order to ensure the effectiveness of the crewing company, different ways of managing the efficiency are possible, depending on the purpose of the operation and the balance of supply and demand on the seafarer market. In some cases, the company can attract any seafarers, and in the others it will be more appropriate for the company to focus on finding prospective or profitable seafarers.

**Keywords:** Crewing Company; Seafarer; Efficiency; Profitability; Qualification

**JEL Classification:** J40; M21

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**Гребенник Н. Г.**

кандидат економічних наук, доцент, кафедра підприємництва та туризму,  
Одеський національний морський університет, Одеса, Україна

**Наврозова Ю. О.**

кандидат економічних наук, доцент, кафедра підприємництва та туризму,  
Одеський національний морський університет, Одеса, Україна

**Данченко О. О.**

аспірант, Одеський національний морський університет;  
крюїнг-менеджер, круїнгове агентство «Глобал Одеса», Одеса, Україна

**Якубек П.**

кандидат економічних наук, доцент,  
Університет ДТІ, Дубниця-над-Вагом, Словаччина

**Підходи до управління ефективністю круїнгової компанії**

**Анотація.** В умовах дефіциту командного складу й надлишку рядового складу на світовому ринку для круїнгової компанії вирішальним фактором успішного функціонування є наявність ефективної системи управління ефективності діяльності. Мета статті полягає в розробці підходу до управління ефективністю моряка для круїнгової компанії. Для цього в статті досліджено підходи до управління ефективністю круїнгової компанії з урахуванням специфіки її роботи та стану на глобальному ринку праці моряків. Авторами запропоновано методичний підхід, що взаємопов'язує управління ефективністю круїнгової компанії та ефективність (перспективність, прибутковість) моряка. Навідміну від існуючих, запропонований підхід дозволяє в залежності від виду круїнгу, особливостей формування фінансових результатів і врахування ситуації на ринку надати рекомендації з підвищення ефективності. За експериментальними розрахунками за даними круїнгового агентства «Глобал Одеса» найбільший прибуток може бути отриманий при повному круїнг-менеджменті (416220 дол. на контракт). За цією ж схемою спостерігається й найвищий питомий прибуток (16664,9 дол. на моряка). Розроблений КУБ надає можливість візуально продемонструвати різні категорії моряків, що в подальшому допомагає круїнговій компанії виділити саме тих моряків, які найбільше відповідають її потребам для досягнення конкретної мети в процесі управління її ефективністю. Наприклад, при базовому значенні коефіцієнта 4,25 можливі два сценарії в управлінні ефективністю. При мінімумі вкладень найбільш «прибутковими» для круїнгової компанії будуть моряки, які за своїми характеристиками відповідають групі «преміум» за умови нормального чи відмінного співвідношення віку та досвіду моряка й відгуків без зауважень і з високою професійною оцінкою від попереднього роботодавця-судновласника. Найбільш «перспективними» з точки зору навчання є моряки, які потрапили до блоку з таким співвідношенням: група «стандарт» з перспективними співвідношеннями «вік – досвід» і «відгуки – характеристики». Проведене дослідження показало, що для забезпечення ефективності круїнгової компанії можливі різні шляхи управління ефективністю залежно від мети функціонування й співвідношення попиту та пропозиції на ринку працевлаштування моряків. В одних випадках компанія може залучати будь-яких моряків, а в других – для неї більш доцільно буде акцентувати увагу на пошуку або перспективних, або прибуткових моряків.

**Ключові слова:** круїнгова компанія; моряк; ефективність; прибутковість, кваліфікація.

**Гребенник Н. Г.**

кандидат экономических наук, доцент, кафедра предпринимательства и туризма,  
Одесский национальный морской университет, Одесса, Украина

**Наврозова Ю. А.**

кандидат экономических наук, доцент, кафедра предпринимательства и туризма,  
Одесский национальный морской университет, Одесса, Украина

**Данченко А. А.**

аспирант, Одесский национальный морской университет;  
круїнг-менеджер, круїнговое агенство «Глобал Одесса», Одесса, Украина

**Якубек П.**

кандидат экономических наук, доцент,  
Университет ДТИ, Дубниця-над-Вагом, Словакия

**Подходы к управлению эффективностью круїнговой компании**

**Аннотация.** В условиях дефицита командного и избытка рядового состава на мировом рынке для круїнговой компании решающим фактором успешного функционирования является наличие системы управления эффективностью деятельности. Цель статьи заключается в разработке подхода к управлению эффективностью моряка. Для этого в статье рассматриваются подходы к управлению эффективностью круїнговой компании с учетом специфики ее работы и состояния на глобальном рынке труда моряков. Авторами предложен подход, взаимосвязывающий управление эффективностью круїнговой компании и эффективность (перспективность, доходность) моряка. В отличие от существующих, предложенный подход позволяет, в зависимости от вида круїнга, особенностей формирования финансовых результатов и учета ситуации на рынке, дать рекомендации по повышению эффективности. Так, по экспериментальным расчетам с учетом данных круїнгового агентства «Глобал Одесса» наибольшая прибыль может быть получена при полном круїнг-менеджменте (416220 долл. на контракт). По этой же схеме наблюдается и самая высокая удельная прибыль (16664,9 долл. на моряка). Разработанный КУБ, позволяющий визуально

продемонстрировать различные категории моряков, в дальнейшем помогает крьюинговой компании выделить именно тех моряков, которые наиболее полно отвечают её потребностям для достижения конкретной цели в процессе управления её эффективностью. Например, при базовом значении коэффициента 4,25 возможны два сценария в управлении эффективностью. При минимуме вложений наиболее «прибыльными» для крьюинговой компании будут моряки, которые по своим характеристикам соответствуют группе «премиум» при условии нормального или отличного соотношения возраста и опыта моряка и отзывов без замечаний и с высокой профессиональной оценкой предыдущего работодателя-судовладельца. Наиболее перспективными с точки зрения обучения являются моряки, попавшие в блок с таким соотношением: группа «стандарт» с перспективными соотношениями «возраст – опыт» и «отзывы – характеристики». Проведенное исследование показало, что для обеспечения эффективности крьюинговой компании возможны различные пути управления эффективностью в зависимости от цели функционирования и соотношения спроса и предложения на рынке трудоустройства моряков. В отдельных случаях компания может привлекать любых моряков, а в других – для нее более целесообразно будет акцентировать внимание на поиске или перспективных, или прибыльных моряков.

**Ключевые слова:** крьюинговая компания; моряк; эффективность; прибыльность; квалификация.

## 1. Introduction

In today's conditions, the decisive factor for a crewing company in terms of the successful functioning of the market is the availability of an effective system for managing effectiveness. A prerequisite for the construction of such a system is the use of an effective mechanism for a comprehensive assessment of its functioning effectiveness, taking into account the system approach, which includes a comprehensive assessment of the efficiency of the crewing company performance. At the same time, it is important not only to evaluate the company's efficiency over a certain period of time, but also to develop various variants of the company's development including different parameters of its activities: the type of crewing, the company's development strategy, the number and types of customers' shipping companies, trends in the market of crewing services, the global seafarers labour market, etc.

## 2. Brief Literature Review

Many scientific papers are devoted to the analysis of approaches and methods for assessing the effectiveness of the company, which are the basis of the company's management system, which should cover the entire spectrum of tasks in the field of strategic and operational management. The elements of this system are setting goals, developing ways to achieve them and evaluating the results obtained using certain methods of assessing effectiveness.

In work [1] it is indicated that there are a lot of methods for managing enterprise efficiency, which are proposed to be grouped into three groups: heuristic, calculated and combined. The dependence of the evaluation method on the criterion of effectiveness is indicated. Also, benchmarking is expected to be promoted as a leading method of doing business.

Some researchers [2] argue that the main performance criteria should include profitability indicators which summarise other performance indicators and allow one to investigate the impact of a set of factors that affect the final result of the company. From the point of view of building a performance management system, the approach based on the assessment of the enterprise potential has been widely disseminated [3]. The authors pay attention to the structuring of economic potential and methods used in its evaluation.

According to many scholars, the most commonly used concept is the one by Norton and Kaplan (Balanced Scorecard - BSC), in which, besides the traditionally estimated financial indicators, customer information, internal processes, and company personnel training and development are analysed. Also, this system provides not only a retrospective analysis of the results achieved, but also predictive values for certain items [4-5].

Evolutionary development in the issue of efficiency assessment was presented by the concept of Business Performance Management (BPM) which is a relatively new concept of management, which indicates a holistic, process-oriented approach to management decisions, aimed at increasing the company's ability to assess its financial situation and manage its performance at all levels by bringing together owners, managers, staff and external contractors within the framework of a common integrated management environment [6].

Some authors propose to use a single integrated indicator as an efficiency criterion, for example, the value of an enterprise that aggregates the influence of all of the above elements [7-9].

Therefore, nowadays a value approach to managing the efficiency of the company, which is based on the estimation of a single indicator - the cost of a company and takes into account

many different factors, including the external environment and market situation, is gaining in popularity [7]. There are a lot of value methods, but the most well-known method, the one of Economic Value Added (EVA), is the calculation of economic value added.

A separate analysis is required for the works of local and foreign scientists, which are devoted to the impact of human resources management on the efficiency of the company. In work [10], crewing services are studied and the basis for increasing the efficiency of crewing services from the point of view of personnel management is considered. At the same time, the proposed method does not take into account the market situation and the possible variability of the company's goals.

The author of this work [11] pays much attention to business processes, however his analysis relates mainly to business processes inherent in the shipowner's office, which does not always coincide with the scheme of work with crewing management and net crewing.

Among foreign researches, it is possible to distinguish the work on hiring procedures which are applied by many Romanian crewing agencies and the practice of using functional IT tools and methods which are aimed at improving the productivity and quality of Marlow Navigation company work [15-16]. In [21], Jeroen Hollebrands analysed the effectiveness of transferring crew management of a shipowner to outsourcing to a well-known ship operator. This concerned the maintenance, supply and insurance of the crew. Aspects of manning and evaluating the effectiveness of this business process has remained unaddressed. Certain aspects of the impact of crew management policies on the ships operational efficiency are given the attention by Jatau (2002) [22]. It is argued that the long-term relationship between the seafarer and the company, and therefore between the seafarer and the ship, increases operational efficiency. A special role in improving the competence and qualifications of a seaman is assigned to training, refresher and updating courses. A comparative analysis was carried out for various crew recruitment schemes for factors such as the length of service for one employer, the total number of years spent at sea, positions, the percentage of seafarers with certificate with endorsement, etc., which confirms the importance of taking such factors into account when evaluating the company effectiveness, yet that did not find its continuation in the assessment methodology. The papers by Leo Čampara, Vlado Frančić and Matko Bupić [23], as well as by Inderveer Solanki [24], is devoted to improving the system of vocational secondary and higher education of seafarers. The education factor will be used in the proposed methodical, however along with other factors.

The correlation between different groups of employers' claims with the salary and labour productivity does not answer the question of how the availability of employees with a certain set of skills affects the employer's efficiency (David Deming and Lisa B. Kahn, 2017) [17]. The ambiguity of various factors namely education and work experience impact on labour productivity was revealed during the study by Indian scholars (B. R. Kotur & S. Anbazhagan, 2014) [18]. We believe that in order to assess a crewing company's effectiveness, it is necessary to expand the list of key factors of influence.

The presence of such a wide range of approaches and methods of efficiency management that reflect the specifics of the crew recruitment shows that there is no single universal methodology. In our opinion, depending on the type of crewing, peculiarities of the financial results formation and taking into account the situation on the market, one can propose one's own mechanism of managing crewing company efficiency.

**3. The purpose** of the paper lies in the developing of a methodical approach to managing seafarers' effectiveness for a crewing company. To do this, approaches to managing crewing company effectiveness taking into account crewing company work peculiarity and the condition of the global seafarers' labour market are examined in this article.

#### 4. Results

The need to ensure the efficiency of the enterprise has led to the appearance of «efficiency management» concept under which a system aimed at achieving a goal (sometimes success), provided its separate components coordinated actions is understood.

According to most scholars' opinion, the efficiency managing process is cyclical. There is no single cycle stages list. Different authors' opinions are presented in work [12]. They all combine the presence of certain process elements: definition of goals, development of plans and their implementation, monitoring of goals which is effectiveness evaluation with the help of the chosen method, and adjustment and improvement of goals or objectives.

Within this work, we will not regard all the overall process stages of managing efficiency, however we will consider it in the light of the main type of crewing company activity which is seafarers' employment. Meanwhile, the moment of choosing seafarers, the work with whom will provide the most effectiveness for a crewing company, is important.

Thus, the choice of the most appropriate method of managing efficiency in particular conditions is based on defining of the purpose of functioning. This is fundamentally important because the goal determines the methods, indicators and their corresponding performance management systems.

It is suggested to include the following most common goals of commercial enterprise performance under market conditions:

- growth of the competitiveness level;
- maximisation of profits;
- maximisation of the enterprise value.

On the basis of the carried out research, we determined the following principles for assessing the crewing company performance efficiency. They are based on classical methods and take into account the need of the ratio to evaluation criterion from the chosen system (Figure 1).

The difficulty in implementing benchmarking in crewing activity is the market international nature and the absence of accurate (reliable) information about crewing companies work at the market. The assessment of the level of competitiveness allows you to determine positions of the company at the market, yet it does not always reveal the internal reserves of the crewing company itself, which is extremely important in efficiency management.

When using the BSC (Balanced scorecard) system, the most difficult thing is to choose an adequate evaluation criterion for achieving a certain goal, as well as to gather necessary information for the assessment. This is especially true of the company's performance quality scorecard, which is in the crewing in the overwhelming majority of cases.

The Economic Value Added (EVA) method is the most appropriate in determining effectiveness of a particular project; it can also be used when assessing a crewing company's performance. It can be taken as an extra method in some cases, however it does not always provide full objective information about the work of the crewing company's separate structural departments and does not show the effect of changes of the company's performance separate scorecard on its effectiveness in the long run.

To assess crewing company's performance effectiveness, it is necessary to determine the performance effectiveness scorecard. All scorecards are related to the crewing company's results which depend on the staff and seafarers work.

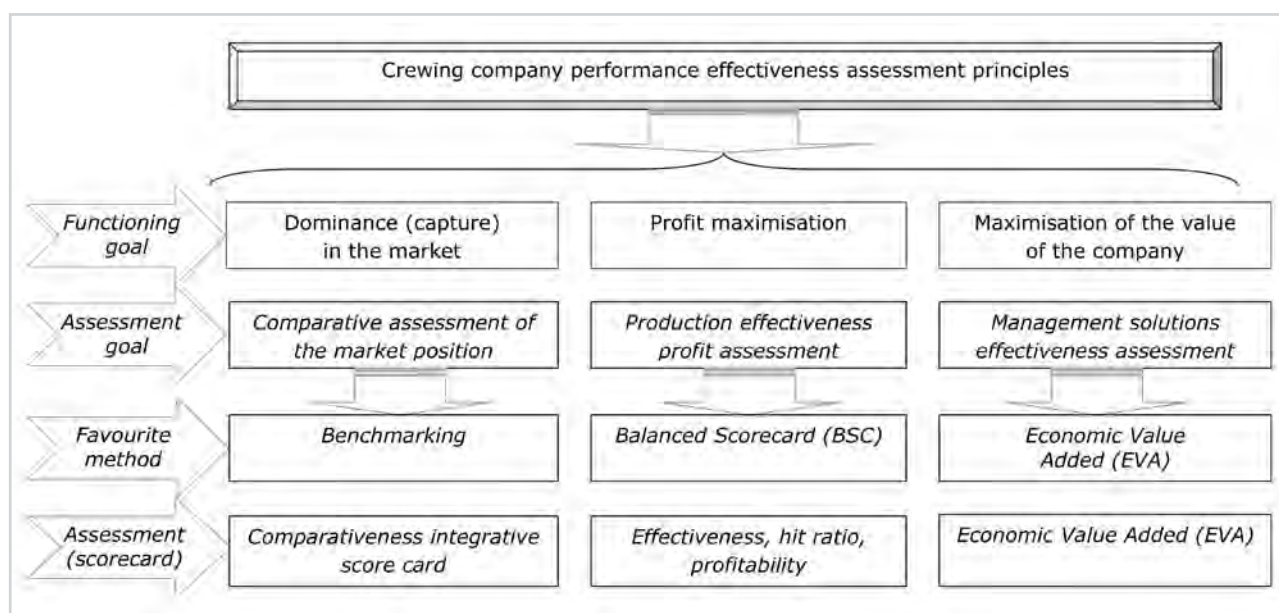


Figure 1:  
**Dependence of the assessment of effectiveness of the crewing company's activity management on the company's goal**

Source: Compiled by the authors

The main crewing company activity and profit source is seafarers' employment on vessels. The cost volumes and structure, as well as the mechanism of profit formation, differ considerably in different types of crewing. This should be taken into account while determining financial scorecards used to manage the crewing company's efficiency [13].

A fundamentally different cost level for a crewing company is observed for various types of crewing. This is due to various schemes for the formation of financial results, which are the subject of research in this research and significantly affect the choice of an effectiveness management system for a crewing company.

The highest profit margin was obtained with full crewing management (Table 1). However, under the conditions of the crewing company, a different number of seafarers were employed for various types of crewing.

Figure 2 shows the values of the unit income, unit costs and unit profit of the crewing company «Global Odessa» in 2018 for various types of crewing. The data presented indicate that the highest level of profit per seafarer is achieved with full crewing management.

Under certain crewing schemes (in particular, the representative company of shipowner), the only approach to evaluate the company performance is to evaluate its costs.

Figure 3 shows the main ways of changing crewing company financial results.

At the same time, it is necessary to remember that employed seafarers have different characteristics, both personal and qualification. On this basis, they have different effectiveness (promise, profitability) for the crewing company. Also, for various purposes, crewing companies can focus on attracting different seafarers. We will focus on the study of the relationship between crewing company effectiveness management and seafarer's efficiency (promise, profitability). To do this, we have classified all seafarers into groups according to characteristics that are dominant for different participants in the employment process:

- a. the «*references - characteristics*» ratio is a dominant feature for a shipping company;
  - b. the «*age - experience*» ratio is a dominant feature for a seafarer;
  - c. the «*seafarer qualifications - loyalty to the crewing company*» ratio is a dominant feature for a crewing company.
1. Calculation of the «*references - characteristics*» ratio. The assessment is carried out solely on the seafarers' characteristics from shipowners received after recent voyages. You can accept

Table 1:  
**Calculation of financial results of the crewing company for various types of crewing, USD/contract**

Indicators	Pure crewing	Crew management		Representative company of shipowner
		full	limited	
Income	69,800	3,981,700	338,480	-
Costs	36,562	3,565,480	277,880	3,653,520
Profit	33,238	416,220	60,600	

Source: Compiled by the authors based on the data of the crewing company, «Global Odessa», 2018

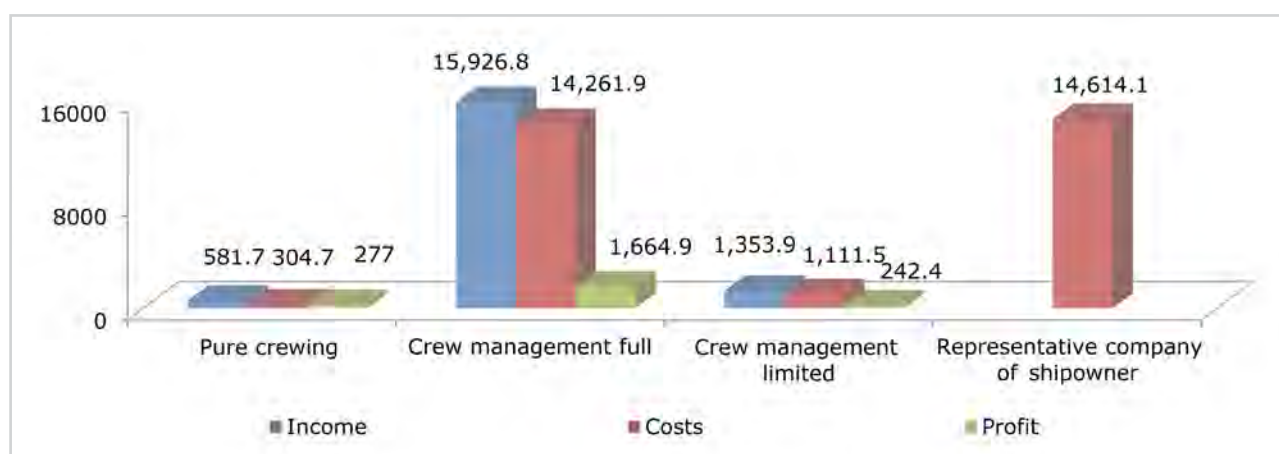


Figure 2:

**The unit income, unit costs and unit profit of the crewing company for various types of crewing, USD /seafarer**

Source: Compiled by the authors according to the data of the crewing company «Global Odessa», 2018

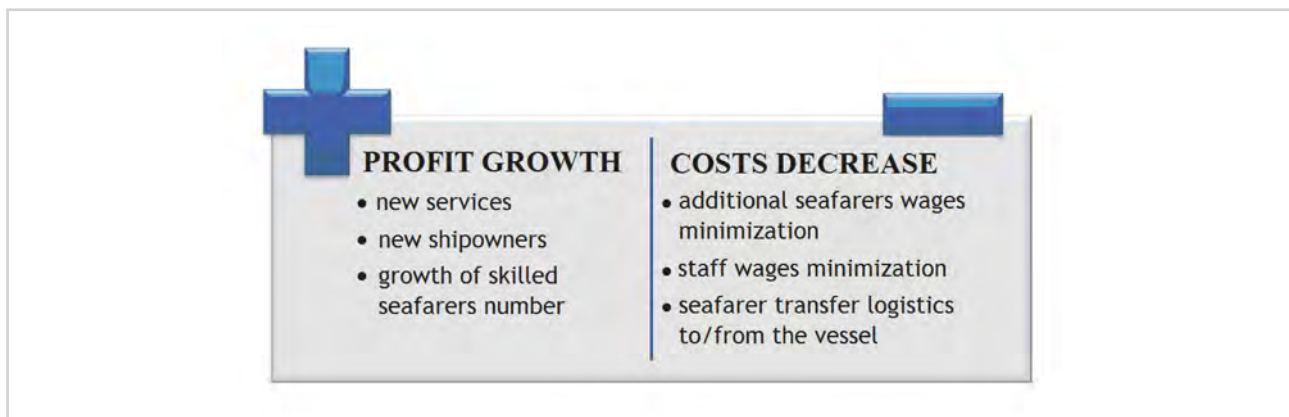


Figure 3:  
**The main ways of changing crewing company's financial results**  
Source: Compiled by the authors

references no later than for 3-4 recent years, provided that the seafarer has been working in his job all this time.

The following scale is proposed:

- «problems» (unsatisfactory) - during previous voyages, there have been incidents because of seafarer's fault; the shipping company has suffered losses; it does not find the seafarer reliable and does not foresee further cooperation with him;
  - «norm» - references from previous voyages indicate that the seafarer carries out his duties efficiently and in a sufficient volume; there are no remarks as for the seafarer's work and behaviour;
  - «prospects'» - the shipping company is satisfied with the cooperation with a seafarer and considers it reasonable to continue it; during the voyage the seafarer performed his duties at a high professional level and in a volume that exceeded his professional duties.
2. Definition according to the «age - experience» ratio. The coefficient (ratio of voyage days in the seafarer's position to his age) is calculated for different age and qualification groups.

The following scale is proposed:

- «unsatisfactory» - the seafarer's age does not correspond to the number of voyage days according to the proposed (appropriate) position;
  - «norm» - the seafarer's age fully corresponds to the number of voyage days;
  - «excellent» (prospects) - the seafarer's age is ahead of standard values of the ratio of voyage days to the seafarer's age.
3. Definition according to the «seafarer qualifications - loyalty to the crewing company (CC)» ratio.
- «STANDARD» - cadets who have a minimum set of certificates for the relevant post;
  - «STANDARD +» - cadets who have the minimum set of certificates required for a given position and have been marked by a crewing company as reliable employees who are loyal to a particular crewing company and who intend to continue their studies (promising in their studies);
  - «PREMIUM» - officers (leading staff), who have a necessary set of certificates for the corresponding position;
  - «PREMIUM +» officers (leading staff), who have a necessary set of certificates required for a corresponding position and have been marked by a crewing company as reliable employees who are loyal to a particular crewing company with whom they have been collaborating for a long time.

Loyalty can be estimated according to the following criteria:

- informal criteria (social, psychological, the company's employee commitment, identification, engagement);
- formal criteria (the number of voyage days per year, offer acceptance (refusal), discipline in documents preparation, crewing managers references, time for documents execution, the number of orders).

Graphically, «efficiency (attractiveness, profitability)» of a seafarer for a crewing company is shown in Figure 4.

This CUBE helps visually demonstrate the different categories of seafarers, which will further contribute to the selection of those seafarers that most fully meet the needs of the crewing company to achieve a specific goal in the management of efficiency.

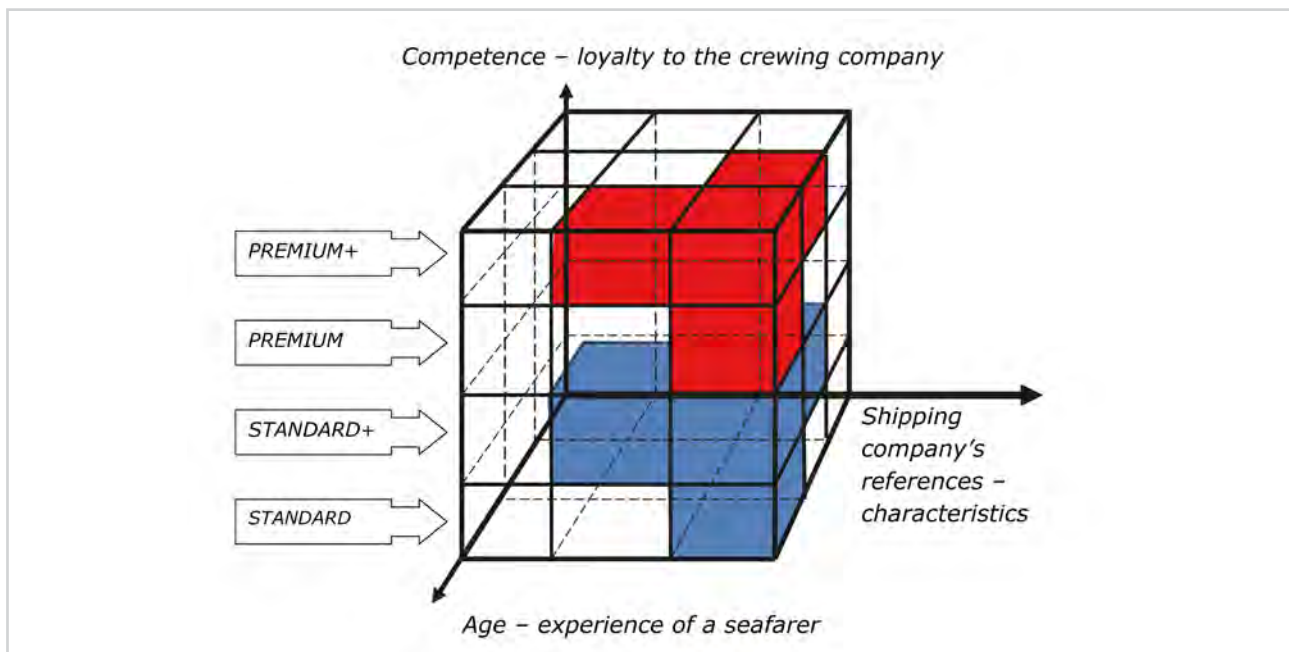


Figure 4:  
**CUBE is a graphic representation of the definition of seafarers' efficiency (prospects, profitability) for a crewing company**  
Source: Compiled by the authors

This approach can be used for various purposes that a crewing company faces, by setting different values of impact of various components. In particular, if the purpose of the study is to identify the most «profitable» seafarers, the indicators characterising the seafarers' competence will become most influential because their level of wages, and consequently, the level of the crewing company's income depends on them. In order to identify the seafarers having the best abilities to learn, the indicators that show loyalty to the crewing company are of the greatest impact. To reduce the risks associated with seafarers productive activities, or to ensure the continuance of relations with a particular shipping company, it is necessary to pay attention to the impact of the indicators of the shipping company's reference group.

For each of the indicators, a score is assigned from 0 to 2. As a result, a range of values is constructed for various groups:

- «problems» - up to 1;
- «norm» - from 1 to 1.17;
- «prospects» - from 1.18 to 1.5.

For example, the STANDARD group provides that seafarers' age and experience are unsatisfactory and there is a lack of feedback from the previous employer-shipowner. The base coefficient is determined as:

$$K = K_{cl}^{st} + K_{ae}^{uns} + K_{rs}^{pr} = 1 + 0 + 0 = 1, \quad (1)$$

where:

$K_{cl}^{st}$  - the indicators characterising the position of the Standard in the «competence - loyalty to the crewing company» ratio;

$K_{ae}^{uns}$  - the indicator characterising the state of unsatisfactory in the «age - experience of a seafarer» ratio;

$K_{rs}^{pr}$  - the indicator characterising the group «Problems» in the «shipping company's references - characteristics» ratio.

The basic parameters that demonstrate the selection of a seafarer by a crewing company are shown in Table 2.

The results obtained with the basic parameters indicate that, for example, with the minimum investment, the most profitable for the crewing company will be the seafarers who by their characteristics go to the red sector in Figure 5. And the most perspective from the point of view of training are seafarers who go to blocks that are highlighted blue (Figure 5, Table 2).



Table 2:  
Basic parameters of a seaman selection by a crewing company

Competence - loyalty to the crewing company	Age experience of a seafarer	Shipping company's references – characteristics		
		«problems»	«normal»	«prospects»
STANDARD	«unsatisfactory»	0.38	0.75	0.94
	«normal»	0.50	1.00	1.25
	«excellent»	0.63	1.25	1.56
STANDARD+	«unsatisfactory»	0.47	0.94	1.17
	«normal»	0.63	1.25	1.56
	«excellent»	0.78	1.56	1.95
PREMIUM	«unsatisfactory»	0.56	1.13	1.41
	«normal»	0.75	1.50	1.88
	«excellent»	0.94	1.88	2.34
PREMIUM+	«unsatisfactory»	0.66	1.31	1.64
	«normal»	0.88	1.75	2.19
	«excellent»	1.09	2.19	2.73

Source: Compiled by the authors

Different market situations are possible. Now the labour market is experiencing a shortage of officers. According to the BIMCO forecast, by the year 2020, the deficit of officers is expected to be 92,000 people, and even more by 2025 which will be 147.5 thousand officers [14]. The solution of this problem is possible with the help of cadet training, assignment of regular ranks, as well as training of a certain category of private. For example, in 2015, out of 39.0 thousand Ukrainian officers working on vessels of the world merchant fleet, 21.85 thousand officers confirmed their skills at the Inspectorate for Training and Certification of Seafarers [19]. The dynamics of seafarers who confirmed their qualification in 2017-2018, taking into account the forecast for 2019, is shown in Figure 5.

The crewing company should decide on further action on the basis of a study of the market situation and an analysis of its own capabilities.

Some large companies set up their own training centres to train and retrain seafarers for the required diplomas in accordance with the requirements of the STCW [20] to provide job vacancies on board the company's vessels.

However, this way is very consuming in terms of the capital. Modern equipment for preparing seafarers for modern vehicles requires large costs. Therefore, only few crewing companies can afford such centres.

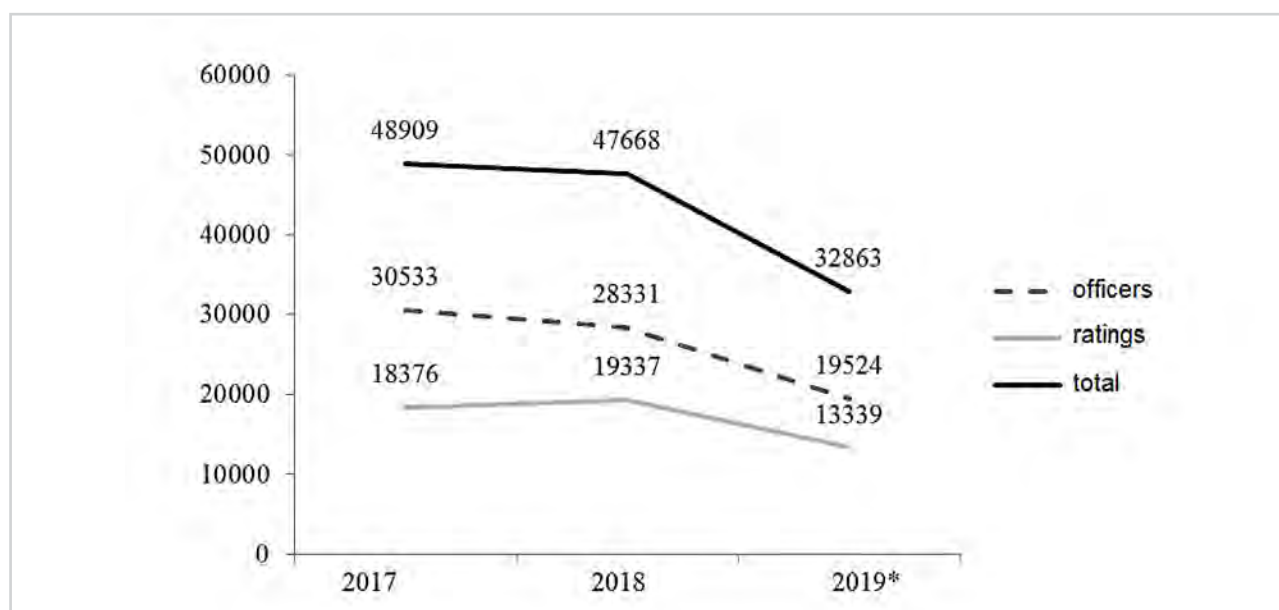


Figure 5:  
Dynamics of people who confirmed their skills at the Inspectorate for Training and Certification of Seafarers\*

Note: \* - Forecast data  
Source: Compiled by the authors based on [19]

Therefore, in order to ensure the effectiveness of a crewing company, different ways of efficiency managing are possible depending on the purpose of the operation and the ratio of demand and supply on the seafarers employment market (Figure 6).

The crewing company is an intermediary, and its task is to keep track of the situation on the market and take timely action. In a situation where the demand for seafarers by shipping companies is considerably less than the supply, in order to ensure the efficiency of its operation, the crewing company should focus on improving the seafarer selection system, which envisages, first of all, investment in the crewing company personnel, its training and introduction of modern HR techniques into the company work.

If supply exceeds demand, it implies a completely different behaviour from the crewing company. To ensure completion of orders from shipping companies, the crewing company must offer seafarers more favourable working conditions, to poach them from other intermediaries.

It is also necessary to take into account the ratio of demand and supply for certain categories of seafarers. Now we can see a shortage of officers. And over time, according to expert estimates [14], this situation is only going to build up. In this case, one of the main ways to ensure the efficiency of the crewing company is to invest in seafarers training in order to meet the demand for officers from the part of shipping companies.

Also, based on various goals of crewing company performance in different market situations, the crewing company is interested in attracting various seafarers. Therefore, depending on crewing company's performance goals, it will be interested in various seafarers.

For example, to enlarge the market share, the crewing company is interested in attracting as many seafarers as possible, regardless of their level of qualification and working experience. Provided Demand > Supply, the crewing company should direct its resources to the development of seafarers' databases. Provided that Demand < Supply, the crewing company should focus on finding and engaging into cooperation new shipboard companies.

If a crewing company wants to increase profit, it is interested in greater seafarers' profitability, which directly depends on seafarer's salary level, which in its turn depends on his qualifications. Provided that Demand > Supply, which indicates that there is a shortage of seafarers at the market, the crewing company must work with all seafarers. However, when Demand < Supply the crewing company can afford to select seafarers with the help of the proposed method (Figure 4 - CUBE). In this case, the crewing company must invest resources into headhunting and engaging (poaching) of only more profitable seafarers.

Provided the crewing company wants to grow in value, it is interested not only in highly skilled (profitable) seafarers, but more in prospective seafarers who seek development (professional development, training and progress). That is, motivation and encouragement of company's own seafarers in order to improve their skills will be the way of company's development to increase its efficiency. This is advisable when there is absence of qualified personnel at the seafarers labour market, that is, when there is a Demand > Supply market situation.

When Demand < Supply, small crewing companies are in a difficult situation as increasing the cost in these conditions is mainly possible establishing their own training centres, the cost of which increases the cost of the crewing company. But this requires significant investment. Therefore, this option is more suitable for shipowners' representatives who can survive in conditions of a limited demand and focus on increasing seafarers' «cost» in the long term by improving their qualifications.

Goal		Increasing the market share	Maximising profits	Maximising the company's value
Category of effective seafarers		Any seafarers	Profitable seafarers	Promising seafarers
Ways of achievement in a market situation	Demand > Supply	Headhunting for any seafarers. The development of seafarers' databases	Headhunting for any seafarers	Headhunting and development of promising seafarers with the help of the CUBE
	Demand < Supply	Looking for and engaging new shipping companies into cooperation	Headhunting for profitable seafarers with the help of the CUBE	Establishing training centres and training seafarers in them

Figure 6:  
**Ways of ensuring the crewing company's effectiveness depending on the purpose of its operation**  
Source: Compiled by the authors

Making a decision to invest into seafarer training is important. The most interesting from this point of view is the «PREMIUM» group. While evaluating, it is necessary to take into account the following factors.

1. Increasing of the company's expenses for the sum of expenses for training and further hiring of seafarers who have passed the training. Raising seafarers' loyalty to this crewing company.
2. Growing of the crewing company's income as a result of seafarers' increased salaries after improving their qualifications.

Probably, in some cases, it will be more reasonable to conclude an agreement with a training centre, or a higher or vocational educational institution.

All these factors need to be taken into account while choosing the company's development option to improve management efficiency.

## 5. Conclusions

The carried out study showed that today, when considering the economy and management of crewing companies it is necessary to apply more advanced tools, not limiting them to using only traditional methods of efficiency management. The dependence of the performance purpose and method of assessing effectiveness was clearly marked. This dependence was illustrated by the example of the three most common company goals.

Taking into consideration that the main activity and also the main source of income for the crewing company is the process of seafarers employment for world merchant fleet vessels, it is proposed to classify all seafarers according to the main features, dominant for the main employment process participants: a shipping company, a crewing company and a seafarer.

The developed CUBE reflects graphically seafarers' efficiency (prospect, profitability) for a crewing company. That is, it provides the opportunity to demonstrate seafarers' different categories visually, which in what follows helps the crewing company to identify those seafarers who are in line with its needs the fullest to achieve a specific goal in the process of company effectiveness management.

To ensure the crewing company effectiveness, there might be different ways of managing its efficiency depending on its performance purpose, and the demand and supply ratio at the seafarer employment market. In some cases, the company can attract any seafarers, and in other cases it will be more reasonable for the company to focus on headhunting prospective or profitable seafarers.

In what follows, it is envisaged to develop a mechanism for managing the crewing company efficiency, taking into account the procedure of the most effective seafarer selection proposed in this paper to ensure the achievement of goals of crewing companies.

## References

1. Volkova, N. A., & Kolyada, A. L. (2015). Analytical methods of efficiency management at an enterprise. *Vestnik Tverskogo Gosudarstvennogo Universiteta. Seriya: Ekonomika. Menedzhment (Newsletter of the Tver State University. Series of Works: Economics and Management)*, 3, 111-117 (in Russ.).
2. Goncharov, V. V. (1998). *In search of excellence in management: A guide for senior management personnel. In 2 toms. Tom 2.* Moscow: MNIIPU (in Russ.).
3. Gavva, V. N., & Goddess, E. A. (2004). *Enterprise potential: formation and evaluation.* Kyiv: Center for Educational Literature (in Ukr.).
4. Kaplan, R. S., & Norton, D. P. (2003). *Balanced Scorecard. From strategy to action.* Moscow: ZAO Olymp-Business. Retrieved from <https://www.twirpx.com/file/270862> (in Russ.).
5. Kozak, H. (2001, May 23). *Balanced system of assessment indicators as a tool for business management.* Retrieved from <https://www.cfin.ru/management/bsc2.shtml> (in Russ.).
6. Orlikovsky, M. O., & Trokoz, D. I. (2014). The last concepts of performance management of modern enterprises. *Efektivna Ekonomika (Effective Economy)*, 5. Retrieved from <http://www.economy.nayka.com.ua/?op=1&z=3034> (in Ukr.).
7. Govorushko, T. A., & Klimash, N. I. (2013). *Managing the performance of enterprises based on a value-based approach.* Kyiv: Logos (in Ukr.).
8. Sinigovets, O. M. (2010). Modern approaches to assessing the effectiveness of an enterprise. *Visnyk NTU «KhPI». Seriya: Tekhnichniy Progres i Efektivnist Vyrobnystva (Bulletin of the NTU «KhPI». Series: Technical Progress and Production Efficiency)*, 58, 8-13 (in Ukr.).
9. Chernega, O. M. (2013). System approach to the performance management. *Naukovyi Visnyk. Odeskyi Natsionalnyi Ekonomichnyi Universytet. Vseukrainska Asotsiatsiia Molodykh Naukovtsiv (Scientific Bulletin. Odesa National Economic University. All-Ukrainian Association of Young Scientists)*, 195(16), 45-54. Retrieved from <http://dspace.oneu.edu.ua/jspui/handle/123456789/1764> (in Ukr.).
10. Pasyuk, E. D. (2008). *Mechanisms to improve the efficiency of services provided by the crewing companies in the maritime labour market (Doctoral dissertation).* Maritime State Academy named after Admiral F. F. Ushakova. St. Petersburg. Retrieved from <https://www.dissercat.com/content/mekhanizm-povysheniya-effektivnosti-uslug-okazyvaemykh-kruingovymi-kompaniyami-na-morskoy-ry> (in Russ.).

11. Bundyuk, R. A. (2011). *Personnel management of a crewing company of a shipping company: theory and practice*. Odessa: Phenix (in Russ.).
12. Lazareva, N. O. (2015). Understanding the Business PERFORMANCE Management. *Ekonomichniy Visnyk Donbasu (Economic Bulletin of Donbas)*, 40(2), 105-109. Retrieved from <http://dspace.nbu.gov.ua/handle/123456789/87861> (in Ukr.)
13. Danchenko, O. O. (2017). The essence and peculiarities of formation of financial results of work of crewing company. *Rozvytok Metodiv Upravlinnia ta Hospodariuvannia na Transporti (Development of Methods of Management and Economics of Transport)*, 59(2), 41-54 (in Ukr.).
14. The Baltic and International Maritime Council (BIMCO) & the International Chamber of Shipping (ICS) (2015). *Manpower Report. The global supply and demand for seafarers in 2015*. Retrieved from <http://www.ics-shipping.org/docs/default-source/resources/safety-security-and-operations/manpower-report-2015-executive-summary.pdf?sfvrsn=16>
15. Dragomir, C., & Utureanu, S. (2012). Seafarers' Employment Procedures in Crewing Companies. *Journal of Applied Economic Sciences*, 12(2) Retrieved from [https://www.researchgate.net/publication/249000109\\_Seafarers%27\\_Employment\\_Procedures\\_in\\_Crewing\\_Companies](https://www.researchgate.net/publication/249000109_Seafarers%27_Employment_Procedures_in_Crewing_Companies)
16. Angelos, A. M. (2011). *Crew Management Administrative Processes and Information Technology Tools Aiming at Improving Productivity and Quality of Work - The Case of Marlow Navigation*. London: Middlesex University. Retrieved from <https://core.ac.uk/download/pdf/17301563.pdf>
17. Deming, D., & Kahn, L. B. (2017). Skill requirements across firms and labor markets: evidence from job postings for professionals. *National Bureau of Economic Research. Working Paper No. 23328*. doi: <https://doi.org/10.3386/w23328>
18. Kotur, B. R., & Anbazhagan, S. (2014). Education and Work-Experience - Influence on the Performance. *IOSR Journal of Business and Management*, 16(5), 104-110. doi: <https://doi.org/10.9790/487X-1653104110>
19. The Ministry of Infrastructure of Ukraine (2017). *Financial plan of the inspection on training and certification of seafarers for 2017-2019*. Retrieved from <https://mtu.gov.ua/timeline/inspekciya-z-pitan-pidgotovki-ta-diplomuvannya-moryakiv.html> (in Ukr.)
20. International Maritime Organization (1978). *The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers*. Retrieved from <http://www.imo.org/en/OurWork/HumanElement/TrainingCertification/Pages/STCW-Convention.aspx>
21. Hollebrands, J. (2012). Performance-based contracting: a new tool in ship management? Retrieved from <https://pdfs.semanticscholar.org/e6c2/d933d710b0d8d5fb7b1c0db773cf94685406.pdf>
22. Jatau, S. U. (2002). *Ship manning and safety: problems in the recruitment, selection and retention of seafarers: a global view (Doctoral dissertation)*. World Maritime University. Malmö. Retrieved from <https://catalog.wmu.se/cgi-bin/koha/opac-detail.pl?biblionumber=16928>
23. Čampara, L., Frančić, V., & Bupić, M. (2017). Quality of maritime higher education from seafarers' perspective. *Scientific Journal of Maritime Research*, 31(2), 137-150. doi: <https://doi.org/10.31217/p.31.2.8>
24. Inderveer, S. (2007). *Empowering the seafarer: manpower solution of the shipping industry (Doctoral dissertation)*. World Maritime University. Malmö. Retrieved from [https://commons.wmu.se/cgi/viewcontent.cgi?article=1123&context=all\\_dissertations](https://commons.wmu.se/cgi/viewcontent.cgi?article=1123&context=all_dissertations)

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