

# A Conceptual Approach to Managing Labor Resources in the Maritime Industry

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**Abstract:** Motivation: More than 70% of accidents in the fleet are due to the "human factor" - a wide range of psychological and psychophysiological qualities of the person, which in some way affect the result of its operations. Statistics of major ship accidents in recent decades show that not a single element of the shipping system is aloof from them. That is ship crews, shipowners, charterers, consignees, classification societies and other organizations associated with maritime transportation form a "chain" of risk. The correct combination of human abilities and machine capabilities significantly increases the efficiency of the "person - machine" systems and determines the optimal use by a person of technical means for their intended purpose. Unfortunately, an adequate model that would allow both quantitative and qualitative optimization of the project team, especially in conditions of incomplete determination of the volume of work, today does not exist. In addition, the existing methods do not take into account the specifics of the formation and conditions for the implementation of projects by such teams as the ship's crew, namely the increased level of danger, the inability to make replacements during the voyage, the international composition, the language barrier, etc. In this context, the issue of human resources management as a basic element of achieving the efficiency of project implementation in the field of maritime transport is also urgent, which implies an emphasis on the problem of project-oriented management of crewing and activity of the crew of marine vessels. The issue of clarifying the role, importance and key elements of HRM strategies and policies in the implementation of these projects requires special consideration. The aim of the study is to develop methodological approaches for the forming of quantitative and qualitative composition and effective management of project teams, as a variable component of the project management system of marine vessels.

**Novelty:** Develop methodological approaches for the quantitative and qualitative composition of project teams, as a variable component of the project team on the example of crews of marine vessels. The task of acceptability of the structure, quantitative and qualitative composition of the team was solved. The terminological base of project management was developed by more clearly defining the concepts of "project team" and "project management team". The approach to the organization of the crewing company recruitment system to work on ships was proposed.

**Methodology and Methods:** In this scientific research to achieve the objective and test the hypotheses suggested in the research paper was used: 1) project teams methodology in project management, in particular, the Project Management Institute Classification (2017) of types of teams in the organizational structure of complex projects and in their management and the taxonomy of SNCB Version 4.1 are designed to provide a comprehensive professional assessment of the level of training of project managers; 2) method for calculating the size of the project team is based on the condition of minimizing its number, which reduces operating costs for the implementation of the project by the Ringelmann effect is known - a formula that provides the ability to quantify and optimize the parameters of the project team; 3) the method of planning of the minimum crew of The International Association of Sea Pilots considering the role of the "human" element in preventing accidents and environmental pollution (the ISM Code and the STCW Convention 78/95 as amended).

**Data and Empirical Analysis:** For the purpose of the study, data were collected and empirical analysis was conducted concerning the analysis of the accident rate of ships and crews for 2009-2019 (causes of accidents: damage to the case and mechanisms; clash; shipwreck and landing; fires and explosions; submergence; contact with the ground; varied; hostilities), that can have a result severe damage or loss of the ship.

**Policy Considerations:** Human factor is the most important aspect that determines the efficiency of shipping development; maintaining of technical and technological processes of the ship puts certain requirements to the quantitative and qualitative composition of the team, deviation from which leads to the occurrence of certain risk events; formation of an effective model of ship's crew manning is the main link in ensuring effective shipping project management.

**Keywords:** Labour resources, crew of marine vessels, minimum crew, maritime industry, project team, project management team, crewing company.

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## 1. INTRODUCTION

For the purpose of a deeper and more comprehensive study and analysis of conditions and factors affecting the safety of the ship's crew, 3 aspects are usually considered:

- 1) technical: reliability (reliability) of the ship, its systems and mechanisms;
- 2) ergonomic: the ergatic system "man-machine" is considered, the mutual fitness of these elements, the functions that they perform; the conditions under which the desired efficiency and reliability of the system is achieved;
- 3) economic: how much money you need to spend to get a sufficient level of security.

Moreover, the result of the project will depend on its crew members much more than on the shipping company management team or other project stakeholders.

### 1.1. Relevance of the Research Topic

The main reason for obtaining an unsatisfactory result in the implementation of most projects are errors in the formation of project teams. Thus, more than 70% of accidents in the fleet are due to "human factor" - a wide range of psychological and psychophysiological qualities of the person, which in some way affect the result of its operations.

Statistics of major ship accidents in recent decades show that not a single element of the shipping system is aloof from them. That is, ship crews, shipowners, charterers, consignees, classification societies and other organizations associated with maritime transportation form a "chain" of risk. Deficiencies in identifying, managing and reducing risks in any part of this "chain" will undoubtedly appear in other places. Therefore, everyone involved in the maritime enterprise, from personnel on board the ship to the director of the shipping company and the management of the national maritime administration, is responsible for the safety of navigation and must take the necessary measures to minimize the risks of existing threats (Futuronautics 2018; Ilina, Miloradov and Kovaltchuk 2019; Martin *et al.* 2018; U.S. Government Accountability Office 2003).

Despite such collective responsibility for ensuring the safety of navigation, the main reason for most incidents at sea is the human factor - a multi-valued

term that describes the possibility of a person making erroneous or illogical decisions in specific situations. The correct combination of human abilities and machine capabilities significantly increases the efficiency of the "person - machine" systems and determines the optimal use by a person of technical means for their intended purpose.

Unfortunately, an adequate model that would allow both quantitative and qualitative optimization of the project team, especially in conditions of incomplete determination of the volume of work, today does not exist. In addition, the existing methods do not take into account the specifics of the formation and conditions for the implementation of projects by such teams as the ship's crew, namely the increased level of danger, the inability to make replacements during the voyage, the international composition, the language barrier, etc. And taking into account the catastrophic consequences of the erroneous actions of almost every crew member, the proposed study can be considered relevant.

In spite of the adequate elaboration of the problems of managing the personnel of marine vessels, there are still many unresolved issues that require serious attention from both theoretical and practical aspects, which determines the choice of the topic and objective of this research paper. In this context, the issue of human resources management as a basic element of achieving the efficiency of project implementation in the field of maritime transport is also urgent, which implies an emphasis on the problem of project-oriented management of crewing and activity of the crew of marine vessels. The issue of clarifying the role, importance and key elements of HRM strategies and policies in the implementation of these projects requires special consideration.

So, according to modern researchers, a project is an action in a limited amount of time and money, aimed at achieving a certain complex of end products (objectives of the project are predetermined his plan) in accordance with standards and requirements for the quality of work performed (Lyridis *et al.* 2005; Chaal 2018; Button *et al.* 2015).

A project is a certain task with specific input data and expected results (goals) that determine the method and its solutions (PMAJ 2017). Various studies can be found and other definitions of the project (Project Management Institute 2017) but they all point out the features common to all projects:

- clear goals that are achieved by simultaneously fulfilling a combination of technical, economic, financial, organizational and other requirements;
- internal and external relationships of operations, tasks and resources, which require coordination in the process of project implementation;
- clearly defined deadlines for the start and end of the project;
- limited resources;
- uniqueness of the conditions of implementation;
- the inevitability of various kinds of conflicts.

*The aim of the study* is to develop methodological approaches for the forming of quantitative and qualitative composition and effective management of project teams, as a variable component of the project management system of marine vessels.

## 2. MATERIALS AND METHODS

In this scientific research to achieve the objective and test the hypotheses suggested in the research paper was used:

- project team's methodology in project management, in particular, the Project Management Institute Classification (2017) of types of teams in the organizational structure of complex projects and in their management and the taxonomy of SNCB Version 4.1 are designed to provide a comprehensive professional assessment of the level of training of project managers;
- method for calculating the size of the project team is based on the condition of minimizing its number, which reduces operating costs for the implementation of the project by the Ringelmann effect is known - a formula that provides the ability to quantify and optimize the parameters of the project team;
- the method of planning of the minimum crew of The International Association of Sea Pilots considering the role of the "human" element in preventing accidents and environmental pollution (the ISM Code and the STCW Convention 78/95 as amended).

For the purpose of the study, data were collected and empirical analysis was conducted concerning the

analysis of the accident rate of ships and crews for 2009-2019 (causes of accidents: damage to the case and mechanisms; clash; shipwreck and landing; fires and explosions; submergence; contact with the ground; varied; hostilities), that can have a result severe damage or loss of the ship.

### 2.1. Project Teams Methodology in Project Management

In accordance with the theory of project management, a project can be defined as a set of actions in which human, material and financial resources are organized to perform a unique set of work of a certain content in conditions of limited cost and time. The project has a life cycle within which the necessary changes take place in accordance with established quantitative and qualitative goals.

Project management, as a type of professional activity, includes planning, organization, monitoring and control of all aspects of the project in the process of continuous achievement of its goals (Kramskyi 2014). The definition of "project management" also does not have the same interpretation in the countries that are the founders of project management:

- project management (PM) is the art of managing and coordinating human and material resources throughout the project life cycle by applying modern management methods and techniques to achieve specific results in the project in terms of scope and scope of work, cost of time, quality and satisfaction project participants (Maliy, Mazurkevich and Molokanova 2008);
- project management is the management task of completing the project on time, within the established budget and in accordance with technical specifications and requirements;
- project management - in accordance with P2M is the combination of science and art that are used in the professional areas of the project to create a project product that would satisfy the mission of the project by organizing a reliable project team that effectively combines technical and managerial methods creates the greatest value and demonstrates effective results of (Zandhuis and Stellingwerf 2013);
- project management - the unity of management tasks, organization, equipment and tools for the implementation of the project (Antonenko and Kramsky 2010).

The project team is a specific organizational structure led by a leader, which is created for the duration of the project in order to effectively achieve its goals and objectives, and when it is completed, is dissolved.

A team in this case is defined as a group of people complementing and interchanging each other in the course of achieving their goals (Maliy *et al.* 2008).

It is conditionally possible to define three types of teams (groups), classified by the content of their work, which are most often formed explicitly or implicitly in the practical activities of companies and enterprises:

- teams creating something new for the organization or performing work that has not previously been carried out;
- teams that deal with problems, goals and objectives in the enterprise through analysis, control and recommendations;
- teams that are not special, but are a constant part of organizational development and carry out the production process and perform repetitive work (processes) (Zakharchenko and Kramskyi 2018).

Two types of teams can be distinguished in the organizational structure of complex projects and in their management: a project team and a project management team (Project Management Institute 2017).

The project team is the organizational structure created for the period of the project or one of the phases of its life cycle to carry out work on the project.

Project Management Team - the organizational structure of the project, including individuals who are directly involved in project management, including representatives of the project team. In some small projects, project management teams include almost all members of the project team (Kramskyi 2014; Zakharchenko and Kramskyi 2018).

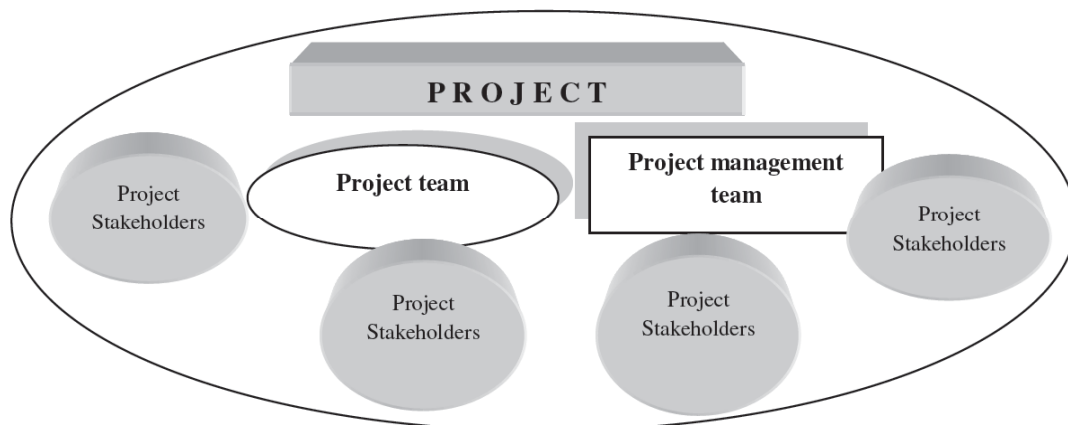
Significant impact on the results of the project have its stakeholders – individuals or organizations whose interests may be affected both positively and negatively in the course of or as a result of completion of the project. The project management team should identify all stakeholders of the project in order to accurately determine the requirements for the project.

In Figure 1, shows the relationship between the Project Team, the Project Management Team and other project stakeholders.

In most cases, the theory of project management pays attention to the formation of a project management team. Thus, the content and taxonomy of SNCB Version 4.1 are designed to provide a comprehensive professional assessment of the level of training of project managers (Baumann 2010). At the same time, insufficient attention has been paid to the formation of the project team in the literature. Today, when forming project management teams, this problem is solved in conditions of incomplete information, often on an intuitive level.

## 2.2. Key Stages of the Functioning of the Project Teams

The project management identified a number of key stages of the functioning of the project teams: the



**Figure 1:** Project Stakeholders.

**Source:** developed by the author.

formation, creation, development, transformation and disbanding.

The formation and creation of a project team is a process of purposefully “building” a special way of people interacting in a group, which allows them to effectively realize their professional, intellectual and creative potential in accordance with strategic goals (Maliy *et al.* 2008; Zakharchenko and Zakharchenko 2019).

The main task at the formation stage is to determine the quantitative and qualitative composition of the project team. Most of the models and methods for calculating the size of the project team are based on the condition of minimizing its number, which reduces operating costs for the implementation of the project.

In the theory of management, the Ringelmann effect is known - a formula that provides the ability to quantify and optimize the parameters of the project team. This formula has the form:

$$C = 100 - 7 \cdot (N - 1),$$

where *C* is the average individual contribution of a person to the work of the team, calculated as a percentage of the average productivity of a separately working person;

*N* is the number of team members.

The formula shows that the productivity of each participant in the project decreases with an increase in the number of persons.

The productivity of the team as a whole initially grows, and then decreases, despite the fact that each person works with a 100% load. Just to increase the size of the project team, all the great efforts and time spent on coordination of actions within the team. If each member of the team must necessarily coordinate their actions with all other participants, the total number of unproductive contacts will be:

$$S = \frac{N \cdot (N - 1)}{2}$$

Moreover, the duration of a single communication between two persons does not exceed the value that can be calculated by the formula:

$$T = 480 \cdot \frac{(100 - C)}{100} \cdot S.$$

In this equation, 480 is the duration of an 8-hour working day in minutes, and (100-*C*) is the fraction of the time that remains for communication if a person's labor productivity is *C*.

The graph of the calculation results is presented in Figure 2, which shows that teams with a quantitative composition of more than 15 people are

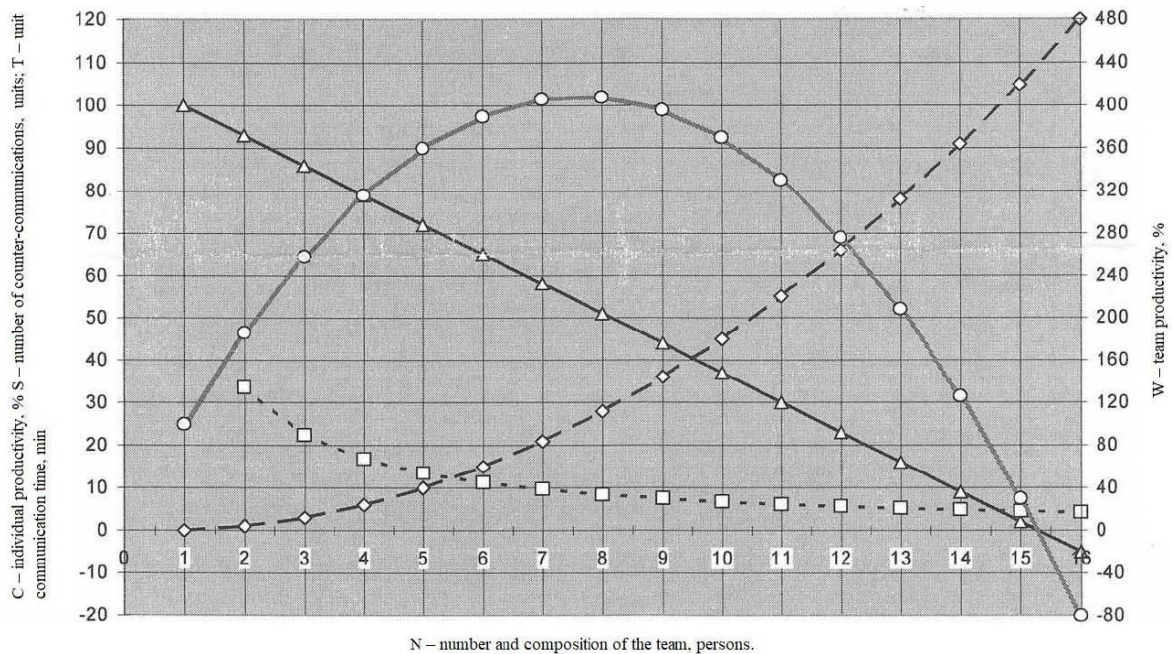


Figure 2: Ringelmann effect for the team and related phenomena.

Source: developed by the author on the base of (Maliy *et al.* 2008; Zakharchenko and Zakharchenko 2019).

counterproductive, and the highest group productivity is achieved with eight members of the project team.

However, even in this case, 50% of the time is spent on maintaining internal team communications, as the team is forced to maintain 28 oncoming communications. Therefore, eight people also cannot be considered the optimal solution for the quantitative optimization of the project team. Therefore, most authors are of the opinion that the optimal project team consists of  $7 \pm 2$  people (Kramskyi 2014; Maliy et al. 2008).

### 2.3. Methodology of Planning of the Minimum Crew

In fact, for each vessel, planning of the minimum crew is carried out taking into account the individual structural characteristics of the vessel, the modes of operation of the vessel and methods of its operation, followed by proof of the proposed solutions. The International Association of Sea Pilots considering the role of the "human" element in preventing accidents and environmental pollution, points to those "risk factors" with which pilots are encountered on some vessels:

- poorly trained team. Unnoticed by any improvements as a result of the introduction of the ISM Code and the STCW Convention 78/95 as amended;
- tired crew members. The workload on crew members has dramatically increased in recent years;
- distraction of crew members from their direct duties to perform procedures divorced from real life;
- poor technical condition of the equipment;
- mismatch of the level of modern "advanced" navigation and other equipment on the vessel to the level of training of crew members (International Maritime Organization n./d.).

Thus, the main cause of high accident navy disadvantages lies in the formation of the crew.

The human factor is crucial if the orientation only on the management of "labor resources" and "staff" without taking into account organizational and professional cultures, individual characteristics of team members and other poorly identifiable and measurable

characteristics of teams often leads to conflicts, difficulties "out of the blue" and the failure of the entire project (Meister 1971).

In addition to the quantitative composition, an equally important role in ensuring the safety of navigation is assigned to the qualitative level of training of crew members. According to the requirements of the STCW-78/95, (International Maritime Organization n./d.) there are three levels of responsibility:

- auxiliary level - the level of responsibility associated with the employee performing strictly defined tasks, duties or responsibilities on a ship under the control of a person who does not operate or operate.
- level of operation - the level of responsibility associated with the work of a specialist in the position of watch assistant to the captain or watch mechanic; management level - the level of responsibility associated with work at sea.
- a specialist as a captain, senior assistant, senior mechanic or second mechanic.

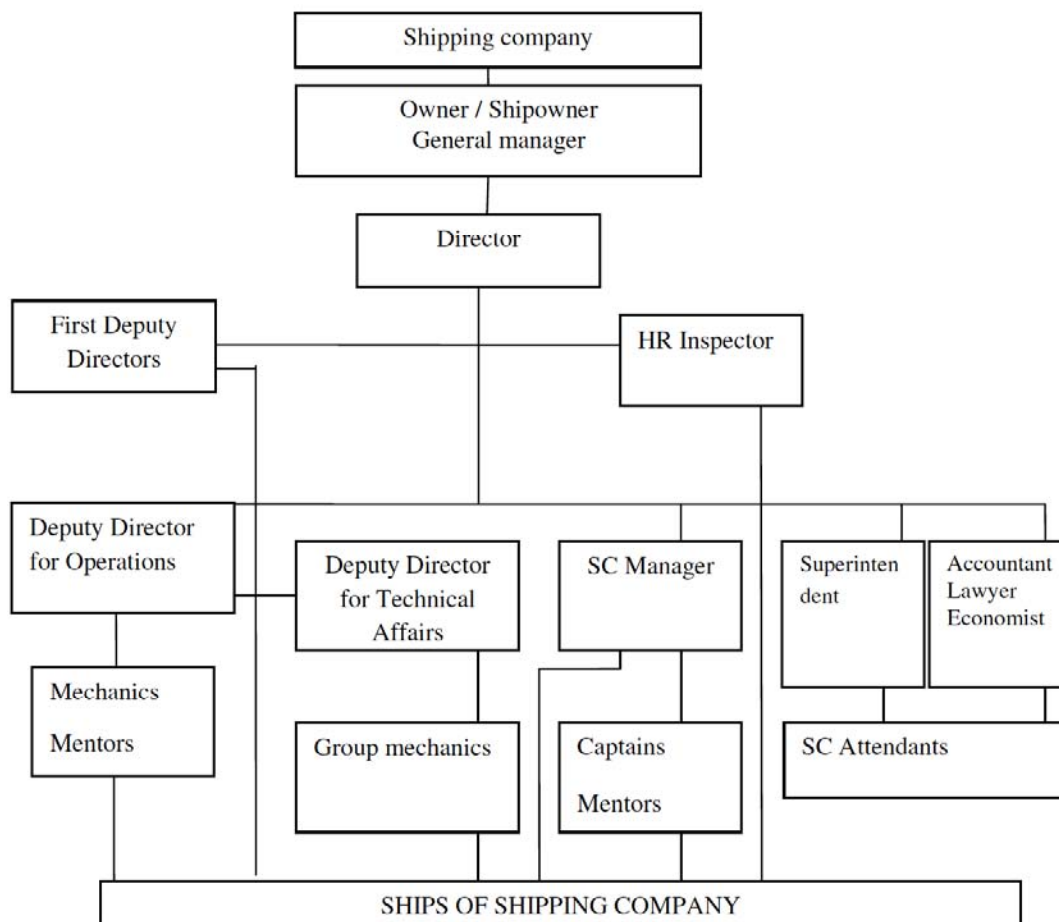
The use of a set of methods, approaches and scientific techniques allowed achieving the goals and main objectives of this research paper.

## 3. RESULTS

### 3.1. The Possibility of Applying the Methodology of Project-Oriented Team Management in the Crewing

In the past decades, the management system of shipping companies was built in such a way that the personnel policy, including the formation of crews of ships, was under the management of the company (see Figure 3) (Zakharchenko and Zakharchenko 2019). Thus, the shipowner assumed responsibility for the quality of training for seafarers, and for the organization of a system of advanced training and recertification, and for timely health checks and professional selection (International Maritime Organization n./d.).

Typically, Crewing works with certain shipowners and recruits crews for the entire fleet of the shipowner, or for part of the fleet, depending on the size of the crewing company. Some Crewing companies provide training services for marine specialists (Lovyagin 1997).



**Figure 3:** An example of the management structure of a shipping company management team.

**Source:** developed by the author on the base of (Zakharchenko and Zakharchenko 2019).

The crew of the ship as a project team. In recent years, the global maritime community has developed the view that the safety of maritime operations can be significantly improved when ships, ports and other enterprises serving the process of transporting goods and passengers form such production and social conditions that are referred to as the “safety culture”.

The problem lies in the development of the system of the international division of labor, which has led the Navy or shipping to create an increasing number of international crews. A different level of training, combined with a language barrier, psychophysical features, specific national customs and traditions dramatically reduce the manageability of this team, especially in extreme situations. Crew selection is carried out by crewing companies, which far from always prioritize the quality of their work, that is, the total level of training and crew coordination (Lovyagin 1997).

Today, experts in the field of project management and the marine industry do not have a clear answer to

the question: can be considered a project - a vessel's voyage. Therefore, we analyze several definitions. Ship's voyage - the length of the working period of a marine ship from the moment it is loaded for loading at the port of departure until the end of unloading at the port of destination or until the same moment when it is returned to the port of departure (Kramskiy 2014; Lovyagin 1997; Kramskiy *et al.* 2019).

Based on this definition, a vessel's voyage can be considered a project for the following reasons:

- **Firstly**, any project is always aimed at achieving a specific goal, in our case, the ship's voyage is aimed at transporting goods, passengers unharmed from port A to port B.
- **Secondly**, the main part of the project is directed actions that must be carried out and coordinated by someone, in our case, the ship's voyage is coordinated by the management of the shipping company (shipowner, cargoowner, supervisor) through the appointed person on the ship - the

master/captain who performs the mission, and controls the crew during the voyage.

- **Thirdly**, the project is always limited in time. The duration of the vessel's voyage can be from 1 (one) day to several months, and in some cases even six months, however, the life cycle of the project is strictly indicated by the voyage assignment.
- **Fourth**, there are no identical projects, just like there are no identical ship's voyage, each voyage will have its own peculiarities and differences, in particular: grade, type of transported cargo, different weather conditions and navigation areas, detentions, arrests, accidents, repairs, crew rotation vessel in ports, etc. Thus, a voyage, like any project, is unique and inimitable. Therefore, each ship's voyage can be considered as a separate project.

Crew of a ship as a project team? There is still no consensus among experts in the field of project management and merchant shipping in answering the question: is it possible to consider the crew of the vessel as a project team or is it a temporary organizational structure that implements some processes. Let's try to put all the points on (i) in this question.

Crew is a group of people united in an ordered hierarchical structure in order to carry out joint work or joint tasks on a moving vehicle. It is worth noting that the word "crew" comes from the practice of navigation, where people performing various functions on ships were united in a team to jointly manage the ship, namely the personnel of vehicles, offshore and merchant vessel is called the "team" (headed by the master (captain)) (Zakharchenko and Zakharchenko 2019; Lovyagin 1997).

Ship crews unite people in a hierarchical structure, in which one can distinguish a manager – the master (captain) of the vessel, his assistants: chief officer, chief engineer (deputies), junior commanders and performers - sailors and motorman's, and other. This definition confirms that the ship's crew contains the characteristics of the project team:

- unity of purpose;
- team work;
- consistency of interests;

- autonomy of activity;
- collective and mutual responsibility for the results of joint activities;
- specialization and complementarity of roles;
- team sustainability.

Thus, crews of marine vessels fully fall under the above definitions of the project team, which allows us to prove the possibility of applying the methodology of project-oriented management of the team in the formation of ship crews (Kramskiy 2014; Zakharchenko and Zakharchenko 2019; Maltsev and Kramskiy 2018).

The management process of merchant shipping was selected as the object of this study. Analyzing the project features presented above, it is easy to prove that this process can be considered as the sum of projects, and it is advisable to link the division into separate projects with the change of crew. In other words, every time a shipowner forms a crew for a certain period of time, he initiates the implementation of another project.

Here we have to face with limited in time (contract validity period), specific goals (mission fulfillment, navigation safety, maintaining the necessary condition of ship systems and mechanisms), and uniqueness (cruise conditions, meteorological conditions, type and amount of cargo, age and condition of the vessel), and pronounced limited resources, and the inevitability of conflicts. Moreover, the result of the project will depend on its executors (crew) to a much greater extent than on the shipping company management team or other project stakeholders.

As follows from the statistical data, the average size of the dead ship is much smaller than the average size of the operating vessel. Based on the stability of statistics on ship losses, it is possible to predict the change in the risk of loss and the probable nature of the ship accident, at least in the near future. It should be noted that the ratio between the various categories of accidents is a fairly stable value. So, over the 10 years under consideration, only a slight redistribution was observed between the number of deaths due to loss of stability and landings (Lanchukovskiy 2009). An increase in the relative number of overturned vessels is an alarming symptom, since these accidents are fraught with the highest risk to human life. Experience shows that a significant part of all emergencies occurs due to untimely detection of the pre-emergency state of



**Table 1: Analysis of the Accident Rate of Ships and Crews for 2009-2019**

Causes of Accidents	Severe damage	Loss of the ship
Damage to the case and mechanisms	449	42
Clash	156	50
Shipwreck and Landing	138	151
Fires and explosions	96	85
Submergence	70	149
Contact with the ground	31	0
Varied	18	21
Hostilities	10	17

ship technical equipment (TE), as well as incorrect actions in an emergency, which is explained by the operator's inability to identify the state of the facility, identify failed elements, predict the development of an emergency and find an effective solution to get out of it. As a result, severe damage or loss of the ship (see Table 1).

Such an approach has led to the emergence of a number of problems that shipowners and officers and rank-and-file crews of marine vessels face every day, namely:

- shortcomings in the system of training, professional development and certification of seafarers in accordance with the requirements of international conventions and resolutions of the International Maritime Organization and the International Labor Organization: SOLAS 1974, the STCW-78/95, CONMARKON 2006 (Kramskiy 2014; International Maritime Organization n./d.);
- ineffective system of monitoring the health of seafarers - medical commissions are increasingly turning into a formality, which leads to serious consequences during the voyage;
- an international crew is formed without any regard to national and ethnic traditions that give rise to conflict situations, the language barrier often prevents well-coordinated work, especially in emergency situations;
- in case of violation by the shipowner of the terms of the employment contract, the sailor remains socially and legally unprotected.

The minimum crew is determined by Rule 13 of chapter V of the International Convention for the Safety

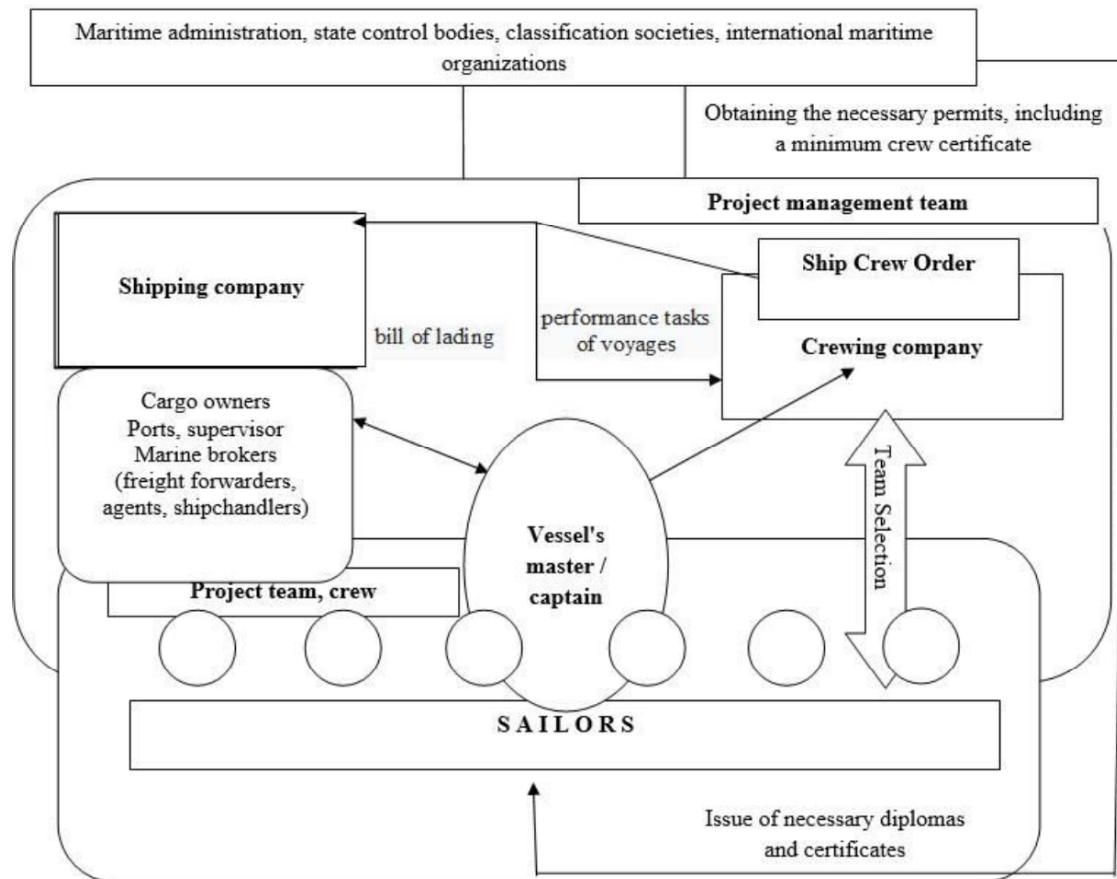
of Life at Sea (SOLAS-74), according to which a vessel engaged in international voyages should be equipped with safe crew in terms of protecting human life at sea and have a certificate of minimum safe crew issued by the government of the state, under the flag of which the ship has the right to voyage International Maritime Organization n./d.).

The globalization processes of recent decades have led to the development of an international division of labor system, as a result of which shipowning companies have concentrated in economically developed countries, and mainly citizens of the Third World countries become sailors (Kramskoy 2015).

Large shipping corporations "Maersk", "CMA CGM", "MSC", "NYK Line" form a single structure which includes: a shipping company, supervisor, marine brokers, a forwarding company, a crewing company, an agent company, shipchangers for the supply of a vessel, etc. (Kramskiy 2014; International Maritime Organization n./d.; Lovyagin 1997). Such corporations independently solve the problem of selecting qualified specialists from all over the world to their vessels.

Smaller shipping companies that cannot afford the above approach, practice a less costly approach to crew formation on board at offshore ship's. Such an approach is as follows: the shipowner enters into an agreement with one or a number of crewing companies to recruit the crew of the offshore vessel. Practice shows that as a result of applying this approach to manning the ship's crew, the shipowner's expenses are reduced, but the process of reducing the competence and cohesion of the ship's crew also occurs (Maltsev and Kramskiy 2018).

Despite the fact that, according to international law, crewing companies are responsible to the shipowner for the "quality" of work performed, in practice their



**Figure 4:** An example of the composition of the project management team in the Merchant Shipping.

**Source:** developed by the author.

function is limited to formal verification of all necessary diplomas, documents and certificates presented by sailors (Boyko *et al.* 2017).

### 3.2. Solving the Task of Acceptability of the Structure, Quantitative and Qualitative Composition of the Team

It should be noted that the task of acceptability of the structure, quantitative and qualitative composition of the team of performers in recent years has become increasingly important not only for shipping, but also in many other different sectors of the economy. Experts from many directions work on a comprehensive solution to this problem from different perspectives: economists, managers, psychologists, doctors, sociologists, etc. In our opinion, we managed to achieve the greatest successes using the project management methodology (Kramskoy 2015).

In the implementation of merchant shipping projects, one cannot ignore the opinions of other interested parties to the project: state and international control bodies, classification societies, cargo owners,

supervisor, port authorities, administrations, etc. In general, the structure of interaction of various stakeholders of shipping projects is presented below in Figure 4.

Thus, it is necessary to ensure that the crewing company has entered into an employment contract with the sailor on its own behalf. And there are such companies - these are, as a rule, divisions of large shipowners / operators, examples of such were given above, but they are rare (Kramskiy *et al.* 2019).

## 4. DISCUSSION

A well-grounded consideration of the specifics of project-oriented management in the practice of efficient crewing for marine vessels requires a comprehensive approach (Kalvaitienė and Senčila 2019; Senčila and Kalvaitienė 2018; GMF 2018): a systemic and comprehensive analysis of the results of management and practice on marine vessels; identification of regular relationships; determination of specific conditions and problems; development of dynamic structure and

technology of management; substantiation of the content of principles, functions, methods, organizational forms and techniques of project-oriented management in this field.

The development and implementation of a project-oriented management strategy in the practice of an efficient crewing for marine vessels should take into account the directions of change and be implemented using new management technologies (Strack *et al.* 2014), namely the development of strategies for the formation of competencies for the implementation of strategy, relevant organizational changes and the formation of a system of motivation according to a specific strategy (Blickstein *et al.* 2016). The fulfillment of human resources management tasks depends not only on the perfection of its development by the management of the crewing company, but also on the strategy implementation by the executives.

The validity of the results of this research is confirmed by the validity and coincidence of the theoretical foundations with the results of research by leading scholars (Pray *et al.* 2014; Österman, Hult and Praetorius 2020; Wu and Winchester 2005), in particular, regarding the need to ensure a controlled impact on human resources in order to ensure their ability to work (International Labour Office 2019), which determines not only the fulfillment of production tasks by personnel, but also the safety of maritime transportation.

The scientific solutions, proposals, practical recommendations provided in the research paper give rise to scientific knowledge in the field of human resources management in the field of maritime transport, while at the same time supplementing to some extent the scientific achievements in the field of methodology of managerial impact on human resources, substantiation of the role of human resources in the efficiency of maritime transport.

The contribution of this research paper to the development of science is the author's theoretical substantiation of the nature and role of project-oriented management in the practice of crewing for marine vessels and effective work of crews. The results of this study are practically important in relation to the strategic management of human resources, as well as the formation of strategic guidelines for the development of personnel working on modern marine vessels.

## 5. CONCLUSION

In this work, the authors analyzed existing international and national regulatory documents, definitions governing the project team, project management team, ship's crew. Despite the quite correct conclusion that the minimum crew of the vessel shall be based on the conditions for ensuring the safe operation of all ship systems and mechanisms.

At the present stage, the shipping industry has not yet created the conditions that ensure the complete safety of marine vessels, so accidents will occur. But the most important fact is the human element, the factor - after all, people working on ships are capable of committing rash acts and actions, making mistakes and mistakes, who are not always sufficiently competent and disciplined.

Analysis of project management theory allowed to prove the possibility of the project approach and a common methodology for project management to solve the problem of forming the optimal crew of a vessel depending on its type, technical condition, age, features of planned voyages, etc.

One of the basic concepts in project management is the concept of "team" in the project, and in project management - the human resources management of the project, which includes the processes of planning, forming and creating a team, its development and support activities, transformation or disbandment of the team. Despite the great attention paid to the formation of project management teams, existing studies do not take into account the specifics and features in the conditions of work of the ship's crew.

It was further developed:

- the terminological base of project management by more clearly defining the concepts of "project team" and "project management team".
- organization of crewing company recruitment system to work on ships.

The application of scientific solutions that have been debated and proposed in this paper is primarily focused on the sphere of sea transport. At the same time, the main idea presented here to apply the project approach and the project methodology in relation to team building is important for other areas, primarily involving project work, long-term team interaction of project participants with a clear distribution of

competencies and areas of responsibility between them. At the same time, it is important for each specific case to provide for the disclosure of the specific scope of application and adapt the proposed methodology to this specificity (standards, interaction features, time and space constraints, etc.).

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