

NAVAL OPERATIONS, IMPORTANT FACTOR OF THE CHANGES IN EFFICIENCY MANAGEMENT IN SHIPPING

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ABSTRACT

Currently the shipping companies have expanded managerial processes, and they began to be organized departments of logistics, marketing and information. They are based on management principles specific to their organization, but new concepts have emerged about time management and even that of chartering. But in terms of management most problems are with naval operations and crews. In this paper is an analysis of these naval operations. The question arises about what they are, how they influence the costs and efficiency of maritime management company. This information can be used by managers of shipping companies, ship-owners and masters of commercial vessels.

Keywords: *company, ship operation, management, efficiency.*

1. INTRODUCTION

At present management processes to a shipping company are divided as in Figure 1, Iordanoaia (2006):

- Human Resource Management.
- Management of Chartering.
- Management of Naval Operations.
- Logistics Management.
- Financial Management.
- Marketing Management.
- Management of Maintenance Ship (fleet).
- Time Management.
- Information Management.
- Management Directors (of head office).

The leadership of "top management" in the management processes undertaken at the premises of companies shipping their share is as follows, Figure 2:

- Management of naval operations (1): 35-40%.
- Logistics Management (2): 30-35%.
- Human Resource Management (3): 4-6%.
- Chartering Management (4): 4-5%.
- Maintenance-Management (5): 3-4%.
- Financial Management (6): 3-4%.
- Administrative Management (7): 1-2%.
- Marketing Management (8): 1-1.5%.
- Time Management (9): 1-1.5%.
- Information Management (10): 0.5-1%.

From company to company as share these values vary. Situations were observed studying managerial processes more shipping companies, which have different ships and by calculating the number of activities, using simple arithmetic average we obtained these results, TSM (2012). An important variable is time seasonal variations of activities, the period for making repairs to the ship, Beziris et. alt. (1988). They have great influence on the economic efficiency of the shipping company.

2. INFLUENCES INSPECTIONS AND MAINTENANCE SHIP SEA VESSEL

Ship inspection program is considered as an area "critical" for the fleet management, Branch (1988),

where the main objective is to meet the requirements of the Management of vessel, with low cost effective and appropriate services at competitive capacity. This however requires attention mainly on the reliability and operability status of the ship, the correlation of market requirements in relation to its load capacity. In simple terms peak period traffic must "meet" with a full fleet, operational, meeting the demand of charterers.

Factors influencing the formulation of the inspection program include the following, Stan (2003):

- Requirements management plan that reflects: the volume of freight traffic in the port of call frequency transport service or ship out how many trips a year, the variety of goods transported. Research-based requirements during inspection and tolerance levels that allow flexibility research data. Working capacity of the terminal-operating costs, together with the storage location of goods, loading of the vessel reported during the ship's travel program.

- Extension to the inspection and maintenance work can be started the ship while the ship is in service or parking during the quay at the port.

- Age, classification and registration of the ship to the ship register.

- Size operating costs by type of terminal that is brewed during the call of the ship and every ship terminal part. In particular it is necessary to rent additional tonnage to take wastes from the ship for inspection.

- Terms of payment of freight, fully, partially or bank deposits. An increasing number of deposits allow a sharing of payment facilities, broken down over the year, affecting cash flow situation of the owner. But it also has negative influences on the company if payment is late.

- Requirements I.S.M. Code and I.S.P.F.S. Code

It was found that the best results from inspections are generally obtained through a well planned inspection program during the 12 months of the year, which are fully integrated company management plan requirements. Features computer programs play a key role in analysis and inspections system to monitors. Currently ships are climbed dry dock for load line inspections at intervals greater than two years.

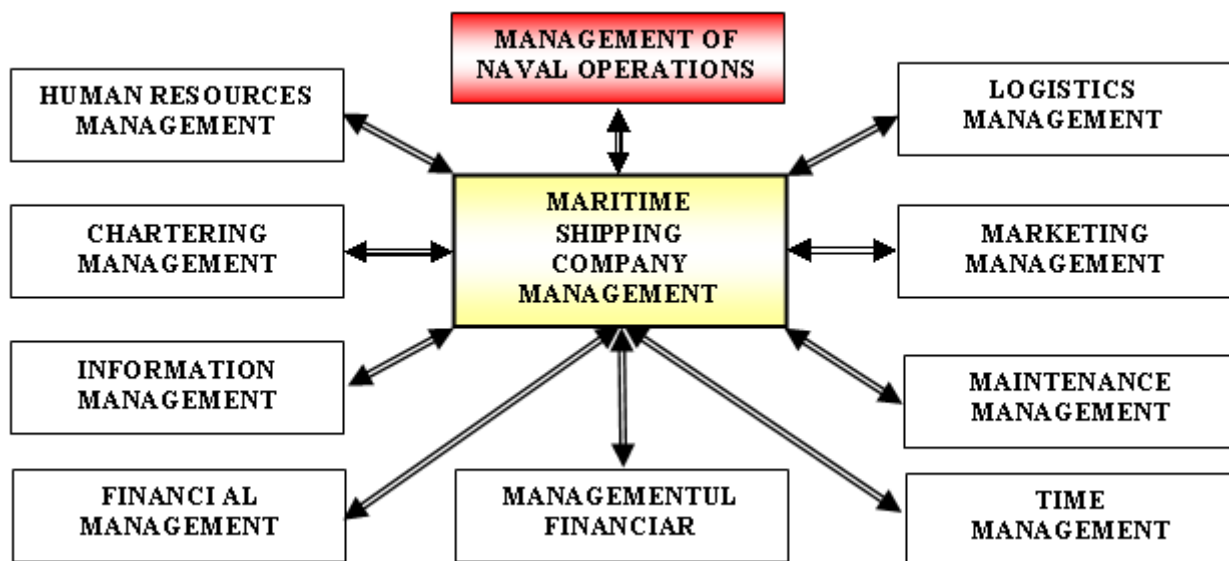


Figure 1 The maritime shipping company management.
Source: The author's study.

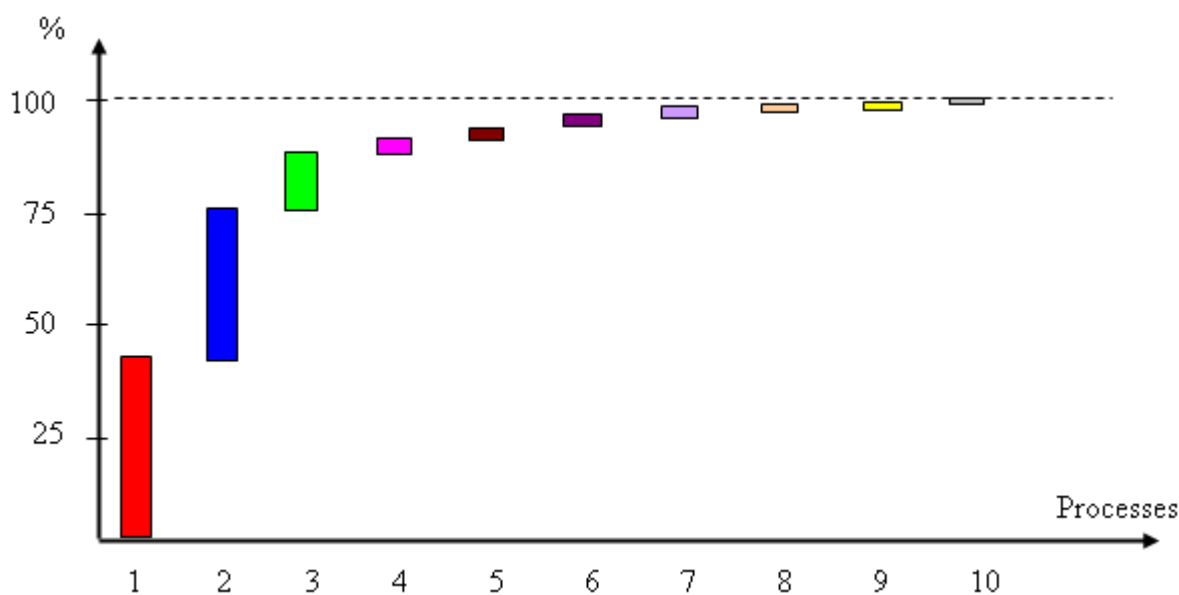


Figure 2 Weight management process.
Source: The author's study, original.

This was possible by adopting management techniques to control board, division of labor inspection across a number of years, we use the best paints, anti-fouling system, which lengthen the term of protection of the hull, etc. They have made significant contributions to extending the period of ascent ship on dry dock. The three primordial factors are considered: contractual costs, time of call, labor standards seamen. Traditional verification and research ship is to bring the dock, where parts to be inspected are disassembled, cleaned, inspected and reassembled. This method is both times consuming and expensive, but is still largely practiced for several reasons. But a number of alternative inspection methods are currently used and were developed with the classification made by the

classification society. The most important checking and control board are:

A). Inspection voyage. Inspector is present during the voyage of the vessel and required inspections performed. If requested, prepare specifications in cooperation with the ship owner or manager on the parties or the facility to be repaired.

B). Notation B.I.S. (Built in Water Surveys for inspection). While ship repair is required after a certain period of time, yet for some reason, the interval between repairs has increased considerably. This extended period may conflict with the "normal" technical rules imposed by international regulations. To arrange minor changes on the body and plants, can be obtained BIS notation, which finally allows a range of repair at 5 years.

C). Inspection continues. Classification rules require inspections and car body to be held every four years. Alternative continuous systems occur even if inspections are divided by a cycle of five years. For engine inspection shows that the safety rules of this part of the ship, it is inspected by the chief engineer (chief engineer). More maintains the motor vessels, in accordance with established maintenance program, this system can replace the continuous inspection of main engine, so subtract one annual inspection class.

D). Planned maintenance system. It shall be a type of approval and may be used as a basis for special inspection arrangements for ships, individually, at the request of the owner. Most ship owners use advanced planning systems and maintenance procedures to increase the demand for cost effective operation. To avoid opening unnecessary equipment and to avoid duplication of work, many companies have introduced a classification alternative inspection arrangements and equipment. The arrangement is based on the planned maintenance system ready for operation ship-owner "on board". This program comprises the following controls:

Company-approved maintenance program classified the owner.

- Initial Inspection by inspector company board.
- Continuous inspection engine is operating.
- Name chief engineer to be approved by classification society.

Annual inspections are made by the chief engineer accepted as class inspections. However annual audit inspection must be made with AGS (Inspection Annual General Meeting). Audit inspection is done to check the arrangements are consistent with agreed procedures. Annual audit inspection report inspector points required by the ship-owner. Inspections were divided over the year and several visits to the board were required to be made by the supervisor. A number of companies have developed a classification system of harmonization of controls, as relevant inspections can be harmonized or synchronized with the requirements of Naval Authority (Maritime) in each country. Each inspection must be made with a tolerance for the link and there are three categories detailed below:

- Annual inspections for about one to three months before and after this date.

- Two inspections to be made six months before and after the date fixed.

Special inspection in four years, with a one year extension. To ensure total benefit from the harmonization of inspections of the ship owner has the following options:

- Inspection during the voyage, and the inspector takes into account the required inspections during the voyage of the ship. If requested and in cooperation with the ship owner, the inspector prepares specifications for the parts to be repaired.

- Annually, layout inspection equipment based on a planned maintenance system and approved.

- Construction Inspection of vessel at berth, obtained by arranging minor changes to the body and the machine, it increases the range of ship repair in five years.

3. PLANNING, ORGANIZATION AND FLEET MANAGEMENT COMPANY

Operational fleet planning is very important for company management and the ship. Its role is to use ships or fleet so as to bring the best results, in particular with reference to the market that is also a certain level of profitability that owners and want. This is a "zone" which is very well represented in the company's budget and shipping is usually scheduled for at least two years, but sometimes over 5 years. A number of factors significantly influence decision making in operational planning of the fleet as follows:

- Large ships tend to be more economical, but are generally constrained by the existence less deep water berths. This is a difficult situation for hiring heavy ships, such as oil tankers. A solution to this problem was found by building smaller ships with a draft, but with a greater width.

- Small Vessels greater operational flexibility, with easy access to port, maritime market can more easily accept a ship smaller than a larger, particularly at lower traffic in maritime trade during the economic crisis.

- Schedules should lead to best use the existing fleet as all ships costs are "out", even if the ships are working or not, go on tour or are pending.

- The company must decide if the navigation needs of fleet planning requirements peak, medium or low. You must understand that without the plan and make investments in ships, there is no benefit of high quality shipping services.

- Managers need to assess if they are planning for annual growth situation for a request or a drop in demand for ships. Method to consider the need for increased transport capacity should be well considered and thought of, before a decision because it can involve high-capacity ships, rental, new tonnage or fast programming.

The data required for fleet planning will vary depending on the situation, company or market, but also because of forecast revenues and costs, which will be dominant in the evaluation and formulation of fleet plan. Information and data that are required for this are:

- Year forecast traffic demand, which is given by the Marketing department.

- Looking for new business prospects, which are obtained for transport, such as those of perishable goods. Data provided by the marketing department may include maritime market research results.

- Details of seasonal peak demand and low months, together with an analysis of the goods contained, storage and revenue factors. They will determine the precise demand and income at different times of the year and will facilitate the choice of how best to provide economic carrying capacity, on the mix of goods and net income will be obtained.

- Specification acceptance ship ports and berths together with any fluctuations or other constraints.

- Port and the costs of their implementation.

Travel-time of each type of transport or shipping route. This is usually provided by the superintendent sea from a port or another.

Individual-capacity transport ship and its validity over the 12 months of the year, taking into account the demands inspections.

-Transshipments facilities on board and whether the port can be used to accelerate the download time and return the ship to reduce port costs.

-The cost of the voyage from a port and at berth, together with other relevant costs, including travel in port, fuel costs, which will vary depending on the port, the cost of the ballast voyage, the ship MF. For certain periods of time, the company may require driving the ship master and chief engineer to calculate and order the ship to a speed at which consumption is reduced or optimized, usually a half of maximum speed. This leads to increased time-to-sea voyage, but a fleet level, reducing fuel costs and lubricants will be significant.

- Alternative options such as the rental costs over the peak period.

- The cost of the crew.

Fleet planning must always be related to:

- Annual budgets and the total fleet of ships.

- Economic forecasts.

- Annual investment options.

- Maritime market-trends.

- Policy flag State or other states of the working area, the European Union or the World Wars Trade Organization.

This planning is facilitated by using specialized computer programs at the company, but those who use, general managers and logistics, must be familiar with market conditions and trends related to the use of the ship (or fleet of ships) on a profitable. Together with fleet planning, corporate business plan is an important task management and shipping company in its proper fleet management. This involves the use of the criteria, but can be influenced in particular the classification of the ship, the markets they operate ships and goods carried as follows:

-The first objective for the Steering Committee of the shipping company is to complete the business plan that will meet the fleet manager, working always within the framework of shipping, considering the safety of the ship (the ship) is the first principle from which begins designing a business plan. Business-plan should reflect the objectives of the company Board. It must be market driven, what is going on this, the annual budget is established based on agreement of all committee members. Fleet-capacity resources must be matched market forecasts sea and must be reflected in the annual budget and program of trips estimated shipping. Maximum resources to be available during peak activity. This is a very important task of logistics department Business-plan should be aimed at reducing costs and income are related to the mixture of freight transported on each trip to ensure that the income provided (estimated) annual budget will be achieved.

- The shipping or travel, arising from the business plan requires special attention on:

- Port costs,

- Purchasing, facilities and fuel costs,

- Area in which the port terminal,

- Port technology,

- Navigation-needed economic resources,

MF-compatible with fuel costs used.

- Competition and obtain income from freight transported (of freight),

- Cost of transshipment cargo.

- Port infrastructure,

- Time return of the ship,

- Autonomy, in nautical miles, day sailing and stationary, and validity of food-storage on board, etc.

- Fuel, ship repair and inspection of the vessel shall be considered given the port and terminal arrangement reached by ship. In terms of planning they are considered the company's strategic goals of maritime navigation. To be cost effective, must involve the payment stage inspection programs and to cause minimum loss established travel program.

- Management of the ship, crew and vessel inspection program is an area of "critical", which generates costs. In fact this is the biggest source of problems for fleet management, the company, its owners or stockholders.

- Port costs, disbursements and insurance are all considered "areas" that require constant review to ensure that the ship owner is a profitable business that can make new investments.

4. FACTORS INFLUENCING SHIPPING SERVICE QUALITY

The current shipping is considered that there are five factors that influence the nature of such shipping service: speed, frequency, re-return, cost and quality of service. Fast and frequent services with re-return ship will be found generally in the liner trade, taking into account that usually can be found cheaper transport ships like "tramp". Speed and frequency of service are essential for safe cargo such as fruit and vegetables. Consumer goods manufacturers evaluate speed so as to reduce the risk of spoilage and cost of goods in transit. The need for high speed is required over the long-distance trade, which can be appreciably reduced during the voyage, and the sender shall benefit for quick deliveries.

Frequently service may be important where goods may be sold in small quantities at frequent intervals. Re-return is important for shippers who have deadlines to letters of credit and import licenses. It also means that goods must arrive in good condition and shipping companies must provide adequate facilities at the docks and their offices to complete the necessary documents and other port and customs formalities. These requirements are recognized and meet operators (charterers, major importers) liner, which require high speed vessels, which have additional capital and bear all operating costs involved, sharing the stage navigation (voyage), to match supply their customers with goods pace required. Price of transport rates for these services, are stable but somewhat higher than those of the ship "tramp". Vessel owners may maintain rates at a reasonable level to make a profit, although they must ally with shippers to ensure that rates are so high that it influences the final prices of goods transported, which would lead to decrease in market demand. There is some justification in arguing that "charterers of ships carrying

goods line, you must pay high shipping costs for this service", in relation to navigation "tramp". Low-value goods, on the other hand, must be transported as cheaply as possible because the cost of transport is directly related to airworthiness. Many of these categories goods such as coal, ore, timber, grain and other bulk goods, are generally transported as scheduled arrangements, so that speed and frequency of service have a minor significance, i.e. no major influence final costs. But most important is the validity of space transportation vessels such as "tramp", where price rates vary by market supply and demand. If there is space available, rates will be only marginal cost of operating the ship. When the market is strong, rates will increase, but an upper limit will be determined by the prospective price of goods, the moment of sale. Prices remain a dominant factor in choosing service by the sender (charterer), despite the fact that governments and trade policy discrimination Flag exercise greater influence in international shipping. In broad terms the distribution costs are 8-15% of the total cost of production. It is also important for sea cargo price to be fixed at a reasonable level, but generate profits necessary to sustain a modern fleet. Service quality is now an issue of great importance in modern shipping and international trade today. Service provided should be customer-oriented, focusing on a safe and movements of goods in an effective way. Transshipments cargo must be effective and does not lead to destruction, partial or total. Wins if cargo carrier receives the deposit and sends it into production or sell, not compensation from the insurer. The management of shipping should be directed to the quality of service rendered to maintain customers, repetition and continuity to get transport.

5. COST-REDUCTION FACTOR OF ECONOMIC EFFICIENCY

Can be considered irrespective of the shipping company, the type of ship transport, sea transport way (line or "tramp"), the place where the head office of the company or Flag, nature and the costs are similar. In reality, major differences occur between shipping companies, which have a range of costs for office operation, costs of salaries of persons employed on the premises, pay taxes, etc., like all other shipping companies, but this is different through a series of specific costs, which are all quite large. Running a shipping company must take into account their level, their share in total business costs. For a company shipping costs are the following main groups:

- Administrative overheads or company.
- Vessel operating expenses.
- Vessel impairment.
- Travel expenses.
- The cost of loading / unloading of ships.

A number of specialist companies shipping expenses divided as follows:

-Operating expenses of the ship on which the share is:

- 30-45% cost of crews,
- 20-30% Technical expenses,
- 10-15% cost of insurance,

- 7-12% cost with shipping supplies and equipment,
- 4-8% cost of lubricants.

- Financial costs are given by the fees and taxes paid.

There are also a number of external factors affecting the costs of:

- Type of ship,
- Area navigation.
- Degree of hazard of goods transported,
- Insurances for ship and crew, etc.

Reducing costs to the shipping company is a very important and is always very topical, given the competition in the maritime, economic and personal crises experienced in the last 20 years. But this is not a simple problem to be solved immediately, without consequences on the ship and its safety. For running a shipping company that is easier to reduce some administrative costs, overhead, staffing, but reducing costs is more difficult vessels. Over the past 10 years have seen a number of measures that were adopted by the management of shipping companies as:

- Changing the organizational structure.
- Reduce the staffing.
- Outsourcing of certain services to specialized companies (crewing, accounting).
- Change of flag-ship by registration in a country with tax cuts and tax (tax havens).
- Renting ship-management companies shipping.
- The introduction of computer performance.
- The introduction of modern communication technologies, etc.

But most problems are the vessels there have been, are and will be the most difficult problems in the future about costs, how to reduce theirs. In the past 20 years companies have adopted a series of measures, some drastic cost reduction and during this time period there were many conflicts in this case. The first measure was to reduce the number of crew members. Thus there were significant reductions of approx. 40-50 people in the early 80s, 15-20 today, their number varying by type of vessel. The second measure was the retrieve a greater number of tasks to persons on board boats, increase their risk even decrease of ship safety. Standing there was disputes between owners, authorities and trade unions the increasing number of tasks of the boat. A very important measure was the introduction of modern computers, reducing the time of writing official documents issued by the ship, sending information to the company, receiving messages with managers, etc.. Another milestone was the modernization of means of communication between parties as between ship and company management, ship agents, ship and brokers, ship and authority, company and third parties.

The highest costs are those crews. But companies have sought alternatives to crew "expensive", with more cheaply. That replaced the sailors and officers from European countries with those in India, the Philippines and in recent years in China. But after a short time ship-owners and ship managers have observed that the reduced quality of service provided on board, the increased number of accidents, incidents and remarks received checks authorities and auditors. Currently there are major distortions on the employment of seafarers, we

can say that there is some confusion about future developments of seafarers. Technical costs are second in total cost share. Therefore reducing technical costs of the shipping company is a challenge for logisticians and managers for business professionals. Reduce technical costs, principle can be made by:

- Reduce the maintenance costs of the vessel by:
- Standardization of material consumption.
- Ship maintenance, planning and daily maintenance materials, weekly and monthly.
- Hiring a highly skilled staff that would have qualified to obtain a high yield of activities. But ask qualified personnel salaries!

Accurate planning of ship-repair.

- Evidence of the precise materials and spare parts.
- Provide means of work, tools and equipment performance, renewed stock of spare parts and consumables from suppliers that offer the best price-quality ratio.

- Avoid large stocks of parts.

You can use e-procurement through public bidding or negotiation to obtain discounts or discount sites. Reducing costs is a high boats, is directly related to naval operations management, at the logistics and marketing industry. In this type of role of logistics and marketing costs are very important purchase lifeboats, rescue equipment, fire fighting equipment and pyrotechnic materials that have high prices, are through electronic auctions. After replacing them at the end land use, the old can be sold to certain institutions or companies can use under certain conditions. Loading equipment, deck, mechanical installations, metal or rope ropes reduce purchase costs for new ones can be avoided by following the maintenance and repair measures on time, quality and especially the ongoing assessment of their status to avoid failures or worsening of these defects.

The motor vessel, its service facilities and electric equipment deck to avoid failure should be observed operating security features and their parameters, perform maintenance and repairs on time and quality. Another cost is related to consumption of drinking water, which must always be rationalized, even if this may cause dissatisfaction crew. It is recommended to use a program to limit water consumption on board. For reducing paint on board is recommended routine maintenance when dry weather conditions allow it, according to the technical characteristics of paint, use painting tools and instruments in performance, to avoid losses, to purchase from suppliers who can provide the quantity and quality needed. For chemicals used in strict compliance with the board recommends how to use them and avoid losses. To avoid additional consumption of fuel and lubricants is recommended the following activities: precise planning of the voyage from berth to berth, making precise navigational control of the position the ship for immediate correction of deviations from the road, their boarding providers that offer best price on the market.

For reducing administrative materials on board ships required the following measures: accurate calculation of daily consumption, weekly, monthly and annual maintenance materials, detergents, soap, etc. and supplies by public auction (electronic, online). For

reducing office supplies necessary for the following measures: accurate calculation of consumption, use of standardized forms to reduce paper consumption, recharge printers on board, reducing the number of printed documents, use. To reduce costs to purchase clothing items are recommended only for areas and season where navigation is performed, for example for navigation during the winter will only purchase specific equipment, similar vessel in the shipping route in the tropical and equatorial will purchase equipment that may be faced by the crew considering the high temperatures, using a uniform means to reduce their costs by making a single supplier chosen by competition, cost reduction is significant especially for companies that have a large number of members and control for manufacturing is high, protective equipment can be purchased directly from producers auction.

6. NAVAL OPERATIONS MANAGEMENT IMPACT ON EFFICIENCY IN SHIPPING

For to determine this impact can use several methods of economic analysis. In the shipping can be used the method of the cost-effectiveness analysis based on the critical point method known as "threshold" of return. The critical point is actually an equilibrium that can be used to determine the size of company activity, following the statement of revenue derived from contracts of carriage (freight) and expenditure. Costs are fixed and variable and the dependent variable workload. In relation to the dynamic activities of the company and the ships, the company accounts are found grouped in fixed costs and variable, with the following evolution:

-Fixed costs per unit are variable (treated as one vessel or the entire fleet), with a total constant, and they decrease with increasing number of the transportation contracts.

-Variable costs are constant per unit in size, but their amount increases with increasing number of activities or transportation contracts.

The relationship between the sum of all operating expenses and total transport activities to be carried across a ship or fleet must be used to determine the minimum level of income to be obtained to cover these expenses. Meeting point of these is in fact break even. Above this threshold yield should obtain profit for the company. From here we actually observe management effectiveness and impact of management on naval operations as a whole. Methodology to perform calculations and then breakeven analysis is differentiated for a vessel for the entire fleet or all of the shipping company if it has in its scope and shipping related activities. Another important aspect that can be used to understand the impact and effectiveness of management decisions on naval operations, value chain analysis is the shipping company. In principle a shipping company has the following value chain analysis activities, Iordanoaia (2006):

- Decomposition transport process is relatively simple and entities contributing to the service are in a very small number as follows:
- Ship: runs the crew, approx. 15-20 people.

- General Manager: holding the “key” of the business.

- Deputy Directors, specifically those responsible for the ship, Logistics, Technical and Marketing: approx. 4-6 people.

- Primary activity is the transport of goods, containing loading and unloading vessels.

- Support activities are only those related to:

- Quality-control and safety.

- Boats.

- Human Resources management.

The last two activities “support” can be outsourced to specialized companies, companies that take tasks and even if they contribute to the value of service activities not belonging to the company directly. Effectively use the value chain shipping company consists of the following steps:

- Decomposition process.

- Award costs.

- Identify critical activities.

- Identify valuable employees.

- Identifying value-links.

- Optimization links.

A) Decomposition process. Transport process is dependent on how ships are engaged on the line or “tramp”. Value generating activity is represented by loading the ship. When the contract is provided as loading and unloading operations to be performed with the help of the board, the service will increase, but the share of such additional activities is limited, basically just some type cargo ships and Ro-Ro is can make, and some ships have no such possibility because the way they have been built and that the board was abandoned facilities for these operations.

B) Award costs. Shipping company costs were already presented in this paper. Their effects on the company are very important and are not an easy task to reduce them.

C) Identification of critical activities. Implementation of the I.S.M. Code principles on board imposed the preparation of the lists of critical situations that may arise on board and that may have negative effects on it, the goods and the crew. Avoiding responsibility is so critical situations commander, crew, and the other factors of responsibility within the company. Avoid critical situations in a year means that brokers offer additional guarantees that the goods will reach their destination on time and keeping business characteristics of the goods. The procedures used on board and maintained at the company are kept strict to all these critical situations.

D) Identification of valuable employees. This step is easier to shipping companies “tramp”, where brokers are those who seek cargo charterers bring the owners to contracts of transport. Maintaining relationships with them is very important and their role in this type of navigation can not be underestimated.

E) Identifying value-links. In the maritime transport relations are among the most important practically very little chance that a shipping company manages to resist without realizing a system of relations with partners, to keep these relationships.

F) Optimization links. This stage is essentially “naval operations management”. Figure 2 shows the share of management processes within the shipping company. To be optimized link is needed primarily a classification of such activities:

- Direct-ship management. Activity commander is required.

- Supply ship. Liability is the company (the director of logistics, technical director or general director) and the vessel's agent, on orders from the master and the chief engineer.

- Searching charter contracts which is required by charter or marketing director.

- Searching for the best-trained officers and sailors, is the Director of Human Resources or crewing company, when the service is outsourced.

- Management's headquarters, the administrative director.

7. CONCLUSIONS

Change management activities in naval operations, involving direct cost variation. This link is established by those measures which they adopt maritime shipping companies to reduce costs. But as in any economic activity, especially in service provision, reducing investment costs by reducing or cutting spending, may have negative effects on medium and long term. Analysis of shipboard situations when reduced crew members, when they cut out parts lists, provide evidence on the downside quality service and lower yields on board facilities. Currently searching for new solutions to increase the role of logistics in naval operations, both in terms of the technical, maintenance, especially in the boats about.

Thus it is advisable to seek solutions to the global organization of the fleet of activities, effective use of information obtained from the maritime market, total involvement of human resources on board and at the company, determining the optimal level of shipping service for eliminate accidental costs, in order to avoid empty vessels traveling without cargo and reduce the time for current and capital repairs. All these aspects are very important for correct decision making by managers of shipping companies to achieve maximum business efficiency.

8. ACKNOWLEDGMENTS

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