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"TECHNOLOGY AND ITS EFFECTS ON CUSTOMER RELATIONSHIP MANAGEMENT (CRM) OF SHIPPING COMPANIES"

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Acknowledgments

Abstract

In the search of competitive advantage, companies are looking for the newest technologies, the latest advances that will give them what they need to be better. Among these there is a system that has been more and more used in companies since the 1990s: the Customer Relationship Management (CRM). CRM is the strongest and the most efficient approach in maintaining and creating relationships with customers. CRM is a business strategy which targets on developing longtime, mutually profitable, individual relationships between costumer-company.

In an international business environment, highly volatile and competitive, such us Maritime Shipping Sector, the improvement of customer relationships is out most important. In this context, the current thesis analyses technology and its effects on CRM of shipping companies.

Keywords: *Customer Relationship Management, Cartering, Technology, Shipping Industry, Shipping Companies*.

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Introduction

The shipping industry has recently developed and evolved a lot. It is true that there has been greater investment in the reconstruction and improvement of land transport infrastructures (road and rail), but maritime transport is presented as an alternative because it allows to reduce the number of vehicles congesting daily on the international road network (Douet & Cappuccilli, 2011). In fact, according to the European Commission, maritime transport, namely Short Sea Shipping (SSS), is the only "mode" that has proved to be able to keep up with the development of road transport (Douet & Cappuccilli, 2011).

Freight transport is a vital component in any economy. It is an economic indicator on the contribution to the economic growth of each country or region. Transport networks facilitate good and people movement, being considered essential to the competitiveness and growth of the economies (Pereira et al., 2015). Therefore, it has become essential for the globalization of supply chains, with the majority of world trade being carried out by sea (75% by volume and 60% by value) (Lee & Song, 2016).

Maritime transport is also more environmentally friendly and contributes to the integration, cohesion and economic development of peripheral areas (allows door-to-door delivery of certain types of goods) with the advantage of offering a relatively low cost service due to the large capacity of ships (Paixao & Marlow, 2002).

When just over 50 years ago, the American Mac Lean boarded the first containers, few people believed in the future of this new mode of transporting goods, that was hard to load and move. Containers were too big and not easily transported by the time's trucks and wagons (Silva, 2011). In fact, the adoption of the container in the 1960s led to a kind of transport revolution - the use of containers meant standardization, allowing goods to be easily handled throughout the whole supply chain and transported in a multimodal way, using any of the different possible means of transport, road, rail and sea, or a combination of these without having to reorganize the cargo (Lee & Song, 2016). In terms of maritime freight transport, this revolution was particularly notable with an increase in the number of companies in the industry over the years. These companies have also increased their fleet capacity, as transporting more goods at once leads to cost reductions. However, since not all ports can receive these larger ships,

companies have tried to fill this fact with feeder services, carried out by smaller capacity vessels that distribute the merchandise by the smaller ports, thus allowing a door-to-door service (Sousa, 2008).

The larger the number of companies, the greater the need to choose the company the customers will work with. Considering that in this field service differentiation is low and that competition is mainly cost-based (Lee & Song, 2016) companies are betting on customer service, a service that adds value due to the fact that both port and shipping companies are challenged to redefine their functional role in the value chain for the purpose of creating customer value and ensuring the survival and growth of the company (Notteboom, 2004).

Precisely in the aspect of customer service, Customer Relationship Management (CRM) tools gain special importance because *"organizations are increasingly focusing on attracting, developing, and retaining businesses (...) managers are placing a greater emphasis on managing their marketing relationships, networks, and interactions, both internally with employees and externally with suppliers"* (Lindgreen, 2004), which is exactly what CRM tools allow: the system's database is powered by relevant customer information, which makes it easier to get to know him and therefore better serve him. However, the implementation of this type of solution does not have immediate effects: *"typical CRM projects involve a long-term development process that extends over two to three years and includes all areas of consultancy, situational report, design of strategy, implementation of strategy, education and training of employees, and evaluation of the CRM Project"* (Lindgreen, 2004).

Therefore the use of a CRM system in Greek shipping companies could have immediate positive consequences.

Aims and Objectives

The scope of this thesis is to investigate the importance of technology in the shipping industry and its impact on Customer Relationship Management (CRM) in shipping companies. To achieve the above goal, a synthesis of relavant studies was conducted to study modern CRM systems. In order to make a detailed study of the importance and consequences of the management of relations in the shipping industry, some sub-objectives were realized, such as:

- Bibliographic review of modern CRM systems
- Study of the factors governing chartering internationally,
- Synthesis of studies around technology and CRM in the shipping industry

Methodology of the dissertation

As already mentioned, the purpose of this study is to perfom the effects of Technology in Customer Relatioship Management of Shipping Companies. So, firstly the meaning of CRM systems and their role in Companies should be comprehended. That's why in this study initially was analized how Customer Relationship Management is perfomed from past to present years. This is a result of a synthesis between different sources of bibliography, internet articles, and several studies. Moreover, with the same methology has been written and the second chapter of this study where an analytical view of Chartering is described. Excensive bibliograpgy has been studied in order to analyze all the factors of chartering properly. Chapter three is a synthesis of sources which brings up the link between the contents of this thesis and refers to the involvements of Technology in Shipping Industry and more specifically to the CRM advancement. Moreover, already existed statistics studies have been used as sources, in order to show fluctuations or percentages through the years. This study contains up to date data which represents the status of crm, chartening and most importantly of technological means up until today. Customer Relationship Management methods in Shipping Industry, is a raising issue. So this thesis may be updated with further study or investigation the upcoming years adjusting the new methods and technichs that will be occurred.

Significance of the study

Globalization is revolutionizing the way we live and the way businesses operate. Technology is the reason for this because it provides solutions that help organizations perform more efficiently and effectively and that enable better execution. Developing customer relationships gives companies a better knowledge and understanding of their needs and leads to new strategies aimed at better results for the customer. CRM is the most powerful and efficient approach on building and maintaining relationships with customers. CRM is not only pure business but also ideate strong personal bonding within people. CRM achieves the development of links between businesses and customers, which makes it easier to identify the actual needs of customers and therefore improves their service (MSG, 2008). It is no coincidence that more and more companies around the world have invested in CRM systems such as BatchBook, Salesforce, Buzzstream, Sugar CRM and others.

Installing a CRM system can definitely improve the situation and help challenge new ways of marketing and doing business effectively. Knowing that shipping is the driving force of world trade since more than 90% of goods are transported by sea, the development of the customer relations sector will bring significant improvements. Therefore, in the age of sea travel every company should have a complete CRM system to be able to meet all its needs.

1. Customer Relationship Management

1.1 Definition of CRM and its development

In the middle of the 20th century, there was an increase in products available for consumption, and thus changed the competitive context of mass marketing and production techniques. Customer-business relationship was radically affected, as the market was closed by many choices in products and services. Before this change occurred, customers were treated en masse rather than individually according to their individual needs and the concept of marketing changed from classical (transactional) to relational (Dohnal, 2002).

Transactional marketing tends to disappear and the new trend is towards relational marketing, defined by Dohnal (2002, p.32) as *"a process of identifying, establishing, maintaining, improving and, if necessary timely termination of economic relations with customers and other concerned subjects for the mutual benefit of all involved parties, which is achieved by mutual fulfilling of obligations and values"*.

The outdated perception that product brings money to the company is slowly turning into new one that money is coming from the customer. Marketing mix of 4P's (Product, Price, Place, Promotion) has been crucial in the past. The main goal of employees was to sell a product, literally imposing it on the market, despite its requirements (Dohnal, 2002)

For the first time, Kotler (1992) mentioned relationship marketing as part of personal selling, stating that the salesperson, who knows how to build strong customer relationships, will succeed in many successful businesses in the future. Relationship management was a key skill that only marketing professionals needed. Nowadays, however, all businesses focus on what the customer wants. They conduct research and design their products according to what their customers buy, because it can solve their problems or can bring tangible benefits. It is worth noting that the current state of marketing is Marketing Mix 4C's: customer cost, customer solution, convenience and communication (Kotler & Keller, 2007).

Thus, a large number of businesses and companies make efforts to restore relationships with new and existing customers, with the aim of their commitment in the long run. Some companies try to achieve this goal through the use of strategies and technologies based on Customer Relationship Management (CRM).

The origin of the term CRM includes many versions and the meaning of the acronym CRM varies from customer relationship management to customer relationship marketing (Buttle, 2009). According to Lehtinen (2007), when CRM was launched, it was less personalized but then turned into direct customer marketing, also known as a specially designed tool aimed at one-to-one customer relationships. As mentioned, the basis of CRM is relational marketing, which aims at improved long-term profitability with an emphasis on gaining new customers and retaining them through effective relationship management (Lehtinen, 2007).

Today, CRM can be defined as a broad, customer-centric business model that maximizes customer value through ongoing marketing and builds on in-depth customer knowledge gained through the collection, management and evaluation of information customer and communication history. CRM is about perfecting the relationship to maximize customer value over time (Baran et al., 2008). This relationship, of course, requires companies to put in a lot of effort and redesign their marketing strategy.

Historically, however, one of the first definitions defines CRM as a special software program that serves the integration and utilization of vast amount of data about individual customers from databases. CRM consists of software and analytical tools that help analyze data to enhance the relationship with the customer (Kotler & Armstrong, 2004). Also in the 1980s, the first customer service teams were created that dealt with customers individually and were responsible for controlling all of the company's customers. Teams have been a valuable tool for maintaining communication and adapting services to customer needs (Roberts, 2005).

In the 1990s, companies began to optimize CRM with the goal of interacting with customers. More specifically, instead of collecting data and using it for their exclusive use, they began to inform customers, on the one hand to improve customer service and on the other hand to give incentives and gifts as a sign of appreciation of their customers' loyalty to the company (Roberts, 2005). In the early 2000s, CRM proved

to be a way of informing and understanding both customer needs and behavior, as opposed to feeding information into a static database. Internet has provided a great benefit in the development of these vast databases, allowing the storage of collateral information (Roberts, 2005).

CRM then evolves further and includes the company's employees and processes. Now, it is defined as the technology that is part of the company's strategy and has as its main goal the maximization of customer loyalty and, consequently, company profitability (Dohnal, 2002). Storback and Lehtinen (2002) state that the goal of CRM is not to bring the business close to a customer, but to live with him. Lehtinen (2007) argues that the purpose of CRM is to build long-term relations with customers, which does not pursue to maximize short-term income, but recognizes strategic customers.

According to a more recent definition, CRM should be considered as a business strategy that aims to develop long-term, mutually profitable, individual customer-supplier relationships and is placed on an IT infrastructure to be developed, allowing clearly defined and controlled processes and places capable personnel in a position to function optimally (Peelen, 2005). In general, CRM covers activities and processes designed to help an organization understand, communicate, and serve customer needs and prospects (Governor Technology, 2008). The main driving force for CRM is the basic philosophy that successful customer engagement, and therefore successful business, is based on the ability to build meaningful relations with customers (Governor Technology, 2008).

1.2 CSR components

Chaffey et al. (2003) emphasized that CRM strategy uses technology and communication parameters to gather data, analyze it and provide the information needed to build an interpersonal relationship with each customer. Thus, they outlined a three-tier model for describing CRM. In this model, it is described how customers were acquired through direct communication and strong value proposition. Then the customers were retained due to the quality of service. The relationship between customers and business can even be expanded, through the delivery of specific products and services to specific customers.

Specifically, CRM is a combination of people, processes and technology, and an integrated and holistic approach between these three components is required for successful CRM implementation (Bull, 2003; Chen & Popovich, 2003; Zablah et al., 2004; Mendoza et al., 2006; Rahimi et al., 2015; Rahimi & Gunlu, 2016).

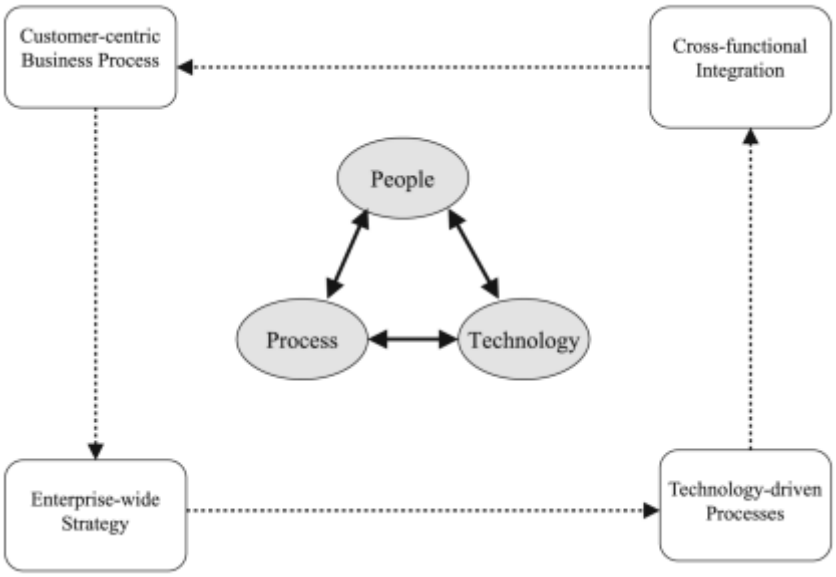

Figure 1: A CRM implementation model

Source: Chen & Popovich, 2003

1.2.1 People

The people component of CRM includes the organizational readiness and collaboration with staff, which is essential for a successful CRM implementation (Chakravorti, 2006). One of the greatest challenges in implementing CRM is aligning the people with the new strategies and processes. CRM entails new processes, the value of which the entire organization must understand and appreciate, and staff must be involved with the strategy and be motivated to reach the objectives (Chen & Popovich, 2003; Mendoza et al., 2006).

The human factor plays a crucial role in CRM strategy. Both customers and employees need to be adequately informed of the changes that the use of CRM brings. For example, employees need to be aware of all aspects of the business, such as organizational behavior. A study conducted by Purdue University showed that a large number of customers left due to poor or insufficient quality of service. Among the

main reasons were the carelessness of the staff, the lack of access of customers to communicate with the appropriate employees, the rudeness of the employees and the repeated slow service (Chaffey et al., 2003).

In addition, the degree of staff loyalty is very important. Employees need to feel satisfied, just like customers, in order to offer the maximum to the company. Another aspect that is particularly important at the company's organization level is the dedication and participation rates of employees who hold high positions in the company. These employees must guide and supervise their subordinates in a proper and efficient manner (Chaffey et al., 2003).

In general, full compliance of all employees of a company is required to be able to properly implement CRM. All departments of the company must cooperate and take care of its proper implementation and use. To do this, there must be exemplary communication, between all employees, from top to bottom. Understanding customer needs and providing quality services are factors that determine the success or failure of the business endeavor (Chaffey et al., 2003).

1.2.2 Processes

The process component of CRM tries to focus on individual customers and uses business process reengineering (BPR) to shift the direction of organizations' processes from product-centric to customer-centric. According to Mendoza et al. (2006), the main business processes that need to be addressed during CRM implementation are sales, services and marketing. In terms of sales, the CRM system plays a crucial role because the seller-customer relationship acquires a face-to-face character, which can lead to the creation of long-term cooperation. As mentioned earlier, marketing evolves from the well-known Marketing 4P's to a new model that focuses on the customer. According to Barnes (2002), the new 4P's model should describe the following four variables: product, processes, performance and people.

In terms of services, according to a Harvard study, the overall quality of services is directly related to the level of customer satisfaction. It is important to have a good understanding of the concept "service quality". In this sense, quality means the level of service that a company wishes to offer in order to meet the needs of its customers. Companies that offer high quality services, they perform good service planning and

execute this design efficiently. The above processes occur to achieve a common goal: customer satisfaction and the establishment of a long-term relationship and cooperation with them (Chaffey et al., 2003).

Hence, a new approach to marketing should be taken, keeping customers' needs at the centre of the business. The relationship between the client and the sales person should be more face-to-face, and the long-term quality of the customer service should be the main focus.

1.2.3 Technology

The technology component of CRM should be seen as key in implementing the CRM strategy and to assist with the re-design of the business (Hansotia, 2002; Mendoza et al., 2006; Rahimi & Gunlu, 2016). Technology collects and analyses data on customers' patterns, interprets customer behavior and develops predictive models. It ensures timely responses, effective customized communications and delivers customized products and services to individual customers (Chen & Popovich, 2003; Mendoza et al., 2006; Chang et al., 2010).

CRM systems are the evolution of Enterprise Resource Planning (ERP) Systems, are using Information Systems (IT) to improve their organizational performance and Data Warehouse for data processing.

Enterprise Resource Planning (ERP) Systems

CRM is part of the evolution of corporate thinking that began with the Enterprise Resource Planning (ERP) initiative of the 1990s. The ERP methodology forces all the resources within a business to work within a business system. In the 1990s, large investments were made in the collection, standardization and organization of information and resources. The results, however, are not so clear in terms of the amortization of these investments. What is indisputable is that the information system processing skills acquired during the implementation of ERP programs enabled many organizations to support CRM programming and E-Commerce that did not exist when ERP was launched. CRM was developed, to a large extent, as a result of data mining, segmented and targeted research, which could be implemented by gathering customer data. Organizations are beginning to realize that they could better serve customers as

they better understand their needs. Therefore, there are significant differences between ERP and CRM. The first serves as a strong foundation in the back office functions of a business, while CRM connects the back and front office functions, with the aim of maintaining relationships and building customer loyalty (Baran et al. 2008).

Figure 2: A CRM implementation model

Source: Chen, 2001

Information Systems (IT)

Information Technology (IT) has been recognized as a means to enable the redesign of business processes, in order to create significant improvements in organizational performance. The use of IT in marketing has been established and has gained a lot of attention from researchers and marketing professionals. The concept of database marketing has existed since the 1960s and has grown rapidly (Petrison et al., 1997). Rapid advances in IT allow new methods of business-to-customer collaboration. In the business world, management recognizes that customers are the core of a business and the success of a business depends on the effective management of relationships with them (Nguyen et al., 2007).

CRM applications benefit greatly from the use of technology, collecting and analyzing information from customer profiles and their behavior and offer value for services and products to each customer. Innovations in the structure of the Internet are a key factor in the development of CRM. The advent of the Internet in commercial use

since 1994 has created an additional task for IT management: delivering information to customers and secure orders around the world (Cordata, 2004).

IT investing in many cases saves business costs and is a source of sustainable competitive advantage. To achieve this goal, organizations need the right combination of innovative information technologies, efficient business processes, better data management and new workforce initiatives (Nguyen et al., 2007). IT plays an increasingly important role in almost all aspects of the organization's activities and corporate strategies. Researchers and professionals often assume that investments in IT will lead to profits and increased productivity (Rahimifard et al., 2002).

One of the newest CRM software applications related to the true value of e-business is E-CRM. E-CRM helps companies improve the effectiveness of their interaction with customers, while at the same time making the interaction familiar through personalization (Mahdavi et al., 2008). Customer analysis in E-CRM involves the preprocessing of data and the creation of customer profiles from it and other data (Petrison et al., 1997).

Also a new type of CRM, which works with a wireless device, manages customer relations via mobile and is called a mobile CRM, also known as M-CRM. It is considered as a tool that enables CRM using advanced wireless communication tools. This new technology can even allow call centers to contact their customers more often to offer new services and improve the relationship between companies and their customers (Goodhue et al., 2002).

Data Warehouse Technology

A data warehouse is an information technology management tool that provides instant access to information by collecting “islands of customer data” throughout the organization by combining all database and operational systems such as human resources, sales and transaction processing systems, financials, inventory, purchasing, and marketing systems. More specifically, data warehouses extract, clean, transform and manage large volumes of data from multiple, heterogeneous systems, creating a historical record of all customer interactions (Eckerson & Watson, 2000). Their use reduces the need for research and other traditional marketing practices (Singh, 1998).

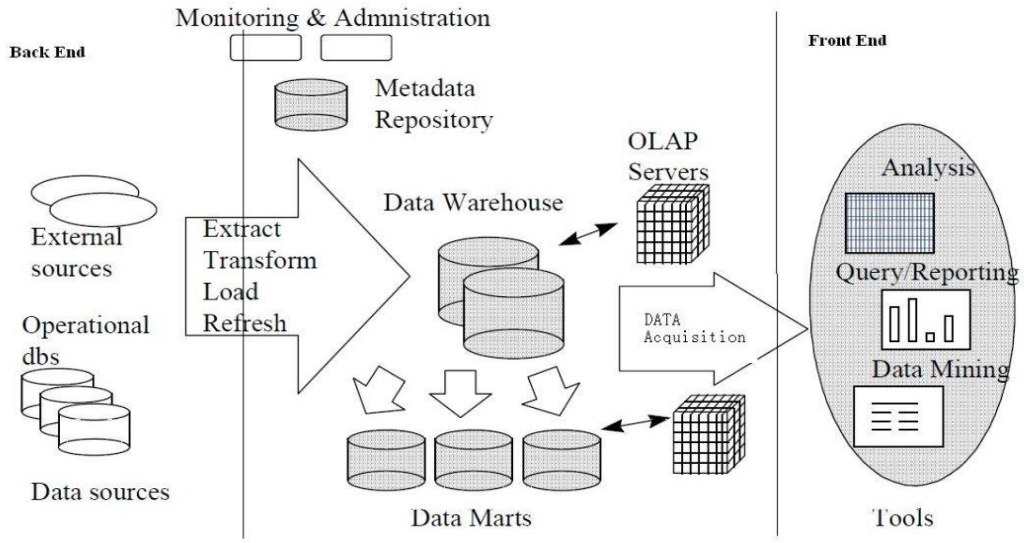

Figure 3: Data Warehousing Technology

Source: Singh, 1998

Data warehousing technology helps significantly in the implementation of CRM, because it consolidates and transforms the data, in order to understand in depth the behavior of the customers. In conclusion, "data warehouses" provide significant benefits to a business, as they provide accurate and fast access to information that facilitates customer service, provides quality information, analyzes profitability and customer profile, and calculates the overall present but and future value of each customer (Singh, 1998).

1.3 Objectives of CRM

Relationship marketing proposes a new approach on business-to-customer (B2C) relationships, while creating new market assumptions. CRM is a business strategy that focuses on maximizing shareholder value by reaching, cultivating, and retaining the right customers. Companies need to understand three key factors for customer relationships: value, satisfaction and loyalty and retaining. Value is calculated differently by each customer. It can be calculated from what the customer demands from a product or service, from the price range, from the quality/price ratio or from what the customer receives in relation to what he/she gives. Customer satisfaction, in addition, is very important as it can lead to the establishment of long-term relationships with the company.

Customer loyalty and retaining is one of the main goals that a business wants to achieve. It has been observed that the most profitable customers for a business are those who remain "loyal" and committed to a product or service offered. The term loyalty could be defined as the customer's personal recognition of how services are offered and how it guides and determines customer behavior. Loyalty can also be associated with the term performance, in relation to product price and quality (Urbanowicz, 2008).

The whole business should be involved in the development of CRM strategies. It includes an appropriate approach in terms of sales, marketing and customer support. A truly complete customer image may include information collected from sales associates, suppliers or service distributors. In general, CRM applications connect front office functions (sales, marketing and customer service), back office (finance, logistics and human resources) with touch points. Company's contact points may include the use of advertisements, call centers, e-mail, Internet, fax, etc. When the company focuses all its attention on business activities, it can reduce communication between businesses and customers (Urbanowicz, 2008).

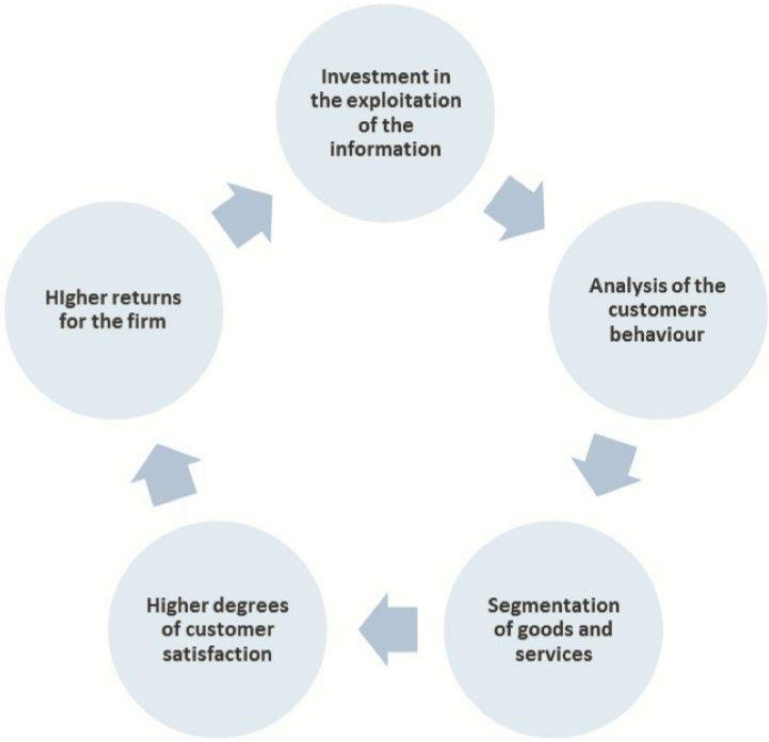

Figure 4: Flow of the processes for the implementation of an CRM system

Source: Heredero & Gomez, 2014

1.4 Benefits of CRM

Nowadays more and more companies are deciding to introduce CRM systems. The main factors that facilitate this process and cause their popularity are (Daliti & Behhehtifar, 2018):

- increase the computing power of computers,
- cost reduction of purchasing computers,
- increase the ability to collect information by computers,
- cost reduction of storing data,
- reliability of increasingly advanced tools for data analysis, data mining or data visualization methods,
- development of e-commerce and ways of interacting with customers via Internet, due to which the cost of these interactions is much lower than in case of traditional ways,
- increase in awareness of importance of current customers' behavior and importance of customer lifetime value,
- increase the complexity and improvement of marketing approaches, including one-to-one marketing, permission marketing and mass customization.

CRM researchers had assumed that CRM benefits varied depending on the type of organization as the methods and technologies related to CRM were customized to specific organization processes. CRM system is essential for any business that works directly with customers and seeks increases in customer base and revenue. Therefore, it is important to point out its main benefits (Leonid & Artem, 2018).

A CRM system is the storage of customer information that contains all customer profiles. In addition to the traditional roles of the database, it has the ability to personalize the needs of individual customers by differentiating products or services for each unique customer (Phan & Vogel, 2009). Gartner (2003) first identified the best four practices that lead to CRM success and four areas where these practices should be applied. The four practices are vision, strategy, valued customer experience, organizational collaboration, and the four areas where they should be applied are process, information, technology and metrics (Das et al., 2018). Galimi (2000) states

that CRM is a business strategy that focuses on customers to increase customer satisfaction and loyalty by providing a more responsive and customized service to each customer.

CRM includes all the opportunities for managing customer relationships: managing contacts, managing customer interactions, managing potential and integrated transactions. CRM contains tools for reporting, importing/exporting contacts, analyzing and segmenting the target audience. Based on the data received from CRM, the user can distribute lists of potential customers among sales department managers, schedule promotions and then analyze their effectiveness (Leonid & Artem, 2018).

The adoption of CRM brings the knowledge to maintain long-term relationship with customers, reach customers, achieve customer's satisfaction, reduce mistrust, remove complaints, etc (Pal Dhaka & Nahar, 2014). CRM systems can help organizations gain potential new customers, promote existing customers purchase, maintain good customer relationship and enhance customer value, so can improve the business images (Pai & Tu, 2011). Thus, CRM provides customer satisfaction, competitive advantages, profitability, reduction of distrust and cost optimization (Urdzikova et al. 2012). CRM has the advantage of data collection and analysis, customer behavior, timely response with effective communication and customer service (Injazz et al., 2008).

According to Shaw (2001), CRM is an interactive process focused on achieving optimum balance between an organization's investments and customer satisfaction, which leads towards an overall profit maximization. The process covers, among others:

- measuring costs in terms of marketing, sales and services, as well as profits generated by individual customers,
- acquisition and permanent knowledge updating with reference to customers' needs, their motivation and behavior,
- application of customer information for the continuous improvement of an enterprise leads to the learning process, based on success and failure, integration of marketing, sales and service activities to achieve common goals,
- implementation of appropriate systems, which support the acquisition and co-shared exchange of knowledge for a customer, as well as measuring the effectiveness of CRM.

In recent findings, the list of benefits is seen as a critical link between CRM initiatives and increasing customer equality. These core CRM benefits are related to the three types of equity which are relationship, value and brand, and finally to customer equity (Richards et al., 2008):

1. Improved ability to target profitable customers
2. Integrated assistance across channels
3. Enhanced sales force efficiency and effectiveness
4. Improved pricing
5. Customized products and services
6. Improved customer service efficiency and effectiveness
7. Personalized marketing messages

The desired CRM benefits do not differ significantly between organizations or countries, as has already been considered. Almost any business can benefit from a comprehensive CRM approach in a variety of ways (Diamanto, 2008):

- *For the organization*. By gathering all the necessary information in an available data base, a CRM system reduces the number of errors an organization can make when dealing with customers. Knowing that addresses and contact details are true and managing service agreements that allow vendors to access this information through the CRM system, they become more focused on providing excellent customer service and thus increasing profits. CRM can also automate communications and other functions of the organization. A CRM system can be programmed with autoresponders that send information when requests are sent to exacting email addresses and occasionally send customers newsletters, new product information, reminders, related news and the like. Because this is followed and managed by the system, it reduces the time it takes to inform customers about the organization. As all these data are collected in one location, salespeople can easily manage quotes and estimates and view buying models.
- *For the customers*: Customers benefit from CRM systems due to increasing efficiency and effectiveness of customer service. When a customer calls to place an order or receive assistance, he/she no longer has to wait for the "right" person to help, because anyone with access to the CRM system can provide assistance.

This increases efficiency and gain customer's loyalty. The client feels that the organization is close to him, knowing his needs, desires and expectations.

- *For the employees*: A CRM system can help employees by empowering them to help customers more professionally, which allows them to do their job better, reducing certain sources of dissatisfaction and increasing job satisfaction. Because employee-client contacts and their results are often recorded in CRM system, both employees and their supervisors can invest time in areas that need improvement. In addition, CRM provides an early warning system for employee effectiveness to avoid problems before becoming embedded. The CRM system can detect these conditions much earlier than an employee who is busy trying to overcome obstacles instead of changing them.
- *For salespeople*: CRM gives salespeople better and more convenient access to all the necessary information. For marketing personnel, CRM offers an easier way to manage and track campaigns and other advertising moves. For customer service personnel, CRM provides direct access to customer information and contacts, allowing them to avoid possible problems before they develop into issues.

Also, CRM increases in product time results in reducing errors and rework due to consistency in information over compliance burden. CRM provides efficient and fast transactions with less processing time. Customer inquiries can be resolved quickly because it is sent directly to the subject matter experts. After using CRM, all tasks and responsibilities are defined for each employee, thus reducing staff absenteeism and turnover. It also provides high employee satisfaction (Pal Dhaka & Nahar, 2014).

1.5 Types of CRM systems

There are different types of CRM software that focuses on some specific key functions required to manage customer relations. The lines aren't distinct, as many platforms integrate elements of various types of CRM. However, prevailing tools can be divided into three categories, based on their functions and tasks within the company (Reicher & Szeghegyi, 2015).

1.5.1 Operational CRM

An operational CRM provides with a complete view of every customers' communication record with the organization. This helps companies directly manage their relationship and interaction with their customers.

The primary function of this CRM is to streamline various business processes i.e., sales, marketing and service through automation. It is also employed to generate leads, then convert them into customers, record their details, and serve them throughout the entire process. This CRM acts as a problem solver in the business-customer relationship.

Traditionally, operational CRM has a significant share of corporate costs because many companies develop and use call centers and sales systems with automation. Therefore, CRM system vendors are trying to offer more and more types of CRM alternatives (Payne, 2007).

1.5.2 Analytical CRM

Out of the three types of CRM, this one mainly deals with data. The fundamental aim of this system is data management and analysis. So, an analytical CRM will collect, organize and analyze the data that is involved in the business process. This usually consists of marketing, sales, service and customer data.

Moreover, Analytical CRMs can also integrate with companies' invoice software to generate detailed reports so it can have a detailed view of their cash flow.

The data analysis will provide insights and detailed reports which will help business leaders or the top management to make various strategic decisions (Payne, 2007).

1.5.3 Collaborative CRM

Collaborative (or Strategic) CRM systems – as the name implies – allow companies to establish communication between various entities that are related to customer service. This might include different departments of the organization (i.e. marketing, sales, customer reps, technical support), external stakeholders, vendors, suppliers, and distributors.

The primary function of this CRM is to streamline workflows and processes across organizational structure and hierarchy. It is a common phenomenon that there is a bit of friction or resistance whenever proposals are handed from one department to the other. For instance, it is vital that the marketing team provides leads to the sales team in a timely manner. Similarly, the sales team needs to deliver sales activity reports to the support team and so on.

This might sound simple and straightforward, but it requires a lot of collaboration, and any loopholes can cost dearly. Collaborative CRM tools handle all the routine tasks through automation. This streamlines the back-office process, customer interactions, and communication within the company, which means there will be more transparency among the teams in the organization.

Collaborative CRMs unite the entire organization to achieve a common goal, which is to optimize customer service to increase the satisfaction rate (Hetyei, 2004).

Figure 5: Three Fundamental Types of CRM

Source: Buttle, 2004

Of course, each of these types of CRM solutions has some similarities. But each serves and supports some distinct purposes when it comes to business operations. These boundaries are not clear in practice. The individual types on their own can work less efficiently than when working together. The usefulness of data collection by an operational CRM can be questioned if the user is unable to make reports, analyzes and predictions using this data. In general, the philosophy of CRM implementation permeates the entire company and concerns not only customers but also partners and staff (Reicher & Szeghegyi, 2015).

1.6 CRM: Success or failure

According to a survey, out of a total of 202 companies that implemented CRM systems, only 30.7% reported successful changes (Dickie, 2000). Another study estimates that 70% of companies that implement CRM systems will ultimately fail (Giga, 2001). Giga survey revealed that companies generally underestimate the complexities of CRM, lack clear business objectives and tend to invest inadequately in the provision of CRM software. While the findings by Giga highlight a fairly gloomy scenario, it is clear that not all organizations are facing failure.

CRM implementation success rates are relatively low, which cannot be matched by the huge investment in CRM systems, nor meet the expectations of the management team. In this context, a lot of research has been done to find out the reasons that lead to the failure of CRM projects (Rigby et al., 2002). These studies identified many reasons that can cause the failure of the CRM. Overall, these reasons relate to different aspects of CRM elements, components and processes (Wang et al., 2010). Some of the factors such as management support, transparent internal process, clear relationship between CRM and the company's business strategy and return on investment, ultimately contribute to the success of CRM implementation. From another perspective, some of the factors that lead to CRM failure are presented, such as:

- Considering CRM simply as a technology
- Insufficient support from the administration
- Non-customer focus
- The business process is not ready for CRM
- Very poor data quality
- Strategy and vision are unclear
- Customers are not involved in CRM design

Specifically, only 3% of companies implement and develop CRM efficiently, 17% begin to realize the complexity of the process, 35% implement the process without any synchronization and 45% of companies have not even evaluated the CRM strategy. In addition, Forsyth (2001, cited by Wang et al., 2010) conducted a survey of 700 companies to study the causes of CRM failure. According to this survey, the main reasons for failure in the CRM implementation are:

- Organizational changes (29%)
- Company policy / inaction (22%)
- Incomplete understanding of the CRM process (20%)
- Inadequate qualifications for CRM implementation (6%)

The study by King and Burgess (2007) (cited by Wang, 2011) summarizes four main pitfalls for CRM implementation:

- CRM implementation, without properly adjusting the customer strategy
- Adoption of CRM solution, without evaluating the situation of the company
- Preference for advanced CRM technology instead of evaluating its suitability.
- Do not focus on customer retention

On the other side, Critical Success Factors (CSFs) is a method that concentrate on identifying factors have critical role for an organization's success as an absence of such factors could lead to failure (Rahimi & Berman, 2009). The development of this methodology was based on the work by Daniel (1961), but little interested was taken towards this concept at this time. A decade later, the concept was used and gained more recognition by Rockart (1979). Identifying success factors is important activity in which it allows companies to direct their resources when implementing their systems to achieve these success factors.

Ranjan and Bhatnagar (2008) defined the CSFs as *"the fixed variables which help develop boundaries of process improvement; if they consider on every step of implementation based on the importance, they will have a greater effect."* In additionally, Somers and Nelson (2001) said that the key success factors are *"the minimum capacity that the company should have to enter the competition"*. However, these above definitions focus more on management in general, and it is also possible to integrate the concept of CSF to CRM implementation projects.

No doubt, a successful CRM implementation demands an integration of the three key components of the CRM process, people, and technology. In nature, each critical success factor has direct or indirect effect on these CRM combination elements. Thus, many scholar, academics and researchers have defined these CSFs from CRM view. Pamsari et al. (2013) defined the CRM CSFs as *"the generic ingredient that has to be*

the essential part of any successful CRM implementation". Pan et al. (2007) defined these CSFs as *"the limited number of areas in which results, if they are satisfactory, will ensure successful competitive performance for the organization"*, assuming that a factor could be considered a CSF only when its presence guarantees the successful implementation of CRM. Also, Esteves and Pastor (2001) defined them as *"the issues influencing the success of an IT-enabled intervention, which they are designed to affect business change"*.

Finally, Wilson et al. (2002) stated that these CSFs are *"the activities that are carried out in order to guarantee a successful implementation of CRM"*, and they can cause a failure in projects if they are neglected or disregarded. However, not all CSFs can be critical failure factors, and vice versa, as a result a CSF can become critical failure factors (Eid, 2007). Although the high number of all above definitions that related to success factors, Williams and Ramaprasad (1996) stated that, there is not a standard method to gather and analyze these success factors. That is the reason that there were a lot of studies and researchers used different methods to identify the CSFs, such as: questionnaires, interviews and synthesis of the previous studies. In conclusion, it is thought that through a significant review of the literature about the CSFs of CRM in the IT and business field, it can come up with a group of the most CSFs required for successful CRM implementation projects.

2. Chartering (shipping)

2.1 Definition

The concept of chartering refers to the commercial employment agreement of a free ship between two groups known as charter parties. On one side is the shipowner, also called the "carrier", and on the other the "charterer" (or shipper or freighter). More specifically, in the charter agreement, the first party is a shipowner who owns the ship, while the charterer is an individual or organization that is in need of a ship (Sullivan, 1999).

The terms and conditions stipulated in the charter are binding on all the parties in the agreement and covers a wide variety of clauses and possible scenarios that may arise. It is considered to be a legally binding and internationally recognized document and is required by Admiralty Law to be drawn up in case of any form of ship hiring or freighting. The contract between the parties is called "charter party" (from the French "charte partier", or "parted document"). From the above, only small coastal shipping is excluded, in which the contract can be proved, using any means allowed in commercial cases (i.e. even with witnesses) (Sullivan, 1999).

The monetary consideration, depending on the type of charter, it is called "freight" or "hire". Freight (FRT) is the amount of money paid by a shipowner or shipping line for the carriage of cargo. Depending on the type of contract, the particular terms and, in some cases, the custom of the ports involved, the freight may include the cost of loading and/or discharging the cargo or may simply cover the ocean carriage. Respectively, hire is the money paid by a charterer to a shipowner for the hire of a ship taken on time charter. It may be expressed, for example, as an amount per day or per dead-weight ton (dwt) per month, hire is payable, by agreement, at regular intervals such as monthly or semimonthly, normally in advance. It is important that hire money is paid on time since otherwise the shipowner has the right to withdraw the ship from the service of the charterer. The amount of the freight or hire is an amount expressed usually in US Dollars (Giziakis, 2010; Deseck, 2012).

2.2 Charter categories

The commercial employment of the ship is divided into four categories of charter (Vlachos & Psychou, 2011):

- *Voyage Charter (V/C)*: Contract of carriage in which the charterer pays for the use of a ship's cargo space for one, or sometimes more than one, voyage. Under this type of charter, the shipowner pays all the operating costs of the ship while payment for port and cargo handling charges are the subject of agreement between the parties. Freight is generally paid per unit of cargo, such as ton, based on agreed quantity, or as lump sum irrespective of the quantity loaded, the terms and conditions of the charter party.
- *Time Charter*: The hiring of a ship from a shipowner for a period of time. Under this type of contract, the shipowner places his ship, with crew and equipment, at the disposal of the charterer, for which the charterer pays hire money. Subject to any restrictions in the contract, the charterer decides the type and quantity of cargo to be carried and the ports of loading and discharging. He is responsible for supplying the ship with bunkers and for the payment of cargo handling operations, pod charges, pilotage, towage and ship's agency. The technical operation and navigation of the ship remain the responsibility of the shipowner.
- *Bareboat Charter*: The hiring of a ship for a period of time during which the shipowner provides only the ship while the charterer provides the crew together with all stores and bunkers and pays all operating costs. This type of charter is favored by persons or companies who wish to own a ship for investment purposes but who do not have the desire or expertise to operate the ship. Similarly, it is favored by persons or companies who have a particular requirement for a ship and the expertise with which to operate one but without the wish or ability to purchase. Also referred to as a demise charter or a charter by demise.
- *Contract of Affreightment (CoA)*: It is usually a contract for the carriage of a specified type and quantity of cargo, covering two or several shipments and running over a long period. In the COA it is the cargo and not the ship that has a central position. The shipowner undertakes to carry a number of cargoes within a specified period of time on a specified route. Agreed frequency of cargoes may require more than one ship. Unlike a true charter, the cargo-owner does not have a laytime period.

2.3 Charter rate formation

The parties involved in a charter negotiate the price which is determined according to the time, the conditions of the freight market (supply - demand) and the requirements of each charter.

2.3.1 Freight Market

The term Freight Market defines the geographical area in which charters are determined. In the freight market there are many people with different interests and goals, each of which contributes to the determination of charters. In times of excessive demand for ship capacity, charter rates soar, resulting in the so-called “freight market explosion” for which the international term “boom” is used. Conversely, when there is a sharp drop in charters, mainly due to oversupply of capacity or other external causes such as war, then the freight market is said to be falling sharply and the international term “roll-down” is more widely used instead of “crash” that used in other places (Toulaki, 2016).

The evolution of maritime transport has created the need to create various shipping agencies (or ships agents) such as the Baltic Exchange, BIMCO, Lloyd’s of London, etc. So, summarizing according to the definition of Giziakis et al. (2010), the freight market is a system of interdependent persons, factors and situations that through economic mechanisms and practical procedures leads to the determination of the charters with which international maritime transport is carried out.

Finally, there are different types of freight markets which differ as follows (Giziakis et al., 2010):

- based on the type of ships (dry bulk cargo, tankers, combined cargo, containers, ro/ro and reefer ships)
- based on the type and nature of transported cargo (dry bulk cargo, liquid bulk cargo, specialised cargo and general cargo)
- based on the geographical distribution and scope of ships
- based on the duration of the charter (short/long-term charter) and
- based on the charter categories.

2.3.2 Freight market persons involved

The world of international merchant shipping is made up of professionals who are involved in a set of activities necessary for the safe transportation of cargo by sea from one part of the world to another. Professionals involved in international merchant shipping can be classified into the following categories according to their activities and role. Analytically:

1. Shipowners

As defined by Greek Maritime Law, the shipowner is the party that owns the ship and essentially expresses its interests in a charter agreement. It is obvious, then, that the concept of shipowner is identical either with the owner and the manager of the ship or the commercial ship manager, who while does not own the ship manages its commercial operation (Kiantou-Pampouki, 2003). In addition, shipowner's name is mentioned in the charter party since it is registered as the representative of its interests.

It is noted that it is common in the domestic and international literature to use the term "carrier" when there are legal issues, while when practical issues arise, the term "shipowner" is used.

2. Charterers

Charterers are the controllers of cargo and the shipping industry's customers. Almost everyone relies in their daily lives on products that charterers transport by sea. Some charterers own ships themselves, either on a hired or permanent basis, chartering ships from independent shipowners when the need comes up. This is often a way of protecting against rising future freight markets (costs). However, most charterers regularly hire ships, or space on ships, to move their products.

According to Greek Maritime Law, a charterer is a party to a charter contract, in which the ship is available for employment. In some cases of charter, the charterer may be identified with the consignor when the cargo owner is also the representative of his interests in the charter agreement, and these may be two different parties when the cargo owner and the cargo representing his interests in the charter agreement are two different natural or legal persons (Delouka, 1979).

Ship Charterers will plan a voyage, calculate the costs involved, organize clearance and dispatch of ships and handle ship and cargo-related documents. They play an important role at the deep end of ship operations, helping to pair ships with suitable cargoes. Charterers usually pay charter rate in dollars and the price they pay may change widely depending on the demand and supply of ships. Facts that are taken seriously by the charterer in a charter are the type of ship, its size, its age, its cargo handling equipment, speed, fuel consumption, general condition of the ship, reputation and image of the ship-owning company in the market, the price of the freight and the possibility to choose a port from a range of alternative ports of loading and discharging. In the event that a full charter of a ship has been agreed and that agreement includes the charterer's right to submarine the ship, then the charterer is the carrier for the bondage relationship between them.

3. Shippers

The shipper, as a rule, has the ownership of the transported cargo and is the one who replaces the role of the charterer, in terms of the delivery of the goods to be transported to the carrier, in case it is not done by the first (charterer). The importance of the shipper in the shipping market is huge. In particular, in the transport of goods by regular ships, its role is crucial. In the freight contract, on the one hand is the shipowner (or carrier) and on the other hand the owner of the goods who, as usual, is the shipper. If the contract of sale and the contract of carriage so permit, the shipper may assume full responsibility for the loading and transport of goods, following a purchase in which he has the role of either seller or buyer (Deluka, 1979).

The shipper’s main responsibility is to complete the supply of the right quality and quantity of cargo to the appropriate pier, on the agreed date and time. In addition, he is responsible for loading the goods on board, either in person or by outsourcing this task to an agent called a "forwarding agent" or "carrier" or "forwarding agent". He may also entrust this task to the ship agent or to the ship company's offices. Also, the care of the shipper-seller is the accompaniment of the goods with all the required documents, as well as the smooth completion of all the necessary formalities, customs, sanitary and others.

Shippers with limited quantities of general cargo, carry out transports by regular ships. For reasons of resistance to strong oligopoly conferences, the shippers have set up the European Shippers Council (ESC), based in The Hague. As mentioned above, the properties of the shipper are often the same as those of the charterer. The relationship that connects them can be varied, such as sub-charter or command. The shipper, however, is not a counterparty to the charterer. Opposite him, the shipper appears as the representative of the charterer. And, in principle at least, it does not acquire rights over the carrier. However, if the carrier (or his representative, especially the master) accepts him as a shipper, he participates in the loading and acquires interest in the voyage. As a result, the shipper acquires an independent claim for the transfer of things, the right to request the issuance of a bill of shipping, to conclude the contract of delivery (Begebungsvertrag), to claim compensation, etc. (Roka, 1993).

4. Operators

The maritime profession of the operator is very important in the field of the freight market and requires excellent knowledge of its conditions. Managers make a profit either by chartering or substituting ships and fall into two broad categories (Circa, 2014):

a) Ship's operator, who first charters a ship from a shipowner by paying the corresponding freight and then sub-charters it to another charterer, but with a higher freight. Essentially, then, secures the profit from the difference between the amount of the freight paid to the shipowner and the amount of the freight receives from the charterer. Of course, in order for this procedure to be legal, there must be a relevant term in the charter agreement that gives the charterer the right to subcharter the ship to a third party. The rights as well as the obligations of the new charterer, called the "sub charterer", are governed by charter party between him and the original charterer (i.e. ship manager), while the rights and obligations of the original charterer against the shipowner remain exactly as agreed in the original charter party.

b) Cargo's operator, who undertakes the sea transport of a cargo, for a freight and then entrusts the transfer of this cargo to a third party, for a freight, provided of course that this person has the appropriate ship for the specific transport. Thus, it

fulfills its obligation to reach the transported cargo at its destination, within the specified time period and at the same time secures its profit, which results from the difference between the amount of the freight, which it receives from the owner of the cargo and the lower amount. of the freight, which he pays to the person who ultimately made the transfer.

5. Shipbrokers

The concept of shipbroker is often equated in the shipping market with that of a chartering broker. Shipbroker, therefore, specializes in the mediation between the transactions that concern either the supply and demand of ship tonnage or the provision of shipping services in order to facilitate the process of concluding contracts. The broader concept of shipbroker can also be seen in (Circa, 2014):

a) chartering brokers

b) insurance brokers

c) ship sale and purchase brokers

d) freight forwarders

6. Chartering brokers

Chartering brokers have as main responsibility the mediation between shipowners and charterers who wish to charter the specific ships to transport cargo. They are, therefore, regulators of the relevant details of the charter contract and for the provision of this service, they are paid with a monetary consideration called "commission" which is always calculated as a percentage of the total freight.

Due to the special role that they play in the market, chartering broker has certain basic properties and follows specific activities. These activities are the following (Roca, 1993):

- Either he is the shipbroker, so he is looking for the most suitable cargo to be transported from his client's ship, or he is the cargobroker so he is looking for the most suitable ship to transport the cargo of his client. Naturally, he always moves in the interest of his client.

- The carrier and the charterer never enter into a direct trading process. The negotiation process is completely organized by the chartering brokers and they always act in order to realize the charter contract, with the greatest possible interest for their client.
- Once the negotiation process is completed, the chartering broker supervises the drafting of the charter party, always having as its main concern to include in it what emerged and was agreed during the negotiation.
- He is authorized to sign on behalf of the parties he represents and in this way binds his client whether he is the charterer or the carrier.
- It is also his responsibility to settle all the financial issues of the charter. He undertakes, for example, the promotion of the invoice with the amount of the fee to be paid by the charterer, so that the transfer can take place by the shipowner. He then monitors the process of paying and receiving the freight in order to be executed on time.

Chartering brokers, in order to be able to provide investment advice, must have a certificate from the Securities and Futures Authority London. In addition, they are divided into various sub-categories depending on the person they represent, the object of their occupation, their place of employment and the type of freight market in which they operate. Analytically, there are (Tsirka, 2014):

- Chartering brokers who act on behalf of shipowners (chartering brokers seeking cargoes) and on the other hand there are chartering brokers who act on behalf of charterers (chartering brokers seeking ships).
- Chartering brokers who work and operate as freelancers in the market (separate individuals, competitive brokers), but there are also those who work exclusively in the shipping office of a shipowner or charterer, safeguarding his interests (employees of shipowners or charterers, in-house brokers).
- Chartering brokers located in a domestic shipping center (e.g. Patras, Piraeus), but there are also chartering brokers located in one of the world's shipping centers (e.g. London, Tokyo, New York), which are called “correspondent chartering brokers”. Naturally, the former are in communication and cooperation with the latter.

- Chartering brokers, whose primary role is to bring shipowner's broker in contact with charterer's broker in order to negotiate a charter. These brokers are called "competitive brokers". There were also chartering brokers whose primary role was to transfer information related to the search for ships or cargo to the world's shipping centers. These brokers were known as "cable brokers".
- Chartering brokers whose main concern is the amount of freight to be paid and not the terms of the charter agreement. These brokers are called "freight brokers". Instead, there are chartering brokers called "charter party brokers", whose interest is focused on the terms of the transfer that will be included in the charter party, and they simply seek the freight to be at the current levels of the freight market.

Finally, chartering brokers are divided into categories and depending on the subject of their employment. Therefore there are:

- "Tanker brokers", i.e. those engaged in the bulk cargo freight market,
- "Dry cargo brokers", i.e. those involved in the dry bulk freight market
- "Containership brokers", .i.e. those who deal exclusively with the container freight market, and
- "Gas brokers", i.e. those whose sole occupation is only the freight market for the transport of bulk liquefied gases.

7. Shipping agents

The capacity of shipping agent has special responsibilities in the shipping market, as it is necessary for the execution of the contract in the port of loading and discharging. Essentially, the shipping agent, upon the order of the shipowner, undertakes (with remuneration or commission) his representation in a specific port or ports in order to carry out work related to the ship. It is common in shipping practice to appoint a general shipping agent in a country, whose main responsibility is to select agents for its major ports.

In the case of Greece, a shipping agent is considered to be one who by profession and with an organized office facility, undertakes, upon appointment by the shipowner (or the disponent owner), to carry out the agency of a ship of any nationality, in addition having the right to issue consignment notes. The issues related to the determination of

the person of the shipping agent are regulated by a special clause in the charter party. The person who will appoint the agent is determined during the negotiation of the charter contract (Vlachos & Psychou, 2011).

The duties of shipping agent are many and important and vary between free shipping and shipping lines. Generally include:

- the representation of the shipowner
- monitoring the entry-exit of the ship in the port,
- the anchorage and in general any action required
- the regulation of port, customs and health operations
- arranging for the goods to be loaded and delivered to the consignee
- the receipt and storage of goods, if for any reason the consignee is unable to
- the care for the execution of tanks and repairs of the ship
- the responsibility for supplying the ship with the necessary supplies

The fees collected by the shipping agent are called agency fees and usually consist of a percentage calculated either in each transaction individually or in total in the turnover which he carried out for each shipowner within a specified period of time.

8. Receiver or consignee or consignataire or Ladungsempfänger

The consignee of the cargo can be either the charterer or the shipper or even another person. In the case of international sales, where the goods can either be shipped directly to the name of their buyer, or sold by the charterer or shipper during the voyage, the consignee is usually another person.

2.4 Freight indexes

Freight indexes are the financial instruments that monitor the conditions and the trend of the freight market. The freight market consist of many sub-markets that are not strictly separated from each other nor interdependent, which form in the general set of the freight market various trends which are heterogeneous. This differentiation of freight markets also led to the creation of corresponding indexes. Based on the type and nature of the cargo concerned, indexes are divided into dry cargo freight indexes and liquid cargo freight indexes.

Also, based on the type of ship, these indexes are divided into those for dry cargo ships and those for liquid cargo ships. In this subdivision of freight indexes, a more specific categorization is made regarding the ship size, such as the indicators for the ships “Handy” (15,000-60,000dwt), “Panamax” (60,000-100,000dwt) and “Capesize” (100,000-200,000dwt). Finally, it is worth mentioning that the configuration of freight indexes is fluid so a brief overview will be made of the most important of them (Toulaki, 2016).

2.4.1 Dry bulk freight indexes

Baltic Dry Index (BDI)

The Baltic Dry Index (BDI) measures shipping costs for dry bulk commodities, including coal, grain, iron ore, finished steel and other metals, minerals and similar materials. Representatives of the Baltic Exchange, the ship brokers’ association responsible for publishing the index, canvass a panel of members daily and gather charter rates (in US dollars) for representative cargoes and routes. In a “time charter” system, agents seeking to transport cargo typically work through brokers, who hire a ship at a per diem rate. The charter is active from the moment the shipowner delivers a vessel for voyage until it is returned free of cargo. Charters may be thought of as a type of forward agreement: Both brokers and their clients gain the security of set income and availability at the risk of losing out on favorable future price movements. Additionally, the Baltic International Freight Futures Exchange uses the BDI as a settlement index, providing sellers and buyers a baseline for futures contracts used to hedge charter rates.

The BDI began in 1985 as the Baltic Freight Index (BFI), based on a weighted average of shipping costs on 13 trade routes: grain (five routes), coal (three routes), iron ore (one route) and general charter (four routes) (Stopford, 2009). The Baltic Exchange reserves the right to modify these routes or their weightings, and since 1985, the number of routes included in the index has increased to match trade volumes. In October 2001, the BDI underwent major expansion to cover 26 shipping routes and four ship sizes: Handysize, Supramax, Panamax and Capesize. Their names refer to limits on their ability to transit the Panama Canal: Handysize and Supramax ships have no restrictions due to size, Panamax are at the limit for passage and Capesize are too large for the canal and must travel around the Cape of Good Hope off South Africa

or Cape Horn at the tip of South America. These carriers typically transport cargo in lots exceeding 10,000 dwt; most often, a single client books an entire vessel for one cargo type. These size classes comprise 36% of the merchant and nonmerchant global fleet of ships (UNCTAD, 2010).

Nowadays, BDI is an assessment of the average price to ship raw materials (such as coal, iron ore, cement, and grains) on a number of shipping routes (about 50) and by ship size. Thus, it is an indicator of the cost paid to ship raw materials on global markets and an important component of input costs. The index is considered a leading indicator (forward-looking) of economic activity since it involves events taking place at the earlier stages of global commodity chains (the procurement and transformation of raw materials). A high BDI index indicates a tight shipping supply due to high demand and is likely to create inflationary pressures along the supply chain. A sudden and sharp decline of the BDI is likely to foretell a recession since producers have substantially curtailed their demand leaving shippers to substantially reduce their rates in an attempt to attract cargo. Like all market indexes, the BDI is constantly changing, reflecting its price discovery mechanism. The major factors impacting BDI are:

- *Commodity demand*. This is mainly a volume impact that could be irrespective of commodity prices. An increase in the demand, particularly if sudden, will likely result in a surge in shipping rates since additional capacity takes time to be brought online (either as new ships or reassignment of existing ones). If expectations about future demand change and producers reduce their raw materials demand accordingly, then the BDI will drop.
- *Ship supply*. Represents the availability of ships in terms of their capacity and their function. Many bulk carriers, such as tankers, cannot be readily converted to other uses, so the bulk market is quite segmented and fairly inflexible. The average ship age can also play since the useful life of a ship is about 25 years. If the average age becomes too high, there are expectations that significant capacity may be reduced and that this would imply a rise of the BDI. Inversely, the addition of new capacity in terms of ship orders may trigger a decline of the BDI, particularly if demand is not expected to change significantly in light of this new supply.
- *Seasonality*. The demand for raw materials, such as grain and coal, has a significant seasonality, which will create fluctuations in the BDI when transporting these commodities is in high or low demand.

- *Bunker oil prices*. Bunker fuel accounts for about 40% of vessel operating costs with limited opportunities to mitigate them. Thus, a surge in oil prices is directly reflected in shipping rates. The opposite also holds as if energy prices drop, the BDI can also drop accordingly.
- *Port congestion and canal capacity*. Some ports, particularly in the context of seasonality, can become congested and can tie up ships for longer periods than usual. This results in higher shipping rates as port supply is reconciled with shipping demand. Additionally, the Panama and Suez canals, important bottlenecks in global freight circulation, have a fixed capacity and can impose additional delays.
- *Geopolitics*. Depending on the geopolitical context, there may be a risk of calling some locations, which is reflected in insurance rates and, consequently, shipping rates. Some chokepoints, such as the straits of Hormuz, Aden, and Malacca, may involve the risks of political instability and piracy, and capacity constraints to maritime circulation.

As an index for the dry bulk shipping industry, the BDI's advantages are its rich historical data, large underlying membership and daily frequency of time charter rates. The index has gained a reputation as a bellwether of economic activity and is used to forecast industrial production and economic growth. Unlike forward rate agreements, the index lacks a speculative component; in theory, it operates according to the fundamentals of supply and demand for ship capacity in real time. An index that trends upward means shipping prices are being bid up. This should signal rising demand for shipping space and accelerating economic activity.

However, critics downplay the BDI's predictive power. China's rapid industrialization, they say, has shifted the index to reflect Chinese demand for commodities. They also point to commodity futures markets as providing better metrics for predicting future demand and to overcapacity that plagues both dry bulk and container fleets. In normal circumstances, the critics say, the index may hint at the direction of activity, but the financial crisis has revealed instability in the measure that makes it unsuitable as a predictive tool.

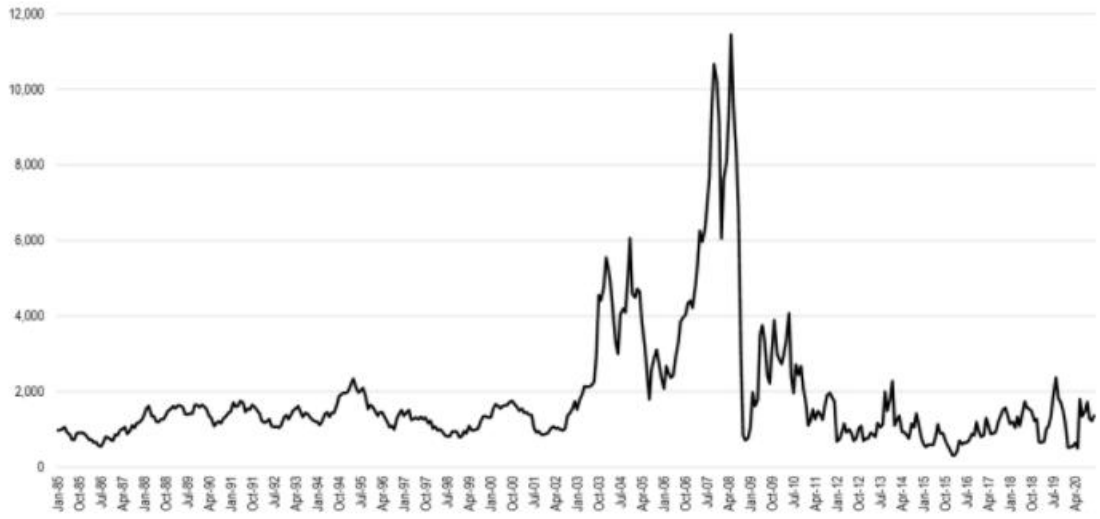

Figure 6: The Baltic Dry Index, 1985-2020

Source: Bloomberg, 2021

The above graph underlines that the BDI has been very volatile in recent years, particularly between 2005 and 2009 when it behaved as a bubble. The main driver of this surge was linked to commodity prices, particularly oil. The index then plummeted back to historical levels and remained weak despite a recovery in global trade. A factor is that many ships were ordered during the "bubble years" and have entered the market, providing capacity growth above demand growth. In recent years the BDI remains low, underlining a situation of excess capacity in the shipping industry.

2.4.2 Liquid cargo freight indexes

Baltic International Tanker Routes (BITR)

The BITR freight index was created in 1998 by the Baltic Exchange to monitor on a daily basis the fluctuation of "spot" freight rates on selected liquid freight routes. In essence, this index concerns the tanker market and is formed according to 11 international offshore oil routes.

From 2001 onwards, however, this index was divided into two sub-freight indexes, for the best information. One is the "Baltic Dirty Tanker Index" (BDTI), which monitors the evolution of crude oil freight on standard routes, and the other is the "Baltic Clean Tanker Index" (BCTI), which monitors the evolution of clean oil freight rates to

standard routes. In essence, the composition of the former includes freight routes for the transportation of crude oil, while the composition of the latter includes routes for the transportation of petroleum products for specific indications of ship size category (Hatzovoulos & Lyridis, 2003).

Worldscale (WIS)

WIS is an established and widely used freight index for tankers. It is a rule for calculating voyages, which is based on a model of a ship with a specific capacity and specific costs, related to maintenance and operation and a certain fuel consumption for a ship that operates between ports (Hwang et al., 2008).

The calculation is made for a round trip from the first port of loading to the port of discharging and back to the port of loading. The new WIS Index was introduced in 1989. Today there are two independent non-profit organizations in London (Worldscale Association - London - Limited) and in New York (Worldscale Association - NYC - INC) that issue the WIS Index. Since charter costs in the charter market are very volatile, fluctuation management is extremely critical to maximizing profit.

Figure 7: Trade Routes Map

Source: Waterfront Shipping, 2008-2021

2.5 Charter Contracts

2.5.1 Contract of goods carriage

For the proper and successful execution of a sea transport of goods, it is essential to have a suitable ship, under the rules of international trade law. Shipping is a consequence of a contract for the sale of goods. The sale contract is the agreement between the buyer and the seller of the transported cargo. It lists the goods, the sale price, the method of payment, etc. Once the sales contract has been drawn up, it is time to find capacity. The shipowner or the ship manager promises and agrees to transport goods by sea or to dispose of his ship to the charterer for this purpose and this agreement is known as a ship charter contract.

The above contracts include terms and abbreviations related to the liability for payment of expenses in the process of international trade and international shipping. The above conditions are included in the payment of expenses such as discharging, port, freight, navigation, costs of counting, stowing and arranging the cargo, etc.

In addition, a set of commonly accepted terms of interpretation (Incoterms) has been adopted in this field, widely used in the international trade arena for greater stability and speed. The scope of these terms covers situations such as the transfer and assumption of responsibility, risk and cost between the buyer and the seller of the goods, as well as issues related to the freight of the goods, their insurance coverage, the manner and place of delivery, discharging, customs procedures, etc.

2.5.2 Charter Party

A charter party is a document of contract by which a shipowner agrees to lease, and the charterer agrees to hire, a vessel or all the cargo space, or a part of it, on terms and conditions forth in the charter party. In other words, the charter party is the written agreement between the shipowner and the charterer and is a formal statement that contains the agreed negotiation of both parties under specific terms and conditions. This form of contract is the most important chartering document in the shipping industry, due to the fact that offers a great utility to both parties concerned but also to the officers on board, to the port agents and to the lawyers. In order to declare valid the charter party, it should be signed by both parties and a witness. Usually the witness is the broker of one two parties.

The charter party can adopt any form and can be drawn up by anybody, but it is preferable to use standard forms of charter parties, that have a balanced character in terms of the rights and obligations of the parties. Some charter parties are specific for a time charter or a bareboat charter, whereas others are restricted to the transport of dry cargoes or are adapted to the requirements of tanker transport. Although each charter party has its own wording, terms and conditions, they all have nevertheless a number of elements in common. While, charter parties are invariably made in writing and in the majority of cases on the basis of standard forms in use, an oral charter party is permitted in most jurisdictions (UNCTAD, 1990). More than fifty charter parties have been approved by the Baltic and International Maritime Council (BIMCO), most of which are voyage charter parties covering various trades. Moreover, there are also standard forms for tanker charter parties, partly because of the specific characteristics of this type of carriage, and partly reflecting the relatively stronger bargaining power of tanker charterers (Todd, 1988).

It is important to state here, that some large shippers have their own forms of charter parties and similarly some large shipping companies only use their own standard form. These forms, in both occasions, are supplemented by a myriad of additional clauses, the so-called "rider-clauses", some of which have attained standardized wording themselves and many which are drafted on an ad-hoc basis.

Some of the standard forms have been in existence since the late 19th century without any real thought being given to their adaption to modern commercial life (Deseck, 2012). Consequently, there are still in use many old and outdated standard forms which contain ambiguous and obscure wording. The mere fact that a large number of "rider" clauses are required in each case is a testimony of the fact that the standard charter party form to which they are appended is in need of supplementing. This is particularly the case in relation to some old dry cargo standard forms is that they tend to favour shipowners, while the more recently drafted forms tend to favour charterers.

Usually, the law that is followed and applied is the English law or otherwise the common law. Under English law, the terms of a charter party are divided into:

1. Expressed and implied
2. Representations
3. Conditions

4. Warranties

5. Innominate

Expressed and Implied Terms

Expressed terms are the terms that are explicitly described in the standard forms or in the additional annex. Implied terms are the terms that are not contained in writing in the charter party, however they are particularly strong for this and are tacitly observed by the parties. These conditions mainly concern important issues, which is why their violation entails significant sanctions. Of course, in case there is a discrepancy between an explicit and an implied term, the explicit always prevails. Important implied terms are seaworthiness, due dispatch and proper route.

Representations

Representations are the terms concerning the presentations given during the negotiations. They are promises made by the parties. Examples of representations are the characteristics of the ship (such as the name of the ship, its mark, shipbuilding time, etc.) and the cargo. In the event that there is any inaccuracy with deceit then the party who suffered the deception is entitled to cancel the contract. In any other case, the contract is considered valid and the party who acted fraudulently is simply obliged to pay compensation.

Conditions

Conditions are the terms that, if violated by one party, give the other party the right to cancel the charter party and claim compensation. Examples of conditions are the nationality of the ship, its geographical location at the time of signing the contract and its class.

Warranties

Warranties are the terms whose violation by one party, gives the other the right to claim compensation. Examples of such warranties are ship maintenance, consumption and speed.

Innominate Terms

Innominate terms are the terms that are sometimes treated as conditions and sometimes as warranties, depending on the severity of the consequences of their failure. One such example is the airworthiness of a ship.

Forms of charter parties

Charter parties, depending on the type of contract, can be:

- standard charter parties
- agreed charter parties
- adopted charter parties
- recommended charter parties
- approved charter parties

Also, depending on the type of charter the charter parties can be:

- travel
- time charter
- naked ship
- contractor transport
- continuous travel

Finally, depending on the type of cargo transported, charter agreements can be for transport:

- oil
- coal
- ores
- cereals
- timber
- rice
- cement
- stones etc.

2.5.3 Bill of Lading (BL)

The Bill of Lading (BL) is a legal document between the charterer/shipper of the cargo and the shipowner which carries the particular cargo (carrier). This document refers in details to the quantity, type and destination of the cargo. Furthermore, the BL can act as a receipt of shipment when the cargo is delivered to the predetermined destination. It is very important the BL to accompany the cargo, and be signed by an authorised representative from the carrier, shipper and receiver (Toulaki, 2016).

On behalf of the shipowner the charterer may sign the BLs in which case the signature binds the shipowner as principal to the contract contained in or evidenced by the BLs (Plomaritou, 2014). It is obvious that the trade and the cargo should be legal not only in the countries where the operations of loading and discharging take place, but also in the county where ship is registered and by the law governing the charter party– which is usually the Common Law. The charterer if it is stated at the charter party may breach the trading limits if he pays the respective extra insurance premium (Coghlin et al., 2008).

The charterer is liable and should compensate the shipowner for any damage to the ship or injury to the crew which may arise during the carriage, loading, discharging of the cargo. There are cargoes such as salt or grains which under conditions may explode or are corrosive, and as a result cause damage to the ship. In this case the charterer is liable for these damages and shall indemnify the shipowner.

In most cases the operation of loading and discharging are under the responsibility and supervision of the master and all expenses are covered by the charterer/shipper. There is a certain clause in the charter party in which the word “responsibility” transfer the risk of any damage may occur by the above operations to the shipowner. The key point here is the stevedores’ damage and the mechanical process of handling the ship’s gear and cargo. Usually, time charters, especially those concerning the trade of a bulk cargo, include a stevedore damage clause which makes the charterer liable, under certain circumstances (Coghlin et al., 2008).

Types of Bill of Lading

The types of BL are (Giziakis et al., 2010):

- *Clean Bill of Lading* or *unclaused bill of lading*. The BL is called "clean" when the cargo loaded on the ship has the right quantity and quality. The cargo is referred to as "apparent good order and condition". The BL does not include reservations about the cargo.
- *Foul Bill of Lading* or *Dirty bill of lading*. This item refers to cargos that are not of the right quality or quantity and show defects. This BL is called "incorrect" and includes remarks or reservations of the master about the condition of the cargo.
- *Received for Shipment Bill of Lading* or *Custody Bill of Lading*. This BL is different from most types, because while most are issued after the cargo is loaded on board, in the line market and more specifically in the container market, this type of BL is issued when the cargo is ready to be loaded.
- *Shipped Bill of Lading*. This BL is issued after all the cargo has been loaded on board.
- *Direct Bill of Lading*. This type of BL involves the transport of goods by sea by ship, directly from the port of loading, to the port of discharging.
- *Transhipment Bill of Lading*. This BL is issued when the cargo is to be transhipped to an intermediate port.
- *Through Bill of Lading*. When the cargo is transported through several carriers, each issues different documents.
- *Combined Transport Bill of Lading*. This BL is issued in case the transport is combined and many means of transport are used.
- *Stale Bill of Lading*. This type of BL is required to be at the port of delivery before or at exactly the same time as discharging the cargo.
- *Groupage Bill of Lading*. In this type of BL, freight forwarding agents collect the goods that shippers send to recipients in the same region or country and transport them as a shipment.
- *Open Bill of Lading*. In this case, the name of the recipient is not mentioned at all. The use of this BL is rare.

- *Named Bill of Lading*. This BL is registered, since it is issued in the name of the consignee.
- *Order Bill of Lading*. It is issued by order of the recipient, so that it can be transferred by him with an endorsement.
- *Negotiable Bill of Lading*. This BL is negotiable.
- *Non Negotiable Bill of Lading*. This type of BL is non-negotiable, and the recipient cannot transfer ownership of the goods by transferring the BL.
- *Sea Waybill*. This type of BL is mainly used in line shipping and has a dual meaning, as on the one hand it acts as proof that the cargo has been received by the shipowner for transport and on the other it functions as proof of a freight agreement.
- *Liner Bill of Lading*. This item is issued in the line market and is a basic contract for the transport of goods.
- *Charter Bill of Lading*. It is the kind used in the free market and works only as proof of loading of goods.

2.6 Forms of Charter

Below is an episcopal description of the various criteria for distinguishing charters.

2.6.1 Distinction based on the tonnage of the ship

According to this distinction, we have the following forms of charter:

- The whole charter, where the charterer uses all the net capacity of the ship and loads full cargo. It is ideal for large transport or transport of large cargos e.g. raw materials, fuel, food.
- The space charter, where more than one charterer charters parts of the ship's tonnage and each of them loads his own cargo.

2.6.2 Distinction based on the commercial operation of the ship

According to this criterion, we can distinguish two major types of charters, the demise charter and the non demise charter (Vlachos & Psychou, 2011).

Demise or bareboat charter

In this type of charter the commercial operation of the ship, as well as the manning and equipment, are responsibilities of the charterer. The charterer, in this type of charter we would say has the role of shipowner.

The demise chartering is not technically a cargo charter, but a rental contract if the management, navigation, insurance and maintenance of the ship pass into the hands of the charterer. The ship is therefore in the full management of the charterer, however he has no right to mortgage or sell it.

This type of charter gives an advantage to those who are inexperienced in the field of shipping, as it gives them the right to invest without being responsible for the commercial and technical management of the ship. On the other hand, demise charter can also serve people with many years of experience in the field of shipping, as it gives them the right to be in the role of shipowner, but without paying capital to buy the ship.

Non demise charter

In this type of charter, the commercial operation of the ship is the responsibility of the shipowner, who rents the ship to the charterer for a certain period of time, in return for payment of a fee, called freight or hire.

This type of charter is the most common and we distinguish the following subcategories of charter:

- *Voyage charter*. The shipowner undertakes to the charterer to transport a certain amount of cargo from the port of loading to the port of discharging, for a certain fee, which is determined according to the respective conditions of the freight market.
- *Consecutive voyage charter*. The ship is chartered for a certain number of voyages, which are made on terms of voyage charter against an agreed fare paid upon completion of each voyage.

- *Time charter*. The shipowner operates his ship as instructed by the charterer between certain agreed dates for an agreed daily or monthly rate. During this period, it will be the charterer who will pay for the voyage costs of the ship such as bunkers, pilotages, port dues related to the cargo, canal dues etc. An analogy would be a contract to hire a car.
- *Contract of affreightment (CoA)*. The shipowner has the obligation to meet the needs of the charterer in a specified volume of transported cargo, between designated ports and agreed time, with ships of the shipowner's choice. Usually the CoA covers long periods of time, during which many trips are made. So we notice that in this type of charter, the focus is on the cargo being transported. It should be noted that the term CoA is also used to describe any charter contract, regardless of the type of charter. CoA is commonly used in line markets.
- *Hybrid charters*. These include elements of voyage charter and time charter in parallel (e.g. trip time charter).

2.6.3 Secondary forms of Charter

1. Cargo transfer in small batches (parceling): carried out mainly with different types of irons
2. Transport of large cargoes (project cargoes): Transport is done by ships, which have cranes with high lifting capacity
3. Joint Ventures: Agreements are made between those who control cargo and those who control ships, with the aim of joint exploitation.
4. Shipping Pools: Concerns groups of shipowners, who aim to promote their ships, aiming at the optimal management and efficiency of their fleets.
5. Charter parties of Services (Vlachos & Psychou, 2011).

3. The use of technology in shipping

3.1 Link between chartering crm and technology

Shipping is a strong market where many sides interact. On the one hand, ship owners seek to maximize the occupation and the income of their vessels. Shipbrokers, have to encourage agreement in unstable market conditions, since they depending on incomplete data. Finally, charterers, as controllers of the world's cargoes, are continually attempting to approach the perfect time, quality and cost to book transportation for their goods. Consequently, chartering it's always a matter of more than two parties and relationships and networks are created which are the glue that hold business-to- business markets together.

The shipping industry appears a variety of the classic features of a business-to-business market and is interesting because many intermediaries are included in the daily conduct of business. It is consider as an industry whose whole existence is founded on the development of relationships and effective communications (Stopford, 2002). For a single voyage of one vessel a ship owner may be co operate with many principals. The most common is that deals between principals take place through the participation of intermediaries, known to as either agents or brokers.

A broker must be well-informed because it is his or her specialist knowledge that adds value to the partnership, whilst the ship owner must maintain constant connection with the broker in order to acquire the most up-to-date information. This communication between the two sides could be interpreted as a reflection of the two persons participating in the dyadic interaction having different natures.

Due to the increase in the availability, diversity, and quantity of data in recent years, commercial shipping has become an even more complex and competitive business. The shipping industry is predicted to create between 100 and 200 million data points each day as a result of the "data boom". In order to be able and make commercial judgments based on factual information, this data must be digested, comprehended, and cross-referenced against an ever-growing set of specific data on vessels, ports, routes, and trading patterns, as well as a variety of commercial, legal, regulatory, and environmental issues.

Shipping is one of the most important modes of transportation, and it is divided into various categories. To gain a competitive advantage, each of these segments is tackling the customer service revolution in a unique way. CRM refers to a rapidly evolving sort of business software system that has been adopted by manufacturers and service providers across a wide range of industries and can be used to get insight into customers' and prospects' purchasing behaviors and preferences. While CRM can provide many benefits for a globally competitive industry like shipping, most carriers

and logistics companies have yet to fully deploy CRM platforms, contrary to popular belief.

As Customer Relationship Management in Chartering is a worldwide issue, a vital field of these co-operation deals with the contribution of technological developments to communications. The element of having unlimited access to information via Internet technology, which enables their market expertise, information on vessel reservations (“fixtures”), vessel availability (“positions”), service requests (“cargoes”), and the capacity to maintain constant connections with various parties via mobile phones and emails in order to facilitate co-operation, communication, and collaboration. Shipping firms have been able to enhance their processes, implement best-in-class practices, reduce costs, and increase efficiency using these methods. Relationships, corporate history, brand names, value-added services, and, most importantly, what services a carrier delivers (that others do not) are all factors to consider when choosing a carrier. CRM, on the other hand, differs significantly between nations due to socioeconomic backgrounds and levels of technology development, and the disparity is most noticeable in banner advertising and order management systems.

In terms of management implications, shipping businesses should strengthen their computerized CRM systems so that they may collect and evaluate important marketing data from their clients, such as shipping routes, trading volume, cargo types, payment terms, and financial situations, among other things. In the highly competitive shipping industry, this can help salespeople and customer service representatives make better decisions, increase service quality, and provide more value to customers. Wong (2007), suggested that CRM, aided by information technologies and the internet, gives a shipping company a competitive advantage.

CRM is more than just a tool for gathering crucial data and information from customers; it's also a communication platform for sharing product and service information, exchanging customer knowledge and sustaining personal ties for the purpose of customer retention, potential client development, new business creation, and the promotion of long-term development of any firm or organization in the maritime supply chain.

3.2 Another aspects of Technology in Shipping

With the passage of time and the evolution of technological means, each sector in the labor market has received multiple influences, both in terms of the resources of industrial production or the distribution of products and services, as well as in the formation of the work culture. Of course, the shipping sector and maritime transport procedures are no exception to technological change. Typically, as stated in a relevant publication of Theta Marine Consulting (2019) on the impact of technological change

on shipping, as specialized in shipping content consulting *"shipping is an industry that is constantly influenced by global trends and advances in technology, materials and fuel"*. In this way it is possible to understand on the one hand, the importance of technology for the shipping industry and the influence it has on the second, on the other hand, the perspectives that can change maritime transport and shipbuilding.

According to John Wilson (2018), *"In addition to the need to comply with existing regulations, technology can increase efficiency and reduce costs by pushing shipowners to adopt in order to remain competitive. At the same time, seafarers are being called upon to become more and more acquainted with technological developments"*. The contribution of technology to shipping is therefore reasonable, as well as the fact that it promises to evolve through developed and evolving technological achievements and methods remains essential. Shipping companies have the opportunity to benefit from the use of technological means both in terms of time savings, which therefore translates into money savings but also in terms of energy, especially if the environmental factor and alternative forms of energy are taken into account.

3.3 Use of technological means in the shipping sector

Technology itself has favored maritime transport, as one considers the possibilities of online shipping, one also realizes the need for immediate delivery of the desired goods, as well as the need to build strong customer relationships. According to a survey conducted by Eurostat (2019), the data of which were exported in January 2020, the percentage of internet users who bought or ordered goods or services in Europe from 2009 to 2019 reaches almost 80% of the total population. From this, it is easy to understand the importance of commercial activities by sea, but also the desire for the adequacy of the use of technology in shipping.

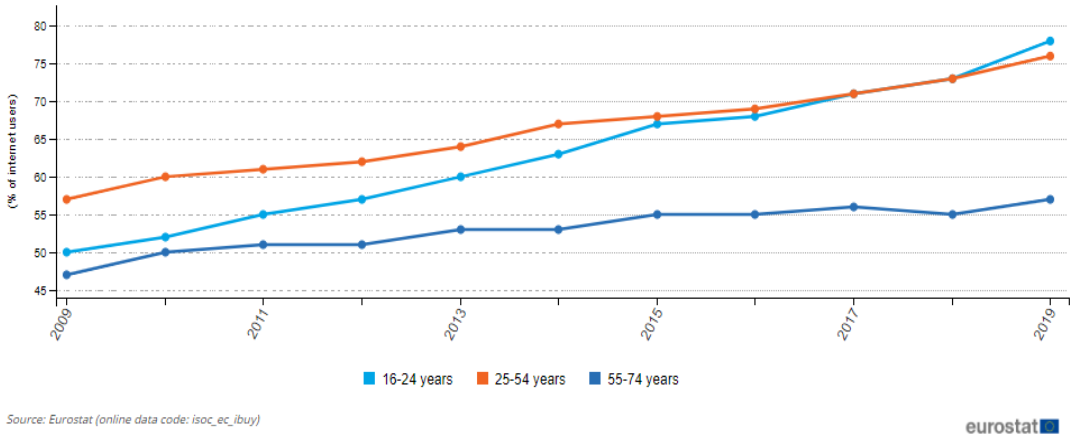

Figure 8: Internet users who bought or ordered goods or services for private use in the previous 12 months, by age group, EU-28, 2009-2019

Source: Eurostat, 2019

An important reference is the change of the shipping industry from the evolution and use of technological means and applications. According to Joe Walsh (2017), a Clyde & Co partner, in a paper published for IMarEST (Institute of Marine Engineering, Science & Technology), *"technology is reshaping the shipping industry"*. As it is typically mentioned below, the evolution of new technologies seem promising in terms of the evolution of maritime transport itself, giving significant benefits to the economy but also to the sustainability of the planet, overcoming any challenges that arise.

The use of technology in shipping can contribute on many areas, one of which is that of communication. For example, the use of satellite channels can facilitate communication and data exchange, while reducing reception time. In addition, such applications facilitate security conditions depending on the respective legal

frameworks. For example, using satellite data it is possible to determine whether a vessel is operating legally or illegally. Illegal activity in merchant shipping can be the illicit trade of either various species or people. The use of satellite channels carries out the brief exchange of significant amounts of data over time, which proves to be particularly useful in the smooth operation of the shipping industry.

The use of Big Data seems to be a very widespread trend in business in recent years. According to Trelleborg Marine Systems' report on "Use of big data in the maritime industry" (2018, p.6): *"The analysis of this big data is extremely useful as it allows businesses to uncover hidden patterns, unknown correlations, ambiguities, market trends and other useful information"*. At the same time, according to a survey conducted in 2016 by Sea Asia, 94% of leaders of the shipping industry recognized the need for the transformation of the industry into "smart shipping", i.e. the autonomous operation of vessels, in order to achieve sustainable of the sector (Trelleborg, 2018).

When it comes to data usage, cloud-based technologies are very common in businesses, mainly due to the ease with which they offer data access and instant availability regardless of distance. The use of such technologies by the shipping industry can facilitate commercial processes, in addition, providing an environmentally friendly face, since the cloud use saves energy, thus contributing to the sustainability of the planet.

An additional technology that seems to be an important part of this change in the shipping industry is artificial intelligence, which uses algorithms to reduce security risks and labor costs. The use of artificial intelligence, therefore, can significantly affect the shipping industry, as it is a key factor in the development of its business model.

In addition, according to Constantine Komodromos, CEO of VesselBot, the shipping industry tends to adopt technologies if they have first been tested by another company or organization. In this way, it is decided that, on the one hand, the shipping industry monitors market trends and the results of the relevant actions regarding a new technology, on the other hand, it maintains a slow course of adaptation to new technologies compared to others industrial sectors, which highlights the industry's need for further development in relation to innovation (Trelleborg, 2018).

3.4 Technology and CRM in shipping

Despite the wide literature on CRM, the literature regarding the application of CRM tools in the shipping industry is still very scarce.

Any company's goal is to deliver the right product, to the right customer, on the precise quantity, in the right conditions, to the correct place, and at the right price (Carvalho et al., 2012). That is also true for a company whose core business is the delivery of goods (whether by land, air or sea) so, it is vital that organizations quickly meet their customers' desires in order to improve their satisfaction and loyalty (Wu & Lu, 2012). *"A customer's relationship with a shipping company involves prices, services, scope of service, schedule, customer relations, company history, convenience, brand name and value-added services"* (Yang & Nguyen, 2011), however *"the main distinguishing factors for customers comprise company history, brand name, customer relations and value added services"* (Wong, 2007, cited by Yang & Nguyen, 2011).

Despite the promise that technology will transform the shipping industry, the adoption of a new technological tool will definitely not be the factor that will influence a customer's choice, because in this business area prior relationships, based on direct contact, are very important and should not be forgotten (Durvasula et al., 2004). In spite of this, Gander (2008) stated that *"a properly integrated IT system can significantly improve customer service by providing accurate shipment data for both the company and the customer, and an integrated IT-based CRM program ensures a more efficient and effective quoting and communications system for sale departments and beyond"*. So, according to Durvasula et al. (2004) "*the shipping industry can use technology as an integral part of its CRM industry; in particular, information technology in the form of the internet and business intelligence can enable shipping firms to focus on their customers more in depth and provide products and sales service at levels that are necessary to retain customers"*. Yang and Nguyen (2011) argue that such a tool may improve the coordination and communication between vessel management, terminal operations, transportation organization and infrastructure management, as well as maximize profits by reducing operational costs.

Although CRM is a tool to get competitive advantage, it should be used as a means, that is, it should not replace the interaction between sales department and customer, because only the human contact allows the development of trustworthy relationships and, consequently, the offer of a personalized service. It should, therefore, serve the company and facilitate its employee's work. It should be *"an assistant in creating satisfaction for the shipper but not the sole source of satisfaction"* (Durvasula et al., 2004). In spite of all the widely recognized advantages of CRM tools and despite the fact that the CRM strategy is to improve the company's performance (Chang et al., 2010), the reality demonstrates that *"most carriers and logistic providers have yet to launch a formal CRM program"* (Fakhredaei, 2007), being the lack of CRM software adapted to the reality of the transportation business the main reason found.

3.5 CRM implementation in shipping industry

CRM is the most common strategy used by most companies today to keep their customers happy. In the world where the choices are plenty, it is important to keep their clients close, strengthen their relationships with them and find new clients who would be able to trust them for long term.

Every company's main customer strategy today relies a lot on getting its CRM applications in order, so that it can keep its customers happy. But as important as CRM is to the world of commerce, CRM and shipping industry are just beginning to warm up to each other.

According to Marine Insight News Network (2019) there are 8 reasons to implement CRM in shipping industry:

- *For customer flux and better management*. The shipping world is not an industry where customers are dealt with on a daily basis. Surely, those who are dedicated customer stay for long but the interaction is not as frequent as in other sectors. But that does not mean that the importance of CRM in shipping industry is something that can be ignored. The need for CRM solutions in marine world is just as dire as elsewhere. Recently, more and more marine workers have started seeking training in CRM, making them more efficient at managing their customer flux.

- *To manage customers better*. But this all brings us to the main point- what is CRM and why is it so important in shipping industry? To put it simple, CRM is the management process that allows a company to keep a tab on its customers in terms of their opinions about the company's services, responding to their questions as quickly as possible, getting suitable feedback and redirecting it so that the suitable changes can be made. Why is it needed? Because this is what helps keep the customers happy and satisfied customers tend to keep coming back. In the marine world, the reasons for CRM are exactly the same.
- *To know about customers' experiences*. Starting with cruise lines that need to know about their passengers' experience with them to the freight and cargo companies responding to their clients' queries readily, CRM applications help them to keep it all organized and running smoothly.
- *To help customers find what they are looking for*. The recent upsurge in the number of people seeking services from the shipping industry makes the need for CRM solution even more urgent. The shipping industry needs the efficient management to make sure all their customers get what they are looking for.
- *To get competitive edge with efficient CRM system*. Another reason why CRM and shipping industry need to align together is because this industry is no longer a monopoly. With privatization, the choices for every single kind of service sought by a potential customer are astounding. May that be a shipping company to move stuff to another country or postal services across water bodies- we name it and we can find more variety to choose from than we would be comfortable with. This particular change means the company offering better services will be the one that has an advantage. And CRM helps them win that advantage.
- *To keep customers informed at all times*. CRM can prove especially useful for companies in the cargo shipping industry as it helps them keep a track of the stuff. If companies can notify their client about status of their shipment to the point it reaches its destination safely, they have a content customer. Tracking becomes much easier with help of CRM. Also, with CRM companies can maintain a better mail system that can function a lot smoother and answer to customers' grievances at a much faster pace. Getting together the mankind for carrying out such a task is one thing but getting this done efficiently is another and with CRM applications, shipping industry can make sure of just that.

- *To increase customer-company communication*. As for larger companies, CRM solution is a blessing in disguise for them because it allows them to interact with customer at the most basic level. Know about the problems they face or questions they have to ask or complaints they have to make and we will understand what does our customer actually wants from us. Give him that and we have a customer for long term and that's what every business is looking for, at end of the day.
- *To make business look less intimidating and more humanly with CRM*. A CRM solution actually provides a human face to all the technical aspects of shipping industry. This human touch helps business in more ways than imagined because when a customer is worried about a shipment or has an angry complaint to make, it's always more comforting to reach a human rather than a computer generated mail. CRM in shipping industry makes a lot of sense, especially judging it from a business point of view.

3.6 The evolution of CRM in Greek Shipping

Two hundred years ago information about shipping services until the return of the ship was minimal, as the only means of communication was correspondence. The ships relied on the official labor supervisors, who supervised the work and arranged the appropriate fare. Shipowners handled the issues concerning the ship, as long as it was away without knowing when and if it will return (Nikiforos, 2013).

Today, information systems have reached the level of the internet and the spread has been rapid in all areas. Now the Maritime Information Systems have entered E-Maritime (Nikiforos, 2013). For example, freighters connect buyers and sellers and deliver products to the customer in efficient ways to create economic value. Therefore, the requirements of prompt information and effective CRM are now imperative needs.

Aiming to create value for shareholders and increase profitable customer retention, Shang and Lu (2012, p. 65) defined CRM as *"a term for the e-commerce methodologies, technologies and capabilities used by companies to manage relationships with customers and the management approach that includes identifying, developing and maintaining successful customer relationships over time"*.

In a survey conducted by a Greek company active in the container shipping industry, CRM is considered a system necessary to attract and increase customer protection, retention and support. The industry is facing stiff and growing competition, which clearly indicates to shipping companies that they need to differentiate their customers. With the ability to store and consolidate a significant amount of customer information, CRM is seen as an opportunity for shipping companies to use their customer information to improve their relationships, increase satisfaction and their dedication and ultimately, increase their profitability (Mouchtaropoulou, 2013).

In particular, CRM to a freight carrier targets many aspects and provides the highest possible quality services to keep customers loyal to the company. According to Danuta (2005), there are four elements that companies need to consider in developing a well-organized customer relationship program. These are:

- The availability of an item, which represents the ability of the supplier to meet the requirements of the customer
- Delivery time, the time it takes to deliver a specific product.
- Reliability, i.e. the commitment of the supplier to keep the promise of delivery.
- The accuracy of the ordered quantities and products.

From the customer's point of view, these points are the basic and critical criteria that a freighter can ask for (Akyuz & Cuong Nguyen, 2012). In general, the adoption of CRM enhances the performance of shipping companies by increasing their satisfaction and commitment, reducing search and acquisition costs for new customers and increasing the profitability of customers who are willing to pay more to enjoy better service and high level services (Mouchtaropoulou, 2013).

4. Conclusions

Initially, the shipping industry has multiple influences on the relationship of technology with other industries, monitors market trends and adopts technologies at a slow pace, once they have already been introduced in another industry. It has been said several times that technology “reshapes” the shipping industry, which is concluded as valid, since the introduction of new systems requires a complete reorganization of the organizational process. The evolution of maritime transport itself has been favored by technology, as long as the number of online purchases is taken into account, thus the need for additional trade has also developed.

An important technology for the shipping sector is CRM, as it concerns customer relationship and service and is called to cover the gap of the industry's daily contact with customers, focusing mainly on a customer-centric marketing approach. In this way, the feedback is achieved, which in combination with the collected data lead to the realization of the best customer service, thus mitigating the chances of customers being absorbed by the competition. Therefore, customer relationships are paramount, since customers are the ones who fuel sustainability and it is equally important to use the tools offered by technology to better maintain relationships. However, customer satisfaction alone is not enough, since there is talk of a restructuring of the shipping industry by technology. As needs increase, there is an exponential increase in imports and exports, which brings to the surface the use of traditional means to satisfy the majority of commercial transactions by shipping companies, which in turn has highlighted the need for the technological modernization of industry. However, the plethora of technologies used or to be used in shipping, from Big Data Analytics to smart ships, are not enough on an individual basis to maximize the efficiency of the objectives set.

It is a fact that the implementation of CRM initiatives and programs has led to failure in various industries and companies. In addition, understanding of CRM and its various aspects, such as definition, scope, processes and technology, is still limited. But understanding the key components of any CRM initiative is critical to its success. This paper provided an extensive review of the literature on CRM procedures.

In essence, as we mentioned, people, technology and process are the three main components of CRM while there are three types or forms of CRM that extend to organisations. In particular, the evolution of these systems in shipping has been rapid due to the development of technology and globalization. Telecommunications has helped to bring information to the forefront of shipping companies.

Therefore, in order to take full advantage of the customer information received from every corner of the globe and in a short period of time, from a shipping company, an integrated customer relationship system must be developed. This system can be used by new and old companies, as well as by companies with small or large turnovers. If CRM is installed and used properly with the cooperation of users, the benefit of shipping is quite large. If managed properly by management, the increase in efficiency will be felt in a very short time.

The CRM strategy, finally, must be an integral part of the overall business strategy and start from the top management of the company, being fully in line with its philosophy, culture, mission and objectives, as it does not only affect its performance from the marketing point of view but also from a financial point of view. Creating value for customers is the basis for building loyal and loyal customers, which means increasing profitability, revenue and market share.

Future in-depth research on customer relationship management would be extremely useful in the Greek Shipping sector. This research could refer to various branches of Shipping and to different sizes of Greek shipping companies. Measuring the performance of CRM systems could be done using a number of indicators, such as customer satisfaction and loyalty indicators through which further results and more valid conclusions could be drawn.

Each organisation has a different view of how a CRM tool works, so, as long as it focuses on the client, the system can be adjusted to better fit the company's needs and their customers' wishes (Junior et al., 2005). It is true that companies that adopt CRM systems benefit from them (Mithas et al., 2005), however the most important aspect to bear in mind is that, *"in the end, what matters more is not the display of technology, but how technology is put to practical use for delivering superior quality service"* (Durvasula et al., 2004).

Bibliography

Akyuz, A. and Cuong Nguyen, T. (2012), Evaluating customer loyalty in association with CRM in freight forwarder firms, International Logistics and Supply Chain Management, Jönköping International Business School.

Baran, R.J., Galka, R. and Strunk, P.D. (2008), Principles of customer Relationship Management. USA: Thomson.

Barnes, S.J. (2002), Wireless Digital Advertising: Nature and Implications. International Journal of Advertising, 21 (3), pp. 399–420.

Bloomberg (2021), The Baltic Dry Index, 1985-2020. Available at: https://transportgeography.org/contents/chapter3/transport-costs/baltic-dry-index/

Bull, C. (2003), "Strategic issues in customer relationship management (CRM) implementation", Business Process Management Journal, 9 (5), pp. 592-602.

Buttle, F. (2004), Customer relationship management (1st ed.). Burlington: Elsevier Butterworth-Heinemann.

Carvalho, J.C. et al. (2012), Logística e Gestão da Cadeia de Abastecimento, Edições Sílabo.

Chaffey, D. Mayer, R. Johnston, K. and Ellis-Chadwick, F. (2003), Internet Marketing, Financial times/Prentice Hall, Harlow.

Chakravorti, S. (2006), "Customer relationship management: a content analysis of issues and best practices".

Chang, W., Park, E.J. and Chaiy, S. (2010), "How does CRM technology transform into organizational performance? A mediating role of marketing capability", Journal of Business Research, Vol. 63, pp. 849-855.

Chen, I.J. (2001), "Planning for ERP systems: analysis and future trend", Business Process Management Journal, 7 (5), pp. 374-386.

Chen, I.J. and Popovich, K. (2003), "Understanding customer relationship management (CRM) People, process and technology", Business Process Management Journal, 9 (5), pp. 672-688.

Clyde & Co (2017), Technology in shipping. The impact of technological change on the shipping industry, Institute of Marine Engineering, Science & Technology, IMarEST. Available at: https://www.imarest.org/policy-news/thought-leadership/1010-technology-in-shipping/file

Coghlin, T., Baker, A. and Kenny, J. (2008). Time Charters, 6th edition, London: Informa Law from Routledge, Lloyd's Shipping Law Library.

Cortada, J.W. (2004), How Computers Changed the Work of American Manufacturing, Transportation, and Retail Industries. New York: Oxford University Press.

Daliti, A. and Beheehtifar, M. (2018), Exploring the Benefits of Customer Relationship Management, Specialty Journal of Knowledge Management, 3 (3), pp. 10-16.

Daniel, D. (1961), "Management information crisis", Harv Bus Rev, pp. 111-121.

Danuta, K.-M. (2005), "Logistics customer service levels in Poland: Changes between 1993 and 2001", International Journal of Production Economics, Vol 93-94, pp. 121–128.

Das, S., Mishra, M. and Mohanty, P.K. (2018), The Impact of Customer Relationship Management (CRM) Practices on Customer Retention and the Mediating Effect of Customer Satisfaction, International Journal of Management Studies, DOI: 10.18843/ijms/v5i1(4)/15.

Delouka, N.A. (1979), Maritime Law, 2nd Edition, Athens (Available only in Greek Language: Δελούκα Ν.Α.,1979, Ναυτικόν Δίκαιον, 2η έκδοση, Αθήνα).

Deseck, P. (2012), Chartering and Charterparty online, Available at: http://www.maritimeknowhow.com/home/chartering-and-charterparties/chartering-and-charterparty-online

Diamanto, K. (2008), The Importance of Customer Relationship Management in Software Enterprises' Life Cycle, Presented to the Project Management Program in the School of Management of City University of Seattle in Partial Fulfillment of the Requirements for the Degree of Master of Science of Project Management.

Dickie, J. (2000), Why CRM projects fail. Available at: www.firstwave.net

Dohnal, J. (2002), Customer Relationship management, Řízení vztahů se zákazníky. Praha: Grada Publishing.

Douet, M. and Cappuccilli, J. (2011), A review of short sea shipping policy in the European Union, Journal of Transport Geography, 19, pp. 968–976.

Durvasula, S., Lysonski, S. and Mehta, S.C. (2004), "Technology and its CRM implications in the shipping industry". International Journal of Technology Management, 28 (1), pp. 88–102.

Eckerson, W. and Watson, H. (2000), Harnessing Customer Information for Strategic Advantage: Technical Challenges and Business Solutions, Special Report, The Data Warehousing Institute, Chatsworth, CA.

Eid, R. (2007), "Towards a successful CRM implementation in banks: an integrated model", Serv Ind J, 27 (8), pp. 1021-1039.

Esteves, J. and Pastor, J. (2001), "Analysis of critical success factors relevance along SAP implementation phases", Proceedings from the 7th Americas Conference on Information Systems.

Eurostat (2019), "E-commerce statistics for individuals", Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php/E-commerce_statistics_for_individuals

Fakhredaei, N. (2007), The factors affecting adoption of CRM at the organizational level in Iran's shipping industry.

Galimi, J. (2000), Strategic analysis report: CRM IT requirements and strategies for Payer Organizations, Gmer Group.

Gander, G. (2008), 10 ways an integrated CRM tool can improve the forwarding process.

Giga (2001), Seven out of ten CRM projects fail, Computing, 16 August, p. 27.

Giziakis, K., Papadopoulos, A. and Plomaritou, E. (2010), Chartering, 3rd Edition, Stamoulis Publications, Athens (Available only in Greek Language: Γκιζιάκης, Κ, Παπαδόπουλος, Α., Πλωμαρίτου, Ε., 2010, Ναυλώσεις, Εκδόσεις Σταμούλη, Αθήνα).

Goodhue, D.L., Wixom, B.H. and Watson, H.J. (2002), "Realizing business benefits through CRM: hitting the right target in the right way," MIS Quarterly Executive, Vol. 1, pp. 79–94.

Governor Technology (2008), An Introduction to Customer Relationship Management Software. Available at: https://www.governor.co.uk/media/2347177/introductiontocrm.pdf

Hansotia, B. (2002), "Gearing up for CRM: antecedents to successful implementation", Journal of Database Management, 10 (2), pp. 121-132.

Hatzovoulos, D.N. and Lyridis, D. (2003), Definition of a standard behavior index for tanker freight rates, National Technical University of Athens (Available only in Greek Language: Χατζόβουλος Δ.Ν., Λυρίδης Δ., 2003, Ορισμός πρότυπου δείκτη συμπεριφοράς ναύλων δεξαμενοπλοίων. Εθνικό Μετσόβιο Πολυτεχνείο).

Heredero, C.P. and Gómez, C.G. (2014), The contribution of CRMs to the ability of market segmentation: The case of the VIPS group, Procedia Technology, 16, pp. 355-364.

Hetyei, J. (2004), ERP systems in Hungary XXI. century, Computerbooks, Budapest.

Injazz J.C and Popovich, K. (2003), "Understanding customer relationship management (CRM) People, process and technology", Business Process Management Journal, 9 (5), pp. 672-688.

Junior, A.G., Santade, H.O., Pizzinatto, N.K. and Farah, O.E. (2005), "CRM: conceitos e métodos de aplicação no marketing de relacionamento", Revista Gestão Industrial, 1 (3).

Kiantoy-Pampouki, A. (2003), Maritime Law, Volume II, 6th Edition, Sakkoula Publications, Athens-Thessaloniki (Available only in Greek Language: Κιάντου-Παμπούκη Α. (2003), Ναυτικό Δίκαιο, Τόμος ΙΙ, 6η έκδοση, Εκδόσεις Σάκκουλα Α. Ε., Αθήνα Θεσσαλονίκη).

Kotler, P. (1992), Marketing management: Analýza, plánování, využití, kontrola. 7. vyd. Praha: Victoria Publishing.

Kotler, P. and Armstrong, G. (2004), Marketing. Praha: Grada Publishing.

Kotler, P. and Keller, K.L. (2007), Marketing management. Praha: Grada Publishing.

Lee, C.-Y. and Song, D.-P. (2016), Ocean container transport in global supply chains: Overview and research opportunities, Transportation Research Part B, pp. 1–33.

Lehtinen, J.R. (2007), Aktivní CRM. Řízení vztahů se zákazníky. Praha: Grada Publishing.

Leonid, I. and Artem, I. (2008), Research and Design of Customer Relationship Management System for Small Companies and Organizations, School of Business and Culture, Business Information Technology, Bachelor of Business Administration.

Lindgreen, A. (2004), The design, implementation and monitoring of a CRM programme: a case study, Marketing Intelligence & Planning, 22 (2), pp. 160–186.

Mahdavi, I., Cho, N., Shirazi, B. and Sahebjam, N. (2008), "Designing evolving user profile in e-CRM with dynamic clustering of Web documents," Data & Knowledge Engineering, Vol. 65, pp. 355–372.

Marine Insight News Network (2019), "8 Reasons to Implement Customer Relationship Management (CRM) in Maritime Industry". Available at: https://www.marineinsight.com/know-more/8-reasons-to-implement-customer-relationship-management-crm-in-maritime-industry/

Mendoza, L.E., Marius, A., Pérez, M. and Grimán, A.C. (2006), "Critical success factors for a customer relationship management strategy", Information and Software Technology, 49 (8), pp. 913-945.

Mithas, S., Krishnan, M.S. and Fornell, C. (2005), "Why do customer relationship management applications affect customer satisfaction?", J. Mark. 69 (4), pp. 201–209.

Mouchtaropoulou, A.E. (2013), Customer Relationship Management using CRM indicators: Case of Container Maritime Services, Business Administration, University of Macedonia (Available only in Greek Language: Μουχταροπούλου, Α.Ε., 2013, Διαχείριση Πελατειακών Σχέσεων με τη χρήση δεικτών CRM: Περίπτωση Υπηρεσιών Θαλάσσιας Μεταφοράς Εμπορευματοκιβωτίων, Διοίκηση Επιχειρήσεων, Πανεπιστήμιο Μακεδονίας).

MSG (2008), Importance of Customer Relationship Management (CRM), Management Study Guide. Available at: http://www.managementstudyguide.com/importance-of-crm.htm

Nguyen, T., Sherif, J. and Newby, M. (2007), “Strategies for successful CRM implementation”, Information Management & Computer Security, Vol. 15, pp. 102-111.

Nikoforos, G. (2013), The role of Information Systems in Shipping, Department of Accounting, TEI of Crete (Available only in Greek Language: Νικηφόρος, Γ., 2013, Ο Ρόλος Των Πληροφοριακών Συστημάτων Στην Ναυτιλία, Τμήμα Λογιστικής, ΤΕΙ Κρήτης).

Notteboom, T. (2004), Container shipping and ports: An overview, Review of network economics.

Pai, J.C and Tu, F.M. (2011), The acceptance and use of customer relationship management (CRM) systems: An empirical study of distribution service industry in Taiwan, Expert Systems with Applications 38 available through Elsevier Ltd.

Paixao, A. and Marlow, P. (2002), Strengths and weaknesses of short sea shipping, Marine Policy, 26, pp. 167–178.

Pal Dhaka, V. and Nahar, P. (2014), A Review: Benefits and Critical Factors of Customer Relationship Management, Int. J. Advanced Networking and Applications, 6 (1), pp. 2191-2194.

Pamsari, M.B., Dehban, M. and Lulemani, H.K. (2013), “Assessment of the key success factors of customer relationship management”, Univ J Manag Soc Sci, 3 (4): pp. 23-29.

Pan, Z., Ryu, H. and Baik, J. (2007), “A case study: CRM adoption success factors analysis and six sigma DMAIC application”, IEEE Comput Soc.

Payne, A. (2007), CRM handbook, customer relations on high level, HVG publisher Ltd.

Peelen, E. (2005), Customer Relationship Management. Edinburgh Gate. England: Pearson Education Limited. (pp.xi-xii), Budapest.

Pereira, T., Rocha, J., Telhada, J. and Carvalho, M.S. (2015), Characterization of the Portuguese SSS into the Europe: A Contribution. International Conference on Computational Logistics, pp. 252-266.

Petrison, L.A., Blattberg, R.C. and Wang, P. (1997), “Database marketing: past, present and future”, Journal of Direct Marketing, Vol. 11, pp. 109–125.

Phan, D.D and Vogel, R.D. (2009), A model of customer relationship management and business intelligence systems for catalogue and online retailers. Information & Management [e journal] 47 available through Elsevier B.V.

Plomaritou, E. (2014), “A Review of Ship-owner’s & Charterer’s Obligations in Various Types of Charter”, Journal of Shipping and Ocean Engineering, 4, pp. 307-321.

Plomaritou, E. (2014), Commercial Risks Arising from Charterparties, Operations and Claim Issues, London: Lloyds Maritime Academy (Module 2 of distance learning course title as “Certificate in Commercial Risks in Shipping”).

Rahimi, I. and Berman, U. (2009), “Building a CSF framework for CRM implementation”, Database Market Cust Strat Manag, 16 (4), pp. 253-265.

Rahimi, R. and Gunlu, E. (2016), “Implementing customer relationship management (CRM) in hotel industry from organisational culture perspective”, International Journal of Contemporary Hospitality Management, 28 (1), pp. 89-112.

Rahimi, R., Nadda, V. and Wang, H. (2015), “CRM in tourism”, In Nilanjan, R. (Ed.), Emerging Innovative Marketing Strategies in the Tourism Industry, 1st ed., IGI Global, Pennsylvania, pp. 16-43.

Rahimifard, S., Bagshaw R.W., Newman, S.T. and Bell, R. (2002), “IT tools to improve the performance of metalworking SMEs”, International Journal of Production Research, Vol. 40, pp. 3589-3604.

Ranjan, J. and Bhatnagar, V. (2008), “Principles for successful a CRM in organizations”, Direct Mark An Int J, 1 (1), pp. 50-55.

Reicher, R. and Szeghegyi, A. (2015), Factors Affecting the Selection and Implementation of Customer Relationship Management (CRM) Process. Acta Polytechnica Hungarica, 12 (4), pp. 183-200.

Richards, A.K and Jones, E. (2008), Customer relationship management: Finding value drivers. Industrial Marketing Management, 37 (2), pp. 120-130.

Rigby, D.K., Reichheld, F.F. and Schefter, P. (2002), “Avoid the Four Perils of CRM”, Harvard Business Review, pp. 101-109.

Roberts, L.P. (2005), The History of CRM -- Moving Beyond the Customer Database, Evaluseek Publishing. Available at: http://www.zazachat.com/kb/crm/articles/crm_history.aspx

Rockart, J.F. (1979), “Chief executives define their own data needs”, Harv Bus Rev, 57 (2), pp. 81-93.

Roka, I. (1993), Introduction to Private Maritime Law (Available only in Greek Language: Ρόκα Ι., 1993, Εισαγωγή στο Ιδιωτικό Ναυτικό Δίκαιο).

Shang, K-C. and Lu, C-S. (2012), “Customer Relationship Management and Firm Performance: An Empirical Study of Fright Forwarder Services”, Journal of Marine Science and Technology, 20 (1), pp. 64-72.

Shaw, R. (2001), CRM Definitions – Defining Customer Relationship Marketing and Management, Customer Relationship Management”, Vol. 8, SCNEducation.

Silva, J. (2011), O transporte marítimo - mais... e mais contentores. Revista de Marinha. Available: http://www.revistademarinha.com/index.php?option=com_content&view=article&id=1437:transporte-maritimo&catid=102:portos-e-canais&Itemid=291

Singh, H. (1998). Data warehousing – concepts, technologies, implementations, and management, New Jersey: Prentice Hall PTR.

Somers, T.M. and Nelson, K. (2001), “The impact of critical success factors across the stage of enterprise resource planning”, Proceeding of the 34th Hawaii International conference on System Sciences.

Sousa, M. (2008), O transporte marítimo na cadeia logística, Seminário de Logística - AEP.

Stopford, M. (2009), Maritime Economics, London: Routledge.

Storback, K. and Lehtinen, J.R. (2002), Řízení vztahů se zákazníky. Customer Relationship Management. Praha: Grada Publishing.

Sullivan, E. (1999), Eric Sullivan’s Marine Encyclopaedic Dictionary, Informa Law from Routledge.

Theta Marine Consulting (2019), “Shipping and technological change: the impact” (Available only in Greek Language: Theta Marina Consulting, 2019, Ναυτιλία και τεχνολογικές αλλαγές: Οι επιπτώσεις). Available at: https://www.pms.uoa.gr/fileadmin/depts/pms.uoa.gr/www/uploads/Theta_Template_NAYTILIA___TECHNOLOGIKES_ALLAGES_-_OI_EPIPTOSEIS_-_NEW_GR_V1.pdf

Todd, P. (1988), Contracts for the Carriage of Goods by Sea, BSP Professional Books, p.19.

Toulaki, P. (2016), Ship Charters, Department of Account and Finance, TEI of Piraeus (Available only in Greek Language: Τουλάκη Π., 2016, Ναυλώσεις Πλοίων, Τμήμα Λογιστικής και Χρηματοοικονομικής, ΤΕΙ Πειραιά).

Trelleborg Marine Systems (2018), Use of big data in the maritime industry. Port Technology.

Tsirka, E. (2014), Ship charters and concerns related to the Greek legal framework, Department of Maritime Studies, University of Piraeus (Available only in Greek Language: Τσίρκα, Ε., 2014, Ναυλώσεις πλοίων και προβληματισμοί που σχετίζονται με το ελληνικό νομοθετικό πλαίσιο, Τμήμα Ναυτιλιακών Σπουδών, Πανεπιστήμιο Πειραιώς).

UNCTAD (2010), Review of Maritime Transport, United Nations, New York and Geneva.

Urbanowicz, M. (2008), Concept of Customer Relationship Management as an example of innovation in banking sector, Research Centre on Enterprise and Work Innovation, Centro de Investigação em Inovação Empresarial e do Trabalho, Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa, Monte de Caparica, Portugal.

Urdzikova, J., Jakabova, M. and Saniuk, S. (2012), “The Customer Relationship Management in Terms of Business Practice in Slovakia”, Research Papers Faculty of Materials Science and Technology in Trnava.

Vlachos, G. and Psychou, E. (2011), Chartering, Stamoulis Publications, Athens (Available only in Greek Language: Βλάχος, Γ., Ψύχου, Ε., 2011, Ναυλώσεις, Εκδόσεις Σταμούλη, Αθήνα).

Wang,C., Huang,Y., Chen, C. and Lin, Y. (2010), The influence of Customer Relationship Management process on management performance. The International Journal of Organizational Innovation, 2 (3), pp. 40-50.

Waterfront Shipping (2008-2021), Trade Routes Map. Available at: https://www.wfs-cl.com/trade-routes-map

Williams, J. and Ramaprasad, A. (1996), "A taxonomy of critical success factors", Eur J Inf Syst, 5 (5), pp. 250-260.

Wilson, H., Daniel, E. and McDonald, M. (2002), "Factors for success in customer relationship management systems", J Market Manag, 18 (1–2), pp. 193-219.

Wilson, J. (2018), Director Technical Services Asia, SCB Management Consulting Services, Ltd., "The effects of technology on shipping", December Issue, Nave chronicles (Available only on Greek Language: Wilson, J, 2018,«Οι επιπτώσεις της τεχνολογίας στη ναυτιλία», Τεύχος Δεκεμβρίου, Ναυτικά χρονικά, σελ. 100). Available at: https://www.naftikachronika.gr/2018/12/29/oi-epiptoseis-tis-technologias-sti-naftilia/

Yang, Y.-C. and Nguyen, H.H. (2011), "Comparison of customer relationship management systems perceptions among container shipping companies in Vietnam and Taiwan", African Journal of Business Management, 5 (15), p. 6515.

Zablah, A.R., Bellenger, D.N. and Johnston, W.J. (2004), "An evaluation of divergent perspectives on customer relationship management: towards a common understanding of an emerging phenomenon", Industrial Marketing Management, 33 (6), pp. 475-489.