DOKUZ EYLÜL UNIVERSITY
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MASTER'S THESIS

A STUDY ON THE SERVICE QUALITY COMPONENTS OF CONTAINER SHIPPING

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THESIS APPROVAL PAGE

DECLARATION

I hereby declare that this master's thesis titled as **"A Study on the Service Quality Components of Container Shipping"** has been written by myself in accordance with the academic rules and ethical conduct. I also declare that all materials benefited in this thesis consist of the mentioned recourses in the reference list. I verify all these with my honor.

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ABSTRACT

Master's Thesis

A Study on the Service Quality Components of Container Shipping

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The role of container shipping lines has changed and evolved in recent years. Container shipping lines need to develop new strategies to satisfy their customers because of globalization and increasing requirements of the customers. Nowadays, container lines are required to give more attention to managing relationships with their customers. Container shipping lines need to achieve service excellence by constantly improving their service performance. They should understand what the shippers expect from container shipping services for improving their service performances. Therefore, it is important to determine dimensions and components of container shipping service quality.

The main aim of this study is to explore the dimensions of service quality and propose a model for measuring service quality in container shipping. In order to reach this aim a questionnaire was developed based on ROPMIS Model and applied on the freight forwarders in Turkey. As a result of the study, a reliable and valid scale consisting of 6 dimensions with 24 variables was explored for measuring container shipping service quality.

Keywords: Service Quality, Container Shipping, Container Shipping Service, Turkey

ÖZET

Yüksek Lisans Tezi

Konteyner Taşımacılığı Hizmet Kalitesi Bileşenleri Üzerine Bir Araştırma

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Dokuz Eylül Üniversitesi

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Denizcilik İşletmeleri Yönetimi Programı

Konteyner taşımacılık hatlarının rolü son yıllarda değişmiş ve gelişmiştir. Küreselleşmenin etkisi ile müşterilerini memnun etmek için yeni stratejiler geliştirmişlerdir. Şimdilerde müşterileriyle ilişkilerini yönetmeye daha fazla özen göstermektedirler. Konteyner taşımacılık hatları hizmet performanslarını sürekli geliştirerek hizmet mükemmelliğini kazanmaya çalışırlar. Konteyner taşımacılık hatları hizmet performanslarını geliştirebilmek için yükletenlerin konteyner taşımacılık hizmetinden ne beklediklerini bilmelidir. Bu nedenle konteyner taşımacılığı hizmet kalitesi boyutlarını belirlemek çok önemlidir.

Bu çalışmanın esas amacı hizmet kalitesi boyutlarını açıklamak ve konteyner taşımacılığında hizmet kalitesini ölçmeye yönelik bir model önermektir. Bu amaca ulaşmak için ROPMIS modelini temel alan bir anket geliştirilmiş ve Türkiye'de faaliyette bulunan nakliye müteahhitlerine uygulanmıştır. Çalışmada sonuç olarak konteyner taşımacılığında hizmet kalitesini ölçmeye yönelik 24 değişkenden oluşan 6 boyutlu bir model önerilmiştir.

Anahtar Kelimeler: Hizmet Kalitesi, Konteyner Taşımacılığı, Konteyner Taşımacılığı Hizmeti, Türkiye

A STUDY ON THE SERVICE QUALITY DIMENSIONS OF CONTAINER SHIPPING

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CONTAINER SHIPPING AND CONTAINER SHIPPING SERVICE QUALITY

LIST OF ABBREVITIONS

App.	Appendix
ANOVA	Analysis of Variance
B/L	Bill of Lading
B2B	Business to Business
CSLs	Container Shipping Lines
EDI	Electronic Data Interchange
EFA	Exploratory Factor Analysis
et al.	Et Alia
F	Frequency
FCC	Fully Cellular Container
FCL	Full Container Load
FONASBA	The Federation of National Associations of Shipbrokers & Agents
ICTs	Information and Communication Technologies
IMO	International Maritime Organization
IMP	International/Industrial Marketing and Purchasing Group
ISPS	The International Ship and Port Facility Security
IT	Information Technology
KMO	Kaiser-Meyer-Olkin
LCL	Less Than Container Load
LOA	Length Overall
m	Million
N	Number
NFCC	Non-Fully Cellular Container
NVOOCs	Non-Vessel Operating Common Carriers
P	Significance Level
p	Page
PCA	Principal Component Analysis
ROPMIS	Resources, Outcomes, Process, Management, Image, Social Responsibility

TEUs	Twent-Foot Equivalent Units
TVE	Total Variance Explained
UK	United Kingdom
UNCTAD	United Nations Conference on Trade and Development
US	United States
UTIKAD	Association of International Forwarding and Logistics Service Providers

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INTRODUCTION

Container shipping is the major part of liner shipping. Its core service is carriage of goods regularly on a specific route. Container shipping lines operate container ships and carry goods in containers which have various specifications and standardized size.

Containerization is one of the important developments which have changed to the international maritime transport landscape. Developments of container shipping services have increased the global trade. The growth of international trade has also increased the demands for container shipping services. Therefore, the capacity of container shipping services constantly increased. The improvements of service quality and cost efficiency are two primary factors that increased the share of container trade in global merchandise trade.

Container shipping lines need to serve in global network because of growth in international trade. They tend to increase their global network coverage to satisfy shippers' needs. Therefore they need to apply the different evolving strategies to provide worldwide services such as strategic alliance, slots chartering, slots sharing and vessel sharing.

Competition among container shipping lines has continuously increased because of steady growth in global containerized trade. Container shipping lines plan their marketing strategy to satisfy their customers' needs, wants and expectations. Container shipping lines have two options to compete in container shipping industry; differentiation of the offering and cost advantage. They can differentiate their services while offering high quality services. Shippers expect high quality service at a fair price from container shipping lines. They also expect close attention to their requirements as well as improved scheduling.

Shippers' expectation is different in the container shipping market. Shippers in the container shipping market are more to care quality than safety (as in the tanker market) or cost (as in the bulk carrier market) (Deste & Meyrick, 1992).

Marketing of container shipping services is considered in business to business marketing. It is important to develop productive and profitable relationships with customers in the business-to business sector as well as in the consumer sector. The

structure of global markets has changed and as a natural result of this change demands of shippers have also changed. This development has forced container shipping lines to restructure their business processes to better satisfy shippers' needs (Yang et al., 2009: 4).

Services literature generally covers service quality in consumer markets. However, studies on service quality in industrial markets are very limited. In the literature of maritime service quality, studies generally focus on the port service quality and container shipping service quality. But the number of container shipping service quality studies in the literature is scarce.

This study primarily aims to determine service quality dimensions in container shipping and proposes a model to measure service quality in container shipping. The study analyzes the service quality perceptions of freight forwarders who are considered as shippers against carriers and act as an important intermediary between shippers and carriers in container shipping.

This study consists of four chapters. In the first chapter, container shipping is defined in terms of liner services. Development of container shipping in the history is summarized and their effect to the global merchandise trade is revealed. Afterward, current statistics and position of container shipping are evaluated both in World and Turkey. Existing trends and major developments in container shipping service are also examined in this chapter. Besides current marketing strategies in container shipping industry and their benefits to container shipping lines are discussed.

The second chapter focuses on the container shipping services and explains its characteristics as a service. The scope of container shipping services is evaluated in terms of core, supplementary and supporting services. Afterward, the relationship between service quality and container shipping is discussed in detail. The literature review relevant to both container shipping service quality and carrier selection criteria in container shipping are placed in this chapter. This chapter ends with conceptual model of the research.

In the third chapter, the methodology of the research is explained. In the methodology context, aim and scope of the study, questionnaire design and sampling is explained in detail. Data analysis methods and the purpose of the methods are also explained in this chapter.

Last chapter includes the results and findings of the research. Characteristics and profiles of the both respondents and their companies involved in the study are presented. A model to measure container shipping service quality is proposed in this chapter.

In the conclusion, the findings of the research are interpreted and recommendations for both future researches and managers are given. This part ends with limitations of the study.

CHAPTER ONE
INTRODUCTION TO CONTAINER SHIPPING SERVICE

1.1 THE CLASSIFICATION OF CONTAINER SHIPPING IN THE SERVICE INDUSTRY

Lovelock (1983) suggested grouping of services different from existing service classifications. His classification of service is mostly used in literature. He claimed that to segment services into clusters which share certain relevant marketing characteristics is a more useful approach. These service characteristics consist of the nature of the relationship between the service organization and its customers or patterns of demand relative to supply.

1.1.1 Classification Based on the Nature of Service

Two fundamental issues are at whom (or what) the act is directed, and whether this act is tangible or intangible in nature. As shown in Table 1, these two points result in a four-way classification scheme involving (Lovelock, 1983: 10);
(1) tangible actions to people's bodies, such as airline transportation, haircutting and surgery,
(2) tangible actions to goods and other physical possessions, such as container shipping, air freight, lawn mowing and janitorial services,
(3) intangible actions directed at people's minds, such as broadcasting and education,
(4) intangible actions directed at people's intangible assets, such as insurance, investment banking and consulting.

In this classification, there are two variables; nature of the service act and recipient of the service. Nature of the service act consists of tangible actions and intangible actions. Recipient of the service are people and goods (or physical possessions). Container shipping service includes tangible actions to goods in containers. It is necessitates to use several handling equipment, transportation vehicles, vessels, containers etc., so container shipping service can be seen as a tangible service.

Table 1: Understanding the Nature of the Service Act

Nature of the Service Act	Direct Recipient of the Service	
	People	**Things**
Tangible Actions	**Services directed at people's bodies:** Cruise shipping Ferry services Health care Passenger transportation Beauty salons Restaurants Haircutting	**Services directed at goods and other of the physical possessions:** Container shipping Tramp shipping Brokering service Stevedoring Industrial equipment repair and maintenance
Intangible Actions	**Services directed at people's minds:** Education Consultancy service	**Services directed at intangible assets:** Marine insurance Banking Accounting

Source: Adapted from Lovelock (1983: 12) and Tuna (1999: 13)

1.1.2 Classification Based on the Type of Relationship with Customer

This classification is based on relationship between service providers and its customers. Type of relationship with customers consists of two forms; membership or informal relations. These relationships can be examined according to nature of service delivery which consists of continuous delivery of service and discrete transactions. Container shipping service involves no formal relationships between container shipping line and its customers. Container shipping lines provide discrete service delivery, but sometimes they can provide continuous delivery of container shipping service depending on the nature of exporters.

According to classification of Lovelock (1983), services which consist of informal relationships between service providers and its customers with continuous delivery are public services (Table 2). Therefore container shipping service can be classified as service that consists of discrete transactions between container shipping line and its customers according to nature of service delivery (Tuna 1999).

Table 2: Type of Relationships Between Service Organization and Its Customer

Nature of the Service Delivery	Type of Relationship between the Service Organization and Its Customer	
	"Membership" Relationship	No Formal Relationship
Continuous Delivery of Service	Insurance Telephone subscription College enrollment Banking	Radio station Police protection Lighthouse Public highway
Discrete Transactions	Long-distance phone calls Theater series subscription Commuter ticket or transit pass	Container shipping Car rental Mail service Movie, theater Public transportation Restaurant

Source: Adapted from Lovelock (1983: 13) and Tuna (1999: 14)

1.1.3 Classification Based on the Flexibility of the Service Features

Customization can be examined according to two dimensions. The first considers the extent to which the characteristics of the service help themselves to customization and the second relates to how much judgment customer contact personnel are able to perform in defining the nature of the service received by individual customers (Table 3).

Table 3: Customization and Judgment in Service Delivery

Extent to Which Customer Contact Personnel Exercise Judgment in Meeting Individual Customer Needs	Extent to Which Service Characteristics Are Customized	
	High	Low
High	Legal services Health care/surgery Architectural design Executive search firm Real estate agency Taxi service Beautician Education (tutorials)	Education (large classes) Preventive health programs
Low	Telephone service Hotel services Retail banking (excl. major loans) Good restaurant	Container shipping Public transportation Routine appliance repair Fast food restaurant Spectator sports

Source: Adapted from Lovelock (1983: 15) and Tuna (1999: 16)

Flexibility of the container shipping service attributes and initiative level of container shipping line's personnel are very low. Therefore it can be said container shipping service can be standardized according to the attributes of the services provided.

1.1.4 Classification Based on the Structure of Supply and Demand for Service

In some service industries demand is steady for their services, whereas there are significant fluctuations in other service industries. If the fluctuations are seen in demand for service, service provider must adjust the capacity to accommodate the level of demand. Service provider must implement marketing strategies to predict, manage, and smooth demand levels to bring them into balance with the capacity. However some demand fluctuations in market cannot be controlled by service provider (Wright and Lovelock, 2014: 32)

This classification consists of two dimensions; extent of demand fluctuations over time and extent to which supply is constrained (Table 4). Container shipping is related to carriage of goods by container. Containers can be used to carry several goods such as textile products, agricultural and food products, automobile parts, technologic materials etc.. So, demand fluctuations in container shipping are affected by demand fluctuating in these products. Container shipping service can satisfy demand promptly and demand fluctuating is narrow (Tuna, 1999: 15).

Table 4: The Nature of Demand for the Service Relative to Supply

Extent to Which Supply is Constrained	**Extent of Demand Fluctuations over Time**	
	Wide	**Narrow**
Peak Demand Can Usually Be Met without a Major Delay	Electricity Natural gas Telephone Hospital maternity unit Police and fire emergencies	Container shipping Insurance Legal services Banking Laundry and dry cleaning
Peak Demand Regularly Exceeds Capacity	Accounting and tax preparation Passenger transportation Hotels and motels Restaurants Theaters	Services similar to above but which have insufficient capacity for their base level of business

Source: Adapted from Lovelock (1983: 17) and Tuna (1999: 146)

1.1.5 Classification Based on the Type of Service Delivery

Service delivery system can be designed according to whether customers need to visit the service organization at its own sites or whether the service should come to the customer (like the internet weather information service and the pizza delivery to her apartment). It is also possible that the interaction can occur through physical channels like mail or electronic channels. These managerial decisions involve consideration of the nature of the service which they provide. They must consider (Wright and Lovelock, 2014: 30);

- where customers are located (both home and workplace may be relevant),
- customers' preferences relating to time of purchase and use,
- the relative costs of different alternatives, and
- seasonal factors.

Container shipping service necessitates visiting the firms of the customers. So it is necessary to cooperate with ship agency at each loading and discharging port (Tuna, 1999: 17). Table 5 presents the place of container shipping service in terms of service delivery method.

Table 5: Method of Service Delivery

Nature of Interaction between Customer and Service Organization	**Availability of Service Outlets**	
	Single Site	**Multiple Set**
Customer Goes to Service Organization	Theater Barbershop	Bus service Fast food chain
Service Organization Comes to Customer	Lawn care service Pest control service Taxi	Mail delivery Container shipping
Customer and Service Organization Transact at Arm's Length (mail or electronic communications)	Credit card co. Local TV station	Broadcast network Telephone co.

Source: Adapted from Lovelock (1983: 18) and Tuna (1999: 17)

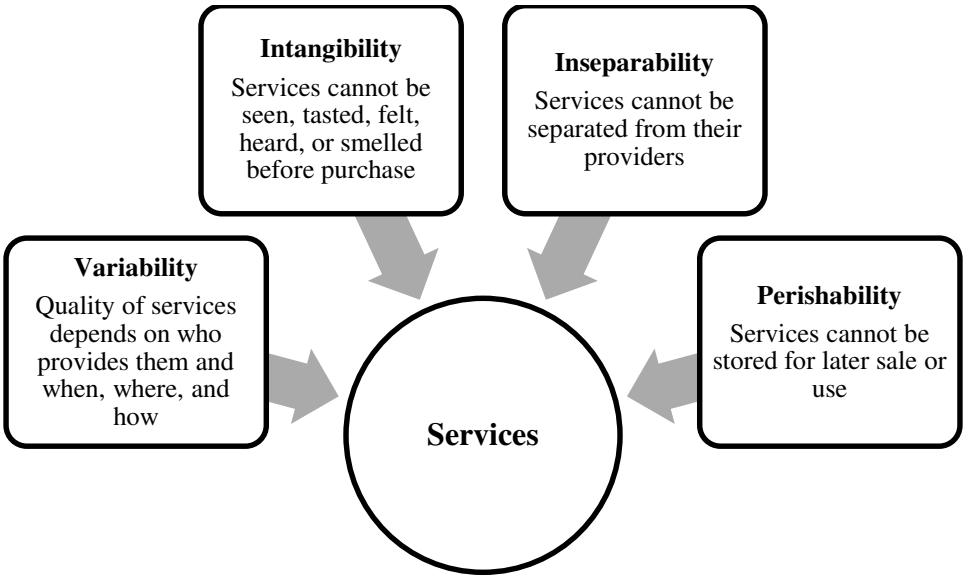
1.2 NATURE AND CHARACTERISTICS OF CONTAINER SHIPPING SERVICE

Kotler and Armstrong (2013) propose that a company must consider four special service characteristics (intangibility, inseparability, variability, and perishability) when planning marketing programs (Figure 1).

Container shipping service has the same service characteristics as common in service industries. But, in some service characteristics, there is difference such as service provider and shippers do not need to be in the same place. As mentioned before, container shipping service includes tangible actions to goods in containers. Therefore container shipping services are tangible services.

Container shipping industry is an international industry in terms of its nature. Container shipping companies' services aim to satisfy the derived demands for the transport of container cargoes. Container shipping mainly includes carrying containerized cargo on regularly scheduled service routes. Therefore container shipping is an activity conducted on a business-to-business basis (Lu et al., 2009:120).

Figure 1: Four service characteristics



Source: Kotler and Armstrong (2013: 261)

The tools of the marketing mix for a container shipping line which is activated in the liner shipping market are (Plomaritou, 2008):

- Product/service (carriage of goods)
- Price (freight)
- Process (negotiation procedure & delivery of goods)
- People (office personnel & ship's crew)
- Place (ports & geographical area of ship's employment)
- Promotion (advertising programs)
- Physical Evidence (container ships, seaworthiness of the vessel).

The container shipping industry consists of container shipping lines. Their core activity is the transportation of containerized goods over sea via regular liner services. A liner service can be defined as "a fleet of ships, with a common ownership or management, which provide a fixed service, at regular intervals, between named ports, and offer transport to any goods in the catchment area served by those ports and ready for transit by their sailing dates" (Stopford 1997: 343; Notteboom, 2012: 230).

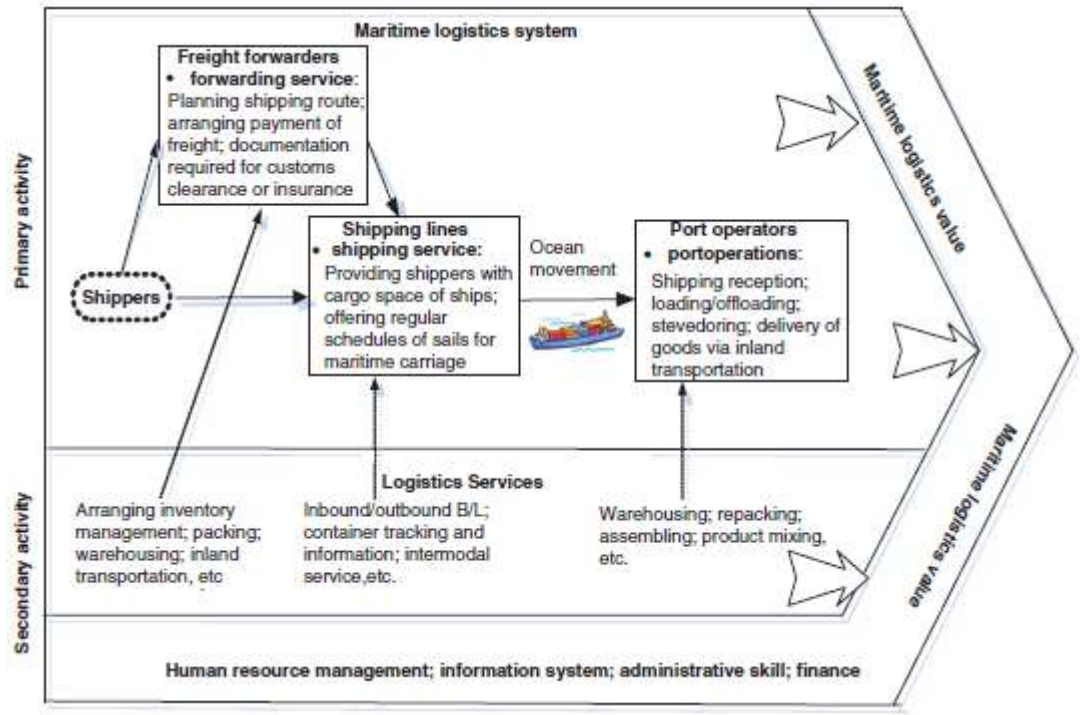
1.3 SERVICE DELIVERY SYSTEM AND MAJOR ACTORS IN CONTAINER SHIPPING

1.3.1 Scope of Container Shipping Service: Core, Supplementary and Supporting Services

It is known that the clients' requirements are orientated towards quality offered by the largest liner companies. Therefore, the companies have adopted the marketing philosophy with the market as a critical point. Kotler (2000) claims that determining the needs of clients and offering the desired satisfaction more effectively and efficiently than its competitors is the duty of the enterprise (Plomaritou, 2006: 13). Shippers consider core and supplementary service as a whole when evaluating container shipping service quality. Therefore, container shipping lines must consider quality of supplementary services as well as core service. Tuna (1999) defines core service of container shipping as a carriage of goods in container from port to port by container ships.

Figure 2 presents the supplementary and supporting services provided by maritime logistics actors and disaggregates a maritime logistics system into primary and secondary activities. The primary activities (supplementary services) consist of the basic functions of the maritime operators (i.e. shipping lines, port/terminal operators and freight forwarders). The secondary activities consist of supporting services which support the primary activities of maritime operators by helping them to run more effectively. Additional logistics services such as human resource management, information system, administrative skill and financial support, are essential in supporting the primary activities of the maritime operators and their organizational capability (Lee and Song, 2010: 567).

Figure 2: Process of Maritime Logistics

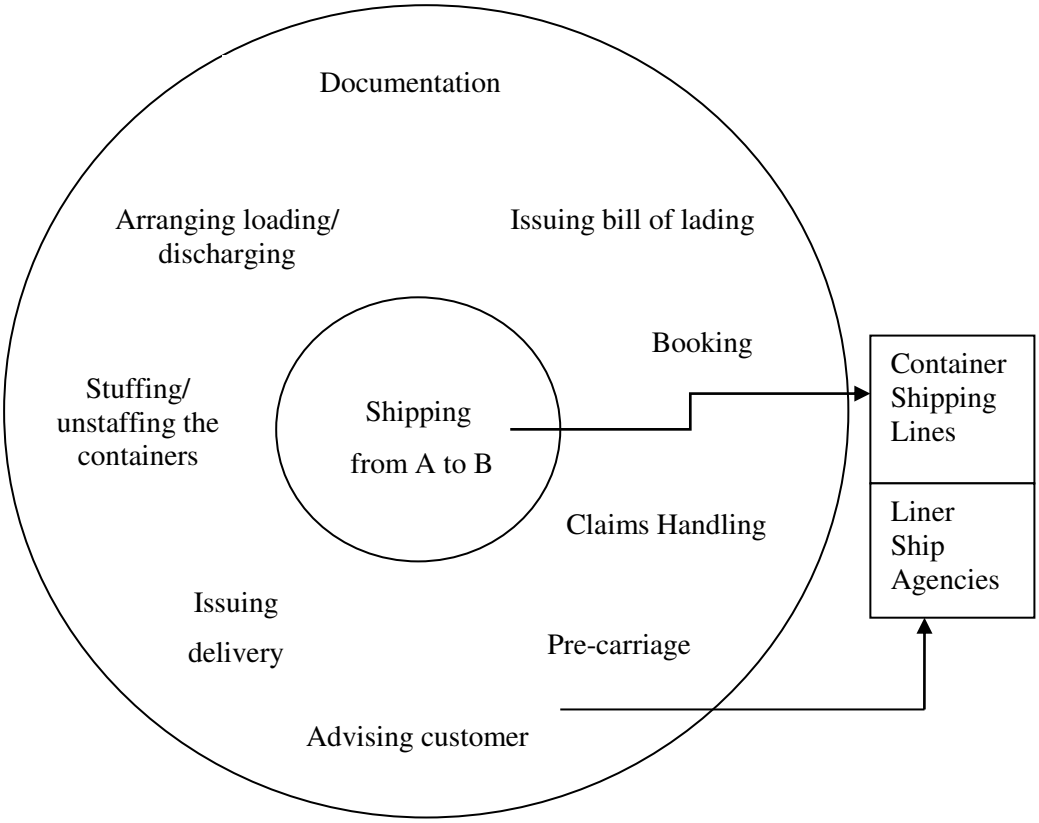


Source: Lee and Song, 2010: 567

Tuna (1999) claims that core service in container shipping is provided by ship owners. Supplementary services and supporting services are provided by owner's agent to shippers. Core service is relevant to outcomes of container shipping service and it is evaluated under reliability dimension of container shipping service quality.

Supplementary and supporting services cover all shipping activities except carriage of goods by container ship (Figure 3).

Figure 3: Core and Supplementary Services for Container Shipping



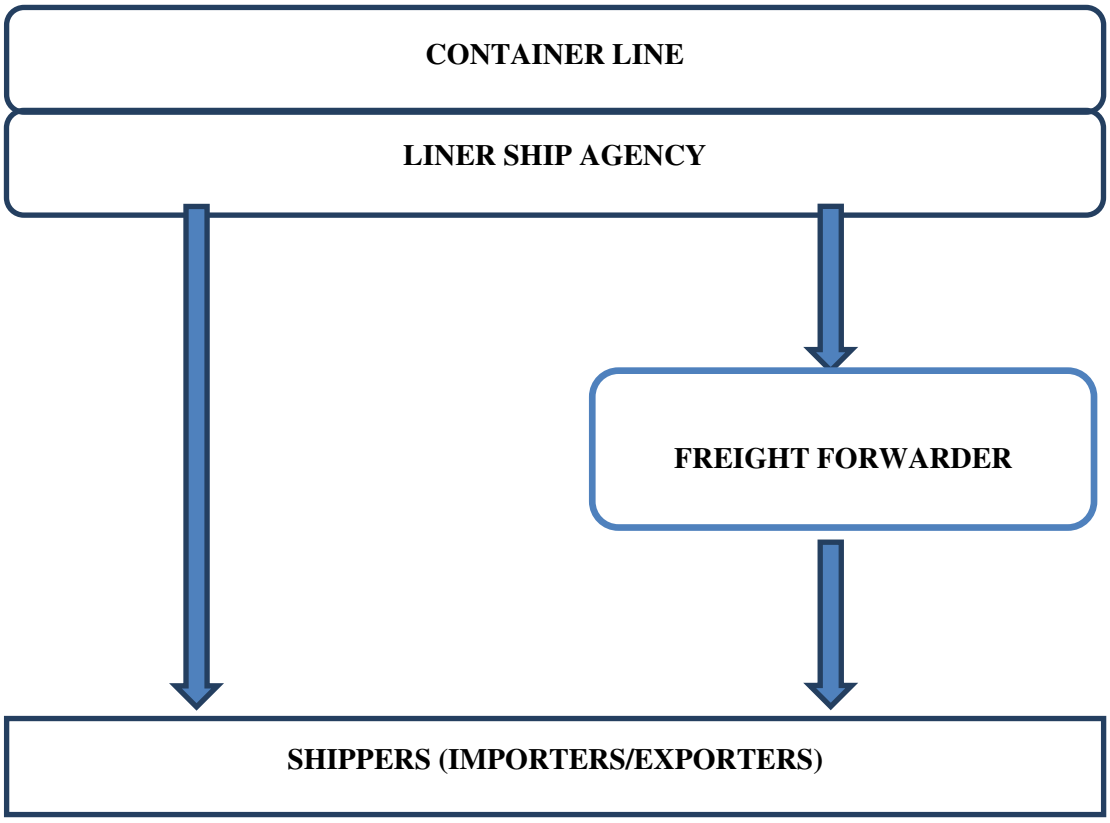
Source: Adapted from Tuna, 1999: 18

1.3.2 Service Delivery System of Container Shipping

Service delivery system consists of operation process and delivery of service outcome by distribution channel and logistics. Service delivery system of container shipping consists of activities of two main actors; shipowner and ship agency. Functions of shipowner and ship agency constitute service delivery system and the customer evaluates the performance of this system.

Figure 4 presents the distribution channel of container shipping. Shipper can contact directly with ship agency (or shipowner) or via freight forwarders who act as an intermediary between them.

Figure 4: Distribution Channel of Container Shipping



Source: Adapted from Tuna, 1999: 20.

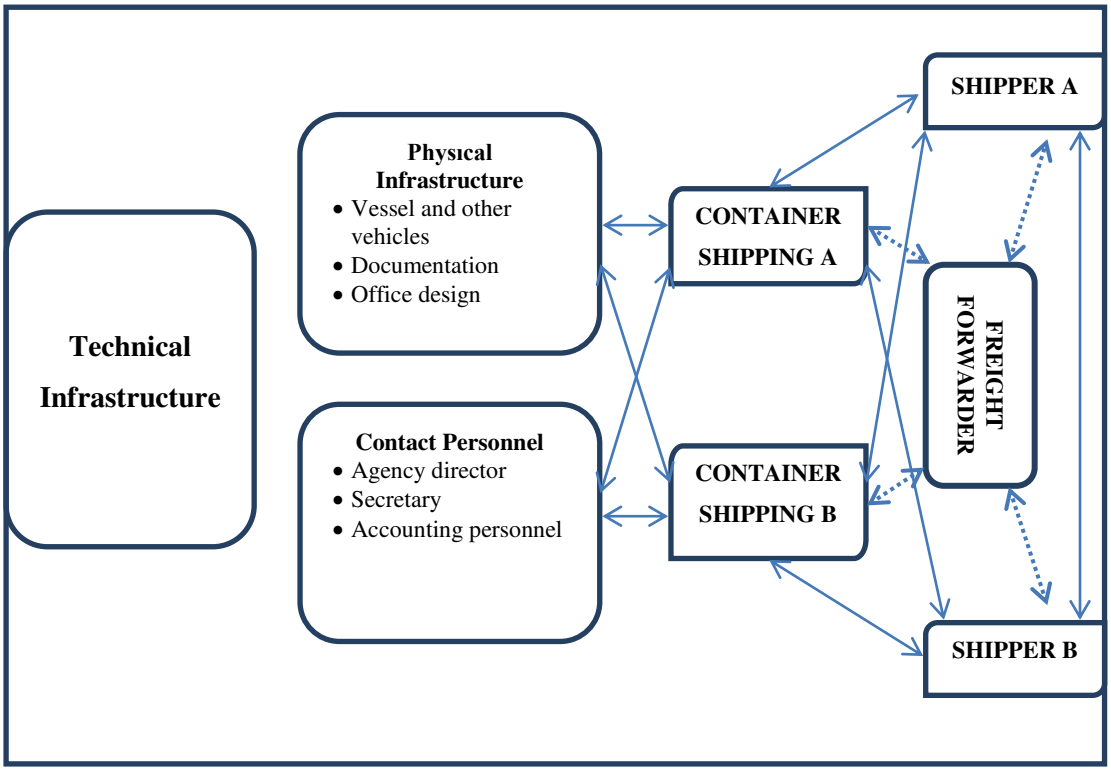
Container ships sailing from port to port transport usually a mixture of empty and loaded containers. The ship arrives to destination port and the loaded containers are delivered to their final consignees (importer). If the final consignee is located inland, the containers are usually transported via truck or train and then, the consignee empties the containers and delivers back to the shipping line. The container cycle steps are as follows (Balzola, 1999: 13-14);

i. Stored in a port or depot
ii. Travelling in a vessel, train or truck
iii. Being loaded at the shipper's site
iv. Being unloaded at the consignee's location, prior to the return to the shipping line depot.
v. Waiting in a transshipment point for its next stage of transportation

1.3.3 Container Shipping Service System from the View of Servuction Model

Shipper and shipowner (or ship agent) do not communicate face to face many times. Container shipping line's representative and shipper usually communicate by telephone, fax or online on internet. Customers (exporters, importers or freight forwarders) can see some tangible physical evidence such as equipment (container) and vehicles (trucks etc.) in service delivery process. Technical infrastructure which consists of functions in service delivery process can't be seen by customers (Figure 5) (Tuna, 1999: 20).

Figure 5: Container Shipping Service System from the View of Servuction Model



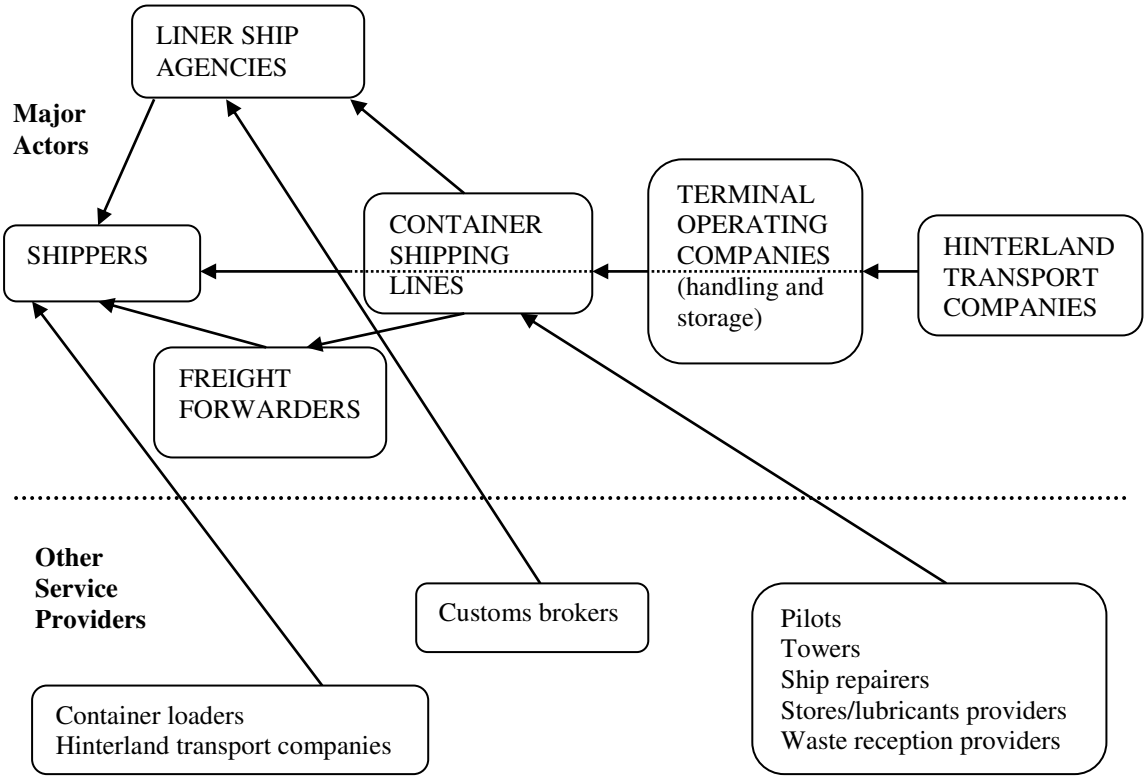
Source: Adapted from Tuna, 1999: 21.

1.3.4 Main Actors in Container Shipping Service Business

Figure 6 shows the place of container shipping actors in the maritime transport chain. The impact of globalization has caused some changes in industrial processes. Shippers give attention to stock reductions and they need more flexible,

diverse, rapid, and tailor-made transport, with smaller and more frequent shipments. An integrated transport, which can provide uninterrupted moves across countries and continents, has become more important to meet customer inquiries and requirements. To meet customer expectations, shipping companies (container shipping lines), shipping agencies (liner ship agencies), and freight forwarders must successfully manage and organize international transport. They also recognize their role as providers of total physical distribution, logistics, and "total transport" services (Lu, 2003: 5).

Figure 6: Place of Container Shipping Actors in the Maritime Transport Chain



Source: Adapted from Meersman et al. (2003).

1.3.4.1 Freight Forwarders

Container shipping industry is a very significant component of the international supply chain. The container shipping industry plays an essential role in the movement of goods all over the world. In the container shipping industry, the services are usually sold to intermediaries (freight forwarders) instead of directly to

the real shippers. The intermediaries are usually identified as non-vessel operating common carriers (NVOCCs) in certain countries, e.g. China and the US. Forwarders usually collect the goods and arrange shipments from different real shippers. Freight forwarders sometimes even consolidate LCL (less than container load) cargoes into FCL (full container load) cargoes for the container shipping lines. Freight forwarders gain profit from the price difference between the freight collected from shippers and that paid to the lines (Yin and Kim, 2012: 313).

Freight forwarder companies have excellent knowledge of the container shipping market. Their network is essential to success in intermediary between shippers and container lines. Their personnel also have an important role for strong competition. Staffs are the principal resource of freight forwarders. They need offices only and a few warehouses for consolidation/deconsolidation operations, so their capital investment is low. Global operators who are able to provide worldwide service by their offices in different countries effected freight forwarders activity, but the nature of the freight forwarder activities almost has not been changed radically. Global operators have advanced information and communication technologies and this resulted in productivity gains and the creation of global networks (Fremont, 2009: 550).

1.3.4.2 Container Shipping Lines

Container shipping lines are the other important actors in the container shipping industry. They compete to gain customers and increase their market share in container shipping market. Unfortunately, in a market where the service provided is relatively homogenous, their competitive options are limited because their provided service is homogenous. They gain competitive advantage by expanding horizontally and acquiring other companies in the industry, and/or by expanding their service activities vertically into related areas such as logistics providers, or with other activities such as terminal operators (Gadhia et al., 2011: 1433).

In the context of liner shipping, container shipping lines transport the goods regularly between two ports. Container shipping lines have broad and complex organizational structure. They capability to serve worldwide and they need to liner

ship agencies to find cargoes. Liner ship agencies also provide service in ports for container shipping lines (Tuna, 1999: 21).

1.3.4.3 Liner Ship Agencies

The Federation of National Associations of Shipbrokers & Agents (FONASBA) describes ship agent as follows (www.fonasba.com);

> *"A ship agent is any person or company that carries out the functions of an agent (see the following slide), irrespective of whether they are in business as a ship agent, or they perform such functions as an adjunct to, or in conjunction with, other activities such as shipowning or operating, providing cargo handling or similar."*

The role of the liner ship agencies is to establish and maintain the connection between the manufacturers of goods that will be shipped and the container shipping lines which will carry them. Their "product" is transport and agents market the facilities offered by the container shipping line, in a competitive business. They are representative of container shipping lines. They are offer reliability and efficiency as an economic commodity, and, moreover, ensure that the expectations of the shipper of the goods are fulfilled. The liner ship agency is liable for the collection of payments for the transportation of goods, a most important role. They also responsible for monitor the progress of the goods as they travel, providing assurance to the shipper and consignee that there are no delays or interruptions in the smooth passage of their goods. (www.bimco.com, 02.08.2015).

CHAPTER TWO
CONTAINER SHIPPING AND CONTAINER SHIPPING SERVICE QUALITY

2.1 CONTAINER SHIPPING AS A LINER SERVICE IN MARITIME TRANSPORT

There is a difference between three separate modes of operation in sea transportation: industrial, tramp and liner shipping. In industrial shipping, the cargo owner is also owner of the ship (Kjeldsen, 2011). Ronen (1983) resembles tramp shipping to a taxi company in that the ships are sailing to the port from which cargo is to be transported. Ronen also resembles liner shipping to a bus network as it publishes schedules and competes for cargo based on the service provided. According to Davies (1983) the liner sector is part of the ocean shipping industry which specializes in supplying regular cargo transport services on determined and fixed trade routes.

Fayle (1932) described a liner service as a fleet of ships with common ownership or management, which delivers a fixed service at regularly between certain ports and offers transport to any goods in the catchment area served by these ports and ready for transit by their sailing dates. Stopford (2004: 343) later updated this definition by adding: ‘‘A fixed route, adding in a regular service and the obligation to accept cargo from all shippers and to sail, filled or empty, on a date fixed by published schedule are what distinguishes the liner from the tramp’’(Sys, 2009: 260).

Containerized liner shipping industry (or container shipping industry) can be clearly distinguished from other maritime industries. Container shipping industry is the major segment of the liner shipping industry. This industry operates vessels (container ships) and carries goods in containers with various but standardized dimensions/sizes, regardless of the contents. Whether filled or empty, these containers is carried in vessels which are service on a regular basis and often according to a fixed sailing schedule, loading and discharging at specified ports (Sys, 2009: 261).

According to Van der Ziel (1994: 65) container shipping market is the total flow of containers between location A and location B. He claims that the traditional definition of liner shipping market comply with the product itself (i.e. the carriage of a container between location A and location B) and the place of production of this product (i.e. the stretch between location A and location B). Under geographical location where the transportation product is sold Van der Ziel reveals the location of demand that may be exclusively at one end of the stretch location A to location B or even far away from the place of production (Sys, 2009: 260). Gregory (2000: 14) defines containers as large metal boxes that can be placed on a trailer chassis, loaded at the exporter's plant, sealed, transported by truck or rail to the ocean port, loaded onto a container ship by crane, and stacked in specially designed container slots. At destination, the container is unloaded from container ships.

2.2 HISTORICAL DEVELOPMENT OF CONTAINER SHIPPING

Since 1970s, many factors have changed to the international maritime transport landscape. These are (Valentine et al., 2013: 229);

- political and geopolitical transformations,
- trade liberalization,
- deregulation and greater private sector involvement in the provision of transport infrastructure and services,
- shocks in energy markets and prices,
- containerization,
- the use of information and communication technologies (ICTs),
- the intensification of world trade and international division of labor,
- the globalization of manufacturing and distribution processes,
- greater economic integration and interdependence,
- the emergence of sophisticated logistics services and providers and
- falling transport costs.

The shipping industry had been fundamentally changed by the development of international trade, intermodal transportation, and technological innovations since the 1960s. The first use of container box which was found by Malcom McLean

served as one of the most important milestones. The Ideal X was carried the first container between American ports in 1956. Since then, the growth of international trade increased the demands for container shipping services. Thereby, the capacity of container shipping services has continuously increased. The improvements of service quality and cost efficiency in the container shipping sector also relieved cargo flow and thus enabled to further growth in a global merchandize trade (Lau et al., 2013: 654).

After from “Ideal X's” maiden voyage, container shipping industry begun to develop by the building of purpose-built container cranes followed by the building of large purpose-built containerships. The world's first purpose-built container crane started to operate on January 9, 1959. It was capable of loading approximately 19 tons-container in every three minutes. Containerization significantly reduced a ship's average time in ports, so investment in larger shipping capacity became now profitable (Bernhofen et al., 2013: 7).

Until the late 1960s, general cargo or break-bulk ships were common in international liner trades. Standard-size boxes or containers were started to be used for carriage of goods in the international trades in 1966. This development changed the way international cargo was transported (Gregory, 2000; Notteboom, 2012).

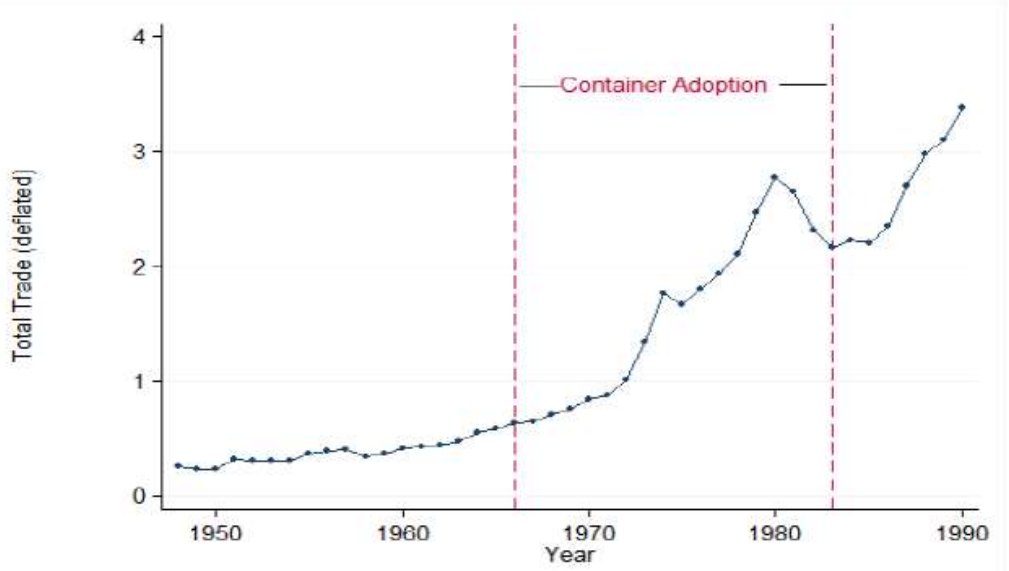
35 foot containers were used by the first fully containerized ships. These containers were the maximum allowable length for truck traffic on US highways. A fully loaded 35 foot container was too heavy for a crane to lift so other companies used much smaller sizes which could be much easier stacked and moved with forklifts. The standardization of container sizes was a major force for the international adoption of containerization. In 1961, the standard nominal dimension of containers were determined as 8 feet wide, 8 feet high and 10, 20, 30 and 40 feet long by the Federal Maritime Board (Bernhofen et al., 2013: 12). Twenty and forty feet containers are the most common sizes of container used in container shipping industry today (Balzola, 1999: 10).

US shipping lines were the first container carriers in the world. By the early 1960s, they carried containerized cargo on routes between the US mainland and Puerto Rico, Hawaii and Alaska. They pioneered for containerization to go global by help of technological developments and the first container shipping services were

founded in the transatlantic trade between the US and European ports in the UK, Netherlands and West Germany in 1966 (Bernhofen et al.,2013: 8).

A wide literature on transportation economics has supposed that containerization has major effect on increase of the globalization of the world economy since the 1960s. Figure 7 shows the rapid increase in the growth in world trade coincides indeed with the period of global container adoption in international trade which occurred between 1966 and 1983 (Bernhofen et al.,2013: 2).

Figure 7: The Effect of Container Adoption on Growth of World Trade



Source: Bernhofen et al. (2013: 2)

During the 1980s, annual growth of the container trade recorded at rate of 7.8 percent. Large portion of this growth in the container trade could be attributed to an increase in the container penetration rate. In this period, cargoes were mostly converted to containers from loose form. Ports developed infrastructure, and acquired handling equipment to handle containers of the increasing number (and growing size) of container vessels in the same period (www.unescap.org).

Table 6 indicates the container fleet deployment. There were 166 ships totaling 126,267 TEUs (twenty-foot equivalent units) in the world fleet at the early 1970s. It increased to 2,565 ships with the combined capacity of 1,53 million (m) TEUs in 1980. In 1990, it is developed into 4,772 ships (3,17m TEUs). There were

7,093 ships totaling 6.54m TEUs in 2000. In April 2014, the container ship fleet consisted of 8,337 ships (18.9m TEUs). The container ship fleet capacity increased on average by 8.3% per year, it nearly doubled every decade in the last 32 years (Tran and Haasis, 2015: 242).

Table 6: Container Fleet Deployment (1982-2014)

	Number of vessels			Fleet capacity (mTEUs)			Average ship size (TEU)		
Years	FCC	NFCC	Total	FCC	NFCC	Total	FCC	NFCC	Fleet
1982	675	1890	2565	0.617	0.85	1.53	997	452	596
1985	965	3010	3975	1.01	1.36	2.37	1055	453	599
1990	1299	3473	4772	1.65	1.52	3.17	1267	438	664
1995	1723	4255	5978	2.67	1.74	4.41	1548	409	737
2000	2723	4370	7093	4.72	1.82	6.54	1732	417	922
2005	3506	4444	7950	7.85	1.91	9.76	2239	430	1228
2010	4855	3092	7895	13.97	2.14	16.11	2878	687	2026
2014	5102	3235	8337	17.32	1.49	18.9	3.394	462	2256

FCC (Fully cellular container)
NFCC (Non-fully cellular container)

Source: Tran and Haasis, 2015: 242

Several factors have caused steady growth such as reduced transit time, reduced shipping costs, increased reliability and security, and multi-modality in container shipping. In 2009, the global financial crisis and subsequent economic recession interrupted this growth. Container trade volumes fell (%9) to an overall volume of 124 million TEUs. However, in 2010, container trades recorded important growth and reached to approximately 140 million TEUs by increasing 12 percent (Alcalde, 2014: 1).

2.3 PLACE OF CONTAINER SHIPPING IN LOGISTICS, TRANSPORTATION AND MARITIME TRANSPORT

Coyle et al. (1999) define logistics as the process of managing the flow of raw materials, inventory, finished goods, services and necessary information from the point of origin to the point of consumption. To minimize the cost of firms and

maximize customer satisfaction by coordinating the flows of materials and information in the most efficient way, and by providing a service to customers at a speedy rate and with a reasonable price is the basic goal of logistics. (Lee and Song, 2010: 564).

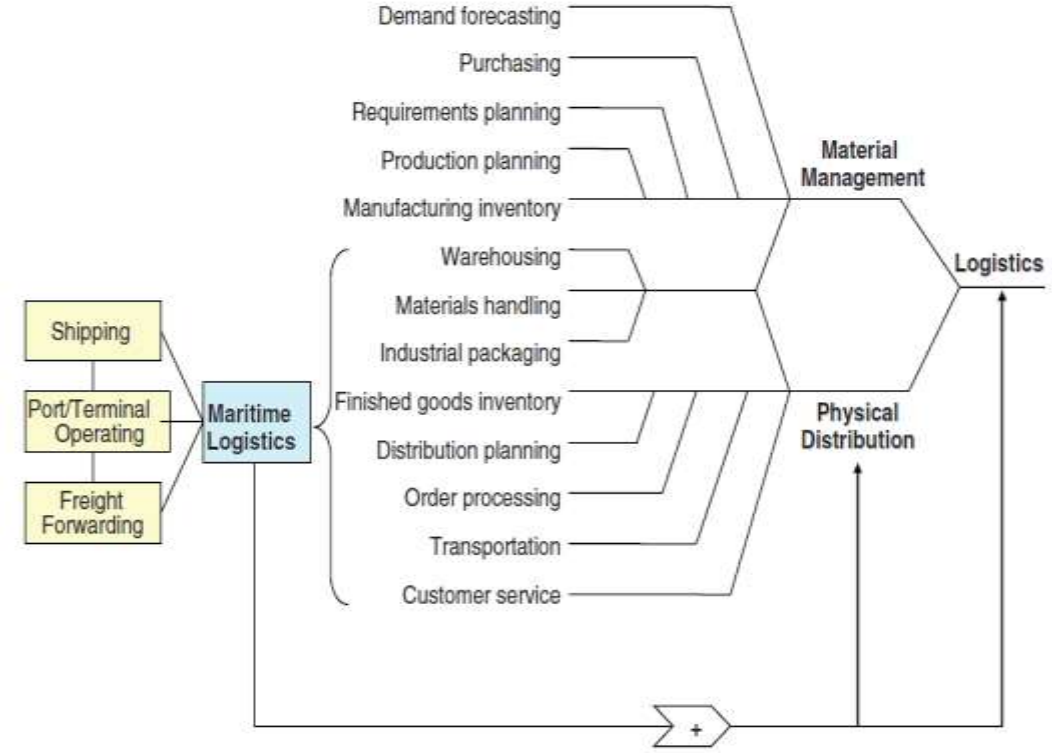
Container shipping is an important constituent of maritime supply chain. The aim of the supply chain is value adding to the goods transported by sea. Container shipping lines carry the goods from point of origin where the goods are valued at a lower level to point of destination where the goods are to be valued at a higher level by providing place and time utility. In the supply chain, container shipping lines interface with various parties such as shippers and ports. They have to coordinate cargo, information, and financial flows along the chain. (Lam, 2014: 1).

Maritime logistics is defined as the process of planning, implementing and managing the movement of goods and information which is involved in the ocean carriage. Maritime logistics can be distinguished from maritime transportation in terms of its focusing point and managerial function (Lee and Song, 2010: 565).

Maritime transportation is an essential part of the world trade and economy. Containerized cargo is the largest proportion of general cargoes transported by ship. Container shipping service is a liner shipping service with fixed sequences of ports of call and fixed schedules at a regular frequency. Container shipping networks are operated by global liner shipping companies and have a complex structure. Container ships sail on several dozens of ship routes and several hundreds of ports. Containers, filled or empty, can be transported between two ports on one ship route. They also carry transit cargoes, in this situation they can sail more than one ship route. Therefore, it is hard task for a container shipping line to plan and operate an efficient shipping network (Wang et al., 2015a: 59).

Figure 8 presents the place of maritime logistics and its relation with other activities in a whole logistics chain. According to Lee and Song (2010) maritime logistics is included in sea transportation service as well as additional logistics services. Additional logistics services in maritime logistics are a major part of physical distribution activities such as warehousing, material handling, packaging, goods inventory, distribution planning, order processing, transportation and customer service.

Figure 8: Maritime Logistics in the Whole Logistics System



Source: Lee and Song, (2010: 567).

International containerized cargoes are transported by container shipping lines in their shipping networks. Shipping network of container shipping lines includes ship routes. Wang et al. (2015b: 128) defines ship routes as a (port rotation) called at by ships in a way that ships visit the first port again after visiting the last one.

Containerized transportation of freight occurs in three basic types of intermodal shipments. Schmeltzer and Peavy (1970: 205) explains these shipment types as the follows;

> *The first is a container loaded and sealed at the supplier's factory and delivered intact to the consignee's warehouse or other place of business. This is termed a "door-to-door" container shipment. It is blessed with the greatest cost savings obtainable from containerization but is burdened with the greatest number of legal barriers, which will have to be surmounted. The second type of shipment is a container loaded by a freight consolidator at an inland point and transported to an inland point overseas, where the container then is broken open and the contents distributed. This is termed a "point-to-point" shipment. Thirdly, the movement of a container consolidated at a port or air terminal and shipped to an overseas port or air terminal, where the contents then are sorted*

for distribution, is termed a "port-to-port" or "air terminal-to-terminal" shipment.

Two primary indicators of maritime logistics value are reduction of cost and lead time and improvement in service quality (e.g. flexibility, responsiveness and reliability). The service quality and price may have a direct impact on the costs and degree of customer satisfaction in regard to the maritime logistics service. So, these two issues may be much concerned than about the degree of asset utility of service providers by customer (Lee and Song, 2010: 569-570).

2.4 CONTAINER SHIPPING IN THE WORLD AND TURKEY

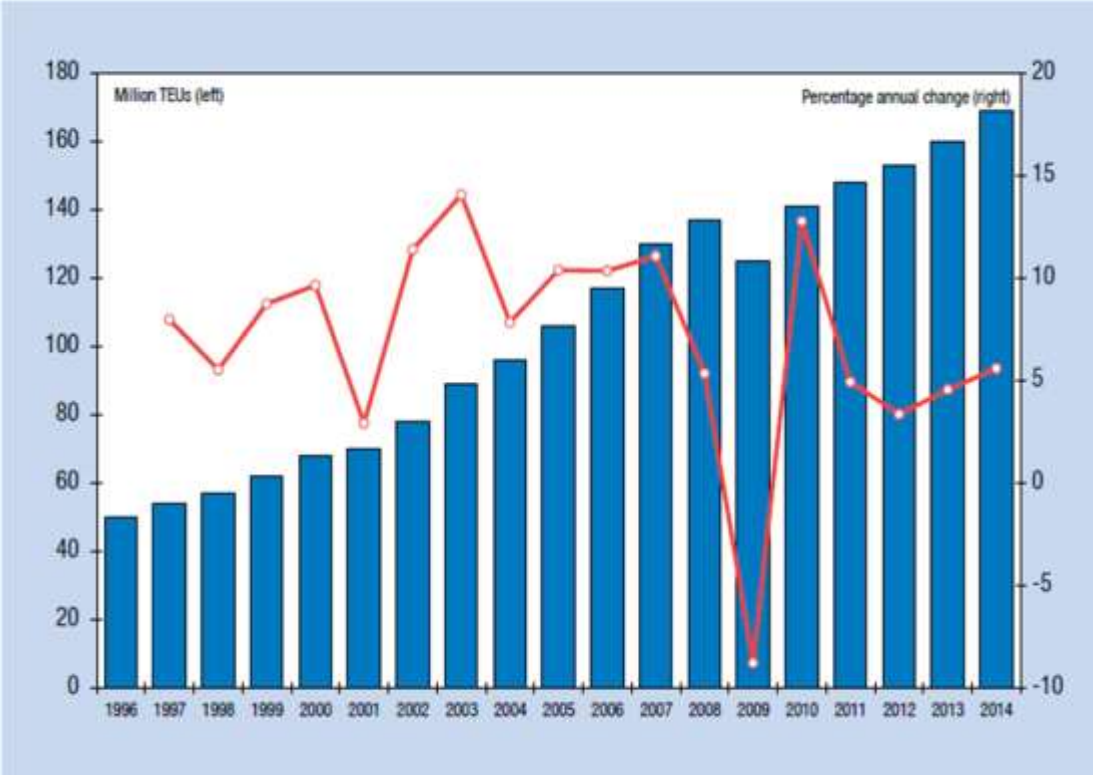
2.4.1 Container Shipping in the World

Global containerized trade was 153 million TEUs in 2012 and it reached to volume of 160 million TEUs with growth by 4.6 per cent in 2013. Figure 9 shows the percentage annual changes and total handling (million TEUs) in global containerized trade between 1996 and 2014 (UNCTAD, 2014: 17).

World fleet showed an increase of 4.1 per cent in 2013. The world fleet reached a total of 1.69 billion dwt in 2014. Bulk carriers' fleet accounted for 42.9 per cent of the total tonnage. It is followed by oil tankers (28.5 per cent) and container ships (12.8 per cent) (UNCTAD, 2014: 5)

The World containership fleet has experienced very important development since the 1990s. The carrying capacity of fleet increased from 3.17 m TEUs (4,772 ships) in 1990 to 18.9 m TEUs (8,337 ships) in 2014. The container shipping lines (CSLs) in the top 20 has a substantial portion of this growth. Their capacity share in the global fleet increased from 39% to around 75% (Tran and Haasis, 2015: 241). Figure 10 shows the top 20 container shipping lines and their fleet with new orders.

Figure 9: Global containerized trade, 1996–2014



Source: UNCTAD, 2014: 17

Figure 10: Top 20 container shipping lines

Rnk	Operator	Teu	Share	Existing fleet / Orderbook
1	APM-Maersk	2,965,931	15.3%	
2	Mediterranean Shg Co	2,544,004	13.1%	
3	CMA CGM Group	1,731,560	8.9%	
4	Evergreen Line	979,298	5.1%	
5	Hapag-Lloyd	975,082	5.0%	
6	COSCO Container L.	824,005	4.3%	
7	CSCL	710,857	3.7%	
8	Hanjin Shipping	633,495	3.3%	
9	MOL	615,087	3.2%	
10	Hamburg Süd Group	587,939	3.0%	
11	OOCL	571,913	2.9%	
12	APL	558,139	2.9%	
13	NYK Line	476,991	2.5%	
14	Yang Ming Marine Transport Corp.	474,844	2.4%	
15	UASC	407,550	2.1%	
16	K Line	394,374	2.0%	
17	PIL (Pacific Int. Line)	368,159	1.9%	
18	Hyundai M.M.	364,238	1.9%	
19	Zim	321,247	1.7%	
20	Wan Hai Lines	230,274	1.2%	

Source: www.alphaliner.com, 14.05.2015.

Container shipping lines also increase their container-ship sizes. The years 2013 and 2014 have seen new deliveries in large-sized container ships. In early 2013 ships of 16,000 TEU received by CMA-CGM. Maersk's series of 20 ships of 18,270 TEU were delivered mid-2014. These ship sizes were surpassed by upgraded 19,000 TEU ships built in the Republic of Korea for China Shipping end of 2014 (UNCTAD, 2014: 30).

Container shipping traffic has grown at an average annual rate of around 10% over the past two decades, with six years of consecutive double-digit growth between 2002 and 2007 (UNCTAD, 2013). In such a context, the supremacy of Asian ports is seen in container shipping (Table 7). In the context of top 20 World container ports, 14 container ports have located in Asia. The port of Shanghai is the busiest one in 2014, with 35 million TEU (Alcalde, 2014: 1)

Table 7: Top 20 World Container Ports (2009-2014)

	Port	Country	2014	2013	2012	2011	2010	2009
1	Shanghai	China	35.290	33.617	32.529	31.739	29.070	25.002
2	Singapore	Singapore	33.869	32.579	31.649	29.938	28.431	25.867
3	Shenzhen	China	24.040	23.279	22.941	22.941	22.510	18.250
4	*Hongkong	China	22.200	22.352	23.117	24.224	23.699	21.040
5	Ningbo&Zhoushan	China	19.450	17.351	16.830	16.830	13.144	10.502
6	Busan	South Korea	18.678	17.686	17.046	16.185	14.194	11.980
7	Guangzhou	China	16.610	15.309	14.744	14.744	12.550	11.190
8	Qingdao	China	16.580	15.520	14.500	14.500	12.012	10.260
9	Dubai Ports	United Arab Emirates	15.200	13.641	13.280	13.000	11.600	11.100
10	Tianjin	China	14.060	13.000	12.300	12.300	10.080	8.700
11	Rotterdam	Netherlands	12.298	11.621	11.862	11.877	11.148	9.743
12	Port Klang	Malaysia	10.946	10.350	10.001	9.604	8.872	7.310
13	Kaohsiung	Taiwan	10.593	9.938	9.782	9.636	9.181	8.581
14	Dallian	China	10.130	10.015	8.060	6.400	5.242	4.552
15	Hamburg	Germany	9.729	9.257	8.864	9.014	7.896	7.008
16	Antwerp	Belgium	8.978	8.578	8.635	8.664	8.468	7.310
17	Xiamen	China	8.572	8.008	7.206	6.461	5.820	4.680
18	Tanjung Pelepas	Malaysia	8.500	7.628	7.700	7.500	6.530	6.016
19	Los Angeles	USA	8.340	8.120	8.078	7.941	7.832	7.262
20	Jakarta	Indonesia	6.503	6.171	6.100	5.650	4.714	3.805

Unit: Number x 1,000 TEU (Twenty-foot Equivalent Units)
All China ports incl. domestic trade and river trade; * including river trade

Source: www.portofrotterdam.com, 15.05.2015.

In the container shipping context, other relevant developments are as follows (UNCTAD, 2014: 20);

- *the regulatory changes approved under the auspices of International Maritime Organization (IMO) requiring that container weights be verified by July 2016,*
- *the postponement of plans to scan 100 per cent of inbound containers in the United States owing to associated negative impact on cargo flows as well as the costs and difficulty in implementing such a requirement,*
- *the dispute around cost overrun and the delays in completing the expansion work of the Panama Canal,*
- *the plans by the Nicaragua Canal Commission to build a new canal to link the Atlantic and the Pacific oceans, and*
- *the antitrust proceeding from the European Commission facing a total of 14 shipping lines, all among the top 20 global carriers in terms of operated capacity*

2.4.2 Container Shipping in Turkey

Global shipping lines are looking to enlarge their operations in Turkey. They aware to some of its fast-growing private ports and they set a course for opportunities such as strong export growth and an anticipated rise in trade with parts of the Middle East including northern Iraq. Turkey's government aims to boost total annual exports to $500 billion and trade to above $1 trillion according to vision 2023 of Turkey. Ports have an important role to reach this objective, so Turkey needs to raise its total port handling capacity sharply to reach this goal (www.gcaptain.com, 27.07.2015).

Recently there have been essential developments in the internal and external environment of the Turkish container shipping sector. These developments can be summarized as follows (Bloem et al., 2013: 29);

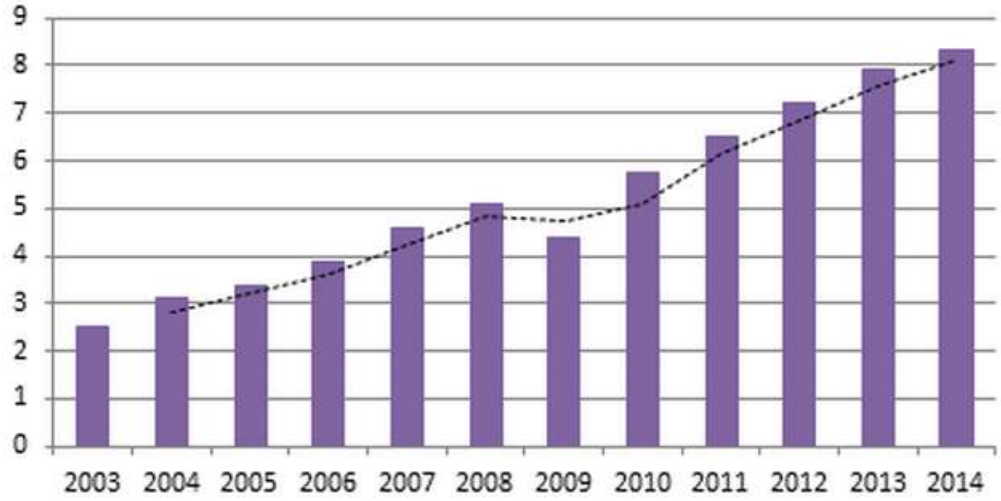
- increase in containerized cargo traffic as a result of the international and regional trade,
- privatization trends of container ports in the world
- new investments in ports,
- expansion and enlargement of existing port capacities,
- administrative changes,
- development of hinterland connections of ports and logistics centers.

Totally 1,95 million TEU container which includes import, export, cabotage and transit were handled at the Turkish ports in 2002, whereas it has reached 7,2 million TEU in 2012 with an increase of more than 360 %. The Turkish container ports handled 7,284,207 TEU in 2013 (Figure: 11) (www.data.worldbank.org, 02.02.2015). Turkish government aims to increase container traffic in Turkey and

they want to reach more than 30 million TEU in 2023. Therefore they planned new investments in container terminals and the reconstruction or renewing of existing terminals in the major ports. Major private container port investments are needed in major container ports especially in Marmara, the Aegean and Mediterranean regions. (Bloem et al., 2013: 29).

Totally 383 million tons cargo was handled in the ports of Turkey in 2014 including internal trade. When the data of last decade compared with that of 2014, it is seen there occurred 100% increase. In 2014, total handled containers were 8,3 million TEU. There is 235% increase compared to the levels of previous decade. Ambarlı Port has the highest share in this handling rate. Ambarlı Port handled almost 40% of all containers (www.hazar.org)

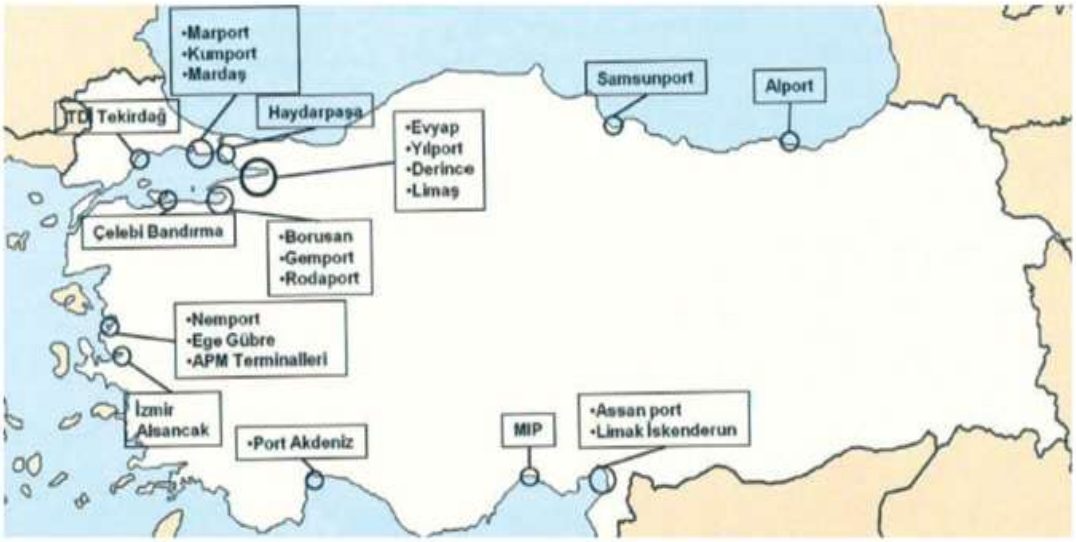
Figure 11: Total handled container in Turkey (million TEU)



Source: www.hazar.org

Figure 12 presents the location of main container ports and terminals in Turkey. Most of them are located in the western part of the country mainly in Marmara Region.

Figure 12: Location of Turkish Main Container Ports



Source: Bloem et al., 2013: 36.

The Turkish branch of Azeri energy giant SOCAR invests in a new container port in Turkey. The Petlim Container Port will be opened in the Aegean Sea in 2015 with the aims of becoming an alternative to Greece's Piraeus Port for container shipments. The Petlim Container Port will be operated by APM Terminals. APM is one of the world's leading companies in the container handling. The port will be serviced to the biggest container ships. The Petlim Container Port, for the first time in Turkey, will enable the berthing of ships with 11,000 TEUs. The port will possess a starting capacity of 1,5 million TEUs (www.hellenicshippingnews.com).

2.5 MAJOR TRENDS AND DEVELOPMENTS IN CONTAINER SHIPPING SERVICES

2.5.1 Growth of Competition in Container Shipping

Container shipping lines expanded their operations worldwide owing to increase in world trade and advances in the shipping industry. Globalization has increased competition among container shipping lines to secure their cargo. Shippers' expectations have also changed. They expect high quality service at a reasonable cost, close attention to be paid to their requirements as well as improved

scheduling. Container shipping lines have given priority to recognize the importance of service quality as a foundation for satisfying their customers' needs, wants and expectations because of the increase in competition among them in the worldwide. Therefore, service quality is a key component in differentiating one container shipping line from another (Lobo, 2010: 258). Basically, container shipping lines have two ways to compete in container shipping industry. These are differentiation of the offering and cost advantage (Seth et al., 2006).

A core issue for market players in container shipping is determining the right strategy that can create and sustain competitive advantage. The decision-makers need to understand the fundamental market changes and requirements exerted on them. Container shipping lines must consider the following three points (Lam and Voorde, 2011: 712);

- Schedule reliability
- Integrated supply-chain solution
- Global network coverage

Shipping lines need to improve their level of service in order to satisfy needs of more sophisticated shippers by taking appropriate decisions. One of the possible ways for container shipping lines is to pursue a general logistics strategy stretching far beyond the arena of maritime shipping. This strategy requires an integrated system encompassing all aspects of logistics related to the carriage and care of cargoes, such as inland transport and distribution, packing, labeling and warehousing. (Koo et al., 2009: 239).

Currently, supply chain is the main competition field in the business world rather than individual players only. Container shipping lines tend to spread their activities to supply chain (Lam and Voorde, 2011: 705). Container shipping lines need to establish cooperation and also actively seek merger and acquisition between them to maintain their newly operated services (Koo et al., 2009: 238).

Koo et al. (2009: 240) explain the activities of the global container shipping lines in supply chain as the follows;

> *"Maersk-Sealand's subsidiary company, Maersk Logistics, offers vendor management, labeling, packing, consolidation, preparation of the necessary paperwork, rapid customs clearance, warehouses, and cross-docking facilities. OOCL established Cargo System that manages the shipping, logistics and value-added services of imported products. NYK Line established an e-*

commerce system that enables customers to monitor and manage their supply chains online and launched New Wave Logistics, which consolidates and distributes cargoes in Europe. HMM set up Hyundai Inter-modal (US) that provides a standard road and rail intermodal service. Hanjin Shipping owns ten exclusive marine container terminal facilities linked to rail, barge and truck transportation, as well as six off-dock container yards. In addition, their intermodal Service Centre in Chicago tracks and monitors on-time arrivals".

Delivery of large-size vessels to container shipping market is another competitive strategy of container shipping lines. Large-size vessels offer economies of scale in a highly competitive market. Information technology may be new competition environment among not just carriers, but also forwarders, logistics based integrators and, potentially, pure technology companies who may use their systems expertise to enter the industry at the expense of traditional players (Peters, 2001: 3).

2.5.2 Increases in Ship Sizes

Most of the developments in containership design have been associated with the increasing of vessel size. Primary aims of the up-sizing vessels are to accommodate trade growth and to offer economies of scale in a highly competitive market (Peters, 2001: 9) The container shipping industry has experienced an essential expansion in the size of containerships over the years (Imai et al., 2006).

The trend in container shipping industry is to increase ship size. While ports have invested in container terminals and cargo handling equipment, the container shipping sector has attended to invest in large-size containerships. They aimed to capitalize on economies of scale associated with larger volumes and to reduce costs, (Valentine et al., 2013: 232). Container shipping lines aim to gain profit from economies of scale, designing fuel-efficient vessels in order to get environmental improvements and reducing operating costs. By the mid-1970, the 1000 and 1500 TEU ships of the first and second generation were operated. Nowadays, Maersk of the first "Triple E" container ship with a declared capacity of 18,000 full TEUs operates in container shipping market (Figure 13) (Alcalde, 2014: 2).

Cullinane and Khanna (1998) investigated the impact of ship sizes on their operation costs focused only on those costs that are functions of ship sizes. They explain the reasons for the increasing size of container ships as follows:

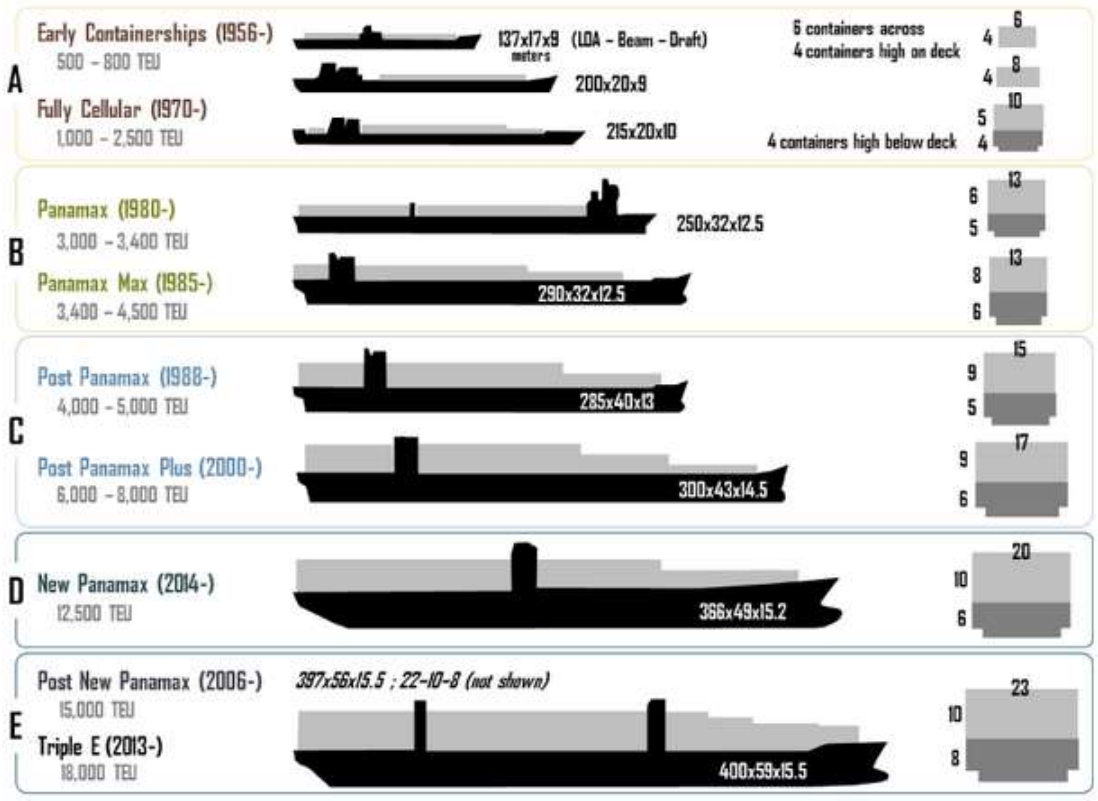
- advantages of economies of scale and forcing competitors to react
- alliances between container shipping lines have made such ships operationally viable
- expectation of increase in volume of international container trade
- developments and improvements to port infrastructure

Early on, the aim of building large ships was to achieve greater economies of scale. The deployment of large ships has resulted in the increase of excess capacity in the container shipping markets despite of the benefits of the economies of scale (Ng and Kee, 2008: 353; Wu, 2009: 118). Lim (1998) has claimed that to add capacity in the form of large ships increases the risk of severe excess capacity. A substantial number of large-size containerships were delivered into the most competitive trade routes by the major container shipping lines. Aggressive competition among major container carriers to deliver both more and larger containerships has caused to the deterioration of the loading factor and ocean freight level (Wu, 2009: 118).

In the absence of strong growth in container volumes transported, the delivery of new large container ships has caused reduce in freight rates that are lower than experienced in the past in spite of a general recovery in seaborne trade in 2010-2012.At the present time, there is overcapacity in the global container shipping market. The reasons of overcapacity are (Brooks et al., 2014: 11):

- delivery of large ships which were ordered before the 2007 financial crisis,
- technological change (the new generation of even larger ships offering significant increases in productivity)

Figure 13: Evolution of New Generation Container Ships

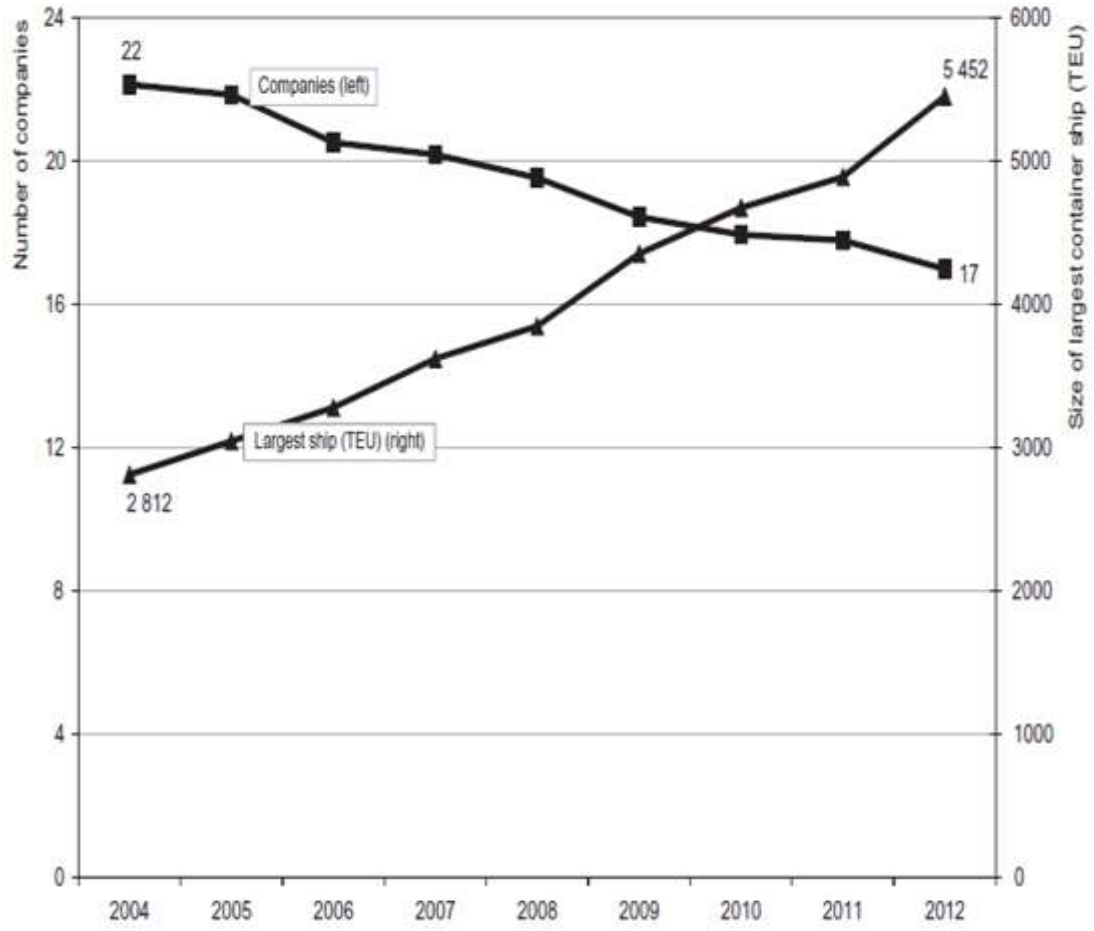


Note: All dimensions are in meters. LOA: Length overall.

Source: Ashar and Rodrigue, 2012

The average number of companies deploying containerships on services from/to coastal countries' seaports declined from 22.1 to 17 between 2004 and 2012. In the same period, the size of the largest container ships deployed rose, from an average vessel maximum of 2,812 TEU in 2004 to 5,452 TEU in 2012 (Figure 14). Vessel size increases more than demand and the vessels need to be filled. Therefore the number of companies in each market drops. (Valentine et al., 2013: 236)

Figure 14: Trends in containership fleet deployment



Source: Valentine et al., 2013: 236

2.5.3 Cooperation and Collaboration in Container Shipping

The liner shipping industry is qualified by advantages to size, both at the vessel level and firm level. Therefore carrier attends to increase their size by strategic alliances as well as grow through merger/acquisition. Advantages of economies of scale in liner shipping have been widely stated by industry participants as well as scholars (Gregory, 2000: 12). Talley (2000) stated that alliances, merging and investing in large-size ships have emerged as a method to smooth the current situation by sharing vessels and reducing operational costs.

Container shipping lines need to have global network coverage to satisfy their customers. Therefore they need to apply different evolving strategies to provide worldwide service. These evolving strategies may be strategic alliance, slots

chartering, slots sharing and vessel sharing. Cooperative strategies allow to container shipping lines to maintain their competitiveness by expanding the service network, without over-committing themselves financially, as well as to take advantage of the strengths that the other consortium members possess. These cooperative strategies include horizontal integration among the container shipping lines. (Lam and Van de Voorde, 2011: 713)

Most of the global containership operators have grouped themselves into alliances since 1994. The alliances have many advantages such as, through operational cooperation, the opportunity to reduce costs and business risks, while offering improved service, increased sailing frequency, increased direct port calls, and a broader range of customer service options. Cooperation is based on activating together on global trade lane. Alliances generally include sharing vessels, coordinating sailing schedules, jointly using port terminals, sharing equipment, and combining information technologies associated with operational matters (Gregory, 2000: 2).

Strategic (horizontal) alliances aim to provide advantages in the employment and utilization of ships over particular routes including type/size of ship, sailing schedules and itineraries, use of joint terminals and container coordination on a global scale (Rodrigue and Browne, 2002; Panayides and Wiedmer, 2011). Strategic alliances in container shipping do not cover joint sales, marketing or price fixing, joint ownership of assets, pooling of revenues or the sharing of profits/losses and joint management and executive functions (Panayides and Wiedmer, 2011: 26)

Alliance structures (Grand Alliance, New World Alliance, and CYKH) enable their members easy access to more loops or services with relatively low-cost implications and allow them to share terminals (Ducruet and Notteboom, 2012b: 399). Table 8 shows the development of the big three strategic alliances between 1996 and 2010.

Table 8: The Development of the Largest Three Strategic Alliances in Container Shipping

1996	**Global Alliance**	**Grand Alliance**	**Hanjin/Tricon**
Main partners	APL, Nedlloyd, MOL, OOCL, MISC	Hapag-Lloyd, NYK, NOL, P&OCL	Cho Yang, DSR/ Senator, Hanjin
Capacity (TEU)	209.645	255.705	199.404
No. of vessels	65	72	72
2000	**New World Alliance**	**Grand Alliance**	**United Alliance**
Main partners	APL-NOL, MOL, HMM,	Hapag-Lloyd, P&O Nedlloyd, OOCL, MISC	Cho Yang, DSR/ Senator, Hanjin
Capacity (TEU)	325.487	350.197	277.000
No. of vessels	90	93	85
2006	**New World Alliance**	**Grand Alliance**	**CKYH**
Main partners	APL, MOL, HMM	Hapag-Lloyd, OOCL, MISC Berhad, NYK Line	Hanjin, Yang Ming, K Line, COSCO
Capacity (TEU)	712.082	966.570	1.046.991
No. of vessels	223	Approx. 350	354
2010	**New World Alliance**	**Grand Alliance**	**CKYH**
Main partners	APL, MOL, HMM	NYK, Hapag-Lloyd, OOCL	Hanjin, Yang Ming, K Line, COSCO
Capacity (TEU)	1.161.468	1.187.607	1.548.508
No. of vessels	282	288	400

Source: Panayides and Wiedmer, 2011: 31

The most recent major cargo-sharing arrangement was made between three major carriers; Maersk, MSC, and CMA-GGM (P3 Alliance). These container shipping lines together represents 38% of the world's container fleet capacity. These three shipping lines operate around 255 vessels. The second major alliance involves six carriers such as Hapag-Lloyd, NYK, OOCL, Hyundai Merchant Marine, APL and MOL (G6 Alliance). They deploy 240 container ships serving 66 ports in Asia, America and Europe. If allowed by competition authorities in Europe and the USA, the P3 Alliance has the potential to be a game-changer. Other shipping lines decide to align their strategies according to the P3 Alliance (Brooks et al., 2014: 14).

Global container lines transport the large volumes of cargo in the route between Asia, Europe and the United States (East West services). Ports such as Singapore and Hong Kong provide transshipment service options for the feeding of cargo into the major alliances. Most services from Australia feed cargo into these transshipment hubs for connection onto larger vessels which sail on the route of East West (Poulter, 2013).

Terminal operators tend to collaborate with the shipping lines in areas involving information sharing, berthing and cargo storage arrangements. In early 2000s, terminal operators focused more on the big container shipping lines, primarily those global operators. But nowadays they tend to work closely with smaller lines such as feeder operators which can contribute to efficiency enhancement. The level of integration between container shipping lines and major container terminal operators has increased in 2002 through 2007 (Lam and Van De Voorde, 2011: 716).

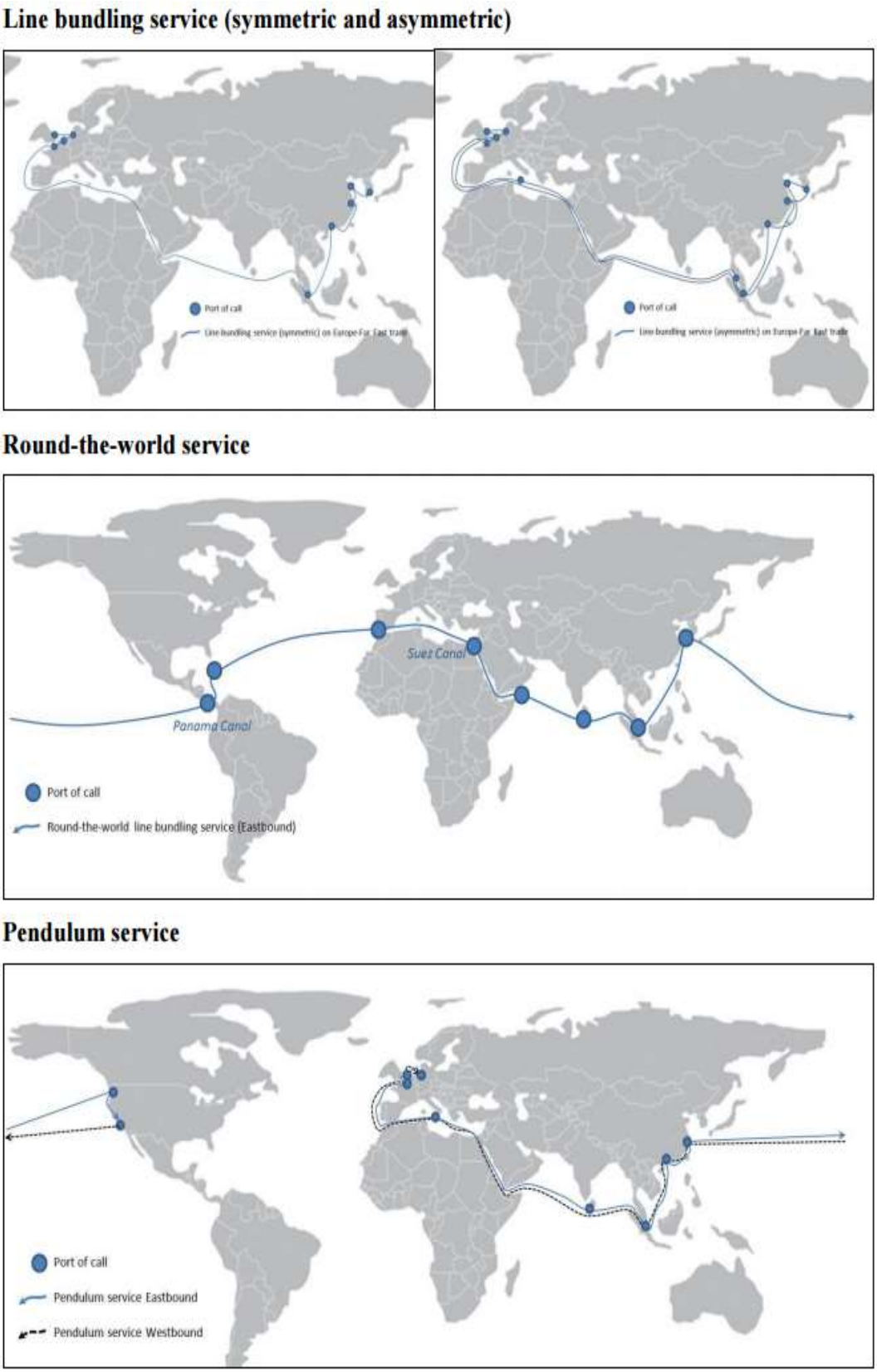
2.5.4 Changes in Container Shipping Service Strategies

Bundling is one of the important objectives of container service network dynamics. The bundling of container cargo includes two levels:

- bundling within an individual liner service, and
- bundling by combining/linking two or more liner services.

Bundling within an individual liner service aims to collect container cargo by calling at various ports along the route instead of focusing on an end-to-end service (Figure 15). Shipping lines have substantially increased average vessel sizes deployed on the route from around 4,500 TEU in 2,000 to over 8,000 TEU in early 2011. These scale increases in vessel size decreased the average number of European port calls per loop on the Far East–North Europe trade: 4.9 ports of call in 1989, 3.84 in 1998, 3.77 in October 2000, 3.68 in February 2006, and 3.35 in December 2009. Two important types of line bundling are round-the-world services and pendulum services (Ducruet and Notteboom, 2012).

Figure 15: Bundling within an individual liner service



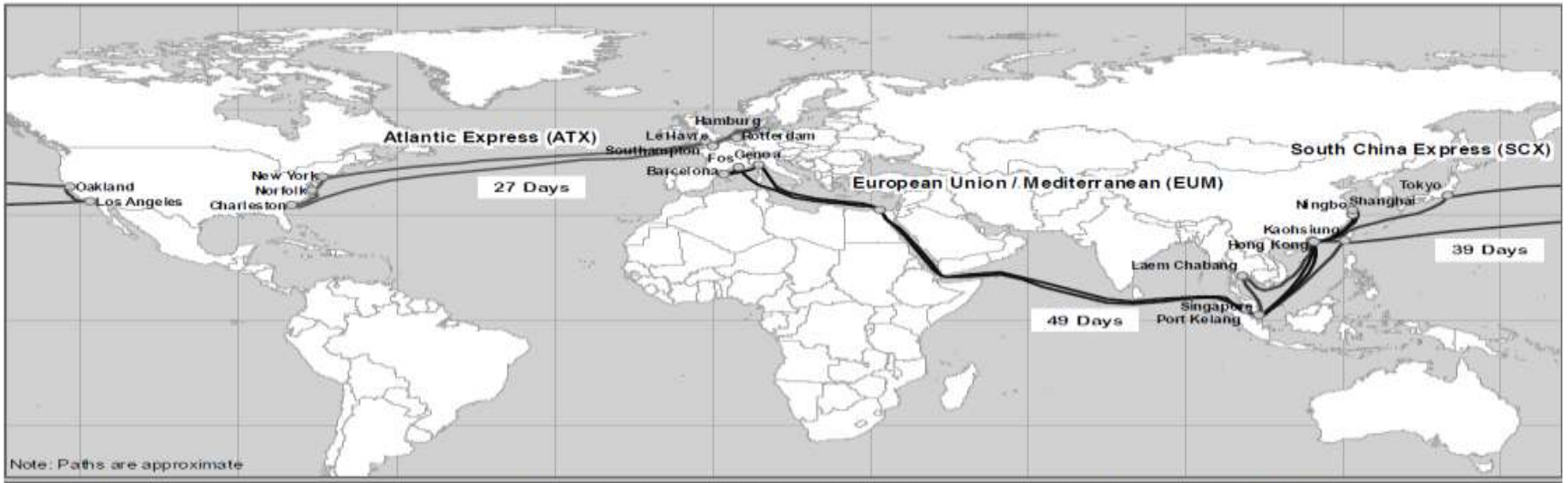
Source: Ducruet and Notteboom, 2012b: 21

Container shipping lines must decide to service scope and type of shipping routes when planning a liner service route. Traditionally, container shipping lines operate in three types of shipping routes. These are port to port, pendulum and round the world shipping routes. Lun and Browne (2009: 108) define these shipping routes as follows;

> • *Port to port involves regular shipping service between two ports, often moving back and forth, but very likely the shipping route is unidirectional. This route pattern has the disadvantage of limited connectivity.*
> • *Pendulum involves a regular itinerary between sequences of ports, often serviced by geographical proximity. A cluster of ports along one seaboard are serviced and then an ocean is crossed. This process is repeated on a regular basis.*
> • *Round the world involves serving continuously a sequence of ports, often in both directions, so that the sequence of ship visits enables a round trip around the world. A limited number of ports per continent are serviced. This type of maritime route planning is mainly used for container shipping.*

The emergence of post-panamax containerships has caused the setting of pendulum services since the Panama Canal is no longer accessible to this new class of ships. For example, pendulum services between Asia and Europe have on average 8 to 10 containerships assigned and involve 8 to 12 port calls. Most transatlantic pendulum services have 6 to 8 containerships and involve 6 to 8 port calls as shown in Figure 16. Container shipping lines are flexible in terms of the selection of port calls, particularly on maritime ranges that have nearby and competing ports grouped as regional clusters (e.g. North American East coast, Western Europe). They can change pendulum service according to changes in market conditions. For instance Evergreen abandoned of round-the-world services in 2002, which were instead replaced by three pendulum services that offer more weekly port calls. The frequency of service of two calls per week did not satisfy the needs of its customers. (Rodrigue and Browne, 2002: 173)

Figure 16: Three Major Pendulum Routes Serviced by OOCL, 2006



Atlantic Express (ATX)

Origin	Destination	Transit Time (days)
Southampton	New York	8
New York	Norfolk	2
Norfolk	Charleston	2
Charleston	Rotterdam	10
Rotterdam	Hamburg	2
Hamburg	Le Havre	2
Le Havre	Southampton	1

European Union / Mediterranean (EUM)

Origin	Destination	Transit Time (days)
Port Kelang	Genoa	14
Genoa	Barcelona	2
Barcelona	Fos	2
Fos	Singapore	15
Singapore	Hong Kong	4
Hong Kong	Shanghai	2
Shanghai	Ningbo	2
Ningbo	Shekou	2
Shekou	Hong Kong	1
Hong Kong	Singapore	4
Singapore	Port Kelang	1

South China Express (SCX)

Origin	Destination	Transit Time (days)
Tokyo	Kaohsiung	4
Kaohsiung	Shekou	1
Shekou	Laem Chabang	4
Laem Chabang	Singapore	3
Singapore	Kaohsiung	3
Kaohsiung	Los Angeles	11
Los Angeles	Oakland	4
Oakland	Tokyo	9

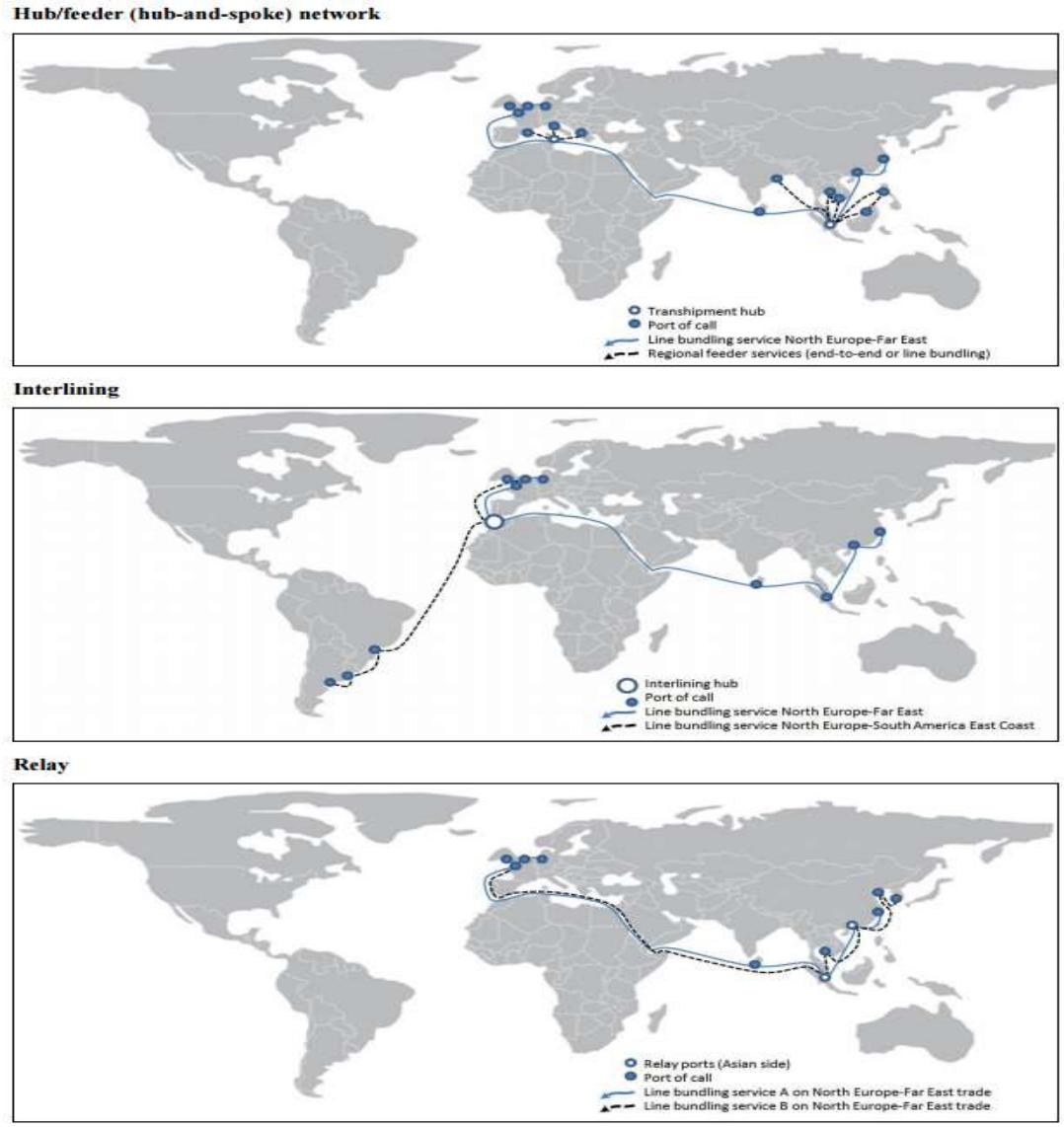
Note: Transit time includes port time

Source: OOCL Web Site

Source: Rodrigue and Browne, 2002: 174.

Bundling container cargo by combining/linking two or more liner services has three main bundling options that include a hub-and-spoke network (hub/feeder), interlining and relay (Figure 17). Container shipping lines established global networks and this caused to hub port development at the crossing points of trade lanes. Intermediate hubs engendered since the mid-1990s within many global port systems: Freeport (Bahamas), Salalah (Oman), Tanjung Pelepas (Malaysia), Gioia Tauro, Algeciras, Taranto, Cagliari, Damietta and Malta in the Mediterranean (Ducruet and Notteboom, 2012b: 4).

Figure 17: Bundling container cargo by combining/linking two or more liner services



Source: Ducruet and Notteboom, 2012: 22

2.5.5 Changing Expectations of Shippers from Container Shipping Lines

The marketing of shipping companies (e.g. container shipping companies) activating in merchant shipping, is the science of Business to Business Marketing (B2B marketing), which deals with the satisfaction of charterer's – shipper's needs for the carriage of goods by sea, with primary aim of the profit of the enterprise (Plomaritou, 2006: 2).

The role of container shipping lines has changed and evolved in global supply chains. So, they are required to give more attention to managing relationships with their partners, particularly with shippers. As a consequent of globalization, shippers are spending more time finding qualified carriers to help increase market share as well as achieve higher levels of customer satisfaction in international market. Qualified carriers naturally must meet more significant criteria relating to employee, equipment, facility capability, and system compatibility with the highest performance and pricing consistency (Jang et al., 2013:494).

Liner shipping market is different from other shipping markets in terms of shippers' expectation. Shippers in the liner market are more emphasis on quality than safety (as in the tanker market) or cost (as in the bulk carrier market). Shippers are more interested in service quality factors such as the directness of sailings, the scheduling flexibility, the on-time pick-up and delivery of cargo, the fast voyage execution, the reduction of turn-around time to a minimum, the appropriate cargo handling and the safe transport of goods (D'este & Meyrick, 1992).

Liner shipping provides time utility to the product through transport operations. Shippers are not only concerned about transporting the cargo. They also require value added services from container shipping lines. Shippers demand an integrated solution or all-inclusive package for the transportation of goods (Lam and Van de Voorde, 2011: 713).

2.6 CONTAINER SHIPPING SERVICE QUALITY

2.6.1 Service Quality in General

Service quality has been widely investigated by the scholars in the services sector. Delivering high quality service is seen as integral to business success and scholars are particularly focused on the relationship between customer satisfaction and service quality (Lobo, 2010: 289). In this part of the study, service quality concept, dimensions of the study and common models used to determine business to business service quality are examined.

2.6.1.1 Service Quality Concept and Dimensions of Service Quality

The qualities of products and services have essential importance in terms of company's business and the national economy (Thai, 2008: 493). There are several researches about quality and most of them are related with goods quality. Goods quality and service quality are different because characteristic of service is different. For a thorough understanding of service quality, three main characteristics of service; intangibility, heterogeneity, and inseparability must be clarified (Parasuraman et al., 1985: 42).

Services are intangible. The service cannot be seen, tasted, felt, heard or smelled like physical products (Kotler, 2000). Parasuraman et al. (1985: 42) stated that many tangible cues to evaluate products quality such as style, hardness, color, label, feel, package, fit helps to consumer but while purchasing service tangible evidence is insufficient to the service provider's personnel, equipment and physical facilities.

The second characteristic of service is heterogeneity. Heterogeneity reflects the potential for high variability in the performance of services. Heterogeneity in service output is a characteristic problem for services with high labor content because service performance is delivered by different people and their performance can differ from each other (Zeithaml et al 1985: 34).

Third, inseparability is a feature characteristic of services. While most goods are produced first, then sold and consumed, most services are sold first and then produced and consumed at the same time. For example an automobile can be manufactured in Detroit, shipped to San Francisco, sold two months later, and consumed over a period of years. But restaurant services cannot be provided until they have been sold, and the dining experience is produced and consumed simultaneously (Zeithalm and Bitner, 2003: 21)

Customers evaluate service quality by comparing their perceptions of what they receive with their expectations of what they should receive. Expectations and perceptions occur experimentally rather than necessarily being real. Therefore, in the context of the service, it is necessary to substitute customer expectations for customers' requirements (Meister, 1990).

Early scholars suggested that service quality perception is comparison of what customer expect from offered service with the seller's actual service performance (Sasser et. al., 1978; Gronroos, 1982; Lehtinen and Lehtinen, 1982). A number of scholars have mentioned that customers' evaluation of perceived service value depends on customers' evaluation of service quality and the interaction between perceived value and perceived quality remain positive. Furthermore, Sweeney et al. (1999) have claimed that perceived quality is an essential construct of perceived value seen as a critical factor in the decision making process (Jayawardhena, 2010; 340).

According to Frankel (1993: 58) service quality is largely an attitude which influences all aspects of the operations. It considers customer and user needs and expectations both internal to the services provided and to external factors of concern. Lewis and Booms (1983) defines service quality as the measure of how well the service level delivered matches customer expectations. Delivering quality service means conforming to customer expectations on a consistent basis (Lewis and Booms 1983).

After reviewing the previous study on service quality Parasuraman et al. (1985: 42) suggest three underlying themes:

- Consumer finds it difficult to evaluate service quality than goods quality.

- Comparison of consumer expectations with actual service performance gives service quality perceptions.
- Quality evaluations involve both evaluations of the process of service delivery and outcome of service.

According to Edvardsson (1998: 144) service quality satisfies needs and meets expectations; those of the customers, employees and owners. Satisfied customers' positive notion effect the other potential customers' choice by spreading good news about service, and this is source of happiness for the employees and also for the owner. The service should satisfy customers' needs and requirements. The service providers must examine the customer expectations. Although the definition is customer – oriented, this does not mean that the service provider should always submit to the customers' requests. The customer can't always fully articulate or verbalize his needs and wishes. To solve this problem service firms should increase functional dialog with the customer and understand the customer needs. In addition to satisfying customer, owner and employee's expectations, needs and demands should be taken into account. Employees and owners must be satisfied to provide high service quality to the customer.

Major benefits of successful service quality can be classified as follows (Adil et. al., 2013: 66);

- Satisfied and retained customers and employees
- Opportunities for cross-selling
- The attraction of new customers
- Development of customer relationships
- Increased sales and market shares
- Enhanced corporate image
- Reduced costs and increased profit margins and business performance.

According to Ghobadian (1994: 46-47) the attainment of "service quality" requires these factors;

- Market and customer focus.
- Empowerment of frontline staff.
- Well-trained and motivated staff.
- A clear "service quality" vision.

Service quality concepts are not well developed in spite of the increasing importance of the service sector and of the significance of quality as a competitive factor. It can be said that the service sector lags behind the manufacturing sector. Moreover, the service sector lags behind the manufacturing sector in covering philosophies such as "total quality management" and "continuous improvement". There are major differences between service and manufacturing sectors in terms of "quality". Some inherent characteristics of the service sector increase the intrication of "quality control" and "improvement efforts" (Ghobadian et al., 1994: 44)

The dimensions of service quality in the literature vary by the approach of Nordic school (Gronroos, 1982,1984) and American school (Parasuraman et al., 1985, 1988), by industries (Lee et al., 2000), by service types (Babakus and Boller, 1992), by culture (Furrer et al.,2000) or providers and companies in the same industry (Zeithalm et al., 1993). These dimensional approaches to service quality help to understand quality dimensions and its features. Consequences of service quality differ according to study perspective. For example economic value may be important as a consequence of service quality for a commercial product. But, this might have little importance (compared to emotional value) as a consequence of service quality for emergency services (Sultan and Wong, 2010: 259-260)

When the service quality literature is reviewed, scholar's different descriptions of service quality dimensions are seen and some of dimensions are added to the previous research of service quality. Sasser et al. (1978) first described seven service quality dimensions:

- Security – confidence and physical safety;
- Consistency - standardization of treatment for each transaction;
- Attitude – civility;
- Completeness - usability of ancillary services
- Condition – condition of facilities
- Availability – availability to services both spatial and temporal
- Training – training of service employers

Gronroos (1982) described service quality dimensions as the "technical quality of the outcome", the "functional quality of process", and the corporate image.

Gronroos description covers all dimensions stated by Sasser et al. (1978) and also describes company's corporate image as a dimension.

Lehtinen (1982) held that service quality is made up of three dimensions: the "physical quality", the "interactive quality", and the "corporate quality".

- Physical quality: the tangible aspects of a service.
- Interactive quality: the two-way interaction between a customer and a service provider (or the provider's representative), including both automated and animated interactions.
- Corporate quality: the image attributed to a service provider by its current and potential customers.

Parasuraman et al. (1985) described ten dimensions namely "reliability, responsiveness, competence, access, courtesy, communication, credibility, security, understanding/knowing customer, tangibles". In 1988, these ten dimensions merged into five dimensions as tangibles, reliability, responsiveness, assurance and empathy by Parasuraman et al..

Haywood-Farmer et al. (1988) described the three service quality dimensions as follows;

- physical facilities, processes and procedures
- people's behavior and conviviality
- professional judgment

Gronroos (1988) defined service quality as a six dimensional element consisting of professionalism and skills, attitudes and behavior, accessibility and flexibility, reliability and trustworthiness, recovery, reputation and credibility.

According to LeBlanc and Nguyen (1988) service quality consists of degree of customer satisfaction, internal organization, physical environment and instruments supporting service-producing system, corporate image and personnel/customer interaction.

Cronin and Taylor (1992) investigated the conceptualization and measurement of service quality and the relationships between service quality, consumer satisfaction, and purchase intentions. They found that a performance-based measure of service quality may be adequate to measure service quality.

Ovretveit (1993) proposed three dimensions namely "customer or client quality, professional or technical quality and management quality". The difference of this study than others was that management quality dimension was mentioned for the first time.

According to Thai (2008: 495-500) the dimensions of service quality can be generally classified into six groups, as follows:

- Resources-related quality dimension: consists of physical resources, financial resources, condition of facilities, equipment, location, infrastructures, etc.
- Outcome-related quality dimension: includes the product or core services being received by the customers, for instance, service accomplishment such as the on-time delivery of a shipment, or the price of a service offered.
- Process-related quality dimension: involves to factors of interactions between employees and customers, for example, how customers perceive the behavior of staff in dealing with customers' requirements, staff's knowledge of customers' wants and needs, as well as application of technology in better serving the customers.
- Management-related quality dimension: includes the selection and deployments of resources in the most efficient way so as to ensure meeting/exceeding customers' needs and expectations, knowledge, skills and professionalism of employees and their understanding and transforming customers' needs and requirements into what they really want. This dimension also relates to the feedback system from customers as new inputs for the new quality management cycle, as well as continuous improvement as suggested by various quality gurus.
- Image/reputation-related quality dimension: involves the overall perception of customers about the service organization.
- Social responsibility-related quality dimension: relates to the ethical perception and operations of an organization to behave in a socially responsible manner.

2.6.1.2 Models of Service Quality

Service quality has many dimensions and improvement of service quality involves many critical issues. Furthermore, service quality has different perceptions viewed by owners/operators or shippers/cargo owners or customer of liner shipping. To understand user's service quality concerns which can only be derived by marketing and customer concern focused studies is important. The other issue is the measurement of service quality and its impact on performance and cost, where performance is related with long-term profitability (Frankel, 1993: 58)

According to Iacobucci et al. (1994) a customer's evaluation of service quality and the concomitant satisfaction is related with repurchase, loyalty, and ultimately a firm's profitability. To this end, researchers have devised different instruments to measure the level of marketing orientation such as marketing audits. In particular, in the service scope, too many researchers have focused on measuring service quality in the consumer sector (Durvasula et al., 1999: 133).

In the literature, scholars have focused on the dimensionality of the service quality. They proposed a number of models including Gronroos' model (1982, 1984), SERVQUAL (Parasuraman et al., 1985, 1988), SERVPERF (Cronin and Taylor, 1992). The aims of these models were to find a better scale to measure service quality from service specific perspectives. Among these models, the SERVQUAL has been widely used and mostly criticized by scholars (Sultan and Wong, 2010: 261).

2.6.1.2.1 Gronroos' Service Quality Models

The first attempt to develop service quality model was made by Gronroos in 1982. He suggested two service quality dimensions;

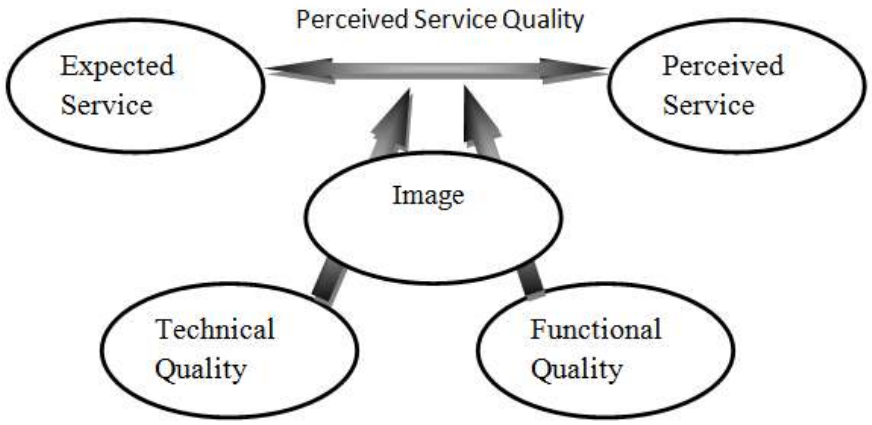
- the technical aspect (what the service provides) and
- the functional aspect (how the service is provided).

In the customer mind, the outcome of service process in which the resources are used (technical aspects) is essential. But it is also important customer perceives how the process itself functions (functional aspects). For some services technical

quality might be difficult to evaluate. For example in health care the service providers' technical skill and also immediate results from treatments might be difficult for a patient to evaluate. Patients (customer) rely on functional quality of health care service such as reliability and empathy to assess service quality (Kang and James, 2004).

Service marketing has no physical products to manage, only resources and a system produces a result for the customer. Product concept was inefficient to explain service quality, so a concept that contains how the service provides satisfaction to customer and how the service providing process is perceived by customer was needed to create. The name of new created service concept was "the perceived service quality model (Figure 18) (Gronroos, 2001).

Figure 18: The Nordic Model (Gronroos 1984)



Source: Brady and Cronin, 2001: 35.

According to Gronroos service quality comprises of three dimensions. These are (Ghobadian, 1994: 50-51):

- ***The technical quality of outcome:*** *It can be said that the technical quality is the actual outcome of the service encounter. Generally, the service outcome can be measured by the consumer in an objective manner. For example; in the case of a car repair garage the technical quality of service outcome means the availability of the car at the agreed time, its tidiness, and its mechanical condition.*
- ***The functional quality of the service encounter:*** *This dimension of "quality" is concerned with the interaction between the provider and recipient of a service and is often perceived in a subjective manner. Returning to the car repair garage example, this dimension of service quality is concerned with: the*

courtesy shown to the customer; physical circumstances of the reception area; amount of explanation provided in terms of what needs to be done; contacting the customer if the car is not going to be ready at the agreed time, or if additional expensive work is required, etc.

- ***The corporate image.*** *This dimension is concerned with consumers' perceptions of the service organization. The image depends on: technical and functional quality; price; external communications; physical location; appearance of the site; and the competence and behavior of service firms' employees.*

Service firms and their customer have continuous relations, so a dynamic aspect is needed in a service quality model. Customers remember previous service process while they contact with the same service firm, therefore the "image" concept is another important component in the perceived service quality model.

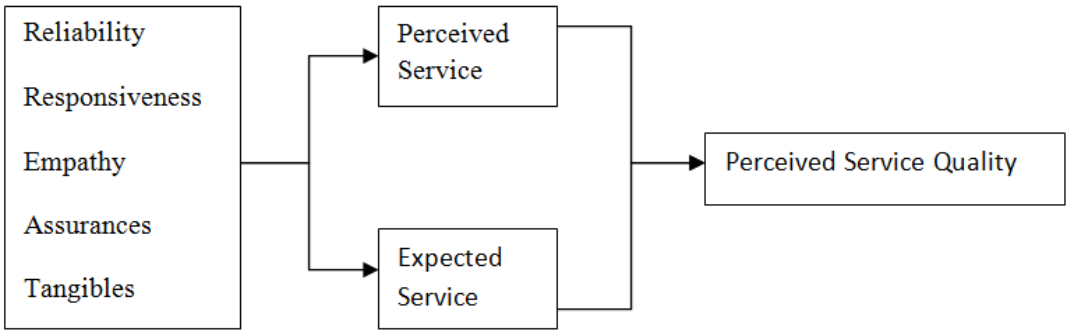
When the literature is examined, it can be said that the link between image and service quality has not been clearly established. However, ordinary customer, with few frequencies of encounters and who may not have the chance to deal with more than one service provider, find it easy to evaluate the service quality of received service in markets where imitation is widespread and in which there is little differentiation. Therefore, they may need some kind of norm to decide what is good, acceptable, or expected. Image and reputation may play the role of norm to decide on good service (Jabnoun and Khalifa, 2005: 376)

2.6.1.2.2 SERVQUAL

Service quality has an essential role on customers' buying of products or services and continuous relation with service provider because customer satisfaction depends on how the service is provided. Companies that revenues come in whole or part from service delivery is interest with accurate and reliable instruments that assess service quality. SERVQUAL is well-known and most common service quality instrument (Landrum et al., 2009: 18).

Buttle (1996: 11) considered that SERVQUAL is based on the disconfirmation model commonly adopted in the customer satisfaction literature. Customer satisfaction is examined in terms of the relationships between expectations and outcomes. If outcome matches expectations, customer satisfaction is estimated. If outcome surpasses expectation then customer delight may occur. If expectation surpasses outcome, then customer dissatisfaction is stated.

Figure 19: The SERVQUAL Model (Parasuraman, Zeithalm, and Berry 1988)



Source: Brady and Cronin, 2001: 35.

The SERVQUAL scale developed and upgraded by Parasuraman *et. al.* (1991) has broadly been accepted in measuring service quality. Parasuraman et al. (1985; 47) first described 10 components; tangibles, reliability, responsiveness, communication, credibility, security, competence, courtesy, understanding/knowing the customer and access. Later, the SERVQUAL scale collapsed into five dimensions in service relationship. Reliability, tangibles and responsiveness remained constant, but the other seven components collapsed into two components, assurance and empathy (Table 9).

Table 9: Perceived Dimensions of Service Quality

Reliability	The ability to perform the promised services accurately and dependably
Responsiveness	The willingness to help customers and provide prompt service
Assurance	The knowledge and courtesy of employees and their ability to convey trust and confidence
Tangibles	The physical facilities, equipment, and appearance of personnel and communication materials
Empathy	The caring, individualized attention provided to the customer

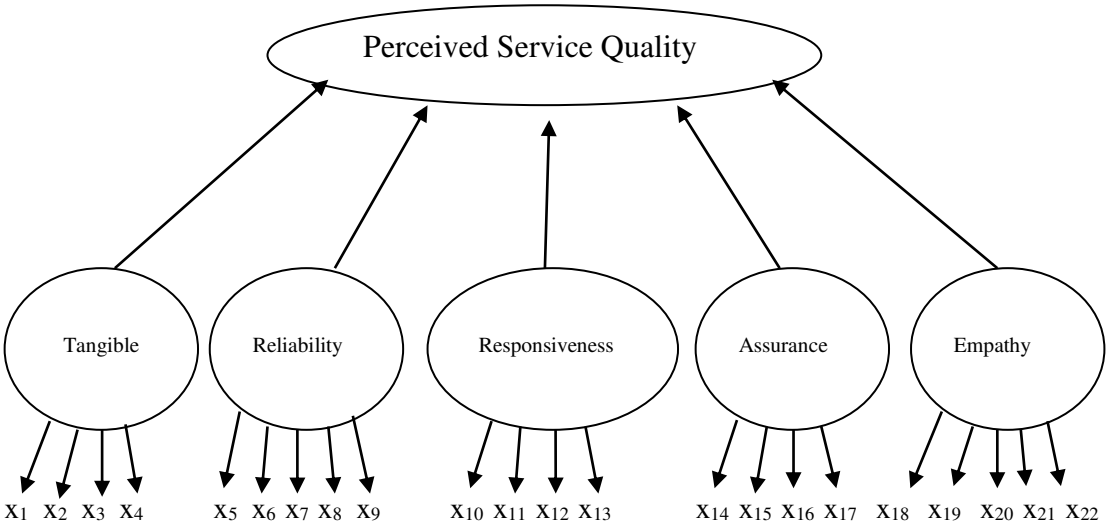
Source: Parasuraman et al., 1988: 23.

Parasuraman et al.'s (1988) SERVQUAL scale has been the prevailing operationalization of service quality for many years. The basis of the model suggested by authors is service quality should be represented as the difference, or ''gap,'' between service expectations of customers and actual service performance

provided by service firms (i.e., the disconfirmation paradigm). Therefore, the GAP paradigm comprises that service quality is assumed sufficient when consumer perceptions of service performance are equal to or greater than the expected level of service. (Brady et al., 2002: 19).

SERVQUAL scale contains 22 items based on the above mentioned five dimensions. SERVQUAL is implicated to measure both expectations about firms in general within an industry and perceptions regarding the particular company whose service is being assessed. Four or five numbered items are used to measure these five dimensions (Figure 20) (Buttle, 1996: 9).

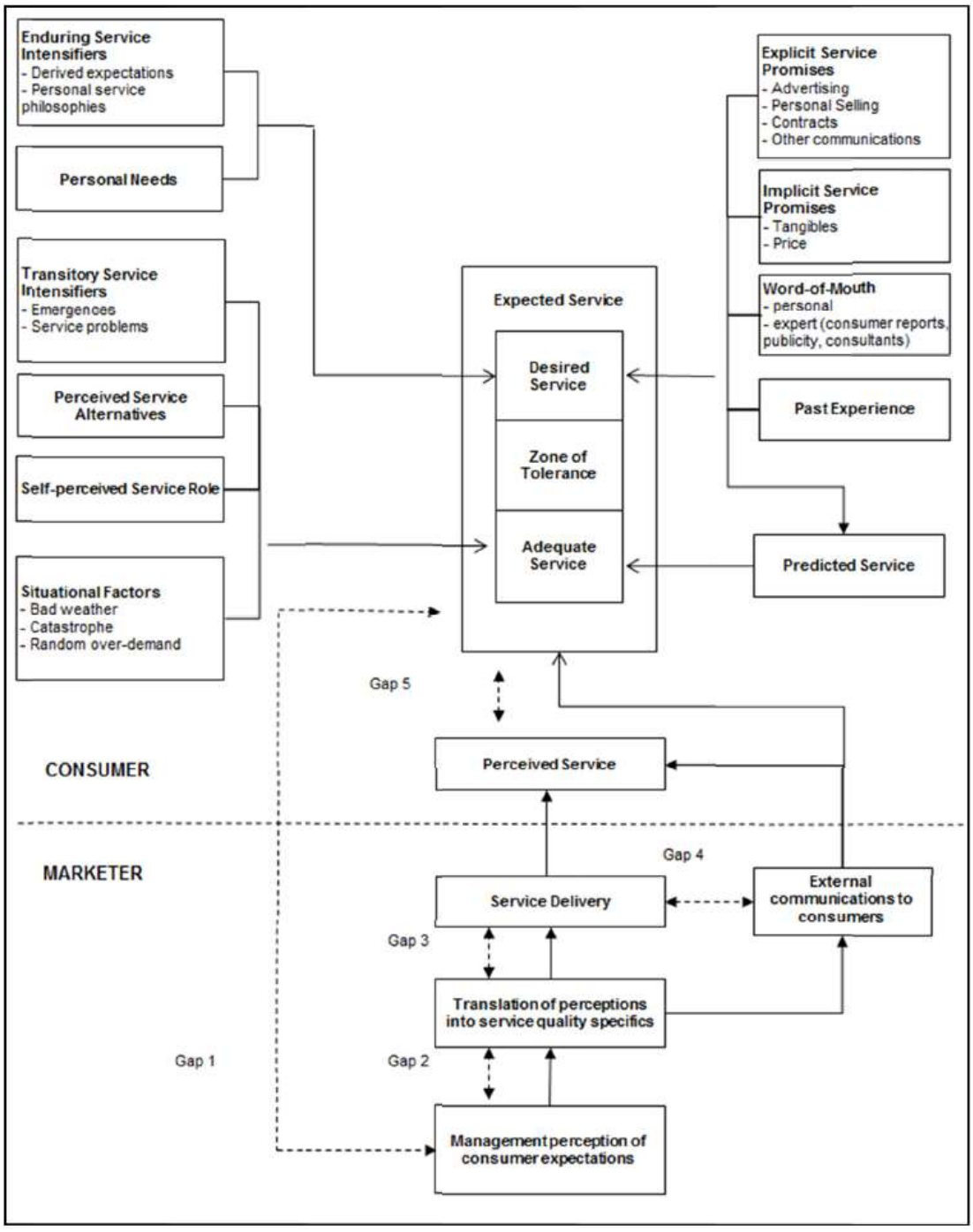
Figure 20: Service Quality As Conceptualized By Parasuraman, Zeithalm, and Berry (1988)



Source: Cronin and Taylor, 1992: 58.

Figure 21 shows the original Gaps Model structure proposed by Parasuraman et al. (1985; 1988) updated with the changes of the part related to customer expectations made by the Mauri et al. in 1993. The GAP model consists of 5 gaps, of which the "Customer Gap" (Gap 5) is the main one as it describes the differences between expectations and actual perception of service quality by the customer (Mauri et al., 1993: 136)

Figure 21: Gap Model of Service Quality



Source: Mauri et al. (1993: 137)

SERVQUAL service quality model quality gaps are as follows (Adil, 2013; 68):

Gap 1: The manager perceptions of the customers' expectations are different from those of the customers,

Gap 2: The service quality specifications are different from the management perceptions of quality expectations,

Gap 3: Quality specifications of the promised service are different from the final service delivered,

Gap 4: Promises made by market communication activities are not satisfied by the delivered service,

Gap 5: Difference between the expectations of what firms should provide and consumer perceptions of how a given service provider performs.

Customer Gap is the essential part of the model. This gap is the gap between customer expectations and perceptions of the service by the customer as it is actually delivered. The basic goal is to remove this gap by meeting or exceeding customer expectations. The other gaps in the model are known as the "provider gaps" and each gap represents a potential cause behind a company's abortion to meet customer expectations (Bitner et al., 2010: 199).

Parasuraman, Zeithaml and Berry (1988) offered that SERVQUAL may be used to:

- follow service quality trends over time;
- compare branches within a bank or building society;
- compare an organization with its competitors; and
- categorize customers into perceived quality segments based on their individual SERVQUAL scores.

SERVQUAL instruments have been used, extended and developed by many researchers to study service quality in different sectors of the services industry (Avkiran, 1994; Babakus and Boller, 1992; Buttle, 1996; Cronin and Taylor, 1994; Fick and Ritchie, 1991; Newman, 2001; Smith, 1995). The dimensions of SERVQUAL has been applied to different service organizations such as hospitals, banks, insurance agencies, real estate brokerage firms, dental clinics and telephone companies (Durvasula et.al. 1999).

Woo and Ennew (2005: 1179) mentioned that SERVQUAL has been widely criticized on both theoretical and operational grounds (e.g., Buttle, 1996), it remains the common scale that used for studies of service quality and continues to be extensively applied (e.g., Trocchia and Swinder, 2003).

2.6.1.2.3 SERVPERF

Cronin and Taylor investigated two objects related with service quality in their 1992 study. First, they claimed that the current conceptualization and operationalization of SERVQUAL is unqualified to measure all service provided by service industry. Secondly, their study examined the relationships among service quality, consumer satisfaction, and purchase intentions. As a result of the study, they have developed and tested a performance-based alternative to the SERVQUAL scale.

Cronin and Taylor (1992) were the first to propose a theoretical justification for rejecting the expectations portion of SERVQUAL in favor of just the performance measures included in the scale named SERVPERF. The term ‘‘performance-only measures’’ refers to service quality measures that depend on consumers’ perceptions of the performance of a service provider, as adverse to the gap between the consumers’ performance perceptions and their performance expectations. Cronin and Taylor (1992) claims that the performance-only SERVPERF instrument is better than the disconfirmation-based SERVQUAL scale across four industries including banks, pest control, dry cleaning, and fast food. Thus, Cronin and Taylor’s (1992) measurement does not clarify the problem about how the service quality constructs should be conceptualized and measured. One of the reasons of the continued uses of the SERVQUAL measure is that the Cronin and Taylor (1992) study has not been replicated (Brady et al., 2002: 17-18).

While SERVQUAL directly measures both consumer’s expectations and performance perceptions, SERVPERF measures only performance perceptions. SERVPERF uses only data from service performance because it considers that respondents provide their ratings by comparing performance perceptions with performance expectations. Therefore, SERVPERF suppose that directly measuring performance expectations is inessential (Carnillat et al., 2007: 475).

According to Landrum et al. (2009: 18) service quality can be evaluated and measured using both SERVQUAL that contains five dimensions and SERVPERF, which employs a performance that only approaches with five dimensions of customers’ perceptions of service provider performance. Both SERVQUAL and SERVPERF provide measures for the same five dimensions of the service quality

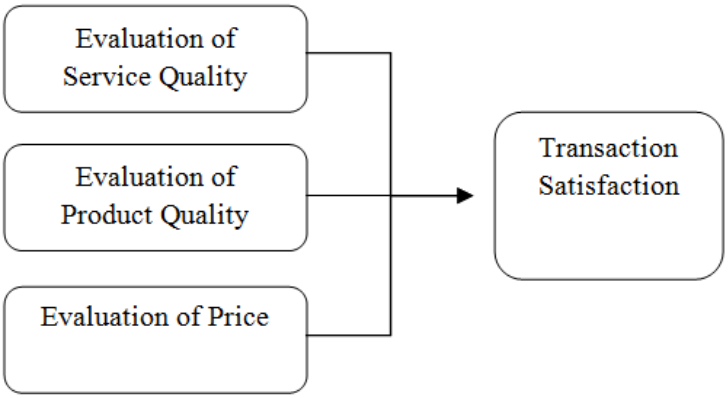
construct. There is not enough published information about the relative importance of each dimension.

The discussion of scholars on the relative usefulness of each scale has been centered on predictive validity and specifically on whether SERVQUAL or SERVPERF better represents service quality. First, some scholars have argued that SERVPERF is a better scale because it does not rely on uncertain customers' expectations. According to the scholars, SERVPERF are based on the opinion that consumer's performance perceptions are already the results of their comparison of the expected and actual service. Thus, the performance-only measures should be preferred to avoid futility. Second, Parasuraman et al.'s (1991) conceptualization of service quality is contradictory to its operationalization. Parasuraman et al. (1991) describe expectations as a type of attitudes, customer expectations must be considered as ideal points. Hence, the Gap model mentions that superior perceptions of service quality occur when performance increasingly exceeds expectations which are theoretically contradictory. The classical attitudinal perspective supposes that positive attitudes occur when evaluations of an object are close to an expected ideal point. Therefore, service quality should culminate when perceptions equal expectations (Carnillat, 2007: 475).

2.6.1.2.4 Transaction-Specific Conceptual Model

Parasuraman et al. (1994) upgraded their SERVQUAL model and suggested new model namely transaction-specific conceptual model. This model proposes a customer's overall satisfaction with a transaction to be a function of his or her evaluation of service quality, product quality and price. Figure 22 characterizes the components of transaction-specific conceptual model.

Figure 22: Components of Transaction-Specific Evaluations



Source: Parasuraman, Zeithaml and Berry (1994;121).

2.6.2 Business to Business Service Quality

Developing productive and profitable relationships with customers is a key goal of firms in the business-to business sector as well as in the consumer sector. Actually, noteworthy attention has been given to understanding the dimensions related with establishing and maintaining long-term relationships with customers. The emerging area of "relationship marketing" emphasizes the keen interest in describing the dimensions associated with such relationships. Indeed, some marketing scholars (e.g. Webster, 1992; Achrol, 1997) maintain that building long term relationships with customers has become the major focus of an increasing number of businesses. The level of quality that a firm delivers to industrial customers is the main factor that impact on this relationship (Durvasula et al., 1999: 132). Service quality has been shown to have an important role on effecting customers' intention to re-purchase service in both business-to-consumer contexts and business-to-business contexts. In their 2007 study, Jayawardhena et al. found that overall service quality is positively related to loyalty to the organization (Jayawardhena, 2010; 340).

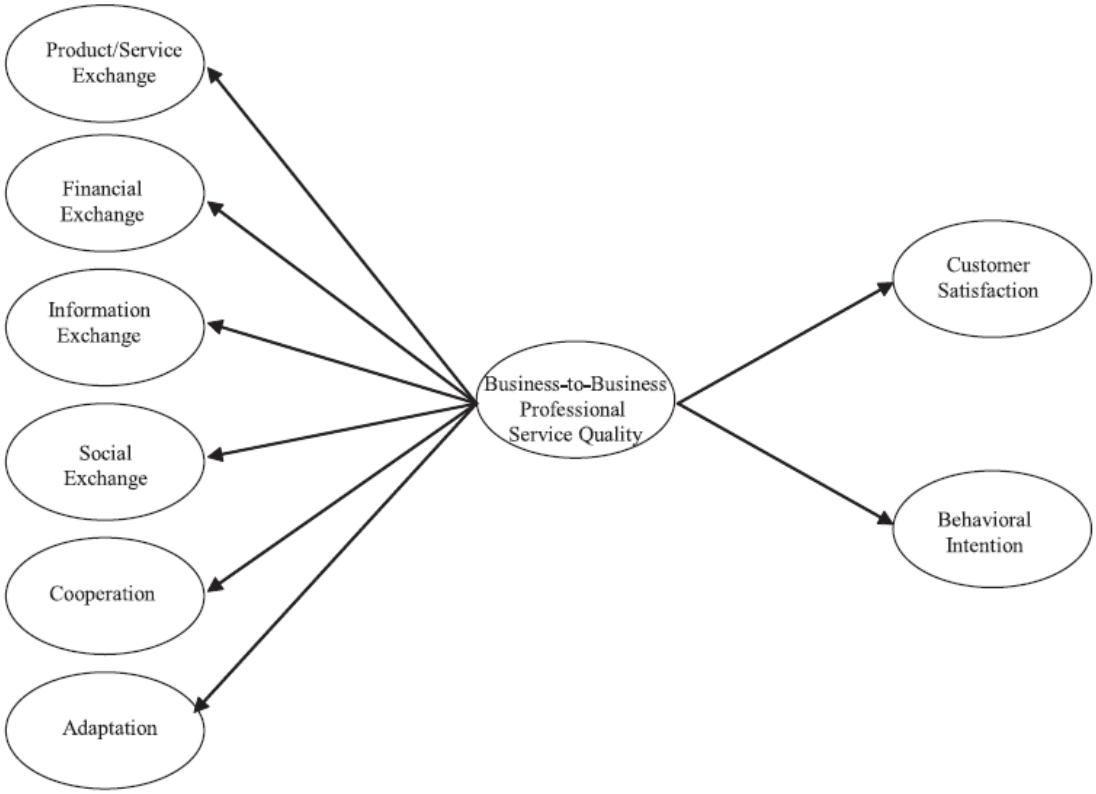
Several scholars claimed that there is a positive relationship between loyalty, service quality and customer satisfaction (Anderson et al., 1994; Cronin et al., 2000; Dabholkar et al., 2000). A similar correlation is found in the business-to-business world. The basic mentality here is that the greater the perceptions of overall service

quality, the more likely the customers will exhibit behaviors beneficial to the firm, for example, loyalty to the firm (Boulding et al., 1993; Jayawardhena, 2010; 340).

Durvasula et al. (1999: 132) reveals that many researches have examined the level of quality (and its dimensions) in the performance of a service. In the study of Caruana et al. (1995) UK service based firms have shown empirical support for the opinion that a service company's advantage in the way it delivers its service offering is related to its business performance. It can be said that certain dimensions in the service encounter have a major impact on this relationship than others (Durvasula et al., 1999: 132).

According to Woo and Ennew (2005: 1179) service quality is based around the nature of the interaction and what that interaction process does for the customer (i.e., its function). The Nordic School has tended to see this in terms of technical and functional dimensions, but more recent work within the International/Industrial Marketing and Purchasing Group (IMP) tradition discusses the opinion of direct and indirect relationship functions that are then seen as determinants of relationship quality. The first four dimensions of the interaction (i.e., product/ service exchange, information exchange, financial exchange, and social exchange) are all seen as core functions in the relationship. The service provider's effectiveness level in these functions shows impact level on service quality evaluation as perceived by the client. However, these four functions alone are insufficient from the perspective on service quality since they basically focus on the individual transactions that serve as building blocks for an overall relationship. The other two items (cooperation and adaptation) supplement the first four in that they relate to the development of a relationship over time and to the activities that take place around and between transactions. Figure 23 shows the individual dimensions of interaction as criteria for the evaluation of business-to-business professional service quality. (Woo and Ennew, 2005: 1179).

Figure 23: Conceptual Model of Business to Business Professional Service Quality



Source: Woo and Ennew, 2005: 1179.

The Nordic and the North American approaches to conceptualizing the dimensions of service quality explicitly overlap and Brady and Cronin (2001) proved the benefits from attempting to integrate the two perspectives in a business-to-consumer service context. These two perspectives have not easily been transferred to a business-to-business context because of concern over the generalizability of retail buyers' evaluative criteria as dimensions for the measurement of service quality delivered to business consumers. (Woo and Ennew, 2005: 1179).

In B2B markets, the basic differences among end-consumers rest on decision-making unit's evaluation of product and service. Buying centers are in contact with the industrial supplier. According to Parasuraman (1998) satisfaction of an industrial customer mostly depends on the satisfaction from different components of buying centers. Individual members of buying center evaluate the service quality of buying center according to their own reference standards, although buying center are guided by the company's objectives (Chumpitaz and Paparoidamis, 2004: 236).

When the literature is reviewed, it can be said that the dimensions on which service quality is measured are generally derived from the SERVQUAL scale or one of its variants. Although it has been widely used by scholars, many scholars have offered that SERVQUAL's five dimensions (i.e., assurance, reliability, responsiveness, tangibility, and empathy) may be so generic as to limit its utility in certain service contexts. Parasuraman et al. (1998) suggested that SERVQUAL scale that has been developed and applied primarily in a business-to-consumer context can be transferred to a business-to-business context. (Woo and Ennew, 2005: 1178).

Spreng et al. reveal that one negative transaction outcome with service provider does not change customers' loyalty if the cumulative levels are sufficiently positive. Customers can see this negative transaction as a unique occurrence, if it doesn't repeat. However, a series of negative transaction outcomes may cause negative image on customer mind and results to lower intentions to repurchase from the same supplier. Remedial action, such as repair or replacement, may be insufficient to retention of customer (Spreng et al., 2009: 547).

The marketing of shipping companies activating in merchant shipping is considered under Business to Business Marketing. The market deals with the satisfaction of charterer's – shipper's requirements for the transportation of goods by sea, with main aim of the profit of the enterprise. The shipping companies must consider what its customers need to offer appropriate transport services, to negotiate the freight rates, as well as to communicate effectively with the target market, the more are the possibilities to achieve the most appropriate, efficient and long-lasting commercial operation of its vessels (Plomaritou, 2006: 2).

In maritime service quality context, Durvasula and Mehta (2000) argued issues relevant to service recovery and service satisfaction in the business-to-business setting of ocean freight shipping. In the study, shipping managers of several manufacturers and trading companies evaluated their satisfaction with factors affecting the service activities related to service recovery (i.e. claims handling, complaint handling and problem handling). Research findings show that service quality perceptions positively affect intended behavior (Durvasula and Mehta, 2000: 448-449).

2.6.3 Logistics Service Quality

The prevalence of the marketing literature addressing customer service, or more specifically service quality, has been aimed at the end-use customer. Mentzer et al. (1999: 9) claims that several authors have attempted to expand the theoretical domain of service quality to a business-to-business context, specifically in the arena of logistics service quality.

Today's competitive environment is qualified by shorter product and technology life cycles, the globalization of markets, and high uncertainties in supply and demand. Manufacturers and retailers, operating in this environment, have developed and globalized their production systems, adopted a "Just-in-Time" philosophy, and outsourced a number of activities with the aim of minimizing total costs and maximizing customer value. This prevalent adoption of the supply chain management approach by shippers has an impact on the crucial success factors in transport and logistics, both for individual logistics service providers, such as logistics specialists, freight forwarders and carriers, and for clusters of organizations, such as ports. (Jang et al., 2013:494)

In the literature, there has been little search directly related with dimensions or determinants of service quality in logistics. Many studies on service quality have focused on service industries, not supply chain as a whole. Selection criteria of transport elements such as carriers or modes were investigated in terms of service quality dimensions. According to Seth et al. (2006: 548) measurement of the service quality in the context of supply chain management offers a challenge for researchers The author describes the reason for this challenges as effective management of supply chain covers delivery of products as well as services; quality of service has both the dimensions: quantitative and qualitative; and quality of service includes interplay of a variety of factors spanning suppliers, manufacturers, distributors, retailers and customers (Seth et al., 2006: 548).

How logistics creates customer satisfaction is investigated by scholars and many descriptions have been done. The most traditional definition is based on the creation of time and place utility. In the logistics literature, the said "Seven R's" define the attributes of the company's product/service offering that lead to utility

creation through logistics service, i.e., part of a product's marketing offering is the company's effectivity to deliver the right amount of the right product at the right place at the right time in the right condition at the right price with the right information. This definition means that part of the value of a product is created by logistics service. The attributes that operational measures of logistics customer services such as percent of items in stock, percent of orders delivered on time, percent of delivered items undamaged are considered the "value" provided by the logistics service dimensions of availability, timeliness, and condition (Mentzer et al., 1999: 9).

Both logistics service quality and customer satisfaction is especially crucial in the current business environment, as the relationship between the service provider and the customer is usually long-term (or at least it is attempted to keep them as such). One of the most important factors in service markets is the support and development of relationship with the customer. A logistics service provider should provide a service in line with the customers' expectations for the relationship to be long-term (Meidute-Kavaliauskienė et al., 2014: 332).

Shipping and intermodal transportation has become quite competitive and users have large numbers of selection options, not only among operators but also routes, modal chains, and more. Different choices do not only mean different transport costs, time, safety, and reliability, they also mean different choice in the type of packaging or containment required, in the frequency of service, in the degree of intermodal integration, and in the information and documentation support provided to a shipper/ consignee (Frankel, 1993: 58).

Premeaux and Phelps (2005) investigated perceptual differences between shippers and motor carriers. Their study indicated that shippers rated carrier response in emergency or unexpected situations, carrier's leadership in offering more flexible rates, information provided by carriers, computerized billing and tracing and a Web-enhanced EDI (electronic data interchange) higher than did carriers. However, carriers rated reputation for dependability, carrier cooperation, past carrier performance, and carrier representative's knowledge of shipper needs higher than did shippers.

The selection of the transportation mode and carrier to move the firm's inbound and outbound freight is a key decision in logistics management. Managers often consider multiple attributes when selecting transportation mode and carrier, often focusing on cost and transit time as the main criteria. This is a significant decision, however, as the process often involves multiple criteria, some of which are not easily quantified. The significance of individual factors often differs from industry to industry, company to company, and even within a company from one facility to the next. Then too, mode and carrier selection is often seen as different for inbound and outbound shipments, even at the same location (Meixell and Norbis, 2008: 183).

Nitin et al. (2006) examined the importance of the concept of service quality in a supply chain and proposed a framework for its measurement. They offered a conceptual model of service quality in supply chain, based on gap analysis. The gaps are bi-directional and cover both inter- and intra-organizational transactions in the supply chain. They used several tools such as quality loss function, data envelopment analysis, etc. with the aim of measuring these gaps. Their proposed framework appears to be beneficial to researchers and practicing managers for improvements in service quality in supply chains (Kannan et al., 2012: 712).

2.6.4 Container Shipping Service Quality

Globalization has caused a strong growth in seaborne trade and consequently provided new opportunities for container shipping service firms in the transport chain. At the same time, globalization has also led to strengthening global competition and has had a great impact on the way companies nowadays operate. The changing structure of global markets and as a natural result of changing demands of shippers has forced container shipping service firms to restructure their business processes to better satisfy shippers' needs (Yang et al., 2009: 4).

''Product'' in the container liner industry means that the transport services provided by container lines. Frankly, the transport service cannot be stored; because, once a particular voyage is undertaken, all unutilized slots on board will be wasted (Yin and Kim, 2012: 313). Liner service that provides regularly scheduled marine

transportation service on fixed routes has a number of service attributes, such as speed, reliability, competitive level of rates, and completeness of service to customers. For liner customers, some of these attributes can be expected to be more important than others and not all liner customers will attach the same importance to any particular attribute. To develop a liner service responsive to customer needs, carriers need to determine the attributes of that service, give individual importance, and know how customer segments differ on the importance of those service attributes (Collison, 1984: 40).

Service quality includes many dimensions that namely change according to different scholars and its improvement involves many strategic issues. The perception of service quality can differ due to different views of parties that act in liner transportation such as owners/operators or shippers/cargo owners or clients of liner shipping. For this reason, it is important to understand user's service quality concerns which can only be derived by marketing and customer concern studies. Another affair is the measurement of the service quality and its impact on performance and cost, where performance is concerned with long-term profitability (Frankel, 1993: 58).

Collison (1984) determined the importance of service attributes to a line's customers both in aggregate and by market segment. He found that transit time, schedule reliability, frequency of sailing and flexibility are most important criteria that effect liner shipping quality.

Suthiwartnarueput (1988) investigated the efficiency of the shipping industry in Thailand in her Ph.D. dissertation. Results of the study indicated that the most important service attribute was found to be the cost of service, followed by punctuality, transit times, frequency of sailings, directness of sailings, as well as past loss and damage experience. The information nature of advertising was noted as the least important item in this research.

Matear and Gray (1993) investigated freight transport services in Ireland. According to freight shippers the most important service attributes were fast response to problems, on-time collection and delivery, value for Money and good relationship with carriers. Freight carriers defined the most important service attributes as

punctuality of sea service, availability of freight space, high frequency of sea service and fast response to problems.

Frankel (1993) determined the quality criteria that indicate the major quality concerns with regards to liner shipping services. These criteria consist reliability of service, time of service and maintenance of delivery time, availability of promised or advertised capacity, cargo safety, security and maintenance, cargo flow control and tracking, documentation and information flows effectiveness (timeliness and accuracy), cost control, billing and cost management, service status control and projection, intermodal management.

Jamaluddin and Shah (1995) examined the marketing of liner shipping services with reference to the Far East/Europe trade. Freight rates, cargo care and handling, knowledge ability, punctuality, transit time and service frequency were the most important service factors that shippers considered. The six service factors considered important by carriers were: knowledge ability, freight rates, cargo care and handling, punctuality, transit time and service frequency.

Chiu (1996) analyzed the logistics performance of liner shipping, assessing carriers' performance from the shipper's perspective. He described six most important service attributes for shippers as prompt response from carrier to any problem, transit time, reliability, documentation services, notice of delay and assistance with loss/damage claims.

Durvasula et al. (1999) presented an application of SERVQUAL as a measurement of service quality in ocean freight services. The results of their study indicated that while five-dimensional factor of SERVQUAL measurement is reasonable, the measurements may be better represented by a more parsimonious (i.e. three-dimensional) factor structure where responsiveness, assurance, and empathy are combined into a single dimension.

Tuna (1999) investigated the service quality carried out within container transportation, the relationship between the perceived service quality and behavioral intentions as well as the feature of the customers. Documentation quality and shipment safety and security (loss and damage) were determined as the most important criteria from the perspective of shippers.

Chen et al. (2010) examined the validity of applying SERVQUAL to the shipping industry of Taiwan and the service quality gaps between business customer types and between employee statuses of business customers by using the data of perceived service quality of the forwarders and the shippers in the shipping industry of Taiwan. Their results of the study do not support the validity of applying SERVQUAL to the shipping industry of Taiwan due to the failures of discriminant and nomological validity.

Kannan (2010) offered a framework based on analytic hierarchy process to ocean container carriers operating in India, with a view to assist them in benchmarking their service quality. His study presented a framework for benchmarking the service quality of container carriers. According to Kannan (2010) Indian shippers use 48 attributes in the carrier evaluation process and they aggregate these service attributes under seven significant criteria, namely rate, customer service, operations, reputation, infrastructure, scheduling and information technology orientation and communication. Rate is considered as the most important service attributes dimensions.

Kannan et al. (2012) assisted ocean container carriers operating in India in their service quality improvement process. They selected seven container carriers and investigated their service capabilities. They determined the list of criteria that decide the service quality of ocean container carriers in the Indian market and then attempted to measure the service quality of the selected container carriers. After that, they carried out gap analysis to find out the comparative strengths and weaknesses of the selected container carriers.

Thai (2008) found that service quality in maritime transport is a six-dimensional construct consisting of resources, outcomes, process, management, image, and social responsibility (ROPMIS). Each dimension is measured by a number of explaining factors making up a total of 24 factors. The results of the study revealed that factors involving the outcomes and process of service provision, as well as the management factors, which all focus on satisfying the customers, received high ranking. They also indicated process and management-related factors which involve the center of all quality systems: the human element (Thai, 2008: 493). Table 10 presents the literature on service quality dimensions in container shipping.

Table 10: Summary of the Literature on Service Quality Dimensions in Container Shipping

Author	Resources	Output	Process	Management	Image	Social Responsibility
Pearson (1980)		-speed of transit -reliability -regularity	-flexibility -first on the quay			
Collison (1984)		-transit time -schedule reliability -frequency of sailing	-flexibility			
Suthiwartnarueput (1988)		-frequency of sailing -cost of service -punctuality -transit times -directness of sailings			-past loss and damage experience	
Frankel (1993)	–availability of capacity –cargo flow control and tracking	–service reliability –service time and delivery time –cargo safety, security and maintenance –timeliness and accuracy –cost control, billing and management		–service status control and projection –intermodal management		
Matear and Gray (1993)		-on-time collection and delivery	-fast response to problems		-good relationship with carriers	

Table 10: Summary of Literature on Service Quality Dimensions in Container Shipping (Continued)

Author	Resources	Output	Process	Management	Image	Social Responsibility
Jamaluddin and Shah (1995)		-freight rates -punctuality -transit time -service frequency	-cargo care and handling	-knowledge ability		
Chui (1996)		-transit time -reliability - documentation services - assistance with loss/damage claims	-fast response to problems - notice of delay			
Durvasula et al. (1999)	-tangibles	-reliability	-responsiveness -assurance -empathy			
Tuna (1999)	-equipment availability -equipment condition	-documentation quality -reliability -transit time	-courtesy of employee -knowledge of employee			
Chen et al. (2009)	-tangibles	-reliability	-responsiveness -assurance -empathy			
Kannan et al. (2010, 2012)	-infrastructure	-rate -customer service -scheduling	-operations - information technology orientation and communication		-reputation	

Note: The dimensions and factors of container shipping quality placed in Table according to ROPMIS Model
Source: Adapted from Thai, 2008

Corporate social responsibility can be seen as a new and indispensable dimension of maritime transport services because safety and environmental protection concerns have critical importance in maritime transportation. The shipping community and society nowadays are very interested in the safety and environmental protection awareness and responsible behavior of service providers in maritime transport. Ruiter (1999), Gratsos (1998) and Eliades (1992) claimed the importance of responsible behavior and activities regarding safety and environment concerns. The other service quality criteria proposed by the authors are safety, reliability and efficiency (Thai, 2008: 501)

Carrier selection studies shall be categorized as shipper-only studies, carrier versus shipper studies and carrier versus export and import shipper studies. Shipper-only studies are one dimensional study which considers the perceived importance of selection criteria only from shippers' perspective. Carriers versus shipper studies are two dimensional studies which study the perceptual differences of several criteria between carriers and shippers. Carriers must know that gaining competitive advantage and developing effective strategies to improve their service quality are possible by understanding the gap between their perception and the shippers' perception of several criteria. Carrier versus export and import shippers studies are multi-dimensional studies which examine the perceptual differences of the importance of various criteria between three groups of parties, namely carrier and export shippers, carrier and import shippers and export and import shippers (Kannan 2011: 756).

While shipper-only studies of carrier selection suppose what carriers should emphasize in the selection decision, shipper-carrier comparisons examine how well shipper expectations are actually met by carriers, and can provide the starting point for developing suggestions to address customer concerns (Murphy et al., 1997: 67). In the study of Murphy et al. (1997), it has been found that there are differences in perceptions of service quality between shippers and carriers. Many of research on carrier selection have focused on the motor carrier selection and depended on univariate analysis of individual carrier selection factors.

Most of transportation choice studies, both before and after deregulation, have indicated that shippers consider service to be more important than price in

carrier selection. Murphy et al. (1991: 33) states that a major source of freight forwarder income is "the price difference between the rate the forwarder quotes a shipper and the lower rate per pound it receives for the consolidated shipments." Consequently, freight forwarders might place a higher priority on price as a criterion in carrier selection. Yin and Kim (2012: 313) claims that the service quality by different lines is more or less at the same level, the offered freight rates become one of the significant factors forwarders need to consider when choosing a specific container line. Therefore, all rational forwarders will tend to choose the one giving them the most profit.

Andel (1996) suggests that shippers are more likely to select carriers that provide better service, so carriers should consider that their marketing strategies should give maximum emphasis to the most important selection criteria to maximize customer satisfaction. When the carrier gives too much importance to the wrong criteria and de-emphasis on certain selection criteria important to customer may lead to customer dissatisfaction and probably customer losts (Abshire and Premeaux, 1991).

In the literature, many carrier selection criteria have been researched since 1970, a small number of these researches have offered both shipper and carrier perspectives. Crum and Allen (1997) suppose that shippers are increasingly demanding better quality service from carriers.

Bardi et al. (1989) investigated the effect of deregulation on carrier selection. Their study described 18 carrier selection determinant measures into four selection factors including rate related factors, customer service, claims handling and follow up, and special equipment availability and flexibility (Table 11). The five most important carrier selection criteria that they determined were transit time reliability, transportation rates, total transit time, willingness of the carrier to negotiate rates and financial stability of the carrier. The study of Bardi et al. (1989) provided the inspiration for the container carrier selection studies.

Table 11: Carrier Selection Criteria in Freight Transportation

Transit time reliability/consistency
Special equipment
Pickup and delivery service
Quality of carrier salesmanship
Door-to-door transportation rates
Freight loss and damage
Total door-to-door transit time
Claims processing
Shipment expediting
Willingness of carrier to negotiate rate changes
Frequency of service
Linehaul services
Financial stability of carrier
Scheduling flexibility
Quality of operating personnel
Willingness of carrier to negotiate service changes
Equipment availability
Shipment tracing

Source: Bardi et al., 1989

According to the liner companies, their selection criteria in view of a shipper are the voyage duration, the frequency and the flexibility of the itineraries, the reliable execution of the transport and the immediacy of the itineraries. Shippers' primary expectations from carriers are safe carriage of goods and the compliance of company with the international safety standards. The carrier's image in the market and the history of losses and damages are other important criteria in selecting the liner company by the shipper. The freight has low effect on shippers' decision in selecting carrier, although it is taken seriously under consideration by them (Plomaritou, 2006: 12).

Pearson (1980) investigated container carrier performance and service quality from shippers' perspective in the UK. He supposes that service attributes such as port itinerary, sailing date, expected arrival date, reliability, regularity, transit time, port proximity, slot availability, etc. are essential criteria in the carrier selection.

According to Brooks (1984, 1985, 1990) cost of service (the most important selection criteria), frequency of sailings, carrier's reputation for reliability, transit time and directness of sailings are important determinants that effect shippers' choice

of container carrier. The other carrier selection criteria are tracing capability of the carrier, sales representative, on-time pick-up and delivery, cooperation between personnel, carrier flexibility, fast claims response, , past loss and damage experience, informational nature of advertising and carrier appropriateness.

Murphy et al. (1991) suggested that intermediary parties, such as brokers and freight forwarders, also make critical transportation choice decisions, not only with respect to "links," but with "nodes" (e.g., airports and water ports) as well. The authors investigated carrier and port selection criteria from the perspective of international freight forwarders. Equipment availability, shipment information, and loss and damage performance were the three most important carrier selection criteria among international freight forwarders. These findings are placed in marked contrast to post deregulation studies on carrier selection, in which reliability and transportation costs have been recognized as key selection factors. Freight forwarders ranked these two factors as fourth and fifth criteria.

Murphy et al. (1997) investigated the relative importance of the carrier selection factors between shippers and carriers. Their study's result indicated that equipment availability, transit time, financial stability, loss and damage, freight rates, rate changes, cargo tracing, line haul service and claims were found to be more important for shippers than for carriers.

Kent and Parker (1998) investigated containership carrier selection criteria and found that there are significant differences between import shippers and carriers; export shippers and carriers; and between import shippers and export shippers. The authors suppose that containership carriers can have well designed transportation strategy by understanding the selection criteria of both import and export customer. They also mention that the international influence on the containerization carrier industry does require some changes in the transportation strategy of the company

Tuna and Silan (2002) defined the determinants of the selection criteria within the liner shipping and conducted a field study among the Turkish shippers. The result of study showed that "reliability and the competence" was the most important factor for the shippers in terms of liner shipping. They proposed that liner transport service providers need to consider each determinant within the "reliability and competence" factor that includes "responding to complaints quickly, delivering

the cargo at the promised time, responding to enquiries promptly, issuing accurate price quotations, issuing accurate shipping documentation, willingness of the personnel to help, dependability in handling problems, expert and knowledgeable personnel, 'transit time, issuing shipping documentation quickly, giving clear & correct information about costs, informing whether goods will be transshipped, responding to urgent deliveries quickly, delivering the cargo without damage".

Lu (2003) determined the five most important carrier service attributes according to shippers as availability of cargo space, low damage or loss record, accurate documentation, reliability of advertised sailing schedules, and courtesy of inquiry. This research supposes that carriers need to be especially concerned with shippers' perceptions of these service factors when developing a shipper–carrier partnering relationship.

Wen and Huang (2007) investigated freight forwarders' perceived satisfaction on service attributes of ocean carriers and their choice behaviors. In their study, a number of service attributes associated with ocean carrier were identified and reduced to three factors – speed/reliability, safety/empathy and convenience. The study also revealed that transit time, frequency of sailing, record of cargo delay, freight rate and two service quality factors (speed/reliability and convenience) are the significant variables influencing the choice of ocean carriers.

Wong et al. (2007) investigated the problems of carrier selection in the China Pearl River delta area, with respect to international shipping. They determined 50 criteria that impact on shipper's selection criteria of carrier and further grouped them under two main categories, namely internal and external factors.

- Internal factors:
  - shipper's reputation
  - cargo location
  - shipper's own capabilities.
- External factors:
  - customer service
  - cargo handling capabilities
  - relationship with Customs office
  - comprehensive global service.

Kannan et al. (2012) investigated ocean container carrier selection criteria from the Indian shipper's perspective and found that low freight is the most important criteria to choose container carrier. The other important factors are pricing flexibility, flexibility, equipment availability and safety. Table 12 summarizes the customer's carrier selection criteria of container shipping service.

Table 12: Summary of the Literature on Carrier Selection Criteria in Container Shipping

ROPMIS DIMENSIONS	CARRIER SELECTION CRITERIA		AUTHORS
RESOURCES	1	Equipment availability	Kent and Parker (1999), Wen and Huang (2007), Wong et al. (2008), Kannan et al. (2012)
	2	Special equipment availability	Kent and Parker (1999), Tuna and Silan (2002), Lu (2003), Wen and Huang (2007), Wong et al. (2008), Kannan et al. (2012)
	3	Condition of containers	Tuna and Silan (2002), Lu (2003), Kannan et al. (2012)
	4	Financial stability	Kent and Parker (1999), Kannan et al. (2012)
	5	Shipment tracing	Brooks (1990), Kent and Parker (1999), Tuna and Silan (2002), Wen and Huang (2007), Wong et al. (2008), Kannan et al. (2012)
	6	Geographical coverage	Lu (2003), Wong et al. (2008), Kannan et al. (2012)
	7	Haulage	Lu (2003), Kannan et al. (2012)
OUTCOMES	8	Directness of sailings	Brooks (1990), Kannan et al. (2012)
	9	Transit time reliability	Kent and Parker (1999), Tuna and Silan (2002), Wen and Huang (2007), Wong et al. (2008), Kannan et al. (2012)
	10	Committed schedules	Kannan et al. (2012)
	11	On time pick-up and delivery	Brooks (1990), Kent and Parker (1999), Tuna and Silan (2002), Lu (2003), Wen and Huang (2007), Wong et al. (2008), Kannan et al. (2012)
	12	Reliability	Tuna and Silan (2002), Kannan et al. (2012)
	13	Claim settlement	Brooks (1990), Kent and Parker (1999), Tuna and Silan (2002), Lu (2003), Wen and Huang (2007), Wong et al. (2008), Kannan et al. (2012)
	14	Safety	Kent and Parker (1999), Tuna and Silan (2002), Lu (2003), Wen and Huang (2007), Wong et al. (2008), Kannan et al. (2012)
	15	Documentation quality	Tuna and Silan (2002), Lu (2003), Kannan et al. (2012)
	16	Low freight	Kent and Parker (1999), Lu (2003), Wong et al. (2008), Kannan et al. (2012)
	17	Competitive charges	Wong et al. (2008), Kannan et al. (2012)
	18	Credit facility	Kannan et al. (2012)
	19	Pricing flexibility	Kent and Parker (1999), Tuna and Silan (2002), Lu (2003), Wong et al. (2008), Kannan et al. (2012)
	20	Container detention free days	Kannan et al. (2012)
	21	Convenient schedules	Brooks (1990), Kent and Parker (1999), Lu (2003), Kannan et al. (2012)
	22	Sailing reliability	Lu (2003), Wen and Huang (2007), Kannan et al. (2012)

Table 12: Summary of Literature on Carrier Selection Criteria in Container Shipping (Continued)

ROPMIS DIMENSIONS	CARRIER SELECTION CRITERIA		AUTHORS
PROCESS	23	Courtesy	Tuna and Silan (2002), Lu (2003), Kannan et al. (2012)
	24	Flexibility	Kent and Parker (1999), Kannan et al. (2012)
	25	Responsiveness	Tuna and Silan (2002), Kannan et al. (2012)
	26	Communication	Tuna and Silan (2002), Wen and Huang (2007), Kannan et al. (2012)
	27	Complaint handling	Lu (2003), Kannan et al. (2012)
	28	Personal attention	Kannan et al. (2012)
	29	Sales call regularity	Lu (2003), Kannan et al. (2012)
	30	Competence of employees	Kent and Parker (1999), Lu (2003), Wen and Huang (2007), Kannan et al. (2012)
	31	Online booking	Lu (2003), Kannan et al. (2012)
	32	Trade announcements	Brooks (1990), Lu (2003), Kannan et al. (2012)
	33	Record maintenance	Kannan et al. (2012)
	34	Confidentiality	Kannan et al. (2012)
	35	Handling emergency	Wong et al. (2008), Kannan et al. (2012)
	36	Customs clearance	Lu (2003), Kannan et al. (2012)
	37	Arrival and delay notice	Tuna and Silan (2002), Kannan et al. (2012)
	38	On-time release of documents	Tuna and Silan (2002), Kannan et al. (2012)
MANAGEMENT	39	Understanding the customer	Kannan et al. (2012)
	40	Empathy	Kannan et al. (2012)
IMAGE	41	Hospitality	Kannan et al. (2012)
	42	Reputation	Brooks (1990), Wen and Huang (2007), Kannan et al. (2012)
	43	Quality certification	Kannan et al. (2012)
	44	Physical facilities	Wong et al. (2008), Kannan et al. (2012)
	45	Convenient operating hours	Tuna and Silan (2002), Kannan et al. (2012)
	46	Gifts and compliments to customers	Kannan et al. (2012)
	47	Professional appearance	Kannan et al. (2012)
	48	Proximity	Kannan et al. (2012)
SOCIAL RESPONSIBILITY			

Source: Adapted from Kannan et al., 2012

2.6.5 Conceptual Model of the Research

Earlier in this study, the general conceptualization of container shipping service quality dimensions was proposed as the general framework for quality dimensions in the container shipping service. The conceptual model of this research was developed according to requirements of descriptive research (Figure 24). However the study can also be defined as exploratory research, because it finds out

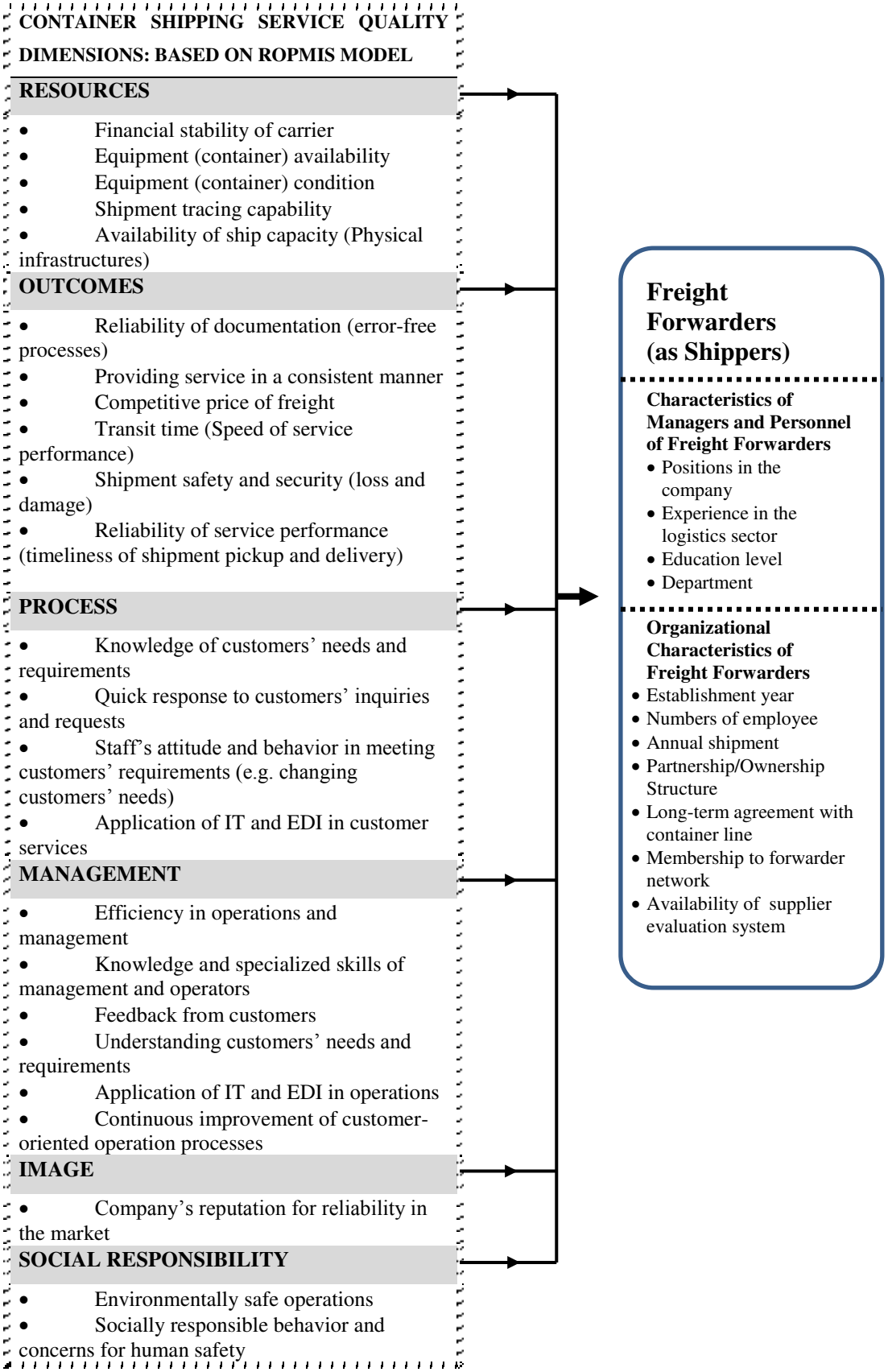
service quality factors in container shipping from the perspective of freight forwarders.

The review of the literature, given in the previous sections, on maritime transportation service quality has revealed that identified dimensions of ROPMIS scale seems to be more appropriate for measuring container shipping service quality considering the nature and attributes of container shipping services. From this viewpoint, Thai's maritime service quality scale adapted to container shipping service quality and conceptual model was created based on this scale. The conceptual model of this study consequently suggests that quality of container shipping services is a construct comprising six dimensions with associated 24 factors.

Conceptual model of this study was developed to reach following aims;

- to suggest a reliable container shipping service quality scale and
- to find whether or not the perceptions of container shipping service quality variables differ according to some characteristics of the respondents and their companies.

Figure 24: Conceptual Model of the Research



CHAPTER THREE
METHODOLOGY OF THE RESEARCH

3.1 METHODOLOGY OF THE RESEARCH

3.1.1 Aim and Scope of the Research

This study generally aims to determine service quality dimensions in container shipping and proposes a model to measure service quality in container shipping. The study also reveals service quality perceptions of freight forwarders who are considered as shippers against carriers and act as an important intermediary between shippers and carriers in container shipping.

The following objectives are aimed at this study;

- to explore and determine dimensions and components of container shipping service quality based on the ROPMIS model.
- to assess the reliability and validity of container shipping service quality scale developed
- dimensions and attributes of container shipping service quality
- to determine whether or not the perceptions of container shipping service quality differ according to the profiles of the respondents and their companies.

In the study, managers and personnel of the freight forwarders active in the field of sea transportation in Turkey were selected as the sample. Freight forwarders acts as an intermediary between shippers and container shipping lines, so they know service quality expectations of shippers from container shipping lines. They are also familiar to service quality perceptions of container shipping lines. Therefore, freight forwarders are the best sample for determining service quality factors in container shipping as their responses are most likely to reflect the opinions of both shippers and carriers.

3.1.2 Questionnaire Development and Design

The questionnaire developed in two parts consists of quality attributes of container shipping service and respondents' profile questions. As shown in Table 9 and Table 11, the factors included in the study have been adapted from ROPMIS scale and the existing relevant literature. In Part One, adapted 24 items from ROPMIS Scale was asked to freight forwarders. They were requested to rate the importance of the adapted 24 items of ROPMIS Scale measuring container shipping service quality on a 5-point Likert scale, starting from 1 as ''not at all important'' to 5 as ''very important''. These items were placed in the questionnaire based on questionnaire developed by Thai (2008) where he placed randomly to avoid the order bias. In addition to these 24 items, 11 items were derived from the literature of container shipping service quality and carrier selection in container shipping. The respondents who were likely to consider the first excerpt of 24 items insufficient were asked to rate the importance of these additional set of 11 items. The 5 point Likert scale was also used to rate importance of the 11 supplementary items. Part Two includes profile questions relevant to the respondents and their companies. Nominal scales were used to collect data about the profile of the freight forwarders and the respondents (Table 13).

Table 13: Scales Used in the Container Shipping Service Quality Questionnaire

Variables	Scales	Place in Questionnaire
Quality attributes of container shipping service quality	24 items with 5-point Likert Scale 11 items with 5-point Likert Scale	**Part I**
Characteristics of the Freight Forwarders	Nominal Scales Open-ended questions	**Part II**

In the literature of service quality, studies are generally relevant to consumer markets. However, studies on service quality in business to business service markets are limited. When the maritime transportation literature was reviewed in terms of service quality, it is observed that studies are generally focused on port service quality and container shipping service quality. But the number of studies on container shipping service quality is a few.

In this study, literature on container shipping carrier selection and container shipping service quality were also reviewed. In the literature, SERVQUAL model was generally used by scholars to measure container shipping service quality. (Durvasula et al., 1999; Tuna,1999;Lobo, 2010; Ugboma et al., 2004; Chen et al., 2009). This study is based on Thai's model to measure container shipping service quality, since his model approaches the maritime transportation service quality from the business to business marketing perspective. So, the ROPMIS Scale used to measure maritime transportation service quality was adapted to container shipping service (Table 14). The model consists of the following six dimensions with 24 items;

- Resources
- Outcomes
- Process
- Management
- Image/reputation
- Social responsibility

Table 14: The Container Shipping Service Quality Items Adapted from the ROPMIS Scale

	Items
1	Financial stability of carrier
2	Reliability of documentation (error-free processes)
3	Equipment (container) availability
4	Environmentally safe operations
5	Efficiency in operations and management
6	Knowledge of customers' needs and requirements
7	Continuous improvement of customer-oriented operation processes
8	Providing service in a consistent manner (maintaining service quality in any situation)
9	Quick response to customers' inquiries and requests
10	Knowledge and specialized skills of management and operators
11	Equipment (container) condition (e.g. old or new, specialized or not)
12	Competitive price of freight
13	Shipment tracing capability
14	Feedback from customers
15	Understanding customers' needs and requirements
16	Application of IT and EDI in customer services
17	Staff's attitude and behavior in meeting customers' requirements (e.g. changing customers' needs)
18	Transit time (Speed of service performance)
19	Shipment safety and security (loss and damage)
20	Socially responsible behavior and concerns for human safety
21	Application of IT and EDI in operations
22	Reliability of service performance (timeliness of shipment pickup and delivery)
23	Company's reputation for reliability in the market
24	Availability of ship capacity (Physical infrastructures)

The literature review of container shipping service quality shows that carrier selection criteria in container shipping are the sources of service quality studies in this field (Jamaluddin and Shah, 1995; Tuna, 1999; Chen et al., 2009; Kannan et al, 2010). When both the service quality and carrier selection studies in container shipping were examined, it was revealed that the factors are similar. In addition to the items used by ROPMIS Scale, eleven items were inserted into the questionnaire as supplementary factors since they were heavily emphasized in the carrier selection literature. Table 15 presents the supplementary container shipping service quality items.

Table 15: The Supplementary Container Shipping Service Quality Items

	Items
1	Service to many ports across the world
2	Knowledge and specialized skills of employees
3	On-time release of documents
4	Adherence to committed sailing schedules
5	Sailing frequency of container carrier
6	Pricing flexibility (Willingness to negotiate rates)
7	Extending credit facilities to shippers
8	Prompt settlement of damage/ refund claims
9	Proper and on-time communication about any matter relating to shipments
10	Door to door transport management
11	Past loss and damage experience

The questionnaire was tested on three freight forwarder managers who have experience of more than 10 years in container shipping industry. In addition to this, three academicians who have studied on shipping and logistics revised the questionnaire. Final version of the questionnaire was developed considering the feedback received from the industrial experts and academicians. The questionnaire was originally written in English but later translated into Turkish with the help of an academician who is expert in Maritime English to provide easy understanding for the respondents.

3.1.3 Sampling

The data were collected from the managers and personnel of the freight forwarders in Turkey who regularly use the services of container shipping lines for their customers' export and import shipments. A list of 406 freight forwarder companies from Association of International Forwarding and Logistics Service Providers (UTIKAD) was examined in detail. In the list, 238 of freight forwarders who do not use sea transportation and those whose contact addresses could not be provided were eliminated. After these eliminations, a list of 168 freight forwarder companies was used as sample in the study. The questionnaire was sent to each freight forwarder by requesting three sets of responses from senior manager, department manager and the other staff (sales representative, customer representative etc.). By the cut-off date of survey, totally 112 questionnaires were returned from 62 freight forwarder companies.

3.1.4 Data Collection

The questionnaire form was used as data collection instrument. The questionnaire was sent on 6 April 2015 to the freight forwarder companies by e-mail consisting of an attachment and web link of web site. Web site was created to increase the response rate because it would provide ease of reply. 33 of the freight forwarder managers and staff answered the questionnaire by e-mail and 45 of freight forwarder managers and staff by web site. After a month, freight forwarders who did not respond to the questionnaire were requested to respond it by e-mail. 24 of freight forwarders were also called by phone and requested to respond the questionnaire. As a result, 46 of freight forwarder personnel responded to the questionnaire by e-mail and 66 of freight forwarder personnel by web site. 28 of the questionnaire were taken from general managers, regional managers and branch managers. 36 of the questionnaire were taken from department managers (sales and marketing managers, operation managers, business development managers, accounting managers etc.). 48 of the questionnaire were taken from sales and marketing representatives.

3.1.5 Data Analysis Methods

The data collected from the freight forwarder personnel were analyzed using SPSS version 16.0 statistics program. The statistics methods used in data analysis are given in Table 16.

Table 16: The Statistics Methods Used in Data Analysis

Purpose of the Analysis	**Analysis Method**
Evaluation of freight forwarders' profile	Descriptive Statistics (frequency and percentage)
Evaluation of the descriptive statistics	Descriptive Statistics (mean, standard deviation), (frequency and percentage)
Determination of the reliability of scales	Reliability Analysis (Cronbach alpha)
Determination of the suitability of scales to factor analysis	Barlett sphericity test Kaiser-Meyer-Olkin test
Determination of the container shipping service quality dimensions	Factor Analysis (Exploratory factor analysis)
Analysis of the differences in the perceptions of container shipping based on some characteristics of freight forwarders	Variance Analysis (One-way anova) T-test

CHAPTER FOUR
RESULTS AND FINDINGS OF THE RESEARCH

4.1 PROFILE OF THE RESPONDENTS AND THEIR COMPANIES

In this part of the study, profiles and characteristics of the respondents and their companies were analyzed.

4.1.1 Positions of the Respondents in Their Companies

Positions of the respondents in their companies were asked in the profile questions. The responses reveal that 25 percent of the respondents are general managers, regional managers and branch managers. Department managers group include sales and marketing managers, operation managers, business development managers and accounting managers and constitute 32.1 percent of the total respondents. 42.9 percent of the respondents are marketing and sales representatives (Table 17).

Table 17: The Distribution of the Respondents in terms of Their Positions in the Company

Positions of the respondents in the company	Frequency	Percent	Valid Percent
General managers, regional managers, branch managers	28	25,0	25,0
Department managers	36	32,1	32,1
Marketing and sales representatives	48	42,9	42,9
Total	112	100,0	100,0

4.1.2 Industrial Experience of the Respondents

The respondents were asked how long they had been working in the maritime industry to assess confidence in their responses. Industrial experience of the respondents in the maritime industry is an important criterion for evaluating the container shipping service quality. This question was answered by all of the respondents. 55.4 percent of the respondents have experience of 10 years or more in maritime industry. 21.4 percent of the respondents have experience of between 5-9

years. The respondents who have less than experience of 5 years in the maritime industry constitute 23.2 percent of the total respondents (Table 18).

Table 18: The Distribution of the Respondents in terms of Their Industrial Experiences

Industrial experience of the respondents	Frequency	Percent	Valid Percent
1-4	26	23,2	23,2
5-9	24	21,4	21,4
10-14	34	30,4	30,4
15 and more than 15	28	25,0	25,0
Total	112	100,0	100,0

4.1.3 Education Levels of the Respondents

When the education levels of the respondents were examined, it was found that the majority of the respondents have Bachelor degree (79.5 percent). The respondents who have master degree constitute 12.5 percent of the total respondents. 5.4 percent of the respondents have associate degree. This group is followed by high school degree (2.7 percent) (Table 19).

Table 19: The Distribution of the Respondents in terms of Their Education Levels

Education Levels of the Respondents	Frequency	Percent	Valid Percent
High school	3	2,7	2,7
Associate degree	6	5,4	5,4
Bachelor degree	89	79,5	79,5
Master degree	14	12,5	12,5
Total	112	100,0	100,0

4.1.4 The Departments the Respondents are Employed in the Company

The majority of the respondents work in sales and marketing departments (44.6 percent). 30.4 percent of the respondents are employed in operation departments. The other respondents are from administration departments (19.6 percent), business development department (3.6 percent) and accounting department (1.8 percent) (Table 20).

Table 20: The Distribution of the Respondents in terms of the Departments They Are Employed in

Department of the Respondents	Frequency	Percent	Valid Percent
Sales and marketing department	50	44,6	44,6
Operation department	34	30,4	30,4
Business development department	4	3,6	3,6
General management	22	19,6	19,6
Accounting department	2	1,8	1,8
Total	112	100,0	100,0

4.1.5 Establishment Years of the Companies Involved in the Study

25.8 percent of the companies have been operating since 1990's. The foundation years of the 21 percent of the companies are 1991- 2000, those of another 21 percent of 2001-2010. 25.8 percent of the companies are 2010 (Table 21).

Table 21: The Distribution of the Companies in terms of Their Establishment Years

Establishment Years of the Companies	Frequency	Percent	Valid Percent
1990 and before	16	25,8	25,8
1991-2000	13	21,0	21,0
2001-2010	13	21,0	21,0
2011-2015	16	25,8	25,8
No response	4	6,5	6,5
Total	62	100,0	100,0

4.1.6 The Number of Employees Employed by the Companies Involved in the Study

29 percent of the companies employ between 50-250 employees in their organization. This group is followed by the companies with 10-49 employees (29 percent). 19.4 percent of the companies employ more than 250 employees. 22.6 percent of the companies employ fewer than 10 employees (Table 22).

Table 22: The Distribution of the Companies in terms of Their Total Number of Employees

Number of employee of the companies	Frequency	Percent	Valid Percent
1-9	14	22,6	22,6
10-49	18	29,0	29,0
50-250	18	29,0	29,0
More than 250	12	19,4	19,4
Total	62	100,0	100,0

4.1.7 Annual Shipment of the Companies Involved in the Study (TEU)

Most of the companies have total shipments between 5,001- 30,000 TEU in a year (43.5 percent). 37.1 percent of the companies have shipments between 1-5000 TEU in a year. 19.4 percent of the companies' annual shipments are more than 30000 TEU in a year (Table 23.

Table 23: The Distribution of the Companies in terms of Their Annual Shipment (TEU)

Annual Shipment (TEU) of the companies	Frequency	Percent	Valid Percent
1-5,000	23	37,1	37,1
5,001-30,000	27	43,5	43,5
more than 30,000	12	19,4	19,4
Total	62	100,0	100,0

4.1.8 Partnership/Ownership Structure of the Companies Involved in the Study

When the partnership/ownership structures of companies were analyzed, it was found that most of the companies are purely local companies (61.3 percent). 21.0 percent of the companies are purely foreign companies. This group is followed by local-foreign partnership companies (17.7 percent) (Table 24).

Table 24: The Distribution of the Companies in terms of Their Partnership/Ownership Structures

Partnership/Ownership Structure	Frequency	Percent	Valid Percent
Purely local	38	61,3	61,3
Purely foreign	13	21,0	21,0
Local-foreign partners	11	17,7	17,7
No response	-	-	-
Total	62	100,0	100,0

4.1.9 Existence of Long-term Agreements between Container Lines and the Companies Involved in the Study

Making long-term agreements with container shipping lines provides advantage for high volume shippers such as credit facilities, offering lower freight rate, providing priority in shipment etc.. These are also important carrier selection criteria in container shipping. 77.4 percent of the companies have long-term agreements with container shipping lines. 22.6 percent of the companies do not have long-term agreements with container shipping lines (Table 25).

Table 25: The Distribution of Companies in terms of Whether There Exist Long-term Agreements between Container Shipping Lines and Their Companies

Agreement with Container Shipping Lines	Frequency	Percent	Valid Percent
Yes	48	77,4	77,4
No	14	22,6	22,6
No response	-	-	-
Total	62	100,0	100,0

4.1.10 Membership of the Companies to the Forwarder Networks Involved in the Study

Nowadays, freight forwarder companies establish business to business networks to decrease their costs and improve their service quality in their shipments. 80.6 percent of the companies are the members of the forwarder networks. 19.4 percent of the companies do not have membership to any forwarder networks (Table 26).

Table 26: The Distribution of Companies in terms of Their Membership to Any Forwarder Network

Membership to the Forwarder Network	Frequency	Percent	Valid Percent
Yes	50	80,6	80,6
No	12	19,4	19,4
Total	62	100,0	100,0

4.1.11 Existence of the Supplier Evaluation System of the Companies Involved in the Study

It is important to evaluate carrier's performance for all freight forwarders, but the number of freight forwarders that evaluates their supplier systematically is not enough. 48.4 percent of the companies have the supplier evaluation systems. However, 51.6 percent of the companies do not have the supplier evaluation systems (Table 27).

Table 27: The Distribution of Companies in terms of Whether They Have the Supplier Evaluation System

The Supplier Evaluation System	Frequency	Percent	Valid Percent
Yes	30	48,4	48,4
No	32	51,6	51,6
No response	-	-	-
Total	62	100,0	100,0

4.2 DESCRIPTIVE STATISTICS OF THE SCALES USED IN THE STUDY

The aim of the analysis applied in this part is to present the descriptive statistics about the scales used in the study. Mean and standard deviation values were found for all the factors of container shipping service quality scales. Frequency and percentage of respondents were also calculated for these factors.

4.2.1 Descriptive Statistics of the Container Shipping Service Quality Scale

Overall mean scores and standard deviations are ranked in order from the highest importance to the lowest importance in Table 28. The most important factor according to the respondents is "the shipment safety and security (loss and damage)" (mean=4.69). 72.3 percent of the respondents marked this factor as "very important" factor which determines the container shipping service quality. The other factors are "reliability of documentation (error-free processes)" (mean=4.64), "quick response to

customers' inquiries and requests" (mean=4.61), "competitive price of freight" (mean=4.49) and "equipment (container) availability" (mean=4.49).

Table 28: Descriptive Statistics of the Container Shipping Service Quality Scale (Mean and Standard Deviation)

Ranking of Importance	Factors of the Container Shipping Service Quality Scale	N	Mean	Standard Deviation
1	Shipment safety and security (loss and damage)	112	4,69	,554
2	Reliability of documentation (error-free processes)	112	4,64	,567
3	Quick response to customers' inquiries and requests	112	4,61	,543
4	Competitive price of freight	112	4,49	,615
4	Equipment (container) availability	112	4,49	,671
5	Reliability of service performance (timeliness of shipment pickup and delivery)	112	4,48	,569
6	Staff's attitude and behavior in meeting customers' requirements (e.g. changing customers' needs)	112	4,46	,656
7	Providing service in a consistent manner (maintaining service quality in any situation)	112	4,45	,627
8	Understanding customers' needs and requirements	112	4,38	,633
9	Shipment tracing capability	112	4,35	,667
10	Equipment (container) condition (e.g. old or new, specialized or not)	112	4,34	,717
11	Continuous improvement of customer-oriented operation processes	112	4,32	,750
12	Knowledge of customers' needs and requirements	112	4,28	,796
13	Knowledge and specialized skills of management and operators	112	4,27	,735
14	Company's reputation for reliability in the market	112	4,20	,792
15	Transit time (Speed of service performance)	112	4,17	,599
16	Efficiency in operations and management	112	4,04	,799
16	Financial stability of carrier	112	4,04	,910
17	Feedback from customers	112	3,94	,841
18	Application of IT and EDI in customer services	112	3,93	,824
19	Availability of ship capacity (Physical infrastructures)	112	3,87	,905
19	Application of IT and EDI in operations	112	3,87	,829
20	Socially responsible behavior and concerns for human safety	112	3,67	1,110
21	Environmentally safe operations	112	3,49	1,048

Scale; 1=Not at all important; 3=Neutral; 5=Very important

Table 29: Descriptive Statistics of the Container Shipping Service Quality Scale (Frequency and Percentage)

Factors of the Container Shipping Service Quality Scale	Not at all important		Not important		Neutral		Important		Very important	
	F	%	F	%	F	%	F	%	F	%
Financial stability of carrier	1	,9	7	6,3	17	15,2	49	43,8	38	33,9
Reliability of documentation	-	-	1	0,9	2	1,8	33	29,5	76	67,9
Equipment (container) availability	-	-	2	1,8	5	4,5	41	36,6	64	57,1
Environmentally safe operations	6	5,4	10	8,9	38	33,9	39	34,8	19	17,0
Efficiency in operations and management	1	,9	1	,9	24	21,4	52	46,4	34	30,4
Knowledge of customers' needs and requirements	-	-	4	3,6	12	10,7	45	40,2	51	45,5
Continuous improvement of customer-oriented operation processes	1	,9	3	2,7	4	3,6	55	49,1	49	43,8
Providing service in a consistent manner	-	-	1	,9	5	4,5	49	43,8	57	50,9
Quick response to customers' inquiries and requests	-	-	-	-	3	2,7	38	33,9	71	63,4
Knowledge and specialized skills of management and operators	1	,9	1	,9	10	8,9	55	49,1	45	40,2
Equipment (container) condition	-	-	-	-	16	14,3	42	37,5	54	51,8
Competitive price of freight	-	-	-	-	7	6,3	43	38,4	62	55,4
Shipment tracing capability	-	-	1	,9	9	8,0	52	46,4	50	44,6
Feedback from customers	1	0,9	7	6,3	16	14,3	62	55,4	26	23,2
Understanding customers' needs and requirements	-	-	1	,9	6	5,4	54	48,2	51	45,5
Application of IT and EDI in customer services	-	-	8	7,1	18	16,1	60	53,6	26	23,2
Staff's attitude and behavior in meeting customers' requirements	-	-	1	,9	7	6,3	44	39,3	60	53,6
Transit time	-	-	1	,9	9	8,0	72	64,3	30	26,8
Shipment safety and security	-	-	1	,9	2	1,8	28	25,0	81	72,3
Socially responsible behavior and concerns for human safety	6	5,4	9	8,0	30	26,8	38	33,9	29	25,9
Application of IT and EDI in operations	2	1,8	3	2,7	25	22,3	59	52,7	23	20,5
Reliability of service performance	-	-	-	-	4	3,6	50	44,6	58	51,8
Company's reputation for reliability in the market	1	,9	2	1,8	14	12,5	52	46,4	43	38,4
Availability of ship capacity	3	2,7	4	3,6	24	21,4	55	49,1	26	23,2

Scale; 1=Not at all important; 3=Neutral; 5=Very important

4.2.2 Descriptive Statistics of the Supplementary Container Shipping Service Quality Scale

The aim of the supplementary container shipping service quality scale is to determine the other important factors considered by freight forwarders for container shipping service quality. Responding this scale was optional because the respondents were requested to go on rating to this scale if they think the container shipping service quality scale adapted from the ROPMIS Scale is inadequate to measure container shipping service quality. 91 of 112 respondents preferred to go on rating this scale. Overall mean scores and standard deviations are ranked in order from the highest importance to the lowest importance in Table 30. "Proper and on-time communication about any matter relating to shipments" has been determined as the most important supplementary factors by freight forwarders with 4.66 mean score. 72.5 percent of the respondents marked this variable as "very important" supplementary factor that determines container shipping service quality. The second important criteria are "the knowledge and specialized skills of employees" (mean=4.56) and "on-time release of the documents" (mean=4.56).

Table 30: Descriptive Statistics of the Supplementary Container Shipping Service Quality Scale (Mean and Standard Deviation)

Ranking of Importance	Supplementary Service Quality Attributes of Container Shipping	N	Mean	Standard Deviation
1	Proper and on-time communication about any matter relating to shipments	91	4,66	,670
2	Knowledge and specialized skills of employees	91	4,56	,733
2	On-time release of documents	91	4,56	,562
3	Prompt settlement of damage/ refund claims	91	4,48	,721
4	Adherence to committed sailing schedules	91	4,42	,684
5	Extending credit facilities to shippers	91	4,40	,665
6	Pricing flexibility (Willingness to negotiate rates)	91	4,27	,776
7	Service to many ports across the world	91	4,16	,749
8	Sailing frequency of container carrier	91	4,14	,659
9	Past loss and damage experience	91	3,89	,900
10	Door to door transport management	91	3,84	,946

Scale; 1=Not at all important; 3=Neutral; 5=Very important

Table 31: Descriptive Statistics of the Supplementary Container Shipping Service Quality Scale (Frequency and Percentage)

Supplementary container shipping service quality variables	**Not at all important**		**Not important**		**Neutral**		**Important**		**Very important**	
	F	%	F	%	F	%	F	%	F	%
Service to many ports across the world	-	-	4	4,4	7	7,7	50	54,9	30	33,0
Knowledge and specialized skills of employees	1	1,1	2	2,2	1	1,1	28	30,8	59	64,8
On-time release of documents	-	-	-	-	3	3,3	34	37,4	54	59,3
Adherence to committed sailing schedules	1	1,1	-	-	4	4,4	41	45,1	45	49,5
Sailing frequency of container carrier	-	-	2	2,2	8	8,8	56	61,5	25	27,5
Pricing flexibility (Willingness to negotiate rates)	1	1,1	1	1,1	9	9,9	41	45,1	39	42,9
Extending credit facilities to shippers	-	-	-	-	9	9,9	37	40,7	45	49,5
Prompt settlement of damage/ refund claims	-	-	2	2,2	6	6,6	29	31,9	54	59,3
Proper and on-time communication about any matter relating to shipments	1	1,1	1	1,1	1	1,1	22	24,2	66	72,5
Door to door transport management	1	1,1	5	5,5	28	30,8	31	34,1	26	28,6
Past loss and damage experience	1	1,1	5	5,5	21	23,1	40	44,0	24	26,4

4.3 THE RELIABILITY ANALYSIS OF THE SCALES USED IN THE STUDY

The scale reliability is defined as the consistency of individual's response to scale variables. The correlation (r) calculated as coefficient of reliability is used to interpret reliability and error factor of individual difference in test point. (Büyüköztürk, 2011:169). Reliability analyze is examined in four categories due to number of form used and number of sessions held. These categories are inter-rater or inter-observer reliability, test-retest reliability, parallel-forms reliability and internal consistency reliability (Şencan 2005: 105). The questionnaire used in this study is suitable for internal consistency reliability analysis. The Cronbach alpha (α) method was used to employ the internal consistency reliability analysis. The Cronbach alpha is the most used method in the studies like this type. If the Cronbach alpha is over the value of 0.70, the scale can be defined as reliable.

In the study, there are two scales, which are named as 24 items container shipping service quality scale and as 11 items supplementary container shipping service quality scale, to measure perceptions of freight forwarders of container shipping service quality. Therefore the Cronbach alpha values of these two scales were accounted.

4.3.1 The Reliability Analysis of the Container Shipping Service Quality Scale

The Cronbach alpha (α) coefficient has a value of 0.911 which indicates the reliability (high internal consistency) of the Container Shipping Service Quality Scale (Table 32).

Table 32: The Reliability Analysis of the Container Shipping Service Quality Scale

The Container Shipping Service Quality Scale	**Number of items**	**Freight Forwarders**	
		N (valid)	Cronbach Alfa (α)
Quality attributes of container shipping service	24	112	,911

Table 33 shows that absolutely no factor has reduced the reliability of the scale to under value of 0.70. If the item of "competitive price of freight" is deleted from the scale, the scale reliability increases to the Cronbach alpha value of 0.915. But, this is unjustifiable process because the reliability of scale is already high and to delete an item is not suggested by the scholars if it is unnecessary.

Table 33: New Cronbach's Alpha of the Container Shipping Service Quality Scale If Any Item is Deleted

The Items of Container Shipping Service Quality Scale	**Scale Variance if Item Deleted**	**Corrected Item-Total Correlation**	**Cronbach's Alpha if Item Deleted**
Financial stability of carrier	99,723	,384	,911
Reliability of documentation (error-free processes)	101,487	,501	,908
Equipment (container) availability	101,620	,403	,909
Environmentally safe operations	93,764	,624	,905
Efficiency in operations and management	97,037	,626	,905
Knowledge of customers' needs and requirements	100,292	,414	,910
Continuous improvement of customer-oriented operation processes	97,829	,616	,905
Providing service in a consistent manner (maintaining service quality in any situation)	98,676	,679	,905

Table 33: New Cronbach's Alpha of the Container Shipping Service Quality Scale If Any Item is Deleted (Continued)

The Items of Container Shipping Service Quality Scale	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Quick response to customers' inquiries and requests	101,625	,512	,908
Knowledge and specialized skills of management and operators	96,622	,717	,903
Equipment (container) condition (e.g. old or new, specialized or not)	100,302	,467	,908
Competitive price of freight	106,882	,021	,915
Shipment tracing capability	99,268	,588	,906
Feedback from customers	98,450	,501	,908
Understanding customers' needs and requirements	100,283	,540	,907
Application of IT and EDI in customer services	98,197	,530	,907
Staff's attitude and behavior in meeting customers' requirements (e.g. changing customers' needs)	100,396	,510	,908
Transit time (Speed of service performance)	101,593	,462	,908
Shipment safety and security (loss and damage)	102,198	,449	,909
Socially responsible behavior and concerns for human safety	92,080	,667	,904
Application of IT and EDI in operations	96,606	,628	,905
Reliability of service performance (timeliness of shipment pickup and delivery)	101,432	,504	,908
Company's reputation for reliability in the market	98,410	,540	,907
Availability of ship capacity (Physical infrastructures)	94,551	,691	,903

4.3.2 The Reliability Analysis of the Supplementary Container Shipping Service Quality Scale

91 of 112 respondents believe that the container shipping service quality scale which was adapted from the ROPMIS Scale is inadequate to measure the service quality. The scale of supplementary container shipping service quality has quite high reliability with the Cronbach alpha value of 0.816 (Table 34).

Table 34: The Reliability Analysis of the Supplementary Container Shipping Service Quality Scale

The Supplementary Container Shipping Service Quality Scale	Number of items	Freight Forwarders	
		N (valid)	Cronbach Alfa (α)
Quality attributes of container shipping service	11	91	,816

The reliability of the scale showed very little change when any item was deleted from the scale (Table 35). For example; if pricing flexibility (willingness to

negotiate rates) item is deleted from the scale, the new Cronbach alpha value of scale increases to 0.823. But, this is unjustifiable process as mentioned before.

Table 35: New Cronbach's Alpha of the Supplementary Container Shipping Service Quality Scale If Any Item is Deleted

The Items of the Supplementary Container Shipping Service Quality Scale	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Service to many ports across the world	19,618	,484	,801
Knowledge and specialized skills of employees	19,169	,574	,792
On-time release of documents	20,391	,530	,799
Adherence to committed sailing schedules	19,632	,543	,796
Sailing frequency of container carrier	19,674	,562	,795
Pricing flexibility (Willingness to negotiate rates)	20,988	,254	,823
Extending credit facilities to shippers	21,167	,292	,818
Prompt settlement of damage/ refund claims	19,357	,555	,795
Proper and on-time communication about any matter relating to shipments	19,201	,637	,788
Door to door transport management	19,095	,412	,812
Past loss and damage experience	18,297	,557	,794

4.4 FACTOR ANALYSIS

Exploratory factor analysis (EFA) was conducted to interpret the factor structures of the container shipping service quality scale. According to Büyüköztürk (2011: 123) factor analysis is a technique used to minimize a large set of variables to a smaller set of basic factors, founding the presence of meaningful patterns among the original variables and extracting the crucial dimension. Principal components analysis with "Varimax" rotation was employed to identify the key dimensions. Following outcomes is necessary for a better factor analysis;

- variable reduction
- irrelevancy must be constituted between the new factors
- Determined factors must be significant.

Kaiser-Meyer-Olkin (KMO) coefficient value and Barlett Sphericity Test must be employed to determine whether data is suitable for the factor analysis or not. KMO coefficient tests the adequacy of data matrix to factor analysis. KMO also tests the suitability of data structure to extraction factor. KMO value is assumed to be more than value of 0.60 for factorability. Barlett's sphericity test indicates whether there is a relation between variables based on partial correlation or not. If accounted chi-square statistics is significant, this means that data matrix is suitable for analysis.

Table 36 presents the result of KMO and Bartlett's Sphericity test. Accounted KMO value (0.835) showed that sampling size is adequate to do reliable factor analysis. 112 of freight forwarders in sampling responded the questionnaire and this number is adequate for reliable factor analysis. Barlett's sphericity test value is less than 0.05 and significant (p=0,000). As a result, the tests findings show that data is adequate to employ factor analysis for ROPMIS Scale.

Table 36: KMO and Bartlett's Test of Sphericity

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,835
Bartlett's Test of Sphericity	Approx. Chi-Square	1303,288
	df	276
	Sig.	,000

Table 37 summarizes the findings of factor analysis that was employed to determine which container shipping service quality variables can be collected under which factors. Factor analysis indicates that 24 variables of container shipping service quality scale grouped under six basic factors that eigenvalues are over than value of 1. Total variance is accounted by totaling variance of each factor. It is reasonable for determined factors to explain 0.60 percent of total variance in the studies of social science which information is less certain (Gegez, 2010: 317). Determined 6 factors account for 65.238 percent of the total variance. Communalities value of variables is over value of 0.50. Only "Quick response to customers' inquiries and requests" has low communalities value (0.425). When the communalities value of variables are considered, it is observed that determined factors majorly describe container shipping service quality.

Factor loading value is assumed to over value of 0.45 for grouping variables under a factor. But, this limiting value can be decreased to a value of 0.30 for small number of factors (Büyüköztürk, 2011: 124). Two factors of container shipping service quaity scale have the factor loading under value of 0.45. "Shipment tracing capability" (0.416) and "providing service in a consistent manner (0.396) have factor loading value less than value of 0.45, but these are acceptable rates.

Container shipping service quality variables which were evaluated by freight forwarders were grouped under six factors. Reliability analysis was employed for each factor by using the Cronbach alpha method. Container shipping service quality factors were labeled as follows;

i. Management and responsiveness
ii. Physical facilities and reliability
iii. Outcomes
iv. Technology and social responsibility
v. Resources
vi. Image and process

Factor 1- Management and responsiveness: This factor group includes 6 variables of container shipping service quality scale and accounts for 14.774 percent of total variance. The Cronbach alpha coefficient has a value of 0.813. "Knowledge of customers' needs and requirements" has the highest factor loading value (0.840). Other variables grouped under this factor are "efficiency in operations and management (0.668), knowledge and specialized skills of management and operators (0.627), feedback from customers (0.546), quick response to customers' inquiries and requests (0.542), understanding customers' needs and requirements (0.517)".

Factor 2- Physical facilities and reliability: As a result of factor analysis, it is observed that this factor accounts for 12.709 percent of total variance. Factor named physical facilities and reliability includes 4 variables. The Cronbach alpha coefficient has a value of 0.742. Variables and factor loading values grouped under this factor are "equipment (container) condition (0.797), equipment (container) availability (0.754), reliability of documentation (error-free processes)(0.636), shipment safety and security (loss and damage)(0.600). The variable of "equipment (container) condition is the most important variable of the factor as factor loading value is 0.797.

Factor 3- Outcomes: This factor group includes 2 variables and explains 12.401 of total variance. Reliability of factor is low because there are only two variables. The Cronbach alpha coefficient has a value of 0.444. Variable of "competitive price of freight" is the most important variable with factor loading value of 0.896. Factor loading value of "transit time (speed of service performance)" variable is 0.453.

Table 37: Factor Analysis Results of the Container Shipping Service Quality Scales

Quality Attributes of Container Shipping	**Alpha(α)**	**TVE %**	**Factor Groups and Factor Loading Value**					
			I	**II**	**III**	**IV**	**V**	**VI**
Factor 1-Management and Responsiveness	0,813	14,774						
Knowledge of customers' needs and requirements			,840					
Efficiency in operations and management			,668					
Knowledge and specialized skills of management and operators			,627					
Feedback from customers			,546					
Quick response to customers' inquiries and requests			,542					
Understanding customers' needs and requirements			,517					
Factor 2-Physical Facilities and Reliability	0,742	12,709						
Equipment (container) condition (e.g. old or new, specialized or not)				,797				
Equipment (container) availability				,754				
Reliability of documentation (error-free processes)				,636				
Shipment safety and security (loss and damage)				,600				
Factor 3-Outcomes	0,444	12,401						
Competitive price of freight					,896			
Transit time (Speed of service performance)					,453			
Factor 4-Technology and Social Responsibility	0,839	9,664						
Application of IT and EDI in customer services						,824		
Application of IT and EDI in operations						,778		
Socially responsible behavior and concerns for human safety						,605		
Environmentally safe operations						,567		
Factor 5-Resources	0,714	9,185						
Financial stability of carrier							,800	
Staff's attitude and behavior in meeting customers' requirements (e.g. changing customers' needs)							,502	
Availability of ship capacity (Physical infrastructures)							,490	
Shipment tracing capability							,416	
Factor 6-Image and Process	0,782	6,504						
Reliability of service performance (timeliness of shipment pickup and delivery)								-,667
Company's reputation for reliability in the market								-,627
Continuous improvement of customer-oriented operation processes								-,539
Providing service in a consistent manner (maintaining service quality in any situation)								-,396
Eigenvalue			8,359	1,961	1,691	1,405	1,236	1,006

Scale; 1=Not at all important; 3=Neutral; 5=Very important

Factor 4- Technology and social responsibility: This factor group includes 4 variables of container shipping service quality scale and accounts for 9.664 percent of total variance. The Cronbach alpha coefficient has a value of 0.839. "Application of IT (information technology) and EDI in customer services" has the highest factor loading value (0.824). Other variables grouped under this factor are "application of IT and EDI in operations (0.778), socially responsible behavior and concerns for human safety (0.605) and environmentally safe operations (0.567).

Factor 5- Resources and courtesy: This factor group includes 4 variables of container shipping service quality scale and accounts for 9.185 percent of total variance. The Cronbach alpha coefficient has a value of 0.714. "Financial stability of carrier" has the highest factor loading value (0.800). The other variables grouped under this factor are as follows; "staff's attitude and behavior in meeting customers' requirements (e.g. changing customers' needs)"(0,502), "availability of ship capacity" (0,490), "shipment tracing capability" (0,416).

Factor 6- Image and process: This factor group includes 4 variables of container shipping service quality scale and accounts for 6.504 percent of total variance. The Cronbach alpha coefficient has a value of 0.782. "Reliability of service performance (timeliness of shipment pickup and delivery)" has the highest factor loading value (0.667). The other variables grouped under this factor are as follows; "company's reputation for reliability in the market" (0,627), "continuous improvement of customer-oriented operation processes" (0,539), "providing service in a consistent manner (maintaining service quality in any situation)" (0,396).

4.5 HYPOTHESIS TESTS

This study carried out variance analysis (ANOVA) and t-test to find whether or not the perceptions of container shipping service quality variables differ according to some characteristics of the respondents and their companies.

4.5.1 Variance Analysis (ANOVA)

ANOVA test was employed to analyze whether or not the perceptions of container shipping service quality differ according to some characteristics of the

respondents and their companies. ANOVA tests the significance of the difference between three or more unrelated sample mean. Detailed information about independent variables used in ANOVA analyses are given in Table 38.

Table 38: Detailed Information About Independent Variables Used in ANOVA Analysis

Independent Variable	**Group 1**	**Group 2**	**Group 3**	**Group 4**	**Group 5**
Department of respondents	Sales and marketing	Operation	Business Development	Administration	Accounting
Establishment years of the companies	1990 and before	1991-2000	2001-2010	2011-2015	-
Employee numbers of the companies	1-9	10-49	50-250	More than 250	-
Annual shipments of the companies	1-5000	5001-30000	More than 30000	-	-

4.5.1.1 Analysis of Differences in the Respondents' Perceptions of Container Shipping Service Quality in Terms of the Department They Are Employed in

The hypotheses founded to determine whether or not the respondents' perceptions of container shipping service quality differ in terms of their department are as follows;

H_0: The respondents' perceptions of container shipping service quality do not differ in terms of their department

H_1: The respondents' perceptions of container shipping service quality differ in terms of their department

The result of analysis was presented in Table 39. According to the result of ANOVA analysis, significances of all variables are over the maximum significance point of 0.05. Therefore, it can be said that the respondents' perceptions of container shipping service quality do not differ in terms of their department. H_0 hypothesis was not rejected.

Table 39: Analysis of Differences in the Respondents' Perceptions of Container Shipping Service Quality in Terms of the Department They Are Employed in

Variables	Homogeneity	F	p	Result
Financial stability of carrier	**,030[a]**	,172	,952	H_0 not rejected
Reliability of documentation (error-free processes)	**,021[a]**	1,027	,397	H_0 not rejected
Equipment (container) availability	**,000[a]**	1,284	,281	H_0 not rejected
Environmentally safe operations	,474	,645	,631	H_0 not rejected
Efficiency in operations and management	,937	,263	,901	H_0 not rejected
Knowledge of customers' needs and requirements	,191	,892	,472	H_0 not rejected
Continuous improvement of customer-oriented operation processes	,103	,465	,761	H_0 not rejected
Providing service in a consistent manner (maintaining service quality in any situation)	,715	,179	,949	H_0 not rejected
Quick response to customers' inquiries and requests	**,017[a]**	,493	,741	H_0 not rejected
Knowledge and specialized skills of management and operators	,290	,552	,698	H_0 not rejected
Equipment (container) condition (e.g. old or new, specialized or not)	,249	,384	,820	H_0 not rejected
Competitive price of freight	**,000[a]**	1,730	,149	H_0 not rejected
Shipment tracing capability	,115	,875	,481	H_0 not rejected
Feedback from customers	,541	,888	,474	H_0 not rejected
Understanding customers' needs and requirements	,056	2,257	,068	H_0 not rejected
Application of IT and EDI in customer services	,459	2,016	,097	H_0 not rejected
Staff's attitude and behavior in meeting customers' requirements (e.g. changing customers' needs)	**,001[a]**	1,044	,388	H_0 not rejected
Transit time (Speed of service performance)	,440	,674	,611	H_0 not rejected
Shipment safety and security (loss and damage)	,701	,160	,958	H_0 not rejected
Socially responsible behavior and concerns for human safety	,075	,839	,504	H_0 not rejected
Application of IT and EDI in operations	**,020[a]**	1,505	,206	H_0 not rejected
Reliability of service performance (timeliness of shipment pickup and delivery)	,314	,029	,998	H_0 not rejected
Company's reputation for reliability in the market	,074	,656	,624	H_0 not rejected
Availability of ship capacity (Physical infrastructures)	,272	,267	,899	H_0 not rejected

a: variable not homogenous; homogeneity value < 0,05

4.5.1.2 Analysis of Differences in the Companies' Perceptions of Container Shipping Service Quality in Terms of Their Establishment Years

The hypotheses founded to determine whether or not the companies' perceptions of container shipping service quality differ in terms of their establishment years are as follows;

H_0: The companies' perceptions of container shipping service quality do not differ in terms of their establishment years

H_1: The companies' perceptions of container shipping service quality differ in terms of their establishment years

Table 40: Analysis of Differences in the Companies' Perceptions of Container Shipping Service Quality in Terms of Their Establishment Years

Variables	Homogeneity	F	p	Result
Financial stability of carrier	,397	3,292	**,027[b]**	**H_0 rejected**
Reliability of documentation (error-free processes)	,145	1,197	,320	H_0 not rejected
Equipment (container) availability	**,007[a]**	2,570	,064	H_0 not rejected
Environmentally safe operations	,114	1,098	,358	H_0 not rejected
Efficiency in operations and management	,573	,662	,579	H_0 not rejected
Knowledge of customers' needs and requirements	,864	1,932	,135	H_0 not rejected
Continuous improvement of customer-oriented operation processes	,329	1,554	,211	H_0 not rejected
Providing service in a consistent manner (maintaining service quality in any situation)	,659	2,378	,080	H_0 not rejected
Quick response to customers' inquiries and requests	,219	1,432	,243	H_0 not rejected
Knowledge and specialized skills of management and operators	,364	1,383	,258	H_0 not rejected
Equipment (container) condition	,246	4,347	**,008[b]**	**H_0 rejected**
Competitive price of freight	**,013[a]**	1,306	,282	H_0 not rejected
Shipment tracing capability	,478	1,812	,156	H_0 not rejected
Feedback from customers	,428	,138	,937	H_0 not rejected
Understanding customers' needs and requirements	,130	1,363	,264	H_0 not rejected
Application of IT and EDI in customer services	,280	1,224	,310	H_0 not rejected
Staff's attitude and behavior in meeting customers' requirements (e.g. changing customers' needs)	,103	1,774	,163	H_0 not rejected
Transit time (Speed of service performance)	,329	,503	,682	H_0 not rejected
Shipment safety and security (loss and damage)	**,000[a]**	2,177	,101	H_0 not rejected
Socially responsible behavior and concerns for human safety	,076	1,863	,147	H_0 not rejected
Application of IT and EDI in operations	,354	1,043	,381	H_0 not rejected
Reliability of service performance (timeliness of shipment pickup and delivery)	,915	1,391	,255	H_0 not rejected
Company's reputation for reliability in the market	,878	,894	,450	H_0 not rejected
Availability of ship capacity (Physical infrastructures)	,296	1,718	,174	H_0 not rejected

a: variable not homogenous; homogeneity value < 0,05
b: significance value < 0,05

As the result of ANOVA analysis, the significant differences were observed in "financial stability of carrier". "Equipment (container) condition" is another variable that has significant difference between sampling groups.

4.5.1.3 Analysis of Differences in the Companies' Perceptions of Container Shipping Service Quality in Terms of Total Number of Employees

The hypotheses founded to determine whether or not the companies' perceptions of container shipping service quality differ according to the their total numbers of employees are as follows;

H_0: The companies' perceptions of container shipping service quality do not differ in terms of their number of employees

H_1: The companies' perceptions of container shipping service quality differ in terms of their number of employees

Table 41: Analysis of Differences in the Companies' Perceptions of Container Shipping Service Quality in Terms of Their Number of Employees

Variables	Homogeneity	F	p	Result
Financial stability of carrier	,993	,163	,921	H_0 not rejected
Reliability of documentation (error-free processes)	,720	,360	,782	H_0 not rejected
Equipment (container) availability	,667	2,231	,094	H_0 not rejected
Environmentally safe operations	,914	1,354	,266	H_0 not rejected
Efficiency in operations and management	**,033[a]**	,611	,611	H_0 not rejected
Knowledge of customers' needs and requirements	,317	2,133	,106	H_0 not rejected
Continuous improvement of customer-oriented operation processes	**,045[a]**	1,576	,205	H_0 not rejected
Providing service in a consistent manner (maintaining service quality in any situation)	,246	,206	,892	H_0 not rejected
Quick response to customers' inquiries and requests	**,015[a]**	,943	,426	H_0 not rejected
Knowledge and specialized skills of management and operators	,063	,613	,610	H_0 not rejected
Equipment (container) condition (e.g. old or new, specialized or not)	,703	2,528	,066	H_0 not rejected
Competitive price of freight	,898	,148	,930	H_0 not rejected
Shipment tracing capability	,666	,171	,916	H_0 not rejected
Feedback from customers	,289	,223	,880	H_0 not rejected
Understanding customers' needs and requirements	,406	1,205	,316	H_0 not rejected
Application of IT and EDI in customer services	,992	,191	,902	H_0 not rejected
Staff's attitude and behavior in meeting customers' requirements (e.g. changing customers' needs)	**,034[a]**	1,675	,182	H_0 not rejected
Transit time (Speed of service performance)	,393	,097	,961	H_0 not rejected
Shipment safety and security (loss and damage)	**,021[a]**	1,135	,342	H_0 not rejected
Socially responsible behavior and concerns for human safety	,916	,903	,445	H_0 not rejected
Application of IT and EDI in operations	,445	,115	,951	H_0 not rejected
Reliability of service performance (timeliness of shipment pickup and delivery)	,117	,291	,831	H_0 not rejected
Company's reputation for reliability in the market	,840	,820	,488	H_0 not rejected
Availability of ship capacity (Physical infrastructures)	,128	,473	,703	H_0 not rejected

a: variable is not homogenous; homogeneity value < 0,05

Test results shows that the companies' perceptions of container shipping service quality do not differ in terms of their number of employees. Significance levels of all variables are over the value of 0.05. The H_0 hypothesis was not rejected for all sub-hypotheses (Table 41).

4.5.1.4 Analysis of Differences in the Companies' Perceptions of Container Shipping Service Quality in Terms of Their Annual Shipments

The hypotheses founded to determine whether or not the companies' perceptions of container shipping service quality differ in terms of their annual total shipments are as follows;

H_0: The companies' perceptions of container shipping service quality do not differ in terms of their annual shipments

H_1: The companies' perceptions of container shipping service quality differ in terms of their annual shipments

As the result of ANOVA analysis, the significant differences were observed in "continuous improvement of customer-oriented operation processes". "Staff's attitude and behavior in meeting customers' requirements (e.g. changing customers' needs)" is another variable that has significant difference between sampling groups. The H_0 hypothesis was rejected for these two variables. Significant differences were not observed in the perceptions of companies of other container shipping service quality variables (Table 42).

Table 42: Analysis of Differences in the Perceptions of Companies of Container Shipping Service Quality in Terms of Their Annual Shipments

Variables	Homogeneity	F	p	Result
Financial stability of carrier	,343	1,042	,359	H_0 not rejected
Reliability of documentation (error-free processes)	,054	1,615	,208	H_0 not rejected
Equipment (container) availability	,943	,036	,964	H_0 not rejected
Environmentally safe operations	,967	,676	,513	H_0 not rejected
Efficiency in operations and management	,129	,262	,770	H_0 not rejected
Knowledge of customers' needs and requirements	,379	,939	,397	H_0 not rejected
Continuous improvement of customer-oriented operation processes	,901	4,550	**,015[b]**	**H_0 rejected**
Providing service in a consistent manner (maintaining service quality in any situation)	,223	,498	,611	H_0 not rejected
Quick response to customers' inquiries and requests	**,007[a]**	1,842	,168	H_0 not rejected
Knowledge and specialized skills of management and operators	,683	1,128	,331	H_0 not rejected
Equipment (container) condition (e.g. old or new, specialized or not)	,812	,621	,541	H_0 not rejected
Competitive price of freight	**,002[a]**	2,105	,131	H_0 not rejected
Shipment tracing capability	,649	2,306	,109	H_0 not rejected
Feedback from customers	,472	1,249	,294	H_0 not rejected
Understanding customers' needs and requirements	,202	2,331	,106	H_0 not rejected
Application of IT and EDI in customer services	,137	,536	,588	H_0 not rejected
Staff's attitude and behavior in meeting customers' requirements (e.g. changing customers' needs)	,346	3,847	**,027[b]**	**H_0 rejected**
Transit time (Speed of service performance)	,335	1,099	,340	H_0 not rejected
Shipment safety and security (loss and damage)	**,018[a]**	,619	,542	H_0 not rejected
Socially responsible behavior and concerns for human safety	,515	,126	,882	H_0 not rejected
Application of IT and EDI in operations	,731	,079	,924	H_0 not rejected
Reliability of service performance (timeliness of shipment pickup and delivery)	**,046[a]**	2,642	,080	H_0 not rejected
Company's reputation for reliability in the market	,749	1,615	,208	H_0 not rejected
Availability of ship capacity (Physical infrastructures)	,590	1,818	,171	H_0 not rejected

a: variable not homogenous; homogeneity value < 0,05
b: significance value < 0,05

4.5.2 t-test Results

t-test was used to analyze whether or not the perceptions of container shipping service quality differ according to some characteristics of the respondents. t-test analyzes the significance of the difference between two unrelated sample mean. Detailed information about independent variables used in t-test analysis is given in Table 43.

Table 43: Detailed Information About Independent Variables Used in t-test

Independent Variable	Group 1	Group 2
Existence of agreement between carrier and freight forwarder	Yes	No
Membership to any forwarder network	Yes	No
Existence of supplier evaluation system	Yes	No

4.5.2.1 Analysis of Differences in the Companies' Perceptions of Container Shipping Service Quality in Terms of Whether There Exist Long-term Agreements Between Container Shipping Lines and the Companies Involved

To determine whether or not the companies' perceptions of container shipping service quality differ in terms of whether there exist long-term agreements between container shipping lines and the companies involved following hypotheses were founded;

H_0: The companies' perceptions of container shipping service quality do not differ in terms of whether there exist long-term agreements between container shipping lines and the companies involved

H_1: The companies' perceptions of container shipping service quality differ in terms of whether there exist long-term agreements between container shipping lines and the companies involved

t-test analysis shows that the perceptions of companies of "knowledge of customers' needs and requirements" differ in terms of whether there exist long-term agreements between container shipping lines and the companies involved ($p=0.45$). Significance levels of other container shipping service quality variables are over the value of 0.05, so the H_0 hypothesis was not rejected for these variables (Table 44).

Table 44: Analysis of Differences in the Companies' Perceptions of Container Shipping Service Quality in Terms of Whether There Exist Long-term Agreements Between Container Shipping Lines and the Companies Involved

Variables	Levene Test		t	P	Result
	F	P			
Financial stability of carrier	,324	,571	,766	,447	H_0 not rejected
Reliability of documentation (error-free processes)	2,690	,106	-1,032	,306	H_0 not rejected
Equipment (container) availability	,304	,583	,576	,567	H_0 not rejected
Environmentally safe operations	,316	,576	-,883	,381	H_0 not rejected
Efficiency in operations and management	,218	,642	-,990	,326	H_0 not rejected
Knowledge of customers' needs and requirements	1,226	,273	-2,044	**,045[a]**	**H_0 rejected**
Continuous improvement of customer-oriented operation processes	,066	,799	-1,216	,229	H_0 not rejected
Providing service in a consistent manner (maintaining service quality in any situation)	,001	,970	-,426	,672	H_0 not rejected
Quick response to customers' inquiries and requests	11,918	,001	-1,914	,066	H_0 not rejected
Knowledge and specialized skills of management and operators	,101	,752	-,393	,696	H_0 not rejected
Equipment (container) condition (e.g. old or new, specialized or not)	,651	,423	-,800	,427	H_0 not rejected
Competitive price of freight	,140	,709	-,361	,719	H_0 not rejected
Shipment tracing capability	,068	,795	,223	,824	H_0 not rejected
Feedback from customers	,006	,937	-,377	,708	H_0 not rejected
Understanding customers' needs and requirements	,355	,554	-,840	,404	H_0 not rejected
Application of IT and EDI in customer services	,757	,388	-1,373	,175	H_0 not rejected
Staff's attitude and behavior in meeting customers' requirements (e.g. changing customers' needs)	,205	,652	-,525	,601	H_0 not rejected
Transit time (Speed of service performance)	1,347	,250	-1,770	,082	H_0 not rejected
Shipment safety and security (loss and damage)	2,349	,131	-,738	,463	H_0 not rejected
Socially responsible behavior and concerns for human safety	1,597	,211	-,589	,558	H_0 not rejected
Application of IT and EDI in operations	,194	,661	-1,763	,083	H_0 not rejected
Reliability of service performance (timeliness of shipment pickup and delivery)	10,344	,002	,139	,891	H_0 not rejected
Company's reputation for reliability in the market	,245	,623	,479	,634	H_0 not rejected
Availability of ship capacity (Physical infrastructures)	1,192	,279	,097	,923	H_0 not rejected

4.5.2.2 Analysis of Differences in the Companies' Perceptions of Container Shipping Service Quality in Terms of Their Membership to the Forwarder Networks

The following hypotheses were founded to determine whether or not the companies' perceptions of container shipping service quality differ in terms of their membership to the forwarder networks;

H_0: The companies' perceptions involved of container shipping service quality do not differ in terms of their membership to the forwarder networks

H_1: The companies' perceptions involved of container shipping service quality differ in terms of their membership to the forwarder networks

Table 45: Analysis of Differences in the Perceptions of Companies of Container Shipping Service Quality in Terms of Their Membership to the Forwarder Networks

Variables	Levene Test		t	P	Result
	F	P			
Financial stability of carrier	1,465	,231	,831	,409	H_0 not rejected
Reliability of documentation (error-free processes)	1,225	,273	-,635	,528	H_0 not rejected
Equipment (container) availability	,039	,845	-,267	,790	H_0 not rejected
Environmentally safe operations	,166	,685	-,534	,595	H_0 not rejected
Efficiency in operations and management	,379	,541	-,547	,586	H_0 not rejected
Knowledge of customers' needs and requirements	,104	,748	-1,480	,144	H_0 not rejected
Continuous improvement of customer-oriented operation processes	,025	,876	-1,022	,311	H_0 not rejected
Providing service in a consistent manner (maintaining service quality in any situation)	,259	,613	,233	,817	H_0 not rejected
Quick response to customers' inquiries and requests	6,671	**,012**	-1,387	,181	H_0 not rejected
Knowledge and specialized skills of management and operators	3,212	,078	,319	,751	H_0 not rejected
Equipment (container) condition (e.g. old or new, specialized or not)	,230	,633	-1,105	,273	H_0 not rejected
Competitive price of freight	,006	,936	,095	,924	H_0 not rejected
Shipment tracing capability	,079	,780	,862	,392	H_0 not rejected
Feedback from customers	,357	,552	-,286	,776	H_0 not rejected
Understanding customers' needs and requirements	2,993	,089	-,167	,868	H_0 not rejected
Application of IT and EDI in customer services	,041	,840	-1,299	,199	H_0 not rejected
Staff's attitude and behavior in meeting customers' requirements (e.g. changing customers' needs)	1,963	,166	,470	,640	H_0 not rejected
Transit time (Speed of service performance)	,710	,403	-1,425	,159	H_0 not rejected

Table 45: Analysis of Differences in the Perceptions of Companies of Container Shipping Service Quality in Terms of Their Membership to the Forwarder Networks (Continued)

Variables	Levene Test		t	P	Result
	F	P			
Shipment safety and security (loss and damage)	1,046	,310	-,448	,656	H_0 not rejected
Socially responsible behavior and concerns for human safety	,029	,866	-,898	,373	H_0 not rejected
Application of IT and EDI in operations	,187	,667	-1,237	,221	H_0 not rejected
Reliability of service performance (timeliness of shipment pickup and delivery)	13,632	**,000**	,181	,859	H_0 not rejected
Company's reputation for reliability in the market	1,413	,239	-,428	,670	H_0 not rejected
Availability of ship capacity (Physical infrastructures)	,014	,907	,594	,555	H_0 not rejected

The analysis results indicate that the companies' perceptions of container shipping service quality do not differ in terms of their membership to the forwarder networks. Significance levels of all variables are over the 0.05 value, so the H_0 hypothesis was not rejected for all variables (Table 45).

4.5.2.3 Analysis of Differences in the Companies' Perceptions of Container Shipping Service Quality in Terms of Whether There Exist Supplier Evaluation Systems of the Companies Involved

The following hypotheses were founded to determine whether or not the perceptions of container shipping service quality differ in terms of whether there exist supplier evaluation systems of the companies.

H_0: The companies' perceptions of container shipping service quality do not differ in terms of whether there exist supplier evaluation systems of the companies involved

H_1: The companies' perceptions of container shipping service quality differ in terms of whether there exist supplier evaluation systems of the companies involved

Table 46: Analysis of Differences in the Companies' Perceptions Container Shipping Service Quality in Terms of Whether There Exist Supplier Evaluation Systems of the Companies

Variables	Levene Test		t	P	Result
	F	P			
Financial stability of carrier	,007	,932	-,258	,797	H_0 not rejected
Reliability of documentation (error-free processes)	,458	,501	-,382	,703	H_0 not rejected
Equipment (container) availability	,003	,954	,897	,373	H_0 not rejected
Environmentally safe operations	,216	,644	,328	,744	H_0 not rejected
Efficiency in operations and management	,256	,615	-,837	,406	H_0 not rejected
Knowledge of customers' needs and requirements	2,093	,153	-1,531	,131	H_0 not rejected
Continuous improvement of customer-oriented operation processes	,005	,942	-1,609	,113	H_0 not rejected
Providing service in a consistent manner (maintaining service quality in any situation)	,006	,938	-1,842	,070	H_0 not rejected
Quick response to customers' inquiries and requests	6,516	**,013**	-2,171	**,034**	**H_0 rejected**
Knowledge and specialized skills of management and operators	,293	,590	-,803	,425	H_0 not rejected
Equipment (container) condition (e.g. old or new, specialized or not)	,425	,517	1,503	,138	H_0 not rejected
Competitive price of freight	,367	,547	-,189	,851	H_0 not rejected
Shipment tracing capability	1,575	,214	-1,352	,181	H_0 not rejected
Feedback from customers	,584	,448	,108	,914	H_0 not rejected
Understanding customers' needs and requirements	,218	,643	-,903	,370	H_0 not rejected
Application of IT and EDI in customer services	,104	,748	-,364	,717	H_0 not rejected
Staff's attitude and behavior in meeting customers' requirements (e.g. changing customers' needs)	,248	,620	-1,850	,069	H_0 not rejected
Transit time (Speed of service performance)	2,988	,089	-1,316	,193	H_0 not rejected
Shipment safety and security (loss and damage)	1,000	,321	1,097	,277	H_0 not rejected
Socially responsible behavior and concerns for human safety	,000	,989	-,335	,739	H_0 not rejected
Application of IT and EDI in operations	,991	,324	,860	,393	H_0 not rejected
Reliability of service performance (timeliness of shipment pickup and delivery)	,057	,812	-,696	,489	H_0 not rejected
Company's reputation for reliability in the market	,001	,976	-1,235	,222	H_0 not rejected
Availability of ship capacity (Physical infrastructures)	2,840	,097	-,334	,740	H_0 not rejected

t-test analysis shows that the companies' perceptions of "quick response to customers' inquiries and requests" differ in terms of whether there exist supplier evaluation systems of the companies. Significant differences were not observed in

other container shipping service quality. Significance levels of other variables are over the value of 0.05, so the H_0 hypothesis was not rejected for these variables.

4.6 GENERAL EVALUATION OF THE RESEARCH FINDINGS

In this part, findings of the research are summarized. Research findings indicate the perceptions of freight forwarders of container shipping service quality. Reliability analysis of scale developed to measure container shipping service quality was tested by the Cronbach alpha (α) method. Reliability of container shipping service quality scale is quite high. The Cronbach alpha (α) coefficient has a value of 0.911. Respondents were asked to rate importance of supplementary container shipping service quality attributes if they think container shipping service quality scale is inadequate. 91 of 112 freight forwarder personnel rated supplementary container shipping service quality scale. The Cronbach alpha (α) coefficient for this scale has a value of 0.816.

When the positions of the respondents were examined, it was observed that 57.1 percent of the respondents were managers including general manager, regional manager, branch manager, sales and marketing manager, operation manager, business development manager and accounting manager. The results also reveal that 55.4 percent of the respondents have experience of 10 or more years in the maritime industry. Majority of the respondents have Bachelor's degree (79.5 percent). 44.6 percent of the respondents work in sales and marketing department.

The questionnaires were answered by 112 personnel from 62 freight forwarder companies. 25.8 percent of the companies were established before 1999. The companies established between years of 2011 and 2015 have the same percentage. 29.0 percent of the companies employ between 50 and 250 employees. The companies which employ between 10 and 49 employees have the same percentage. Most of the companies have between 5,001 and 30,000 TEU annual shipments (43.5 percent). 37.1 percent of the companies have annual shipments between 1 and 5,000 TEU. When the partnership/ownership structures of companies are examined, it is observed that most of the companies are purely local owned companies (61.3 percent).

Freight forwarder companies involved in this research attend to do long-term agreements with container shipping lines. 77.4 percent of the companies have long-term agreements with container shipping lines. To be a membership of any forwarder network is important for freight forwarder companies. 80.6 percent of the companies are members to forwarder networks. 51.6 percent of the companies don't have the supplier evaluation systems.

When the container shipping service quality scale is examined, it is observed that the most important variable for freight forwarder personnel is shipment safety and security (loss and damage). 72.3 percent of the respondents marked this variable as "very important" and mean score has value of 4.69. Reliability of documentation (error-free processes) is the other variable that freight forwarder personnel stated as important criteria (mean=4.64). The other important variables are respectively "quick response to customers' inquiries and requests" (mean=4.61), "competitive price of freight" (mean=4.49), and "equipment (container) availability" (mean=4.49).

91 of 112 respondents preferred to go on rating the supplementary container shipping service quality scale that was constituted from container shipping service quality literature. Most of the respondents rated "proper and on-time communication about any matter relating to shipments" as the most important supplementary variable. The mean score of this variable has value of 4.66.The other important variables are "knowledge and specialized skills of employees" (mean=4.56) and "on-time release of documents" (mean=4.56).

Exploratory Factor Analysis technique was used to minimize the large set of container shipping service quality variables to a smaller set of basic factors. Principal components analysis with "Varimax" rotation was employed to identify the key dimensions in container shipping service quality. Accounted KMO has the value of 0.835. This means sampling size is adequate to do reliable factor analysis. Barlett's sphericity test value is less than 0.05 and significant (p=0,000). The tests findings show that data is adequate to employ factor analysis for container shipping service quality scale. As a result of factor analysis, container shipping service quality variables are grouped under six factors. These 6 factors account for 65.238 percent of the total variance. Container shipping service quality factors are labeled as follows;

Factor 1 - Management and responsiveness; consists of six variables (Knowledge of customers' needs and requirements, efficiency in operations and management, knowledge and specialized skills of management and operators, feedback from customers, quick response to customers' inquiries and requests, understanding customers' needs and requirements). "Knowledge of customers' needs and requirements" and "quick response to customers' inquiries and requests" were examined under process dimension and the other factors were examined under management dimension by Thai (2008).

Factor 2 - Physical facilities and reliability; consists of four variables (Equipment (container) condition, equipment (container) availability, reliability of documentation, shipment safety and security). Thai grouped equipment-related variables under resources dimension and reliability of documentation and shipment safety and security variables under outcomes dimension.

Factor 3 – Outcomes; consists of two variables (Competitive price of freight, transit time). Thai grouped these two variables under outcomes dimension.

Factor 4 - Technology and social responsibility; consists of four variables (Application of IT and EDI in customer services, application of IT and EDI in operations, socially responsible behavior and concerns for human safety, environmentally safe operations). Thai examined factors relevant to technology under process and management dimensions. He also grouped the other two factors under social responsibility dimension.

Factor 5 – Resources; consists of four variables (Financial stability of carrier, staff's attitude and behavior in meeting customers' requirements, availability of ship capacity, shipment tracing capability). "Staff's attitude and behavior in meeting customers' requirements" were examined under process dimension and the other factors were examined under resources dimension by Thai.

Factor 6 - Image and process; consists of four variables (Reliability of service performance, company's reputation for reliability in the market, continuous improvement of customer-oriented operation processes, providing service in a consistent manner). Thai grouped "reliability of service performance" and "providing service in a consistent manner" factors under outcomes dimension, "continuous improvement of customer-oriented operation processes" factor under management

dimension, "company's reputation for reliability in the market" factor under image dimension.

ANOVA and t-test were employed to find whether or not the perceptions of container shipping service quality variables differ in terms of some characteristics of the respondents and their companies. Significant differences were found in the companies' perceptions of some variables such as "financial stability of carrier" and "equipment (container) condition" in terms of their establishment years. There are also significant differences in perceptions of the companies involved of "continuous improvement of customer-oriented operation processes" and "Staff's attitude and behavior in meeting customers' requirements" in terms of their annual shipments. The perceptions of the companies of variable named "knowledge of customers' needs and requirements" differ in terms of whether there exist long-term agreements between container shipping lines and the companies involved.

The container shipping service quality variables with significant differences between groups of independent variable were presented in Table 46.

Table 47: Container Shipping Service Quality Factors Which Differ According to the Characteristics of the Respondents and Those of Their Companies

Independent Variables (Characteristics of Respondents and Their Companies)	**Dependent Variables** (Container Shipping Service Quality Factors)	**Hypothesis Test**
Department of respondents	-	ANOVA
Establishment years of companies	Financial stability of carrier	ANOVA
	Equipment (container) condition	
Employee numbers of companies	-	ANOVA
Annual shipments	Continuous improvement of customer-oriented operation processes	ANOVA
	Staff's attitude and behavior in meeting customers' requirements (e.g. changing customers' needs)	
Long-term agreement with container shipping line	Knowledge of customers' needs and requirements	t-test
Membership of forwarder network	-	t-test
Supplier evaluation system	Quick response to customers' inquiries and requests	t-test

As the result of hypotheses test, the significant differences were not found in the perceptions of container shipping service quality variables in terms of the following characteristics of respondents and those of their companies;

- Department of the respondents
- The number of the employees of the companies
- Membership to forwarder networks

CONCLUSIONS

Service quality measures have been developed and widely tested for consumer services, but these measures are not adequate when applied to business to business sector. Although some measurement scales were adapted to measure the container shipping service quality, the dimensions of these scales were needed to upgrade by scholars (Durvasula et al., 1999; Tuna, 1999; Tuna and Silan 2002; Chen et al., 2009) Therefore, a key question arises as to develop a scale to measure the container shipping service quality. To address this issue, this study presents a model to measure container shipping service quality. The study also evaluates the importance of container shipping service quality from freight forwarders' perspectives.

The ROPMIS Scale was adapted to measure perceptions of the freight forwarders of container shipping service quality in this study. ROPMIS Scale was chosen because:

• It has been developed to measure especially maritime transportation service quality, so factors are most appropriate to measure container shipping service quality

• the scale proposes a more useful instrument than alternative scales (SERVQUAL, SERVPERF etc.).

An Exploratory Factor Analysis was employed to see if the 24 items ROPMIS Scale could be broken down into sub-categories. Tabachnick and Fidell (2007) propose using the principal component analysis (PCA) technique in reducing a large number of variables to a smaller number of factors, and as an initial step to reveal the maximum number and nature of factors. The results indicated that the 24 container shipping service quality factors can be classified into six categories of services named as "management and responsiveness, physical facilities and reliability, outcomes, technology and social responsibility, resources, image and process". The reliability of the proposed model was evaluated using the Cronbach alpha methods (α). The reliability of the scale is quite high.

Exploratory factor analysis indicated that "management and responsiveness" factor is the most important factor in container shipping service quality from the freight forwarders' perspective. Container shipping lines' relationship with customer and responsiveness seems most important for freight forwarders as shippers in

container transportation. The results of the study have also indicated that "efficiency in operations and management" is important factor in container shipping. Container shipping lines must consider their management capabilities and responsiveness in order to improve their container services to meet shippers' expectation. Managers can use the container shipping service quality scale designed and explored in this study to develop a research instrument, such as questionnaire, to survey their customers' evaluation of quality of service provided.

As the result of descriptive statistics "shipment safety and security (loss and damage)" were determined by freight forwarder personnel as the most important service quality variable. "Reliability of documentation (error-free processes)" is the other factor that freight forwarder personnel stated as the second important factor. The findings of the study show great similarities to the literature regarding the most important factors of container shipping service quality from the views of shippers. Tuna (1999) found "shipment safety and security (loss and damage)" and "reliability of documentation (error-free processes)" as the most important factors for shipper in his study on container shipping service quality. Tuna explained the reasons behind these findings as follows;

- "shipment safety and security (loss and damage)" is the most important outcomes of container transportation,
- bill of lading is the most important document for exporter while collecting cash against bill of lading from bank.

"Documentation quality (reliability of documentation)" was determined as an important container carriers selection criterium in many studies (Tuna and Silan, 2002; Lu 2003; Kannan et al., 2012)

The other important variables determined as the important container shipping service quality factors are "quick response to customers' inquiries and requests, competitive price of freight, and equipment (container) availability". These factors also have great similarities to the literature regarding important factors of container shipping service quality and important carrier selection criteria.

These container shipping service quality factors were found as important container shipping service quality factors in many studies. Lu (2003) described the important service attributes in a partnering relationship from both shippers' and

maritime firms' perspectives. In his study, the primary service criteria from the perspective of shippers were "accurate documentation (reliability of documentation), reliability of advertised sailing schedules, availability of cargo spaces, prompt response to shippers' complaints and on-time pick up". Tuna and Silan (2002) defined important carrier selection criteria in container shipping such as "issuing accurate shipping documentation, delivering the cargo without damage, responding to urgent deliveries quickly, responding to enquiries promptly". Quick response to customers' inquiries and requests was determined as important service quality factors by Matear and Gray (1993). Competitive price of freight was determined as important service quality factors in a few studies (Murphy et al., 1997; Wong et al., 2008; Kannan et al., 2012).

"Safe transportation of goods and the compliance of company with the international safety standards" are important carrier selection criteria according to shipper. The liner company's image in the market and the history of losses and damages play determinant role in selecting the liner company by the shipper. (Plomaritou, 2006: 12). Safe transportation of cargoes was also determined as important selection criteria in many studies (Kent and Parker, 1999; Tuna and Silan, 2002 Lu, 2003; Wen and Huang, 2007; Wong et al., 2008; Kannan et al., 2012).

Murphy et al. (1991) investigated carrier selection criteria from the perspective of international freight forwarders. "Equipment availability, shipment information, and loss and damage performance" were determined as the three most important carrier selection criteria among international freight forwarders. Murphy et al. (1997) also investigated the relevancy of carrier selection factors between shippers and carriers. "Shipment safety and security (loss and damage), equipment (container) availability and freight rates" were determined as important carrier selection criteria in container shipping.

Variance analysis and t-test were used to test the hypothesis. The main hypothesis of research was whether or not the perceptions of container shipping service quality differ in terms of some characteristics of the freight forwarder personnel and those freight forwarder companies. Significant differences were observed in perceptions of some variables such as "financial stability of carrier" and "equipment (container) condition" in terms of establishment years of the companies.

Significant differences were also found in perceptions of "continuous improvement of customer-oriented operation processes" and staff's attitude and behavior in meeting customers' requirements" in terms of annual shipments of the companies. There is significant difference in factors of "knowledge of customers' needs and requirements" in terms of whether there exist long-term agreements between container lines and the freight forwarder companies. The perceptions of companies differ in factors of "quick response to customers' inquiries and requests" in terms of whether the companies involved have supplier evaluation systems of the companies. The perceptions of container shipping service quality do not differ according to department of respondents, personnel numbers of freight forwarders, and freight forwarders membership to any forwarder network.

Container shipping lines need to achieve service excellence by constantly improving their service performances. Container shipping lines cannot improve service performances unless they understand what the shippers expect from container shipping services and what level of service gaps exist between current performances and best practices. If the container shipping lines provide satisfactory services to shippers, it is more likely that these shippers will continue to do business with them.

The most significant limitation of this study is the use of an insufficient sample. The results may therefore not be representative of the perceptions of the whole population of freight forwarders. The study was conducted only in Turkey because of time and cost limit. Future studies related with service quality in the maritime industry could address this problem by using representative and larger samples in worldwide.

This study presents only the viewpoints of freight forwarders on container shipping service quality. Other parties of container shipping such as shippers (exporters and importers) can be taken as sample in the future studies. This study is mainly based on the ROPMIS scale. Other service quality models or approaches can be also applied to the container shipping service quality studies. The similar study with a same questionnaire can be applied on other countries' shippers or freight forwarders in the future researches.

A reliable and valid scale to measure container shipping service quality was developed as the result of this study. The Cronbach alpha (α) coefficient is quite

high, which indicates the reliability (high internal consistency) of the developed scale.

When the literature of service quality is examined, it is found that very few studies are relevant to container shipping service quality. This study has contributed to the container shipping service quality literature.

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APPENDICES

APPENDIX 1: Questionnaire Form

APPENDIX 1

A SURVEY STUDY ON CONTAINER SHIPPING SERVICE QUALITY

The purpose of survey prepared by Res. Asst. Resul Tepe under the counseling of Prof. Dr. D. Ali Deveci is ***determining the dimensions of container shipping service quality***. Information obtained under the research is to be used only for scientific purposes; the results will not be associated with any respondent. Please send e-mail to the address below after filling out the survey. Thank you for your participation and provide valuable information to research, I wish ease your work.

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I. QUALITY ATTRIBUTES OF CONTAINER SHIPPING SERVICE

How would you rate the importance of the following as attributes of quality of the container shipping service?

1	2	3	4	5
Not at all important	**Not important**	**Neutral**	**Important**	**Very important**

	Service quality factors (attributes) of container shipping	**1**	**2**	**3**	**4**	**5**
1	Financial stability of carrier					
2	Reliability of documentation (error-free processes)					
3	Equipment (container) availability					
4	Environmentally safe operations					
5	Efficiency in operations and management					
6	Knowledge of customers' needs and requirements					
7	Continuous improvement of customer-oriented operation processes					
8	Providing service in a consistent manner (maintaining service quality in any situation)					
9	Quick response to customers' inquiries and requests					
10	Knowledge and specialized skills of management and operators					
11	Equipment (container) condition (e.g. old or new, specialized or not)					

	Service quality factors (attributes) of container shipping (continued)	**1**	**2**	**3**	**4**	**5**
12	Competitive price of freight					
13	Shipment tracing capability					
14	Feedback from customers					
15	Understanding customers' needs and requirements					
16	Application of IT and EDI in customer services					
17	Staff's attitude and behavior in meeting customers' requirements (e.g. changing customers' needs)					
18	Transit time (Speed of service performance)					
19	Shipment safety and security (loss and damage)					
20	Socially responsible behavior and concerns for human safety					
21	Application of IT and EDI in operations					
22	Reliability of service performance (timeliness of shipment pickup and delivery)					
23	Company's reputation for reliability in the market					
24	Availability of ship capacity (Physical infrastructures)					

Do you think 24 factors is enough to measure container shipping service quality?

☐ Yes ☐ No

If your response 'NO', please rate the importance of the following as supplementary attributes of quality of the container shipping service.

	Other service quality factors (attributes) of container shipping	**1**	**2**	**3**	**4**	**5**
1	Service to many ports across the world					
2	Knowledge and specialized skills of employees					
3	On-time release of documents					
4	Adherence to committed sailing schedules					
5	Sailing frequency of container carrier					
6	Pricing flexibility (Willingness to negotiate rates)					
7	Extending credit facilities to shippers					
8	Prompt settlement of damage/ refund claims					
9	Proper and on-time communication about any matter relating to shipments					
10	Door to door transport management					
11	Past loss and damage experience					

I. GENERAL PROFILE QUESTIONS

1) Your title in the company	
2) Your experience in logistics sector	
3) Your education level	☐ Primary ☐ High school ☐ Associate's degree ☐ Bachelor's degree ☐ Master's degree ☐ Doctorate degree
4) Department you work (Operation, Marketing etc.):	
5) Foundation year of your company	
6) The total number of employees	☐ 1-9 ☐ 10-49 ☐ 50-250 ☐ more than 250
7) The total estimated handling of your company (TEU):	
8) Partnership/Ownership Structure of your company:	☐ Completely domestic ☐ Completely foreign ☐ Domestic and foreign partnership
9) Does your company have an agreement with any container line?	☐ Yes ☐ No
10) Does your company a member of any forwarder network?	☐ Yes ☐ No
11) Does your company have supplier evaluation system?	☐ Yes ☐ No