Measuring the Service Quality of Passenger Shipping: Case of Famagusta and Kyrenia Ports, North Cyprus

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Submitted to the
Institute of Graduate Studies and Research
in partial fulfillment of the requirements for the Degree of

Master of Arts
in
Marketing Management

Eastern Mediterranean University
June 2013
Gazimağusa, North Cyprus

Approval of the Institute of Graduate Studies and Research

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ABSTRACT

Current study aims to assess service quality perceived by passengers at ports of TRNC, reveal out essential measures and their predictive power that passengers rely on while determining the service quality and service quality's effect on customer satisfaction. Two different perspectives were used while measuring service quality (perception based and perception – expectation based). Several analyses conducted throughout the study. Among them, Exploratory Factor Analysis has been run in an attempt to reduce five dimensions and 28 items which were introduced initially. Later, new dimensions' interactions on each other were analyzed by applying Structural Equation Modeling in PLS. Results of the study reveal out 3 and 4 dimensional alternatives for assessing service quality at passenger ports. Further, it is evidenced that tangibles dimension is perceived as two separate determinants (physical structure and visual appeal). The effect of service quality on customer satisfaction is supported. Moreover, among the dimensions which are introduced later effect of physical structure, process and interrelations with passengers are proved to be positive and significant on service quality perceived by passengers. Finally, insufficient provision of passenger port services is evidenced for all dimensions. Hence, serious attention and advances on each attribute should be on the agenda of port authorities.

Keywords: Service Quality, Customer Satisfaction, Passengers, Ports, Turkish Republic of Northern Cyprus

ÖZ

Bu çalışma Kuzey Kıbrıs Türk Cumhuriyeti'nde bulunan yolcu limanlarının hizmet kalitesini ölçmeyi, hizmet kalitesi anlayışında baz alınan boyutlar ve bunların etkilerini ve nihai hizmet kalitesinin müşteri memnuniyeti üzerinde olan etkisini test etmeyi amaçlamaktadır. Toplanılan verilere belli başlı analizler uygulanmıştır. İlk olarak sunulan 5 boyut ve 28 maddeyi aza indirgemek amacı ile faktör analiz; aza indirgenmiş yeni boyutların birbirleri arasındaki etkileşimi açığa çıkartmak için de Smart PLS programında Yapısal Eşitlik Modellemesi uygulanmıştır. Böylece, yolcu limanlarında hizmet kalitesini ölçme amaçlı 3 ve 4 boyutlu alternatifler önerilmiştir. Fiziki özellikler boyutunun yolcular tarafından iki farklı boyut (altyapı ve görsel çekicilik) olarak algılandığı bulunmuştur. Hizmet kalitesinin müşteri memnuniyeti üzerindeki etkisi desteklenmiştir. Yeni boyutlardan altyapı, süreç ve yolcularla olan ilişkilerin nihai hizmet kalitesi üzerinde olumlu ve önem teşkil eden etkileri kanıtlanmıştır. Son olarak, Gazimağusa ve Girne yolcu limanlarında sunulan hizmetlerin her boyut açısından yetersizliği ortaya çıkmıştır. Liman başkanlığı, müdürlüğü ve yetkili diğer mercilerin ilgili odaklanma ve geliştirme projelerine girişimleri tavsiye edilmektedir.

Anahtar Kelimeler: Hizmet Kalitesi, Müşteri Memnuniyeti, Yolcular, Limanlar, Kuzey Kıbrıs Türk Cumhuriyeti

Dedicated to my parents

ACKNOWLEDGMENTS

Several people deserve special thanks for their contribution to my study. I would like to express my heartfelt thanks to Assoc. Prof. Dr. Mustafa Tümer for his supervision, patience and kindness throughout my study. It would not be possible to finish the study without his help. Special thanks for Assoc. Prof. Dr. İlhan Dalcı for his contribution as well.

I appreciate Serpil-Ahmet Dökmecioğlu and Gülsen-Mehmet Alkut for their moral and financial support. They are the ones who make my thesis endurable. I also appreciate my sister-in-law, Elvan K. Dökmecioğlu for her contribution and patience.

Finally, I would like to thank to my friends Ata Kalaycıoğlu, Taraneh Foroutan … and Hossein Hosseini for their emotional and moral support during my thesis.

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LIST OF ABBREVIATIONS

E: Expectation

H: Hypothesis

Inters: Interrelations with Passengers

P: Perception

PhyStrc: Physical Structure

PLS: Partial Least Square

RATER: Reliability, Assurance, Tangibles, Empathy, Responsiveness

Reliab: Reliability

Sat: Customer Satisfaction

SEM: Structural Equation Modeling

SERVPERF: Service Performance

SERVQUAL: Service Quality

Servql: Service Quality

SPO: State Planning Organization

TRNC: Turkish Republic of Northern Cyprus

VisApp: Visual Appeal

Chapter 1

INTRODUCTION

Providing quality in service businesses is extremely important and has considerable impact on companies' success (Normann, 1984; Shaw, 1978). Its direct relation with higher marginal income, marketing and financial success of the company and further effect on customer satisfaction, number of new customers, lower engagement of businesses in competitive price environment and lower failures during service performance was debated by various researchers in the literature (Parasuraman, Berry & Zeithaml, 1985; Buzzell and Gale, 1987; Anderson, Fornell and Lehman, 1994; Rust and Oliver, 1994; Buttle, 1996).

These debates are also acceptable in maritime industry. It is emphasized that in order to stay alive in the port industry, service quality inclinations must be pursued; since the demand for port services viewed as derived one (Marlow & Paixao, 2001). It is also argued that the position of the port and the level of its merit in a nation is significantly affected by its quality (Kolanovic, Skenderovic, & Zenzerovic, 2008) which ultimately affects the improvement of a nation's life standards (Song and Yeo, 2004).

As it is known, Cyprus is the third largest island in Mediterranean Sea. Since this is the case, conveyance to/from TRNC is provided by two means of transportation; either by sea transportation or aviation. Ercan Airport, located in Nicosia, is the one

that provides air transportation services; while sea transportation from TRNC is ensured by two ports – Port of Famagusta and Kyrenia Tourism Port. Although, only 5% of transportation is maintained by sea ports while the rest is accountable for air transportation. By considering all these, it is important to understand service quality perceptions and expectations of passengers at Famagusta and Kyrenia ports to shed light on several important issues.

1.1 Aim of the Study

The purpose of the current study is to assess service quality, perceived by passengers, at Port of Famagusta and Kyrenia Tourism Port; which are the only available ports for passenger shipping in Turkish Republic of Northern Cyprus (TRNC). In the light of achieving this, service desires and perceptions of passengers were identified which let us introduce service quality determinants in passenger shipping of TRNC case. After seeing the impact of each introduced dimension on service quality, perceived by passengers, its effect on customer satisfaction was intended to be measured as well.

Findings of the study will provide information about service quality determinants at passenger ports of TRNC and the rank of their perceived importance. Satisfaction level of customers will be pointed out as well. Thus, valuable information will be provided to port authorities which will enable the management to see their position in terms of service quality at passenger ports, identify the points which should be focused more and might implement new strategies for further advancement in terms of quality.

1.2 Methodology of the Study

The sample of the study consisted of passengers, selected randomly, who were using either Famagusta or Kyrenia Tourism Port. In total 417 usable responses (215 for Famagusta and 202 for Kyrenia) between November 2012 and February 2013 were collected for analysis at the passenger arrival/departure gates of the ports and during passengers' sailing.

For the collection of first hand quantitative data, questionnaire was designed and employed with reference to Parasuraman *et. al.*'s revised SERVQUAL model (1988). It is made up of three sections. First section measures passengers' perceptions and expectations with 28 attributes in total, based on five dimensions of service quality; namely tangibles, reliability, responsiveness, assurance and empathy. Passengers were required to rate their perceptions and expectations on 5-point Likert scale (1: Strongly Disagree to 5: Strongly Agree); since it is thought that passengers would use the scale more valid. Section two only intends to measure passengers' perceptions of port's overall service quality, customer satisfaction, repurchase intention and word of mouth about related port. The last section is about demographic information of passengers.

Several analyses have been conducted throughout the study. Initially, reliability analysis was conducted to test consistency of measurement scale; which is then followed by gap analysis for seeing the mismatch level of service quality perceptions and expectations of passengers. After this, exploratory factor analysis has been run in an attempt to reduce dimensions which were initially introduced to more manageable

size. Finally, PLS analysis took place to see the interactions of dimensions between each other which are introduced later.

1.3 Research Questions and Hypotheses

This study mainly questioned the applicability of SERVQUAL model for measuring service quality and its ultimate effect on customer satisfaction in the case of passenger shipping. Therefore, the following six hypotheses were proposed and tested in the case of TRNC passenger shipping:

H1: Tangibles has positive effect on overall service quality, perceived by passengers.

H2: Reliability has positive effect on overall service quality, perceived by passengers.

H3: Responsiveness has positive effect on overall service quality, perceived by passengers.

H4: Assurance has positive effect on overall service quality, perceived by passengers.

H5: Empathy has positive effect on overall service quality, perceived by passengers.

H6: Overall service quality, perceived by passengers, has significant effect on passengers' satisfaction.

1.4 Limitations of the Study

Current study has certain shortcomings. One of them is the generalizability of the results; since only maritime industry from passengers' perspective was taken into consideration while determining service quality dimensions. The other one is the ignorance of the effect of some other variables (e.g. price, situational factors) on customer satisfaction, except service quality.

Chapter 2

LITERATURE REVIEW

2.1 Services World

Service-producing sector is growing all around the world and it is dominant in the markets of different countries. Shift from industry to service sector was first seen in North America (Kellerman, 1985); and also, Griliches (1992) stated that rapid enlargement of service sector showed up around 1960 (Melvin, 1995). In addition, Fountain (2001) claimed academic interest in social shift from industry to service sector around in 1973, with Bell's *'The Coming of Post-Industrial Society'* book. Below are some statistical findings and estimations of different researchers about services industry:

- In 1992, almost 70% of people in Organization for Economic Co-operation and Development (OECD) countries were working in the services sector (Evangelista & Sirilli, 1998).
- There has been almost 12 percent rise in gross domestic product (GDP) of European Union which comes from service sector between the years of 1970 and 1990 (Gross, Banting, Meredith, & Ford, 1993).
- It is expected that within the next 8 years, there will be $5.4 trillion increase in the United States' real output which is anticipated to come from the service providing sectors (Henderson, 2012).

Today, according to Central Intelligence Agency's annual report (The World Factbook, 2011), 63.4% of GDP, internationally, is coming from service sector while the rest, %30.7 and %6, is attributable to industry and agriculture sectors respectively. Further, globally, most people (42.4%) are working in the service sector. Figure 1. (p.9) illustrates GDP distribution of different countries by sector, including Turkish Republic of Northern Cyprus (TRNC), European Union (EU) and the world.

"Like beauty, the definition of a service activity is often in the eye of the beholder" (Inman, 1985, p.4). As it is emphasized in this sentence, researchers brought different descriptions to services; since they can be seen in diverse activities (Melvin, 1995). Zeithaml, Bitner and Gremler (2013), describe services as "deeds, processes, and performances provided or coproduced by one entity or person for another entity or person". Quinn, Baruch and Paquette (1987) brought the definition as "all economic activities whose output is not a physical product or construction, is generally consumed at the time it is produced, and provides added value in forms that are essentially intangible concerns of its first purchaser". Further, Hill (1977, p.318) defined service as "a change in the condition of a person, or a good belonging to some economic unit, which is brought about as a result of the activities of some other economic unit, with the prior agreement of the former person or economic unit".

Service providing businesses can be found in:

- government sector (courts, hospitals, postal service etc.),
- private non-profit sector (museums, charities, colleges etc.),
- good part of the business sector (airlines, banks, hotels etc.),
- retail sector (cashiers, salespeople, etc.), and

- labor force in manufacturing sector (accountants, computer operators etc.)

(Kotler & Keller, 2012)

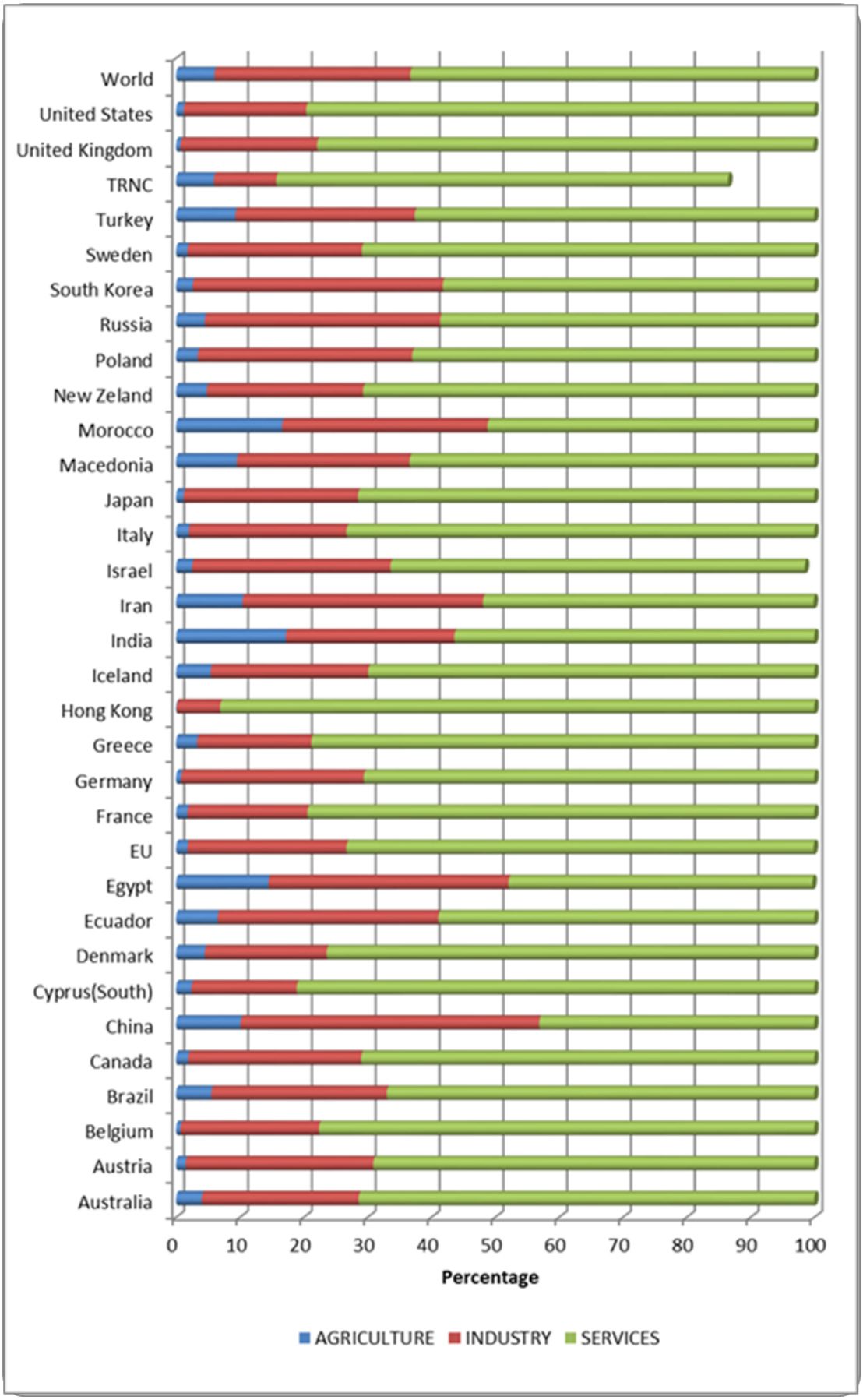

Figure 1: GDP Distribution by Sector

2.2 Turkish Republic of Northern Cyprus and Port Industry

After Sicily and Sardinia, the third largest island in Mediterranean Sea is Cyprus; with 9.251 kilometers square (km^2). Turkish Republic of Northern Cyprus (TRNC) is established on 15^{th} of November, 1983 and covers one third of the island (3.355 km^2). According to the most recent statistical figures of state planning organization (2012), there are 294.396 people living in TRNC, including those temporary inhabitants (e.g. students).

Since it is an island, conveyance to/from TRNC is provided by two means of transportation; either by sea transportation or aviation. Ercan Airport, located in Nicosia, is the one that provides air transportation services. Direct flights are available to different parts of Turkey.

On the other hand, sea transportation from TRNC is ensured by two ports – Port of Famagusta and Kyrenia Tourism Port. Because of political conditions, passenger transportation is only available between some parts of Turkey (Alanya, Tasucu and Mersin) and TRNC (Kyrenia and Famagusta) by roll on roll off (RoRo) and high speed passenger ships; and these services are provided by four different companies; namely, Akgünler Shipping, Filo Shipping, Kıbrıs Türk Denizcilik Incorporation and Starline Shipping (TRNC Harbors Directorate Office, 2013). In spite of this situation, ships from different nations are always welcomed to the Ports of Famagusta and Kyrenia.

Figures in Table 1, are obtained from Harbors Directorate Office (2013) and Ministry of Communication and Public Works (2013) and illustrate passenger traffic by different modes of transport within last 5 years.

Table 1: Passenger Traffic by Different Modes of Transport

	2008	**2009**	**2010**	**2011**	**2012**
Sea Transportation	263.293	208.686	205.537	163.326	144.872
Percentage	12,5%	9,9%	8,7%	6,3%	5%
Air Transportation	1.845.970	1.913.479	2.151.226	2.443.843	2.777.148
Percentage	87,5%	90,1%	91,3%	93,7%	95%

It can be concluded from the table that, most of the time passengers preferred air transportation more than sea voyage. Further, among the years, number of passengers who preferred air transportation has increased and constituted 95% of the travelers in 2012; while sea transportation preference was in decline and made up only 5% of the total passengers.

Transportation and communication sector is made up of six subsectors in TRNC, including sea and air transportation. This sector generated 9,4% of gross domestic product in 2010 and it is estimated 9,3% in 2011; which cannot be ignored (SPO, 2012).

2.3 Quality

In spite of strategic importance of the concept ‘Quality’ in businesses, there is not a common worldwide meaning for the word (Vishuen, Veena, Boopen, Sawkut, 2010; Thai, 2008; Jain and Gupta, 2004). Therefore, variety of definitions were brought to quality by different researchers. Among them, Eiglier and Langeard (1987), considered quality as the one that gratifies the clients. Parasuraman, Zeithaml &

Berry (1985) and Jain *et. al.* (2004) pointed out in their researches that according to Japanese production philosophy, quality means "zero defects and doing it right the first time". Dale (2003, p.4) described quality in more general terms as " irrespective of the context in which it is used, it is usually meant to distinguish one organization, event, product, service, process, person, result, action or communication from another".

Hoyle (2009, p.24) mentioned in his book that several definitions of quality can be seen in different situations as follows:

- "A degree of excellence (OED) – The meaning used by the general public
- Freedom from deficiencies or defects – The meaning used by those making a product or delivering a service
- Conformity to requirements (Crosby) – The meaning used by those designing a product or service or assessing conformity
- Fitness for use – The meaning used by those accepting a product or service
- The degree to which a set of inherent characteristics fulfills requirements (ISO 9000:2005) – The meaning used by those managing or assessing the achievement of quality."

However, it is clear that measuring and appraising quality in services is more difficult than measuring the products; since the nature of services lead people to make evaluation based on experience and credence qualities rather than search quality. (Parasuraman, Zeithaml and Berry, 1985; Zeithaml and Bitner, 2001).

2.4 Quality in Services

Providing quality in service businesses is extremely important and has considerable impact on companies' accomplishment (Normann, 1984; Shaw, 1978). Many researchers discussed that high service quality is directly linked with higher marginal income in businesses (Parasuraman *et. al.,* 1985; Buzzell and Gale, 1987; Anderson, Fornell and Lehman, 1994; Rust and Oliver, 1994). They all argued that, this leads more satisfied customers thus increase in purchase of existing ones, rise in the repurchase intentions of customers which brings long-term relationship between provider and the customer, rise in the number of new customers, lower engagement of businesses in competitive price environment and lower failures during performing services. Several other researchers also stressed out the relationship between service quality and customer satisfaction. They all confirmed that perceived quality of the performance evokes satisfied customers (Cronin *et. al.*, 1992; Spreng and Mackoy, 1996; Cronin, Brady, Hult, 2000; Caro and Garcia, 2007). In addition, Gronroos (1984) and Parasuraman *et.al.* (1985) supported that both customer perceptions yet, also expectations of the service affect customer satisfaction. Importance of service quality was also emphasized by Buttle (1996) in a way that it is one of the determinants of companies' marketing and financial success.

Many researchers described service quality as the level of match between the customers' prior expectations to service performance and their perceptions of the performance (Gronroos, 1984; Parasuraman *et. al.*, 1985; Asubonteng, McCleary, Swan, 1996). Parasuraman *et. al.* (1985) emphasized that evaluations on quality are not driven only from the service outcome; yet, from the service delivery process as well.

Since service quality is described as the comparison of customers' service performance expectations and perceptions; it is important to understand the meaning of the notions. Perceived service quality defined as "global judgment, or attitude, relating to the superiority of the service" (Parasuraman, Zeithaml, Berry, 1988, p.16). Garvin (1984b) also claimed that, perceived service quality depends on people themselves since; one can judge the quality as good while the other perceives it as normal. Zeithaml and Bitner (1996) pointed out in their research that, interaction between customers and providers, service evidence, image and price are the factors that affect customers' service judgments. On the other hand, expectations have been viewed as performance criterions which are believed by customers; and serve as the basis for customer judgment (Zeithaml, Parasuraman, Berry, 1993). However, it is important to distinguish the use of 'expectation' in different literatures. In customer satisfaction literature, expectations are used as 'estimations' of the service performance, i.e., customers' feelings of what 'would' be offered; while in service quality literature it is described as customer demands and wishes (Miller, 1977), i.e. considered as what 'should' be offered (Parasuraman *et. al.*, 1985/1988). Zeithaml *et. al.* (1996) mentioned that, word of mouth endorsements of others, stated or unstated promises, customers' past experiences and their individual service philosophies are some of the factors that constitute expectations.

2.4.1 Dimensions of Service Quality

It is critical and worthy for service companies to know the wants and needs of their customers. Therefore, variety of service quality dimensions defined by different researchers in the literature.

Among them, two of the most known are Parasuraman, Zeithaml & Berry's five dimensional SERVQUAL model (will be discussed in detail later in this chapter) and Gronroos' two dimensions of service quality: technical and functional (Ugboma, Ugboma, Damachi, 2009). Technical quality is described as what the customer gets as an outcome while the way of service delivery process is named as functional quality (Gronroos, 1982/1984). O'Neill and Palmer (2003) mentioned in their research that according to Gronroos (1983/1988), functional quality plays more important role in delivering high service quality when compared with technical; since it is easier to imitate technical quality. Thai (2008) mentioned in his research that Gronroos (1984) added one more determinant as corporate image.

Compatible with Gronroos' perspective, two and three dimensions of service quality are described by Lehtinen and Lehtinen (Parasuraman *et. al.*, 1985). Service quality from the perspective of customers is viewed as two-dimensional approach of Lehtinen and Lehtinen's research (1982/1985) and it is discussed that quality in service delivery process and its outcome affect the level of service quality (Parasuraman *et. al*., 1985; Kolanovic, Skenderovic, Zenzerovic, 2008). They further allowed the discussion of three dimensional service quality approach of Lehtinen and Lehtinen (1982/1985) in their research; which are interaction quality – contact between customers and front-line employees/fellow customers, physical quality – tangible aspects of the performance and corporate quality – reputation and characteristics of the company (Parasuraman *et. al.*, 1985; Kolanovic, Skenderovic, Zenzerovic, 2008).

Numerous other authors measured service quality by different determinants. Several researchers suggested that measures and number of dimensions of service quality depend on and change among different services (Cronin and Taylor, 1992; Brown, Churchill, Peter, 1993). In spite of this variation, Harte and Dale (1995) argued that reliability, assurance, tangibles, empathy, fees and timelines are the 6 important attributes which customers expect in services. Further, quality of service encounter, what a customer gets as a result and servicescapes are three measures brought by Brady and Cronin (2001).

By taking literature review into consideration, Thai (2008) summarized service quality measures, which customers search for, into 6 clusters including:

- resources quality: refers all kind of raw materials to provide service, i.e. location
- outcome quality: what customer delivers as a result of interaction
- process quality: factors in moments of truth, i.e. perceived attitudes of front-line employees
- management quality: efficient administration of resources to satisfy ultimate end -users
- image/reputation quality: customer's general perception about provider
- social responsibility related quality: all the activities and attitudes engaged in under the title of social responsiveness.

2.4.2 Service Quality in Ports

Quality plays pivotal role in the vying nature of the ports. Its importance was pinpointed by several authors in their researches. Among them, Marlow & Paixao (2001) said that in order to stay strong in the port industry, service quality inclinations must be pursued; since the demand for port services viewed as derived

one. A similar view was also supported in the lines of some other authors by stressing, the way to succeed competitive advantage in transportation passes from following service quality advancements (Cotham, Cravens & Hendon, 1969). On the other hand, Kolanovic *et. al.* (2008) emphasized that, the position of the port and the level of its merit in a nation is significantly affected by its quality; which ultimately affects the improvement of a nation's life standards (Song and Yeo, 2004). Furthermore, Lopez and Poole (1998) supported the significance of indications quality at ports; by basing on the idea of Nelson (1974) who defined the port services which can not be assessed before the involvement of the users.

Thus, what is the meaning of quality at ports? Although, Kolanovic *et. al.* (2008) argued that it is not easy to define the notion of service quality at ports because of its special properties, several authors mentioned in their researches that port quality takes its root from the International Standards and defined it as delivering services in a way that meets the port users' voiced or unvoiced expectations (Lopez *et. al.*, 1998; Pantouvakis, 2006; Pantouvakis *et. al.*, 2008).

Given the role and importance of service quality in the port sector, it is essential to know the interest groups' expectations and perceptions about provided services (Pantouvakis *et. al.*, 2008; Vishuen *et. al.*, 2010). However, although the widespread consciousness about the notion, there are limited studies carried out related with quality measurement at ports (Vishuen *et. al.*, 2010). Among these studies, in spite of the presence of direct service quality determinants researches, majority defined the determinants of port and shipping company selection, which is accepted as an ancillary indicator of service quality dimensions at ports (Notteboom, 1997; Fleming

2000; Thai, 2008). Several determinants of service quality at ports, including indirect indicators, will be discussed in this section, while the dimensions of SERVQUAL in the port sector will be the topic of the next section.

It is obvious that assessment of the service quality in the port sector based on various determinants and features rather than single notion (Kolanovic *et. al.*, 2008). Lopez *et. al.*, (1998) employed three determinants of port service quality, namely punctuality – delivering service on promised time; efficiency – advantages and disadvantages of delivered services; and security – providing safety to customers and achieving long-term relationships with them as a result of gained confidence.

Later, several dimensions in cabotage transportation from the perspective of individual clients are defined by Pantouvakis (2006). These dimensions include information – provision of related data about arrivals and departures; parking facilities – provision of parking lots for individual clients' cars and related costs; services – front line employees' attitudes; cleanliness – hygiene level at the port; security and safety – level of assurance perceived; and guidance and communication – provision of necessary facilities related with individual clients after their arrival.

Thai (2008) also widened the literature by examining different port users' opinions (except passengers) and introduced six important service quality determinants at ports (including 24 elements in total) with an acronym ROPMIS – resources, outcomes, process, management, image and social responsibility. The hindmost dimension's importance in the maritime sector was also supported in the studies of some other authors and in several schemes; e.g. Eliades, 1992; Ruiter, 1999.

Some other quality dimensions at ports said to be intermodal management, service status control and projection, effectiveness of document and information flow, availability of promised or advertised capacity, reliability, service time, cargo safety, billing and cost management, cost control, cargo flow control and tracking, and security and maintenance (Frankel, 1993); reliability, safety, speed and frequency (Lopez, 1996); and relationship with service providers (Panayides & So, 2005).

As it is mentioned above, port and carrier preference factors by different groups, namely shippers, logistic service providers, shipping companies, are also accepted as service quality attributes of ports. In this light, Foster (1978) carried out a pioneering research; and by ranking the performance factors, introduced quality and frequency of the service, proximity, and facilities as preference factors. After a while, as opposed to his previous research, he claimed that service and port charges are the first factors to be considered while preferring a port (Foster, 1979). Slack (1985), meanwhile, identified eleven factors of port selection and emphasized the importance of freight forwarders' service factors and port charges as major determinants. Later, Tongzon (2002, p.3) identified seven important determinants of port selection as "frequency of ship visits, efficiency, adequacy of port infrastructure, location, competitive port charges, quick response to port users' needs and port's reputation for cargo damage" while emphasizing the priority of the second one. In addition, Cuadrado, Frasquet and Cervera (2004, p.326) summarized selection dimensions under the headings of "geographical location, connections with hinterland, port services and complementary logistics services" which has some compatible determinants with studies mentioned previously. Apart from these, it is introduced that provision of related data about shipment, presence of related and necessary

equipment, and loss and damage performance are considered as influences in selecting a logistic service provider (Murphy, Dalenberg and Daley, 1989, 1991).

In the literature, it is possible to find several other researchers' studies about similar determinants of port and carrier selection, e.g. Brooks (1985, 1990); Branch (1986); Murphy (1987); D'Este and Meyrick (1992); Ng (2006); and Ugboma (2007). Yet, taking the reviewed literature into account, different interest groups' port preference factors can be classified as qualitative influences – refer biased determinants e.g. reputation, frequency, safety; and quantitative influences – refer unbiased determinants e.g. cost (Tongzon, 2002; Kolanovic *et. al.*, 2008).

2.5 SERVQUAL

Parasuraman, Zeithaml and Berry's (1985) SERVQUAL model, also called the American Model (Pantouvakis, Chlomoudis, Dimas, 2010), is one of the most widely known and accepted instrument for assessing quality in services. The basis for the SERVQUAL instrument is the Parasuraman *et. al.*'s (1985) gap model; which depicts arise of five gaps in service delivery process that will affect the ultimate end user's performance evaluations in return. These gaps are summarized below:

Gap 1 – The listening gap: is the misperception of the management about what end-users expect from a particular service. Complicated management system, miscommunication within the organization, failure to understand customer needs and poor communication between providers and customers are the reasons which lead arise of this gap.

Gap 2 – The design and standards gap: is the difference between management's evaluation of customer expectations and real established service quality standards.

Various kinds of resource limitations, trends in the market and service quality apathy of management considered as factors that form the gap.

Gap 3 – The performance gap: is the discrepancy between the organization's service performance standards and real performance of boundary spanners. Bergman and Klefsjo (1994, p.273) suggested that "role ambiguity, role conflict, poor employee and technology job fit, inappropriate supervisory control systems, lack of perceived control and lack of teamwork" are the factors contributing for the performance gap.

Gap 4 – The communication gap: occurs when there is a difference between given external promises about a service and its real performance. Possible causes of this gap include overpromising through communication means and lack of conveying organization's endeavors to end-users while providing high quality.

Gap 5 – The customer gap: is the SERVQUAL model's main concentration. It refers the discrepancy of customers' expectations and perceptions (defined as service quality). It is emphasized that the first 4 gaps that arise as a result of service provider's misunderstandings, affect the fifth gap. Therefore, all the preceding gaps should be closed to eliminate Gap 5; since the model suggests that the lower the difference in the first 4 gaps, the higher the service quality perceived by customers (Parasuraman *et. al*., 1985). In other words, service quality gap falls as mean score, Perception – Expectation, rises (Zeithaml, Parasuraman, Berry, 1990).

Gap model indicates acceptable level of service quality in a way that, when performance perceptions are lower than expectations dissatisfactory service quality, when they are equal to each other satisfactory quality and when perceptions are higher than expectations supreme quality occurs (Parasuraman *et. al.*, 1985). It is worth to mention that SERVQUAL model has its origin in expectancy

disconfirmation paradigm like Oliver (1980). Oliver explained the difference between perceptions and expectations as 'disconfirmation' then, linked it to satisfaction. Dissatisfaction occurs as a result of negative disconfirmation where expectations exceed perceptions. On the other hand, customers are delighted when perceptions exceed expectations (positive disconfirmation). Finally, when perceptions and expectations are equal to each other (zero disconfirmation) customer satisfaction is achieved.

Since, Parasuraman *et. al.* (1985) viewed service quality as the difference between customer's perceptions and expectations from the service provided; they initially proposed 10 dimensions for assessing service quality; which is believed that all customers search for regardless of the service type. 97 different variables are gathered under these dimensions including reliability, responsiveness, competence, access, courtesy, communication, credibility, security, understanding/knowing the customer and tangibles (Parasuraman *et. al.*, 1985, 1988). Later, they considered some of the dimensions as revising and overlapping; thus, multi-item scale under 5 dimensions, which is called SERVQUAL instrument, was introduced (Parasuraman *et. al*., 1988). Parasuraman *et. al.* (1988) proposed this model in a way that customers score their performance perceptions and expectations, by using 22 items under 5 dimensions, on a 7-point Likert scale. Tenner and DeTorro (1992) argued 'RATER' abbreviation makes these dimensions to be simply remembered. These mentioned dimensions are defined below by Parasuraman *et. al.* (1988, p.23):

(1) "**Reliability:** ability to perform the promised service dependably and accurately.

(2) Responsiveness: willingness to help customers and provide prompt service.

(3) Assurance: knowledge and courtesy of employees and their ability to inspire trust and confidence.

(4) Empathy: caring, individualized attention the firm provides its customers.

(5) Tangibles: physical facilities, equipment and appearance of personnel".

Although Parasuraman *et. al.* (1985) validated the dimensions of service quality in four different service sectors (retail banking, product repair and maintenance, securities brokerage and credit cards), they emphasized that with minor modifications SERVQUAL is applicable in various service industries (Parasuraman *et. al.,* 1985, 1988). Various researchers also suggested that the importance and confidence of SERVQUAL instrument can be understood, by its wide application in different service settings (Brown and Swartz, 1989; Carman, 1990; Witkowski and Wolfinbarger, 2002; Vishuen *et. al.*, 2010). Application of SERVQUAL instrument can be seen in: banking industry (Wong and Perry, 1991; Cronin *et. al.,* 1992; Kwon and Lee, 1994; Newman, 2001; Zhu, Wymer and Chen, 2002), hotel industry (Saleh and Ryan, 1992; Gabbie and O'Neill, 1997), health industry (Carman, 1990; Lytle and Mokwa, 1992; Walbridge and Delene, 1993; Bebko and Garg, 1995; Lim and Tang, 2000; Wong, 2002), tourism industry (Fick and Ritchie, 1991; Walker, 1996), airline industry (Sultan and Simpson, 2000; Robledo, 2001), maritime industry (Durvasula, Lysonki and Mehta, 1999; Ugboma, Ibe, Ogwude, 2004; Ugboma, Ogwude, Ugboma, Nnadi, 2007; Pantouvakis, Chlomoudis, Dimas, 2008; Ugboma, Ugboma, Damachi, 2009; Pantouvakis, 2010; Vishuen *et. al.*, 2010; Miremadi, Ghalamkari, Sadeh, 2011) and so on.

2.5.1 Criticisms of SERVQUAL

While the SERVQUAL model has been used in various service settings by different researchers, several criticisms has been brought to the instrument as well. One of the most inclusive one is the Buttle's (1996) research; in which counterarguments are gathered under two headings: theoretical and operational.

Buttle (1996) argued that in spite of the lack of the evidence, difference between customers' perceptions and expectations assumed as the service quality in the model. Carman (1990), Babakus and Boller (1992) and Teas (1993) discussed this view in their researches as well. Further, Buttle (1996) said that the instrument concentrates on how the service is delivered rather than what is being delivered. This review was also supported by the study of Kang and James (2004), Liu (2005) and Fowdar (2005). Another criticism is related with dimensions of SERVQUAL. Thai (2008) mentioned in his research that, service quality determinants of the model are found to be too vague or too narrow by different researchers in different study settings. Several researchers also support this by questioning the usability of the instrument in all service industries and disciplines (Sachdev, Verma, 2004; Sureshchandar, Rajendram, Anantharaman, 2002); namely economics, social sciences and psychology (Llosa, Chandon, & Orsingher, 1998). Various researchers further suggested that some dimensions of SERVQUAL are not discrete enough; thus, overlapping occurs (Durvasula, Lysonski, Mehta, 1999; Kang, 2006). Even Parasuraman, Zeithaml and Berry (1994) discussed the similarity of the dimensions except reliability and tangibles. Other researchers criticize SERVQUAL model as well. Asubonteng *et. al.* (1996) argued that determinants used in the instrument and relationship between satisfaction and quality are the main critics of the model.

Furthermore, Jain *et. al.* (2004) based on the studies of various researchers, collected main criticisms of the instrument under 4 headings as long surveys, validity of determinants, reliability of the instrument and the model which SERVQUAL based on.

Presence of these criticisms leads modification of SERVQUAL in the studies of several authors (Marinkovic, Senic, Kocic, Sapic, 2011). Among them, Cronin and Taylor's (1992) SERVPERF (performance only) model is the most famous one (Jain *et. al.*, 2004; Marinkovic *et. al.*, 2011) in which only assessing customers' perceptions is enough and less complicated to understand the level of service quality (Cronin *et. al.*, 1992). They suggested that service quality increases as customers' perceptions of the performance rises. They also, tested and validated their model in fast food restaurants, banking, dry cleaning and pest control sectors. Although this view was supported by several other researchers including Babakus *et. al.*, 1992 ;Brown *et. al.*, 1993; SERVPERF model has its critics too; since, it doesn't entail customer expectations (Marinkovic *et. al.*, 2011).

Notwithstanding above criticisms, Asubonteng *et. al. (*1996, p.80) advocated "until a better but equally simple model emerges, SERVQUAL will predominate as a service quality measure". In addition, Robinson (1999) and many other researchers emphasized the SERVQUAL to be the most famous model as a quality measure.

2.5.2 SERVQUAL in the Port Industry

Wide application of SERVQUAL model in many different industries is obvious. Despite of this, it is rarely used in the shipping industry (Pantouvakis *et. al.*, 2008).

Among the limited number of studies, SERVQUAL scales' application in providing service settings was tested by Durvasula *et. al.*, (1999) through 114 shipping companies' administrators, who use Singapore port for the transportation of cargo across oceans. Although the convenience of the instrument in port quality assessment was mentioned, fewer (three) dimensional measures were recommended by authors. It is introduced that tangibles, reliability and gathering the rest three determinants under one heading might be preferred (Durvasula *et. al*., (1999). They further claimed that considering only judgments of users might end up with better service quality estimation at ports; despite of the usability of the difference between user perceptions and expectations for improvement issues. Finally, they confirmed that port users' overall satisfaction can be measured better and indicated by determinants of the instrument except 'tangibles'.

Ugboma *et. al.* (2004), conducted a research in the ports of Nigeria, to assess reliability of the SERVQUAL instrument and further identify primary service quality dimensions in maritime industry. Results were drawn from forty different logistic service providers' and shippers' opinions by employing analysis of variance and gap score. Eventually, the usability of the instrument for service quality measurement in the port sector was confirmed. More specifically, they emphasized the importance of 'tangibles', especially in terms of modern looking equipment, and 'responsiveness' in the assessment of service quality at ports; while, 'empathy' dimension viewed as the least important. Ugboma *et. al.*'s (2007) other study, also confirmed the findings of their initial research. Yet, they further added that users' positive judgment of the delivered service leads their ultimate satisfaction by pinpointing direct robust correlation between customer satisfaction and instruments' of the service quality

determinants. Meanwhile, it is important to keep in mind that, study has some restrictions which raise several questions, e.g. acceptance of findings in other industries.

Vishuen *et. al.*, (2010) is the other researcher who shed light on remarkable service quality determinants for different interest groups at ports. The sample used in the study was specific logistic service provider's different kind of interest groups (including its own working staff as well) who use Port Louis in Mauritius Island. As a result, newly added dimension 'operationalization of services' and the rest of the determinants in the instrument except 'tangibles' found to be important service quality indicators among managers and employees in the port environment. Yet, it is important not to forget that weighted approach was used to reach this result. Researchers also measured the importance of dimensions from the perspective of clients; thus, 'operationalization of services', 'assurance', 'responsiveness' and 'tangibles' were introduced as critical dimensions at ports although the low ratings on staff visage and waiting time for ships. Furthermore, usability of the instrument in the maritime sector was approved one more time (Vishuen *et. al.*, 2010).

Another study carried out by Miremadi *et. al.* (2011) in Iranian Port. Based on the different port users' (except passengers) expectations and judgments on SERVQUAL's revised variables, they concluded that 'tangibles' and 'empathy' (as opposed to Ugboma *et. al.'s* study, 2004) dimensions are the most critical to reduce service quality gap in the sector.

Up to now, all the studies mentioned above are about SERVQUAL application in the port environment from different interest groups' perspective except passengers. In the literature there seems to be only one study of the instrument which is carried out directly from the port passengers' perspective. The question of 'why passengers have low importance in the maritime industry' was answered by Pantouvakis (2006). He claimed that individual clients have more price competitive options now, in terms of modal choice (e.g. planes), and the combination of this with decreased restrictions between countries could be one of the causes. He also found out that, service quality execution for individual clients at ports is limited, since they are viewed as rapid port users. Larroque's (1995) lines in Pantouvakis' research supported this idea by claiming conventional role of the ports as good transportation rather than passengers. The last cause was argued to be the need for more marketing focused orientation of service quality; because of insufficiency of the standard certification series for meeting all the customer needs (Pantouvakis, 2006).

Dimensions of SERVQUAL were tested in passenger shipping by Pantouvakis *et. al.*, (2008). Only judgment based opinions of 434 individual clients, in Piraeus Port - Greece, were obtained through the five dimensional model and analyzed. Although, intersecting of the dimensions except 'reliability', the instrument was found to be adequate in passenger shipping. However, it is claimed that two dimensional model (reliability and others under one dimension) is more usable at passenger ports. Finally, he added the strong impact of tangibles on general passenger satisfaction (Pantouvakis *et. al.*, 2008).

2.6 Conceptual Model and Hypotheses

As it was mentioned in Marinkovic et. al's (2011) research ,two perspectives were brought to the concept of service quality in the literature. According to Gronroos, 1984, Parasuraman *et. al.*, 1985 and several other researchers the difference between consumers' service expectations and perceptions is the basis for the service quality; while, on the other hand, for Cronin *et. al.*, (1992), Caro *et. al*.,(2007) and some other researchers it was solely the perceptions of customers.

In the study both types of perspectives have been tested and analyzed, based on Parasuraman *et. al.*'s (1994) revised SERVQUAL dimensions. Models can be seen in Figure 2, where straight line arrows represent the first approach and mainly based on Parasuraman *et. al.*'s (1985, 1988, 1994) conceptual model; while dashed arrows illustrate service quality measurement based on the perceptions of customers (Cronin *et. al.*'s, 1992, SERVPERF model).

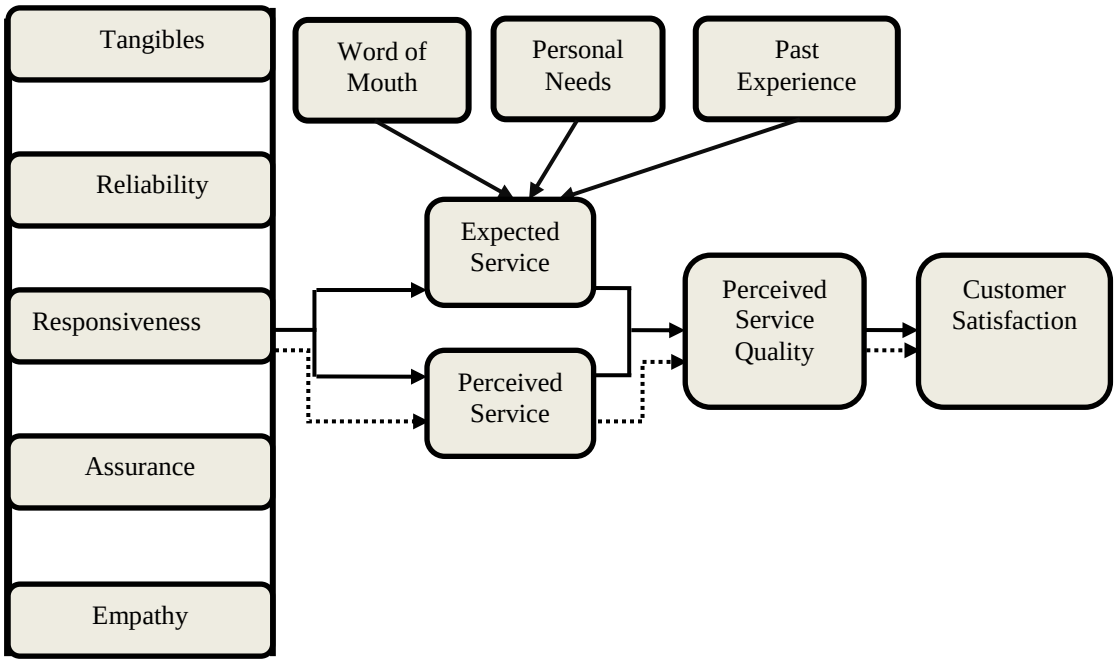

Figure 2: Determinants of Perceived Service Quality

Parasuraman *et. al.*, (1985, p.16) defined service quality as "a global judgment, or attitude, relating to the superiority of the service"; thus, it is viewed as the difference between customers' perceived service performance and *normative* expectations related with that service. As it is mentioned before, it is important to realize that *should* expectations are used in the first approach. This quality view also supported by several other worthy researchers (Sasser, Olsen & Wyckoff, 1978; Gronroos, 1982, Parasuramsn *et. al.*, 1990). It is argued that service quality, perceived by consumers, lies on a scale; where the difference level between consumers' perceptions and normative expectations implies its satisfactory level. Thus, service quality is accepted as dissatisfactory if P<E, satisfactory if P=E and ideal if P>E (Parasuraman *et. al.*, 1985).

After some alterations, five dimensions with 22 items in total were introduced as service quality determinants; where consumers' should expectations on service and perceptions of specific service performance should be measured with each determinant. Yet, Parasuraman *et. al.*, (1985) added that these determinants might differ in their impact when shaping consumers' perceptions and expectations. They also suggested that word of mouth, past experiences and personal needs are the factors that affect consumers' pre-purchase expectations.

As it was mentioned before, two approaches can be seen in the model. Cronin *et. al.*, (1992) discussed that only attitude based conceptualization could be easier and better measure for service quality; thus, only customers perceptions were taken into consideration as a second approach in the model.

It is seen in the literature that antecedents of service quality and satisfaction concepts have their origin in expectancy disconfirmation (mismatch of consumer perceptions with their expectations) (Oliver, 1980; Parasuraman *et. al.*,1988; Zeithaml *et. al.*, 1993; Spreng and Mackoy, 1996). Thus, it is said that one of the differences between these two, is based on the standard (expectation) which is considered (Parasuraman *et. al.*, 1988; Oliver 1980, 1997; Boulding, Karla, Staelin & Zeithaml, 1993). They argued that if the case is customer satisfaction, consumer 'predictions' on performance are taken as expectations while if the case is service quality, consumer 'desires or wants' play the role for expectations. So, customer satisfaction is the function of customer perceptions and predictions through dis(confirmation). Then, Oliver (1993) attempted to combine these two literatures and proposed a new model; that brought various debates about relationship between service quality and customer satisfaction in the literature.

Apart from this view, different perspectives about customer satisfaction and its relation with service quality are available in the literature. Several researchers argued that direct effect of sole perception exists on satisfaction (Woodruff, Cadotte, & Jenkins, 1983); while others emphasized that expectations have direct (un)favorable effect on it (Tse & Wilton, 1988; Oliver & DeSarbo, 1988). It has been also argued that service quality is an antecedent to satisfaction (Woodside, Lisa & Robert, 1989; Cronin *et. al.*, 1992; Rust *et. al.*, 1994; Strandvik & Liljander, 1994) although contrary views are also present in the literature (Parasuraman *et. al.*, 1985, 1988; Bitner, 1990; Bolton & Drew, 1991).

It is obvious that literature is still lacking the consecutive order between service quality and satisfaction though both type of relations have studied and supported before. In this study, the effect of service quality on customer satisfaction will be tried to be proved at Northern Cyprus' passenger ports. Taking reviewed literature and above discussions into consideration, six hypotheses could be formulated as follows:

H1: Tangibles has positive effect on overall service quality, perceived by passengers.

H2: Reliability has positive effect on overall service quality, perceived by passengers.

H3: Responsiveness has positive effect on overall service quality, perceived by passengers.

H4: Assurance has positive effect on overall service quality, perceived by passengers.

H5: Empathy has positive effect on overall service quality, perceived by passengers.

H6: Overall service quality, perceived by passengers, has significant effect on passengers' satisfaction.

Chapter 3

METHODOLOGY

3.1 Sample of the Study

As it is known population is the whole interest group of the study. Thus, anyone who uses Famagusta or Kyrenia Ports for some reason generates the population for this study. Table 2 below, which is obtained from TRNC Harbors Directorate Office (2013), illustrates passenger figures against years in two different ports (Famagusta and Kyrenia):

Table 2: TRNC Famagusta and Kyrenia Port Passenger Traffic (2008-2012)

Year	TRNC	Famagusta	Kyrenia
2008	263293	44108	219185
2009	208686	38198	170488
2010	205537	33439	172098
2011	163326	27339	135987
2012	144872	29284	115588

The aim of this study is to test the importance and applicability of SERVQUAL dimensions in passenger port industry. To do so, simple random sampling method was used for the study where each element (person) of the population had equal chance of being selected. In total 417 people questioned (215 from Famagusta and

202 from Kyrenia Ports). Respondents' demographic information will be analyzed in the next chapter.

3.2 Pilot Study

Small scale study was carried out, before distributing questionnaires, with an intention to test comprehensibility and clearness of instructions and statements; and also to test convenience of filling out questionnaire properly. Pilot study was carried out by the researcher herself, in the passenger hall of Famagusta Port before their departure. 40 questionnaires were used in total as a test study.

The researcher carried out 35 of the questionnaires face to face. Instructions and statements were read out politely and then responses marked by the researcher herself. The rest 5 questionnaires were filled out by passengers themselves, one at a time, in the presence of the researcher. During and at the end of both cases, the respondents were asked about their opinions and suggestions related with any part of the questionnaire.

Respondents had some problems of differentiating and realizing that both perceived and expected service levels were asked. Thus, explanation of perceived and expected service levels dilated in more detail and arrows added to illustrate different service level's related column.

3.3 Instrument Design

In the study, both first hand and second hand data were used. For the collection of first hand quantitative data, questionnaire was designed and employed with reference to Parasuraman *et. al.*'s multiple item scale (1988).

An instrument (questionnaire) is made up of three sections. First section measures passengers' perceptions and expectations with 28 attributes in total, based on five dimensions of service quality; namely tangibles, reliability, responsiveness, assurance and empathy. Tangibles is made up of seven statements and measures physical facility and appearance related attributes at the ports. Second dimension, reliability, includes seven statements with an intention to reveal whether processes are done without any mistake and promises are kept at the ports. Another dimension is responsiveness which measures punctuality and warmth of the working personnel at the ports with four attributes. Assurance is represented by five statements to measure the staff's level of concern and also their ability to make passengers feel secure during processes. The last dimension is empathy and includes five attributes to measure the level of attention given to passengers by the personnel of the port. Table below illustrates different attributes of each dimension with their references:

Table 3: Dimensions/Items and Related Sources

Dimensions and Attributes	**References**
TANGIBLES	
Port has modern looking equipment.	Ugboma, C., Ibe, C., & Ogwude, I. C. (2004). Service Quality Measurements in Ports of a Developing Economy: Nigerian Port Survey. *Managing Service Quality, 14*(6), 487-495. Ugboma, C., Ogwude, I. C., Ugboma, O., & Nnadi, K. (2007). Service Quality and Satisfaction Measurements in Nigerian Ports: An Exploration. *Maritime Policy Management, 34*(4), 331-346. Pantouvakis, A., Chlomoudis, C., & Dimas, A. (2008). Testing the SERVQUAL Scale in the Passenger Port Industry: A Confirmatory Study. *Maritime Policy and Management: The Flagship Journal of International Shipping and Port Research, 35*(5), 449-467. Pantouvakis, A. (2010). The relative importance of service features in explaining customer satisfaction: A comparison of measurement models. *Managing Service Quality,* 20(4), 366-87
Materials associated with the service (pamphlets, handbook or statements) are visually appealing.	Pantouvakis, Chlomoudis, & Dimas, 2008. Pantouvakis, 2010
Port facilities are up to date.	Pantouvakis, Chlomoudis, & Dimas, 2008. Pantouvakis, 2010
Port's terminal, embarkation/disembarkation and hygiene areas are adequate and sufficient.	Ugboma, Ogwude, Ugboma, & Nnadi, 2007. Pantouvakis, Chlomoudis, & Dimas, 2008. Pantouvakis, 2010
Connection to other transportation means and parking spaces are adequate.	Pantouvakis, Chlomoudis, & Dimas, 2008. Pantouvakis, 2010
Appearance of the personnel is good.	Ugboma, Ibe, & Ogwude, 2004. Ugboma, Ogwude, Ugboma, & Nnadi, 2007.
Physical facilities of the port are visually appealing.	Ugboma, Ogwude, Ugboma, & Nnadi, 2007.
RELIABILITY	
All functions are performed according to specifications.	Pantouvakis, Chlomoudis, & Dimas, 2008. Pantouvakis, 2010
When a passenger or port user has a problem, port procedures are able in solving it.	Pantouvakis, Chlomoudis, & Dimas, 2008. Pantouvakis, 2010
Port provides high quality services to the customers.	Pantouvakis, Chlomoudis, & Dimas, 2008. Pantouvakis, 2010
Port provides reliable services.	Pantouvakis, Chlomoudis, & Dimas, 2008. Pantouvakis, 2010
Port insists on error-free records.	Pantouvakis, Chlomoudis, & Dimas, 2008. Pantouvakis, 2010
Port performs services right the first time.	Parasuraman, Zeithaml, & Berry, 1988
Port provides services at the promised time.	Ugboma, Ibe, & Ogwude, 2004 Ugboma, Ogwude, Ugboma, & Nnadi, 2007.
RESPONSIVENESS	
Personnel in the port tell you exactly when services are to be performed.	Pantouvakis, Chlomoudis, & Dimas, 2008. Pantouvakis, 2010
Personnel in the port give you prompt service and solve any problem.	Pantouvakis, Chlomoudis, & Dimas, 2008. Pantouvakis, 2010

Personnel in the port always are willing to help me.	Ugboma, Ogwude, Ugboma, & Nnadi, 2007. Pantouvakis, Chlomoudis, & Dimas, 2008. Pantouvakis, 2010
Personnel in the port never be too busy to respond to my requests.	Pantouvakis, Chlomoudis, & Dimas, 2008. Pantouvakis, 2010
ASSURANCE	
Personnel in the port are consistently courteous to you.	Pantouvakis, Chlomoudis, & Dimas, 2008. Pantouvakis, 2010
You feel secure inside port's area.	Pantouvakis, Chlomoudis, & Dimas, 2008. Pantouvakis, 2010
The behavior of personnel in the port will instill confidence to you.	Pantouvakis, Chlomoudis, & Dimas, 2008. Pantouvakis, 2010
Personnel in the port have the knowledge to answer your questions.	Ugboma, Ibe, & Ogwude, 2004. Pantouvakis, Chlomoudis, & Dimas, 2008. Pantouvakis, 2010
You feel secure while you are conducting transactions in the port.	Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). SERVQUAL: A Multiple Item Scale for Measuring Consumer Perceptions of Service Quality. *Journal of Retailing, 64*(1), 12-40.
EMPATHY	
Personnel in the port give passengers individual attention.	Ugboma, Ogwude, Ugboma, & Nnadi, 2007. Pantouvakis, Chlomoudis, & Dimas, 2008. Pantouvakis, 2010
The port facilities operating hours are convenient to passengers.	Pantouvakis, Chlomoudis, & Dimas, 2008. Pantouvakis, 2010
Port personnel understand passengers' specific needs and personal requirements.	Ugboma, Ogwude, Ugboma, & Nnadi, 2007. Pantouvakis, Chlomoudis, & Dimas, 2008. Pantouvakis, 2010
Port personnel deal with their customers in the best and heartedly way.	Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). SERVQUAL: A Multiple Item Scale for Measuring Consumer Perceptions of Service Quality. *Journal of Retailing, 64*(1), 12-40.
Port has personnel that pay individual attention to its customers.	Pantouvakis, Chlomoudis, & Dimas, 2008.

In the first section of the questionnaire passengers rated their perceptions and expectations on 5-point Likert scale instead of seven; where 1 is strongly disagree, 2 is disagree, 3 is neither agree nor disagree, 4 is agree and 5 is strongly agree. The reason behind can be explained as; it would be easier for passengers to understand the difference between numbers (1 to 5) thus, use the scale more valid.

Section two is quite short and intends to measure port's overall service quality (1 statement), customer satisfaction (2 statements), repurchase intention of passengers (1 statement) and word of mouth (wom) about related port (2 statements) based on

perceptions of passengers (refer table 4 to find related references for the given statements). 5-point Likert scale is employed in this section.

Table 4: Statements and Related Sources

Statements	References
Overall Service Quality	
The overall quality of the services provided by my port is excellent.	Ugboma, Ogwude, Ugboma, & Nnadi, 2007.
Customer Satisfaction	
After considering everything, I am extremely satisfied with my port.	Ugboma, Ogwude, Ugboma, & Nnadi, 2007.
My port always meets my expectations and gives value service.	Ugboma, Ogwude, Ugboma, & Nnadi, 2007.
Repurchase Intention	
I prefer this port for my transportation again.	Yen, C. H., & Lu, H. P. (2008). Factors Influencing Online Auction Repurchase Intention. *Internet Research-Emerald, 18*(1), 7-25.
Word of Mouth	
My friends speak positively about this port.	Goyette, I., Ricard, L., Bergeron, J., & Marticotte, F. (2010). e-Wom Scale: Word of Mouth Measurement Scale for e-Services Context. *Canadian Journal of Administrative Sciences*, *27*, 5-23
I recommend this port to my friends for their transportation.	Goyette, Ricard, Bergeron & Marticotte, 2010.

The last section of the questionnaire collects data about demographic information of the passengers; in the light of profiling respondents under several titles. Totally, 11 short questions were directed to respondents including: gender, age, nationality, city of residence, marital status, level of education, occupation, monthly income level, frequency by ship, purpose of travel by ship and number of different ports used before.

The questionnaire was prepared in English; which then translated to Turkish using back- to-back method. Since, almost all the passengers' mother language was Turkish; Turkish version of the instrument was used. The questionnaires were carried out at the passenger arrival/departure gates of ports and during sailing of passengers

within four months period. 20% of the questionnaires were held face to face while the rest was distributed and collected later. In total 482 questionnaires were distributed. After eliminating 65 questionnaires because of improper, missing, and wrong filling; 417 usable questionnaires (215 for Famagusta and 202 for Kyrenia) were employed for the analysis.

Chapter 4

DATA ANALYSIS AND FINDINGS

Several analyses have been conducted to find out applicability of Parasuraman *et. al.'s* (1985, 1988, 1994) service quality model and its relationship with customer satisfaction at passenger ports of TRNC. Statistical Package for Social Sciences (SPSS) version 21.0 was used for demographic, reliability, gap and factor analyses. At the end of the factor analyses (both perception and perception-expectation oriented) newly proposed dimensions were introduced. In order to make further checking reliability, validity and relationships between constructs and predictive ability of the model was tested by applying Structural Equation Modeling (SEM) in Partial Least Square (PLS) software.

4.1 Demographic Analysis

As it is mentioned before, several questions related with demographic information of the respondents, compose the last section of the questionnaire. In the following tables (table 5-13) descriptive statistics for each question is analyzed by using SPSS 21.0.

Table 5: Distribution by Gender

	Frequency	Percent	Cumulative Percent
Male	299	71,7	71,7
Female	118	28,3	100,0
Total	417	100,0	

The table above illustrates the distribution of passengers based on gender. Interestingly, two third of the entire sample was made up of male respondents (almost 72%) while the rest, almost 28%, comprised of female respondents.

Table 6: Distribution by Age

	Frequency	Percent	Cumulative Percent
Under 18	6	1,4	1,5
18 – 30	158	37,9	39,7
31 – 40	120	28,8	68,8
41 – 50	86	20,6	89,6
51 – 60	40	9,6	99,3
61 and above	3	,7	100,0
Total	413	99,0	
Missing	4	1,0	
Total	417	100,0	

Passengers were also asked about their ages (refer Table 6). Among the entire sample most of the respondents (158) were between the age of 18 and 30 years which constitute almost 38% of the sample. The second highest frequency of ages was between 31 and 40 years with hundred and twenty passengers which made up almost 29% of the total sample. Eighty six passengers' age range was between 41-50 years with 20,6% while forty passengers were between the ages of 51 and 60 (9,6%). Only six people in total were under 18 years and people who are 61 and above made up almost 2% of the sample.

Table 7: Distribution by Nationality

	Frequency	Percent	Cumulative Percent
Azerbaijani	2	,5	,5
British	1	,2	,7
Indian	8	1,9	2,6
Turkish Cypriot	227	54,4	57,1
Turkish	179	42,9	100,0
Total	417	100,0	

Table 7 depicts the distribution of port passengers by nationality. They were asked to mention their nationalities through open ended question and as a result they were classified into 3 main groups as Turkish Cypriot, Turkish and others. Two hundred twenty seven (54,4%) of the respondents were Turkish Cypriot who constituted the majority of the passengers. This figure was followed by Turkish passengers who made up almost 43% of the sample with hundred and seventy nine people. Only 11 passengers (2,6%) were from different nationalities (including Indian, Azerbaijani and British) and were grouped as the category of 'others'.

Table 8: Distribution by Marital Status

	Frequency	Percent	Cumulative Percent
Married	223	53,5	53,5
Single	157	37,6	91,1
Divorced	13	3,1	94,2
Widowed	4	1,0	95,2
Engaged	16	3,8	99,0
Living Together	4	1,0	100,0
Total	417	100,0	

As can be seen in table 8, marital status of passengers was also observed. More than half of the passengers (53,5%) were married while single passengers constituted 37,6% of the sample. In contrast to these figures, engaged passengers were only sixteen in total (3,8%) while the rest 2% of the passengers (8) were widowed or living together.

Table 9: Distribution by Education Level

	Frequency	Percent	Cumulative Percent
Primary School	36	8,6	8,7
Secondary School	59	14,1	22,9
High School	147	35,3	58,5
Undergraduate	152	36,5	95,2
Master	16	3,8	99,0
Doctoral	4	1,0	100,0
Total	414	99,3	
Missing	3	,7	
Total	417	100,0	

Another profile of the respondents was drawn based on their education levels (see Table 9). Out of four hundred and seventeen passengers only three didn't answer the question which constitute less than one percent (0,7%) of the sample. The rest of the figures were as follow: Majority of the passengers was either undergraduate (152) or high school (147) diploma holders with 36,5% and 35,3% respectively. Fifty nine passengers that constituted 14,1% of the sample was secondary school graduate while thirty six passengers (8,6%) graduated from primary school. Passengers with master degree claimed 3,8% of the sample while doctoral degree graduates accounted only 1% of the sample.

Table 10: Distribution by Profession

	Frequency	Percent	Cumulative Percent
House Wife	13	3,1	3,1
Sailor	13	3,1	6,2
Security	18	4,3	10,6
Sea Captain	10	2,4	12,9
Employee	13	3,0	14,6
Clerk	58	13,9	28,5
Student	66	15,8	44,4
Teacher	16	3,8	48,2
Private Sector	5	1,2	49,4
Self-Employment	25	6,0	55,4
Driver	54	12,9	68,3
Other	126	30,4	100,0
Total	417	100,0	

Through the light of detecting passengers' occupation, open ended question directed to the respondents (see Table 10). 15,8% of the sample was made up of students, 13,9% from clerks and 12,9% from drivers which can be seen as the most common profession of passengers in the sample. Self-employed people constituted 6% while 4,3% was accountable for securities. 3,8% of the passengers were teachers; while, passengers who were housewives and sailors were in the same amount (thirteen for each) and each of these professions was constituting 3,1% of the respondents who were questioned. Passengers who were employee (13), sea captain (10) or worked in a private sector (5) have considerable but lower percentages when compared with previously mentioned professions. The rest of the passengers were all from different backgrounds which were classified as 'other' and constituted 30,4% of the sample.

Table 11: Distribution by Monthly Personal Income Level

	Frequency	Percent	Valid Percent	Cumulative Percent
1,000 TL and less	61	14,6	15,7	15,7
1,000 - 2,000 TL	172	41,2	44,2	59,9
2,000 - 3,000 TL	90	21,6	23,1	83,0
3,000 - 4,000 TL	47	11,3	12,1	95,1
4,000 - 6,000 TL	10	2,4	2,6	97,7
6,000 TL and more	9	2,2	2,3	100,0
Total	389	93,3	100,0	
Missing	28	6,7		
Total	417	100,0		

Regarding monthly personal income level of the observed passengers, the following figures were obtained: Majority (44,2%) of the respondents' income level was between 1,000 - 2,000 TL, as opposed passengers (2,3%) with the income level of 6,000 TL and more. The rest of the sample was as follow: 90 passengers (23,1%) stated their income level between 2000 – 3000 TL, 61 passengers (15,7%) as 1000TL and less, 47 passengers (12,1%) between 3000 – 4000 TL, and 10 passengers (2,6%) between 4000 – 6000 TL. Please notice that valid percentages were used since missing answers for this question constituted 6,7% of the whole sample.

Table 12: Distribution by Frequency of Travel

	Frequency	Percent	Cumulative Percent
Once a month	14	3,4	3,4
Few times a month	84	20,1	23,7
Every three months	40	9,6	33,4
Every six months	50	12,0	45,5
Once a year	111	26,6	72,4
Less than once a year	114	27,3	100,0
Total	413	99,0	
Missing	4	1,0	
Total	417	100,0	

Table 12 depicts passenger distribution by frequency of travel. Majority of the passengers in the sample travel either less than once a year (27,3%) or once a year (26,6%). This figure is followed by 84 passengers who travel more frequently (few times a month) and constituted 20,1% of the studied sample. 12% of the passengers were travel in every six months while the figure was 9,6% for every three months travelers. Once a month travelers were in minority, 14 in total, and make up 3,4% of the sample.

Table 13: Distribution by Purpose of Travel

	Frequency	Percent	Cumulative Percent
Work	128	30,7	30,8
Education	36	8,6	39,5
Holiday	198	47,5	87,2
Other	53	12,7	100,0
Total	415	99,5	
Missing	2	,5	
Total	417	100,0	

Questioned passengers were also asked about their purpose of travel. Almost half of them (47,5%) were travelling because of vacation. Hundred and twenty eight passengers that constituted 30,7% of the respondents were travelling for work/business purposes. Only 8,6% of the respondents were travelling because of their education while the rest 12,7% was accountable for some other reasons (e.g. transportation of vehicles, bringing spare parts).

Table 14: Distribution by Previously Used Different Number of Ports

No. of Ports	Frequency	Percent	Valid Percent	Cumulative Percent
0	20	4,8	4,9	4,9
1	84	20,1	20,4	25,3
2	169	40,5	41,1	66,4
3	55	13,2	13,4	79,8
4	26	6,2	6,3	86,1
5	15	3,6	3,6	89,8
6	4	1,0	1,0	90,8
7	3	,7	,7	91,5
8	4	1,0	1,0	92,5
9	4	1,0	1,0	93,4
10	11	2,6	2,7	96,1
12	1	,2	,2	96,4
20	2	,5	,5	96,8
25	1	,2	,2	97,1
40	6	1,4	1,5	98,5
50	1	,2	,2	98,8
60	1	,2	,2	99,0
80	1	,2	,2	99,3
85	1	,2	,2	99,5
100	1	,2	,2	99,8
168	1	,2	,2	100,0
Total	411	98,6	100,0	
Missing	6	1,4		
Total	417	100,0		

Last question of the instrument was about the number of different ports that have been used by the passengers before. Responses varied through the range of 0 – 168 ports. The frequent answer which obtained was two (41,1%). Please refer table 14 for more details.

4.2 Reliability Analysis

Reliability simply refers constancy of the obtained results in the case of conducting the same research again (Carmines & Zeller, 1979; McDaniel & Gates, 2010). Among the several ways of measuring reliability, internal consistency technique has been employed in this study; in the light of assessing the reliability of the used dimensions and attributes on perceived and expected service quality levels. This technique has also been used in the researches of several worthy authors including Parasuraman *et. al.* 1988; Carman, 1990; Cronin and Taylor, 1992 in order to test the employed scale.

Widely known instrument - Cronbach's alpha, is utilized for measuring internal consistency thus, scale's reliability; where coefficient of 0.7 is considered as adequate to accept measurement scale as reliable (Nunnally, 1978; Nunnally & Bernstein, 1994). It was added by Churchill (1979) that, coefficient of 0,7 indicates the exclusion of any random error in measures.

Since the main focus of the study is on the dimensions of SERVQUAL; reliability coefficient for each dimension of perceived and expected service is illustrated in table 15, on the next page:

Table 15: Alpha Coefficients

Dimensions	No of Items	Perceived Quality	Expected Quality
Tangibles	7	0,798	0,920
Reliability	7	0,913	0,915
Responsiveness	4	0,904	0,878
Assurance	5	0,924	0,907
Empathy	5	0,919	0,909
Total	28	0,962	0,972
Overall	56	0,962	

Results indicate that, alpha value for each dimension is above 0,7, where most of them is adjacent to 1,00. In Overall, alpha was calculated as 0,962. So, Nunnally and Bernstein's rule of thumb (1994) is met and according to Churchill (1979) these measures don't include any random error. Therefore, it is possible to draw a conclusion that the measurement scale has high internal consistency; thus results are reliable.

4.3 Gap Analysis

In order to check level of service quality satisfaction at ports, from passengers' perspective, gap analysis has been employed. Table 16 shows service quality perceptions and expectations on each dimension and attribute; and also gap means with related standard deviations.

It is advocated that customers' service quality expectations related with an attribute, signal the importance of it (Lewis, Orledge & Mitchell, 1994). From the figures it can be seen that expectation level of passengers on each dimension are close to each other and range between 4,57 and 4,60. Though, specially, knowledge of the personnel to answer questions (assurance), providing services at the promised time (reliability) and convenient operating hours to passengers (empathy) under different dimensions perceived as the most important attributes for passengers. Further, to

generalize, it can be said that tangibles is the least important dimension while assurance holds the leadership in the ranking. Former finding was supported in the literature by Parasuraman *et. al.* (1990), Lewis *et. al.* (1994) and Ugboma *et. al.* (2004).

Later, gap mean for each item and dimension was calculated by subtracting related item or dimension's mean expectations from mean perceptions (perceptions – expectations). As can be seen from the table, gap means for dimensions range between -1,85 and -2,14. 'Tangibles' has the highest gap score, with -2,14; while 'assurance' dimension holds the lowest difference with -1,85. So these can be explained in a way that, maximum difference between passengers' perceptions and expectations was seen in tangibles dimension especially when it comes to port's modern looking equipment and its up to date facilities. On the other hand, it is the 'assurance' dimension which holds the minimum discrepancy between perceptions and expectations of passengers. Yet, all dimensions have negative value which implies that, expectation of passengers for each dimension is higher than their perceptions. In other words, it is possible to say that provided services at ports do not satisfy passengers' expectations in none of the dimensions where tangibles holds the leadership.

Table 16: Gap Score Analysis and Standard Deviation

DIMENSION/ITEM	Perception Mean	Expectation Mean	Gap Mean (P-E)	Gaps' Std. Dev.
TANGIBLES	**2,4178**	**4,5549**	**-2,1390**	**,78032**
Item 1	2,1391	4,5012	-2,3621	1,09008
Item 2	2,2662	4,5564	-2,2902	1,14553
Item 3	2,1990	4,5683	-2,3693	1,10193
Item 4	2,2909	4,5851	-2,2957	1,11791
Item 5	2,6570	4,5253	-1,8671	1,20098
Item 6	2,8945	4,5971	-1,7026	1,15726
Item 7	2,4602	4,5542	-2,0966	1,13083
RELIABILITY	**2,6568**	**4,5866**	**-1,9275**	**,89121**
Item 1	2,6259	4,5564	-1,9305	1,11263
Item 2	2,7650	4,5971	-1,8321	1,12045
Item 3	2,3309	4,5564	-2,2254	1,10811
Item 4	2,6587	4,6139	-1,9543	1,15762
Item 5	2,7422	4,5553	-1,8145	1,18842
Item 6	2,7139	4,5841	-1,8699	1,16819
Item 7	2,7633	4,6193	-1,8523	1,17415
RESPONSIVENESS	**2,6538**	**4,5727**	**-1,9163**	**1,06297**
Item 1	2,7914	4,5707	-1,7794	1,21855
Item 2	2,6235	4,6043	-1,9808	1,23826
Item 3	2,6379	4,5481	-1,9087	1,22870
Item 4	2,5745	4,5635	-1,9880	1,27906
ASSURANCE	**2,7451**	**4,6010**	**-1,8507**	**1,07943**
Item 1	2,7482	4,5841	-1,8317	1,27650
Item 2	2,7284	4,5995	-1,8702	1,28662
Item 3	2,6715	4,5971	-1,9257	1,23714
Item 4	2,7938	4,6235	-1,8297	1,22760
Item 5	2,7909	4,6034	-1,8125	1,26622
EMPATHY	**2,5773**	**4,5846**	**-2,0053**	**1,07603**
Item 1	2,4580	4,5564	-2,0983	1,24515
Item 2	2,7458	4,6139	-1,8681	1,27640
Item 3	2,5108	4,5635	-2,0528	1,22164
Item 4	2,5133	4,6082	-2,0940	1,29037
Item 5	2,6442	4,5851	-1,9399	1,35103

Standard deviations are also given in the table and vary between 0,78 and 1,08. 'Tangibles' has the most consistent results since, the lowest standard deviation occurs by this dimension. Opposed to tangibles, dimensions with the highest standard

deviations are ‘assurance’ (1,079) and ‘empathy’ (1,076); which imply lower reliability of results.

4.4 Factor Analysis

One of the reasons of using factor analysis is “reducing a data set to a more manageable size while retaining as much of the original information as possible” (Field, 2005, p.619). In the analysis, items with high correlation levels are represented by factors. For this research, exploratory factor analysis has been employed in the light of quantifying construct validity and dimensionality of the used variables from both perspectives of service quality (perception based (Cronin *et. al.*, 1992) or gap based (Parasuraman *et. al.*, 1985,1988)).

4.4.1 Factor Analysis (Perception based only)

Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and significance of Barlett’s test of sphericity are illustrated in table 17. KMO measure is 0,967, accepted as excellent value since, it is greater than 0,9; thus, it is confirmed that the sample is big enough to apply factor analysis (Kaiser, 1974). Barltlett’s test of sphericity’s significance is 0,000 which implies robust relationship among items as well.

Table 17: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,967
Bartlett's Test of Sphericity	Approx. Chi-Square	8581,852
	Df	378
	Sig.	,000

Initial and extracted communalities are depicted in table 18; where principal component analysis has been employed as extraction method. Extraction communalities are forecasts of the variance in each item accounted by the factors (or

components) in the factor solution (Field, 2005). Communalities for these variables (items) vary between 0,440 and 0,793. Since these values are large enough (> 0,4; Stevens, 1992) for each item, none of the items were discarded for the analysis.

Table 18: Communalities

	Initial	Extraction
…modern looking equipment.	1,000	,664
…are visually appealing.	1,000	,498
…facilities are up to date.	1,000	,644
…and hygiene areas are adequate and sufficient.	1,000	,589
…transportation means and parking spaces are adequate.	1,000	,522
…the personnel is good.	1,000	,558
…port are visually appealing.	1,000	,508
…performed according to specifications.	1,000	,595
…has a problem, port procedures are able in solving it.	1,000	,668
…high quality services to the customers.	1,000	,440
…provides reliable services.	1,000	,614
…insists on error-free records.	1,000	,607
…performs services right the first time.	1,000	,673
…provides services at the promised time.	1,000	,594
…tell you exactly when services are to be performed.	1,000	,700
…give you prompt service and solve any problem.	1,000	,653
…always are willing to help me.	1,000	,689
…never be too busy to respond to my requests.	1,000	,596
…are consistently courteous to you.	1,000	,708
…feel secure inside port's area.	1,000	,627
…personnel in the port will instill confidence to you.	1,000	,745
…have the knowledge to answer your questions.	1,000	,708
…feel secure while you are conducting transactions in the port.	1,000	,656
…give passengers individual attention.	1,000	,743
…operating hours are convenient to passengers.	1,000	,590
…understand passengers' specific needs and personal requirements.	1,000	,720
…deal with their customers in the beast and heartedly way.	1,000	,793
…personnel that pays individual attention to its customers.	1,000	,728

In table 19, it can be seen that three components' (factors) corresponding initial eigenvalues are more than 1 and these three factors explain almost sixty four percent of cumulative variance.

Table 19: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	14,192	50,686	50,686	14,192	50,686	50,686	11,492	41,043	41,043
2	2,473	8,831	59,516	2,473	8,831	59,516	3,380	12,070	53,113
3	1,168	4,170	63,686	1,168	4,170	63,686	2,960	10,573	63,686
4	,987	3,525	67,211						
5	,858	3,066	70,277						
6	,787	2,812	73,090						
7	,623	2,223	75,313						
8	,573	2,048	77,360						
9	,540	1,927	79,288						
10	,516	1,844	81,131						
11	,500	1,784	82,915						
12	,434	1,550	84,465						
13	,422	1,507	85,972						
14	,376	1,342	87,313						
15	,363	1,296	88,610						
16	,340	1,214	89,823						
17	,326	1,164	90,988						
18	,307	1,095	92,082						
19	,278	,994	93,076						
20	,274	,977	94,053						
21	,260	,928	94,981						
22	,246	,879	95,860						
23	,236	,843	96,703						
24	,213	,762	97,465						
25	,200	,714	98,179						
26	,186	,663	98,843						
27	,164	,587	99,430						
28	,160	,570	100,000						

Table 20 illustrates rotated component matrix; where varimax with Kaiser Normalization was the method of rotation. As a result ***three factors***, which constitute 63.7% of the total variance, have been suggested for measuring service quality (only perception based) at passenger ports of TRNC. Interestingly, items related with tangibles have been split into two different dimensions where one component is formed with the first four items while the rest three is accountable for another component. The rest of the items, namely reliability, responsiveness, assurance and empathy are classified under one component.

Table 20: Rotated Component Matrix

	Component		
	1	2	3
…modern looking equipment.			,793
…are visually appealing.			,698
…facilities are up to date.			,786
…and hygiene areas are adequate and sufficient.			,713
…transportation means and parking spaces are adequate.		,627	
…the personnel is good.		,545	
…port are visually appealing.		,582	
…performed according to specifications.	,611		
…has a problem, port procedures are able in solving it.	,605		
…high quality services to the customers.	,583		
…provides reliable services.	,617		
…insists on error-free records.	,559		
…performs services right the first time.	,651		
…provides services at the promised time.	,628		
…tell you exactly when services are to be performed.	,730		
…give you prompt service and solve any problem.	,769		
…always are willing to help me.	,810		
…never be too busy to respond to my requests.	,737		
…are consistently courteous to you.	,791		
…feel secure inside port's area.	,714		
…personnel in the port will instill confidence to you.	,823		
…have the knowledge to answer your questions.	,762		
…feel secure while you are conducting transactions in the port.	,735		
…give passengers individual attention.	,844		
…operating hours are convenient to passengers.	,707		
…passengers' specific needs and personal requirements.	,821		
…deal with their customers in the beast and heartedly way.	,875		
…personnel that pay individual attention to its customers.	,821		

Thus, in the case of TRNC passenger ports, new dimension of service quality can be introduced as 'physical structure', 'visual appeal', and 'process'. Table on the next page depicts related items for dimensions introduced later. Positive impact of physical structure (H1), visual appeal (H2), and process (H3) on overall service quality; and its positive impact on customer satisfaction (H4) were introduced as the new hypotheses for this model.

Table 21: Lately Introduced Dimensions and Related Items (p focused)

Dimensions and Items
Physical Structure
Port has modern looking equipment.
Materials associated with the service (pamphlets, handbook or statements) are visually appealing.
Port facilities are up to date.
Port's terminal, embarkation/disembarkation and hygiene areas are adequate and sufficient.
Visual Appeal
Connection to other transportation means and parking spaces are adequate.
Appearance of the personnel is good.
Physical facilities of the port are visually appealing.
Process
All functions are performed according to specifications.
When a passenger or port user has a problem, port procedures are able in solving it.
Port provides high quality services to the customers.
Port provides reliable services.
Port insists on error-free records.
Port performs services right the first time.
Port provides services at the promised time.
Personnel in the port tell you exactly when services are to be performed.
Personnel in the port give you prompt service and solve any problem.
Personnel in the port always are willing to help me.
Personnel in the port never be too busy to respond to my requests.
Personnel in the port are consistently courteous to you.
You feel secure inside port's area.
The behavior of personnel in the port will instill confidence to you.
Personnel in the port have the knowledge to answer your questions.
You feel secure while you are conducting transactions in the port.
Personnel in the port give passengers individual attention.
The port facilities operating hours are convenient to passengers.
Port personnel understand passengers' specific needs and personal requirements.
Port personnel deal with their customers in the best and heartedly way.
Port has personnel that pay individual attention to its customers.

4.4.2 Factor Analysis (Perception-Expectation based)

In this part, service quality perceived by passengers is based on the discrepancy between passengers' perceptions and ideal expectations. Thus, gap scores are the basis of the calculations in the following part.

Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and significance of Barlett's test of sphericity are illustrated in table 22. KMO measure is 0,960,

accepted as excellent value since, it is greater than 0,9; thus, it is confirmed that the sample is big enough to apply factor analysis (Kaiser, 1974). Barltlett's test of sphericity's significance is 0,000 which implies robust relationship among items as well.

Table 22: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,960
Bartlett's Test of Sphericity	Approx. Chi-Square	7233,901
	Df	378
	Sig.	,000

Once again, principal component analysis has been employed as extraction method and as can be seen communalities were computed in table 23. Extraction communalities vary between 0,479 and 0,755. Since these values are large enough (> 0,4; Stevens, 1992) for each item, none of the items were discarded for the analysis.

Table 23: Communalities

	Initial	Extraction
…modern looking equipment.	1,000	,690
…are visually appealing.	1,000	,588
…facilities are up to date.	1,000	,646
…and hygiene areas are adequate and sufficient.	1,000	,594
…transportation means and parking spaces are adequate.	1,000	,666
…the personnel is good.	1,000	,510
…port are visually appealing.	1,000	,534
…performed according to specifications.	1,000	,564
…has a problem, port procedures are able in solving it.	1,000	,634
…high quality services to the customers.	1,000	,631
…provides reliable services.	1,000	,650
…insists on error-free records.	1,000	,635
…performs services right the first time.	1,000	,688
…provides services at the promised time.	1,000	,597
…tell you exactly when services are to be performed.	1,000	,644
…give you prompt service and solve any problem.	1,000	,570
…always are willing to help me.	1,000	,652
…never be too busy to respond to my requests.	1,000	,533
…are consistently courteous to you.	1,000	,699
…feel secure inside port's area.	1,000	,636
…personnel in the port will instill confidence to you.	1,000	,706
…have the knowledge to answer your questions.	1,000	,701
…feel secure while you are conducting transactions in the port.	1,000	,650
…give passengers individual attention.	1,000	,667
…operating hours are convenient to passengers.	1,000	,479
…understand passengers' specific needs and personal requirements.	1,000	,706
…deal with their customers in the beast and heartedly way.	1,000	,755
…personnel that pay individual attention to its customers.	1,000	,720

Components (factors) with initial eigenvalues more than 1 are four in total and these four factors explain 63,4% of cumulative variance (refer table 24).

Table 24: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	12,610	45,035	45,035	12,610	45,035	45,035	8,615	30,768	30,768
2	2,745	9,804	54,840	2,745	9,804	54,840	4,310	15,393	46,160
3	1,316	4,702	59,541	1,316	4,702	59,541	3,039	10,855	57,015
4	1,078	3,851	63,392	1,078	3,851	63,392	1,785	6,377	63,392
5	,981	3,502	66,894						
6	,758	2,708	69,602						
7	,694	2,480	72,082						
8	,618	2,206	74,288						
9	,574	2,051	76,340						
10	,554	1,980	78,320						
11	,509	1,817	80,137						
12	,487	1,738	81,875						
13	,468	1,671	83,546						
14	,437	1,561	85,107						
15	,417	1,489	86,596						
16	,404	1,443	88,038						
17	,364	1,298	89,337						
18	,341	1,219	90,556						
19	,336	1,201	91,757						
20	,322	1,152	92,909						
21	,304	1,086	93,995						
22	,288	1,028	95,024						
23	,268	,956	95,980						
24	,254	,907	96,887						
25	,248	,885	97,771						
26	,221	,789	98,560						
27	,212	,758	99,319						
28	,191	,681	100,000						

Kaiser Normalization was the method of rotation and the related matrix can be seen in table 25. ***Four factors***, which make up 63.4% of the total variance, have been suggested for measuring service quality (perceptions - expectations) at passenger ports of TRNC. Items related with tangibles have been split into two different dimensions where one component is formed with the first four items while the rest three is accountable for another component. Yet, this time reliability dimension is separate from the rest of the dimensions and shows similarity with the original model; which means there is no difference in the items that make up this dimension in both default SERVQUAL model and TRNC passenger ports case. Finally, the rest of the dimensions (responsiveness, assurance and empathy) are classified under one component as it was the case in only perception based analysis.

Table 25: Rotated Component Matrix

	Component			
	1	2	3	4
…modern looking equipment.			,812	
…are visually appealing.			,753	
…facilities are up to date.			,783	
…and hygiene areas are adequate and sufficient.			,706	
…transportation means and parking spaces are adequate.				,727
…the personnel is good.				,480
…port are visually appealing.				,563
…performed according to specifications.		,576		
…has a problem, port procedures are able in solving it.		,615		
…high quality services to the customers.		,571		
…provides reliable services.		,717		
…insists on error-free records.		,690		
…performs services right the first time.		,698		
…provides services at the promised time.		,678		
…tell you exactly when services are to be performed.	,658			
…give you prompt service and solve any problem.	,674			
…always are willing to help me.	,741			
…never be too busy to respond to my requests.	,627			
…are consistently courteous to you.	,766			
…feel secure inside port's area.	,699			
…personnel in the port will instill confidence to you.	,783			
…have the knowledge to answer your questions.	,723			
…secure while you are conducting transactions in the port.	,723			
…give passengers individual attention.	,731			
…operating hours are convenient to passengers.	,609			
…passengers' specific needs and personal requirements.	,777			
…deal with their customers in the beast and heartedly way.	,834			
…personnel that pay individual attention to its customers.	,808			

Thus, in the case of TRNC passenger ports, where service quality is reflected by the discrepancy between perceptions and expectations, new service quality dimensions can be introduced as 'physical structure', 'visual appeal', 'reliability', and 'interrelations with passengers'. Table on the next page introduces newly proposed dimensions with related items. Although these outcomes challenge with

Parasuraman's (1988) widely known American Model, supporting researches on dimensionality are also present in similar and different sectors (e.g. Babakus *et. al.*, 1992; Durvasula *et. al.*, 1999; Pantouvakis *et. al.*, 2008).

Table 26: Lately Introduced Dimensions and Related Items (p-e focused)

Dimensions and Items
Physical Structure
Port has modern looking equipment.
Materials associated with the service (pamphlets, handbook or statements) are visually appealing.
Port facilities are up to date.
Port's terminal, embarkation/disembarkation and hygiene areas are adequate and sufficient.
Visual Appeal
Connection to other transportation means and parking spaces are adequate.
Appearance of the personnel is good.
Physical facilities of the port are visually appealing.
Reliability
All functions are performed according to specifications.
When a passenger or port user has a problem, port procedures are able in solving it.
Port provides high quality services to the customers.
Port provides reliable services.
Port insists on error-free records.
Port performs services right the first time.
Port provides services at the promised time.
Interrelations with Passengers
Personnel in the port tell you exactly when services are to be performed.
Personnel in the port give you prompt service and solve any problem.
Personnel in the port always are willing to help me.
Personnel in the port never be too busy to respond to my requests.
Personnel in the port are consistently courteous to you.
You feel secure inside port's area.
The behavior of personnel in the port will instill confidence to you.
Personnel in the port have the knowledge to answer your questions.
You feel secure while you are conducting transactions in the port.
Personnel in the port give passengers individual attention.
The port facilities operating hours are convenient to passengers.
Port personnel understand passengers' specific needs and personal requirements.
Port personnel deal with their customers in the best and heartedly way.
Port has personnel that pay individual attention to its customers.

So, after factor analysis positive impact of physical structure (H1), visual appeal (H2), reliability (H3) and interrelations with passengers (H4) on overall service quality; and

its positive impact on customer satisfaction (H5) were introduced as the new hypotheses for perception – expectation based model.

4.5 Partial Least Square (PLS) Analysis

Structural Equation Modeling (SEM) was preferred over other analysis (e.g. regression) since path analysis for all variables can be done in a single analysis and at the same time (Barclay, Thompson, & Higgings, 1995; Komiak & Benbasat, 2006; Miranda, Chamorro, Murillo, & Vega, 2012). Further, PLS was employed because of its several efficacies; including lessening type II errors which lead stronger predictions, small scale research necessities etc. (Fornell & Bookstein, 1982; Hulland, 1999; Chin, Marcolin, & Newsted, 2003). Thus, SEM in Smart PLS was employed to analyze data (interactions) between variables by applying bootstrapping technique (Efron & Gong, 1983) and following Anderson & Gerbing (1988) and Hulland's (1999) steps.

According to these researchers, two steps need to be followed during PLS analysis. Firstly, measurement model has to be analyzed in order to make sure that constructs that have been used to measure service quality are reliable and valid. After proving construct reliability and validity, analysis of structural model takes place to evaluate association between constructs and hypothesized model's predictive capacity. Hence, in the following parts, suggested steps have been followed for perception based and perception-expectation based models respectively; since both models are intended to be tested and analyzed.

4.5.1 Testing Measurement Model (Perception based only)

To test the competence of the measurement model, reliability and validity (both convergent and discriminant) criterion on each dimension (construct) were appraised. Reliability for each construct was determined by the values of Cronbach's Alpha and composite reliability. As can be seen from table 27, each construct's alpha coefficient is large enough (more than Nunnally's (1978, 1994) threshold level of 0.70) except visual appeal (α = 0,64). Further, less biased appraisal of reliability - namely composite reliability (Shook *et. al.*, 2004; Frances *et. al.*, 2012), for dimensions ranged between 0,79 and 1,00; therefore minimum acceptable level of 0,6 has been exceeded for all dimensions (Fornell & Larcker, 1981). Thus, constructs in the study illuminate superb reliability; in other words, in case of repeating the study once more the same results would be achieved.

Table 27: Reliability and Convergent Validity

Constructs	***Cronbach's Alpha (α)***	***Composite Reliability***	***AVE***	***R^2***
PhyStrc	0,78	0,89	0,60	
VisApp	0,64	0,79	0,56	
Process	0,97	0,97	0,60	
Servql	1,00	1,00	1,00	0,40
Sat	0,83	0,92	0,85	0,50

Convergent validity of the items was determined as well. It simply means "the degree to which two or more attempts to measure the same trait through maximally different methods are in agreement" (Venkatraman & Ramanujam, 1987, p.114).

According to Fornell *et. al.* (1981), two criterions, namely construct average variance (AVE > 0,5) and loadings (at least 0,7; but in some books 0.5, p.385) of items, assessing the same construct should be met to verify the convergent validity (Chang, Chiu, & Chen, 2010). As can be realized, AVE values of the constructs range

between 0,56 and 1,00 (all above 0,5; refer table.27). Further, items measuring the same construct have loadings more than the recommended level of 0,5 (refer table 28). Therefore, required criterions to ensure convergent validity of items were ensured.

Table 28: Items and Cross Loadings

	PhyStrc	***VisApp***	***Process***	***Servql***	***Sat***
PhyStrc1	**0,81**	0,34	0,28	0,24	0,33
PhyStrc2	**0,73**	0,26	0,21	0,28	0,26
PhyStrc3	**0,78**	0,38	0,23	0,30	0,34
PhyStrc4	**0,78**	0,40	0,33	0,32	0,33
VisApp1	0,33	**0,59**	0,25	0,14	0,15
VisApp2	0,35	**0,87**	0,64	0,40	0,45
VisApp3	0,37	**0,76**	0,35	0,26	0,30
Process1	0,21	0,54	**0,84**	0,49	0,59
Process2	0,28	0,47	**0,76**	0,47	0,54
Process3	0,29	0,47	**0,85**	0,52	0,61
Process4	0,29	0,56	**0,84**	0,50	0,59
Process5	0,28	0,45	**0,79**	0,48	0,58
Process6	0,27	0,39	**0,81**	0,54	0,60
Process7	0,27	0,51	**0,76**	0,41	0,55
Process8	0,28	0,38	**0,79**	0,53	0,60
Process9	0,24	0,40	**0,78**	0,48	0,54
Process10	0,29	0,52	**0,83**	0,50	0,61
Process11	0,33	0,51	**0,73**	0,42	0,50
Process12	0,30	0,58	**0,76**	0,44	0,58
Process13	0,36	0,40	**0,65**	0,44	0,50
Process14	0,30	0,48	**0,74**	0,41	0,46
Process15	0,29	0,45	**0,66**	0,37	0,45
Process16	0,27	0,49	**0,77**	0,45	0,52
Process17	0,23	0,52	**0,70**	0,40	0,48
Process18	0,17	0,51	**0,82**	0,49	0,58
Process19	0,26	0,46	**0,81**	0,53	0,55
Process20	0,23	0,46	**0,82**	0,53	0,56
Process21	0,15	0,38	**0,75**	0,45	0,55
Servql	0,37	0,39	0,61	**1,00**	0,71
Sat1	0,39	0,46	0,67	0,66	**0,92**
Sat2	0,36	0,36	0,65	0,65	**0,92**

In the light of testing measurement model, finally, discriminant validity was evaluated, to assure the dissimilarity of the items which assess the same construct (Hulland, 1999; Lin, 2012). To do so, it should be checked if dimensions' square root of AVE (refer table.29 for diagonals) exceed their correlation coefficients or not (off diagonals in table.29) (Fornell *et. al.*, 1981; Parolia, Goodman, Li, Jiang, 2007). As

can be seen, each dimension has the highest relation with its own measures. In other words, inter-construct correlations are lower than diagonal values. Thus, discriminant validity of the constructs is proved. It can be concluded that there are satisfactory events for construct validity.

Table 29: Latent Variable Correlations

Constructs	***Sat***	***Process***	***Servql***	***PhyStrc***	***VisApp***
Sat	***1,00***				
Process	0,71	***1,00***			
Servql	0,71	0,61	***1,00***		
PhyStrc	0,41	0,34	0,37	***1,00***	
VisApp	0,45	0,61	0,39	0,45	***1,00***

4.5.2 Testing Structural Model (Perception based only)

Values of R^2 and path coefficients (β) were calculated for testing structural model; thus, to measure the strength of the associations between dependent and independent variables (β) and also hypothesized model's predictive control on dependent variables (Chang *et. al.*, 2010). Results of the structural model are depicted in Figure 3 and Table 27 and 30.

R^2 values for dependent variables (Service Quality, Customer Satisfaction) diverge from 0,40 to 0,50. In other words, it can be said that 40% of the change in service quality, perceived by passengers, is caused by physical structure, visual appeal and process; while, 50% of the change in customer satisfaction can be explained by service quality in the case of TRNC passenger shipping (refer Table 27 and Figure 3).

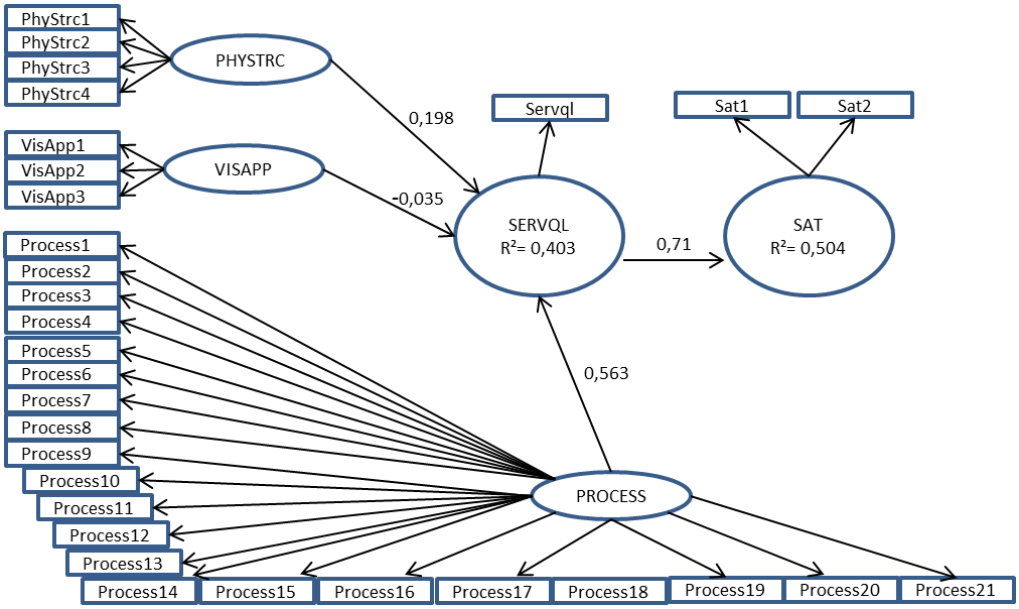

Figure 3: Structural Model Results (perception based)

Path coefficients are depicted in Figure 3 and table 26. It is found out that overall service quality, perceived by passengers, increases customer satisfaction at passenger ports of TRNC (β= 0,710, t= 24,30, p< 0,01). Further, it can be said that physical structure (β= 0,198, t= 4,53, p< 0,01) and process (β= 0,563, t= 13,05, p< 0,01) have positive and significant effect on service quality, perceived by passengers. However, impact of visual appeal (β= -0,035, t= 0,72, insignificant) on overall perceived service quality is not supported. Thus, it can be concluded that Hypotheses 1, 3 and 4 are supported while Hypothesis 2 is rejected. In other words, the model is supported partially.

Table 30: Proposed Model Results

Hypothesis	***Effect***	***Path Coefficient (β)***	***t- value***	***p- value***
H1:PhyStrc → Servql	+	0,198	4,53	p<0.01
H2:VisApp → Servql	+	-0,035	0,72	Insignificant
H3:Process → Servql	+	0,563	13,05	p<0.01
H4: Servql → Sat	+	0,710	24,30	p<0.01

4.5.3 Testing Measurement Model (Perception-Expectation based)

As can be seen, in order to test suitability of the measurement model (perception-expectation based), reliability and both convergent and discriminant validity were assessed on each variable. Reliability for each construct was determined by the values of Cronbach's Alpha and composite reliability. Based on Nunnally's (1978, 1994) threshold level of 0.70, it is possible to say that each construct's alpha coefficient is large enough except visual appeal ($\alpha = 0{,}64$). However, when much less biased appraisal of reliability - namely composite reliability (Shook *et. al.*, 2004; Frances *et. al.*, 2012) has been conducted, it has been realized that minimum acceptable level of 0,6 has been exceeded for all dimensions (Fornell & Larcker, 1981) since values range between 0,79 and 1,00. Thus, constructs in the study illuminate superb reliability; in other words, in case of repeating the study the same results would be achieved.

Table 31: Reliability and Convergent Validity

Constructs	***Cronbach's Alpha (α)***	***Composite Reliability***	***AVE***	***R^2***
Inters	0,95	0,96	0,63	
PhyStrc	0,81	0,87	0,63	
Reliab	0,89	0,91	0,59	
VisApp	0,64	0,80	0,57	
Servql	1,00	1,00	1,00	0,37
Sat	0,79	0,90	0,82	0,50

Convergent validity of the items was determined by taking each construct's average variance (AVE > 0,5) and loadings (at least 0,5) into consideration Fornell *et. al.* (1981). As can be realized, AVE values of the constructs range between 0,57 and 0,82 (all of them above 0,5; refer table 31). Also, items measuring the same construct have loadings more than the recommended levels of 0,5 or 0,7 (refer table 32).

Therefore, required criterions to ensure convergent validity of the items were ensured.

Table 32: Items and Cross Loadings

	PhyStrc	*VisApp*	*Reliab*	*Inters*	*Servql*	*Sat*
PhyStrc1	**0,80**	0,36	0,31	0,21	0,16	0,18
PhyStrc2	**0,77**	0,34	0,25	0,19	0,20	0,20
PhyStrc3	**0,77**	0,42	0,24	0,17	0,21	0,22
PhyStrc4	**0,84**	0,49	0,36	0,33	0,30	0,30
VisApp1	0,44	**0,66**	0,27	0,23	0,14	0,12
VisApp2	0,36	**0,85**	0,54	0,52	0,32	0,34
VisApp3	0,45	**0,75**	0,37	0,28	0,23	0,24
Reliab1	0,34	0,45	**0,76**	0,60	0,37	0,39
Reliab2	0,23	0,50	**0,78**	0,62	0,41	0,46
Reliab3	0,35	0,33	**0,70**	0,54	0,39	0,42
Reliab4	0,29	0,42	**0,80**	0,58	0,38	0,41
Reliab5	0,31	0,43	**0,78**	0,57	0,36	0,38
Reliab6	0,25	0,46	**0,82**	0,63	0,42	0,45
Reliab7	0,25	0,40	**0,76**	0,58	0,39	0,43
Inters1	0,17	0,42	0,62	**0,82**	0,46	0,51
Inters2	0,28	0,43	0,61	**0,77**	0,46	0,49
Inters3	0,26	0,42	0,63	**0,84**	0,47	0,53
Inters4	0,24	0,48	0,65	**0,82**	0,48	0,53
Inters5	0,25	0,43	0,61	**0,79**	0,43	0,47
Inters6	0,25	0,30	0,58	**0,77**	0,52	0,56
Inters7	0,20	0,40	0,56	**0,70**	0,39	0,47
Inters8	0,29	0,34	0,57	**0,80**	0,48	0,54
Inters9	0,26	0,38	0,59	**0,84**	0,50	0,54
Inters10	0,25	0,42	0,61	**0,84**	0,50	0,55
Inters11	0,17	0,45	0,64	**0,78**	0,47	0,51
Inters12	0,24	0,36	0,60	**0,77**	0,50	0,54
Inters13	0,24	0,36	0,62	**0,81**	0,52	0,55
Inters14	0,19	0,32	0,59	**0,72**	0,40	0,44
Sevql	0,29	0,33	0,50	0,60	**1,00**	0,94
Sat1	0,24	0,29	0,49	0,60	0,65	**0,87**
Sat2	0,29	0,33	0,50	0,60	1,00	**0,94**

In the light of testing measurement model, finally, discriminant validity was evaluated, to assure the dissimilarity of the items which assess the same construct (Hulland, 1999; Lin, 2012). To do so, it should be checked if dimensions' square root of AVE (refer table 33 for diagonals) exceed their correlation coefficients or not (off diagonals in table 33) (Fornell *et. al.*, 1981; Parolia, Goodman, Li, Jiang, 2007). As can be seen, each dimension has the highest relation with its own measures. In other

words, inter-construct correlations are lower than diagonal values. Thus, discriminant validity of the constructs is proved. It can be concluded that there are satisfactory events for construct validity as well.

Table 33: Latent Variable Correlations

	Inter	***PhyStrc***	***Reliab***	***VisApp***	***Servql***	***Sat***
Inter	**1,00**					
PhyStrc	0,30	**1,00**				
Reliab	0,76	0,37	**1,00**			
VisApp	0,49	0,52	0,55	**1,00**		
Servql	0,60	0,29	0,50	0,33	**1,00**	
Sat	0,65	0,30	0,55	0,34	0,94	**1,00**

4.5.4 Testing Structural Model (Perception-Expectation based)

To test structural model, it is necessary to measure the strength of the associations between dependent and independent variables through path coefficients (β) and also to assess hypothesized model's predictive control on dependent variables (R^2) (Chang *et. al.*, 2010). Thus, results can be found in Figure 4 and Table 31 and 34.

R^2 values for dependent variables (Service Quality, Customer Satisfaction) diverge from 0,37 to 0,54. In other words, it can be said that 37% of the change in service quality, perceived by passengers, is caused by physical structure, visual appeal, reliability and interrelations with passengers; while, 54% of the change in customer satisfaction can be explained by service quality in the case of TRNC passenger shipping (refer Table 31 and Figure 4).

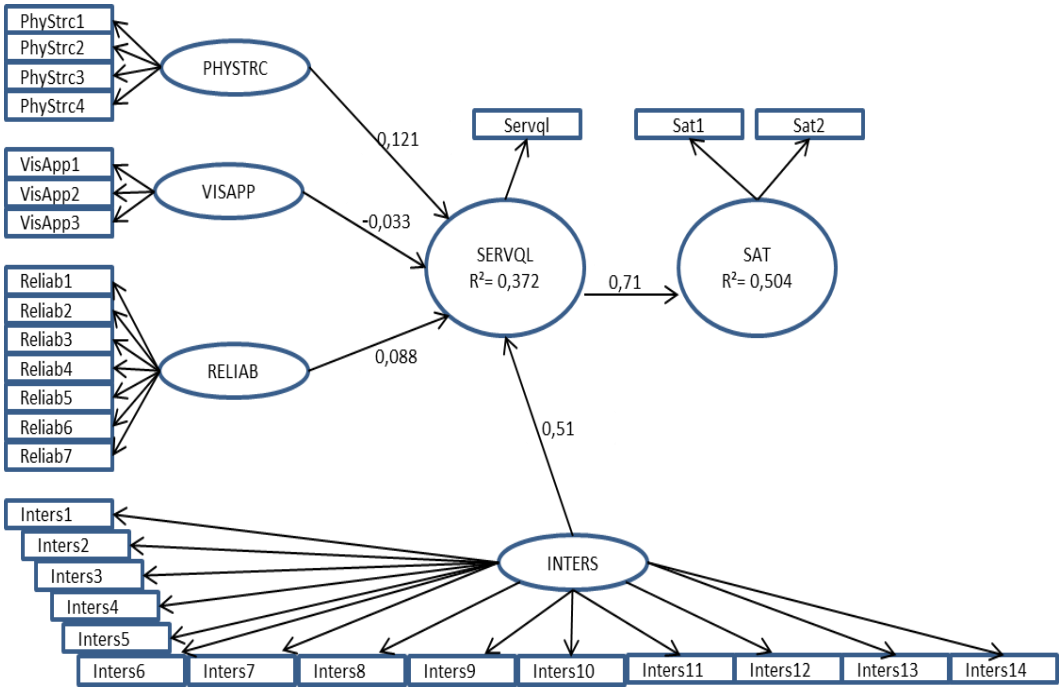

Figure 4: Structural Model Results (perception – expectation based)

Path coefficients are depicted in Figure 4 and table 34. As it was the case in the previous model, it is found out that overall service quality, perceived by passengers, increases customer satisfaction at passenger ports of TRNC (β= 0,710, t= 26,68, p< 0,01). Further, it has been proved that physical structure (β= 0,121, t= 2,84, p< 0,01) and interrelations with passengers (β= 0,510, t= 9,22, p< 0,01) have positive and significant effect on service quality, perceived by passengers. However, the impact of visual appeal (β= -0,033, t= 0,74, insignificant) and reliability (β= 0,088, t= 1,36, insignificant) on overall perceived service quality are not supported. Thus, it can be concluded that Hypotheses 1, 4 and 5 are supported while Hypotheses 2 and 3 are rejected. So, hypothesized model is partially supported.

Table 34: Proposed Model Results

Hypothesis	***Effect***	***Path Coefficient (β)***	***t- value***	***p- value***
H1:PhyStrc → Servql	+	0,121	2,84	<0,01
H2:VisApp → Servql	+	-0,033	0,74	Insignificant
H3:Reliab → Servql	+	0,088	1,36	Insignificant
H4:Inter → Servql	+	0,510	9,22	<0,01
H5: Servql → Sat	+	0,710	26,68	<0,01

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Chapter 5

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

Overall service quality perceived by passengers which is based on both SERVQUAL and SERVPERF models are intended to be measured at Famagusta and Kyrenia ports. Questionnaire was administered, with reference to Parasuraman *et. al.*'s multiple item scale (1988), as a research tool to collect relevant first hand data for the analysis. The sample of the study was constituted by passengers who travelled for any purpose using either Famagusta or Kyrenia Port during four months period (November 2012- February 2013). Pilot study was administered and after some minor amendments questionnaires were carried out; which in total 417 usable responses were obtained. Data analyses conducted throughout the study, can be outlined in four steps as reliability analysis, gap analysis, exploratory factor analysis and partial least square analysis for both models.

In the first phase, the questionnaire's (survey instrument) reliability (5 dimensions and 28 attributes) was tested by Cronbach's alpha (Parasuraman *et. al.* 1988; Carman, 1990; Cronin and Taylor, 1992). All the reliability results for the dimensions were satisfactory.

Gap analysis was conducted in order to see the mismatch level of passengers' service quality perceptions and expectations; which in turn will help port authorities to see

attributes which are needed to be focused more in order to increase the satisfaction level of passengers. Unfortunately, it is realized that mean values on each item and dimension were negative (passenger perceptions < expectations); where tangibles holds the leadership. This implies insufficient provision of passenger port services on all dimensions (tangibles, reliability, responsiveness, assurance and empathy). Hence, serious attention and advances are required for each attribute mentioned by port authorities. However, although tangibles received the largest gap mean, if dimensions are ranked based on their importance, it is the last one according to passengers' expectations (which was also supported by several researchers in the literature) while assurance seems to be the most important.

As it was mentioned before, the main purpose of the study is to shed light on measures that passengers rely on while determining the service quality perceived at TRNC ports; and further reveal those measures predictive strength. To do so, exploratory factor analysis has been run in an attempt to reduce five dimensions and 28 items which were introduced initially; since it was suggested by Field, 2005; in his book as principal idea of factor analysis and also used by Babakus *et. al.* 1992; Kolanovic *et. al.*, 2008; Pantouvakis *et. al.*, 2008; in their researches. Results of the exploratory factor analysis suggest 3 (based on SERVPERF model) and 4 (based on SERVQUAL model) dimensional alternatives with 28 attributes. According to SERVPERF model, tangibles dimension should be divided into two and the rest four dimensions should be gathered under one factor; whereas the same results are acceptable for the latter model (SERVQUAL) except for the distinction of reliability dimension from others. So, one can conclude that new dimensions in which overall service quality perceptions of passengers based on, are physical structure (4 items),

visual appeal (3 items) and process (21 items) according to SERVPERF model; and physical structure (4 items), visual appeal (3 items), reliability (7 items) and interrelations with passengers (14 items) according to SERVQUAL model. Although this contradicts with Parasuraman *et. al.*'s (1988) five dimensional quality determinant model, similar results can be seen in the literature. For instance, Durvasula (1999) introduced three dimensional approach (tangibles, reliability and the rest under one factor) as service quality determinants in the case of cargo transportation across oceans, where Pantouvakis *et. al.* (2008) proved validity of two dimensional approach (reliability and the rest under one factor) at one of the passenger ports of Greece. However, none of them defended the division of tangibles into two different dimensions.

Later, interactions of new dimensions between each other were analyzed by applying Structural Equation Modeling in PLS and following Anderson & Gerbing (1988) and Hulland's (1999) steps. After ensuring reliability and validity of measures in both models, strengths of the associations between dependent (service quality and customer satisfaction) and independent variables (β) and also hypothesized model's predictive control on dependent variables (R^2) were tested. Based on SERVPERF model, results reveal out that physical structure, visual appeal and process (21 items) affect 40% of the change in overall service quality; while overall service quality's effect is 50% on customer satisfaction. Further, it is confirmed that their positive effects are significant except visual appeal. The reason behind this insignificancy might be the passengers' purpose of travel, e.g. work, education etc. which makes the effect of visual appeal unimportant on service quality. When SERVQUAL model is tested, 37% of the change in service quality, perceived by passengers, found to be

explained by physical structure, visual appeal, reliability and interrelations with passengers (14 items); while, 54% of the change in customer satisfaction is accountable by service quality. However, effects of reliability and visual appeal on overall service quality perceived by passengers were not significant. Reasons of insignificancy in visual appeal were introduced before. Insignificancy of reliability dimension might be explained in a way that supports Cronin's view of performance only measurement; since in that case there is not such a dimension (reliability).

Overall, in this study modified version of service quality measures have been employed by applying SERVQUAL (Parasuraman *et. al.*, 1988) and SERVPERF (Cronin *et. al.*, 1992) models. Although, there are plenty of researches in the literature related with these two models; their applications at passenger ports are rare and the first in TRNC. As a result, several conclusions can be drawn. Firstly, as in the literature, overall service quality is found to be one of the variables which leads customer satisfaction. Secondly, it is revealed out that, tangibles dimension is perceived as two separate determinants (physical structure and visual appeal) in the case of passenger shipping. Finally, among the new introduced dimensions; physical structure, process and interrelations with passengers have positive and significant effects on service quality perceived, within the context of passenger shipping at TRNC ports.

5.2 Managerial Implications

Port authorities might draw several conclusions from the results of the study. It is evidenced that none of the dimensions are controlled sufficiently at TRNC passenger ports, which influence the passengers' overall service quality perceptions. This causes service quality perceptions of customers to be less than their expectations.

Hence, other circumstances being equal, it increases the likelihood of passengers to switch to other means of transportation (e.g. plane) in order to receive higher level of service quality. Several suggestions are given that might help port authorities to minimize the perceived gap on each dimension.

International standards should be followed while arranging passenger halls and associated materials. For instance, passengers and freights should not circulate at the same area; which is the case at TRNC ports. So, separation of passenger halls from load areas and environmental monitoring are suggested. Moreover, although it is not easily attainable, direct transit of passengers from ship to passenger halls can be implemented as further advancements. These will help to minimize the mean gap in physical structure.

Although it is not significant, visual appeal is identified as another service quality determinant, which customers are not satisfied. Thus, several improvements are required to eliminate the gap on this dimension. There is only one gate at the passenger hall which is used for departures and arrivals. This can be one of the prominent negation for passengers. So, separation of departure and arrival gates is recommended. Also, there should be available bus and taxi stations nearby the passenger halls. Final recommendation is about staff. Staff should be pleasing and noticeable. This can be succeeded by obligating them to wear uniforms.

Numerous suggestions can be given for improving reliability perceptions of passengers. 24-hour available frontline employees at passenger halls is necessary in case of lost baggage and any problem related with tickets. So, these kind of teams

could be provided at passenger halls. Another important issue that should be considered is the use of security cameras at passenger halls. Unfortunately, none of the ports has security cameras, which would be referred in case of any problem e.g. accident, theft. So, purchase of security cameras should be on the agenda of port authorities.

The last determinant, interrelations with passengers, is also important and needed to be improved. Lack of information boards related with arrival /departure time of ships can be accepted as one of the most important negation under this determinant. Provision of these boards are strongly suggested. It is also important to have information desks at passenger halls which passengers should easily reach in case of any problem.

Port authorities should be aware of the fact that physical structure, process and interrelations with passengers affect overall service quality positively and significantly. Thus, these dimensions could be accepted as essential in delivering high quality services. In other words, port authorities should prioritize the advancements on these essential areas to increase service quality perceptions and thus, satisfaction of passengers.

5.3 Study Limitations and Future Research

There are several shortcomings of the present study which generates some suggestions for future researches. At first, generalizability of the results might be questioned; since, data for the study obtained from the single industry (maritime industry from passengers' perspective) in TRNC. Thus, carrying out the same

research in different countries and in different industries should be intended for future researches.

Another limitation of the study is only testing overall service quality's influence on customer satisfaction; while the rest of the variables' effect was ignored due to employed model. Yet, as it is known several other variables (e.g. price, situational factors) might affect customer satisfaction as well (Zeithaml *et. al.*, 2103). So, it can be suggested to measure these variables' effect on customer satisfaction and rank them due to their importance in the case of passenger shipping.

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APPENDICES

Appendix A: Questionnaire Sample (Turkish)

Bu araştırma Doğu Akdeniz Üniversitesi, İşletme Bölümü Araştırma Görevlisi Gülsen Dökmecioğlu ve Doç.Dr. Mustafa Tümer tarafından yürütülmekte olan Yüksek Lisans (Master) tez çalışmasında kullanılacak ve kişisel veriler saklı tutulacaktır.

Beklentilerinizle bağlantılı olarak, **Gazimağusa / Girne /** (lütfen yuvarlak içine alınız) Limanında sunulan hizmetlerin performansı hakkındaki izlenimlerinizi ölçmek istiyoruz. Lütfen aşağıda tanımlanan beklentilerin farklı seviyeleri hakkında düşününüz.

Algılanan Hizmet Seviyesi – Algılamış olduğunuz (tecrübe edindiğiniz) hizmet seviyesi
Arzulanan (istenen) Hizmet Seviyesi – Arzuladığınız hizmet performansının seviyesi

Soruları yanıtlarken aşağıdaki cetvel kullanılmalıdır. Sizin aşağıdaki ifadelere katılma veya katılmama seviyenizi anlatan en iyi rakamı basitçe yargılayarak (düşünerek) seçiniz.
Lütfen her bir ifade için belirtin: (a) Limanın hizmet performansı hakkındaki **algınızı** belirleyen birinci kolondaki rakamlardan birini daire içine alınız ve (b) Kullandığınız limanda **arzu ettiğiniz** hizmet seviyesini belirleyen ikinci kolondaki rakamlardan birini daire içine alınız

1 ☹	2	3 😐	4	5 ☺
Kesinlikle Katılmam	Katılmam	Fark Etmez	Katılırım	Kesinlikle Katılırım

	Algılanan Hizmet Seviyesi					Arzulanan Hizmet Seviyesi				
FİZİKİ ÖZELLİKLER	☹		😐		☺	☹		😐		☺
Limanda kullanılan donanım ve teçhizatlar modern ve iyi durumdadır.	1	2	3	4	5	1	2	3	4	5
Hizmetle birleşen maddeler (broşür, el kitabı, beyanlar, ifadeler) görsel olarak çekicidir.	1	2	3	4	5	1	2	3	4	5
Limanın bulunduğu tesis, kullanılan vasıtalar, araç gereçler ve sunulan imkânlar moderndir.	1	2	3	4	5	1	2	3	4	5
Liman terminali, yolcu indirme bindirme ve hijyen açısından uygun ve yeterlidir.	1	2	3	4	5	1	2	3	4	5
Limanın diğer ulaşım araçlarına ve park alanlarına bağlantısı uygundur.	1	2	3	4	5	1	2	3	4	5
Liman personeli temiz (tertipli) görünümlüdür.	1	2	3	4	5	1	2	3	4	5
Limanın fiziksel olanakları görsel olarak çekicidir.	1	2	3	4	5	1	2	3	4	5
GÜVENİLİRLİK	☹		😐		☺	☹		😐		☺
Limanda bütün yükümlülükler ve işlevler belirtildiği gibi yerine getirilir.	1	2	3	4	5	1	2	3	4	5
Yolcu ya da başka liman kullanıcısının karşılaştığı bir problem, liman tarafından izlenilen yöntem ve prosedürlerle çözülebilir.	1	2	3	4	5	1	2	3	4	5
Liman müşterilerine yüksek kalitede hizmet sağlamaktadır.	1	2	3	4	5	1	2	3	4	5
Liman güvenilir hizmet sağlamaktadır	1	2	3	4	5	1	2	3	4	5
Liman, hatasız kayıtta ısrarlıdır.	1	2	3	4	5	1	2	3	4	5
Liman, (ilk seferde) hizmetlerini gereğine uygun yerine getirir.	1	2	3	4	5	1	2	3	4	5
Liman, hizmetini söz verdiği zamanda sağlar.	1	2	3	4	5	1	2	3	4	5
HIZLI VE DOĞRU GERİ BİLDİRİMDE BULUNMA	☹		😐		☺	☹		😐		☺
Liman personeli, hizmetin tam olarak ne zaman yerine getirileceği hakkında bilgi verir.	1	2	3	4	5	1	2	3	4	5
Liman personeli, dakik/hızlı hizmet sağlar ve herhangi bir olumsuzluğu en erken zamanda giderir.	1	2	3	4	5	1	2	3	4	5
Liman personeli, her zaman size yardım etmeye hazır ve heveslidir.	1	2	3	4	5	1	2	3	4	5
Liman personeli, hiçbir zaman müşterilerin istek ya da sorularına yanıt vermek için çok yoğun olmazlar.	1	2	3	4	5	1	2	3	4	5
GÜVENCE/EMNİYET	☹		😐		☺	☹		😐		☺
Liman personeli size sürekli olarak saygılı ve kibar davranır.	1	2	3	4	5	1	2	3	4	5
Liman sınırları içerisinde kendimi güvende hissederim.	1	2	3	4	5	1	2	3	4	5
Liman personelinin davranışları, müşterilerine güven aşılar.	1	2	3	4	5	1	2	3	4	5
Liman personeli, sorularınızı yanıtlayacak bilgiye sahiptir.	1	2	3	4	5	1	2	3	4	5
Limandaki işlemleriniz gerçekleşirken kendinizi emniyette hissedersiniz.	1	2	3	4	5	1	2	3	4	5
EMPATİ/EŞDUYUM	☹		😐		☺	☹		😐		☺
Liman personeli yolcularına bireysel/özel ilgi gösterir.	1	2	3	4	5	1	2	3	4	5
Liman, yolcular için uygun çalışma saatlerine sahiptir.	1	2	3	4	5	1	2	3	4	5
Liman personeli, yolcuların gereksinim ve özel ihtiyaçlarını anlar.	1	2	3	4	5	1	2	3	4	5
Liman personeli, müşterileriyle en iyi şekilde (yürekten) ilgilenir.	1	2	3	4	5	1	2	3	4	5

	Algılanan Hizmet Seviyesi					Arzulanan Hizmet Seviyesi				
Liman, size kişisel (bireysel) dikkat veren çalışanlara sahiptir.	1	2	3	4	5	1	2	3	4	5

Sizin aşağıdaki ifadelere katılma veya katılmama seviyenizi anlatan en iyi rakamı basitçe yargılayarak (düşünerek) seçiniz.

1 ☹	2	3 😐	4	5 ☺
Kesinlikle Katılmam	Katılmam	Fark Etmez	Katılırım	Kesinlikle Katılırım

HİZMET KALİTESİ	☹		😐		☺
Genel olarak, kullandığım limanın hizmet kalitesi mükemmeldir.	1	2	3	4	5
MÜŞTERİ MEMNUNİYETİ	☹		😐		☺
Genel olarak kullandığım limandan çok memnunum.	1	2	3	4	5
Kullandığım liman beklentilerimi her zaman karşılar ve değerli hizmet sağlar.	1	2	3	4	5
TEKRAR KULLANMA EĞİLİMİ	☹		😐		☺
Ulaşımım için, limanı yeniden kullanmada tereddüt etmem.	1	2	3	4	5
SÖYLENTİ	☹		😐		☺
Liman hakkında arkadaşlarımdan olumlu tavsiye alırım.	1	2	3	4	5
Ulaşımları için, limanı arkadaşlarıma tavsiye ederim.	1	2	3	4	5

DEMOGRAFİK BİLGİLER

Verdiğiniz bilgiler gizli tutulacaktır ve bu bilgiler toplu olarak analiz edilecektir. Bireysel cevaplar herhangi bir şahsa herhangi bir sebeple verilmeyecektir. Her bir soru için, size en uygun seçeneği işaretleyiniz.

1. CİNSİYET

☐ Bay ☐ Bayan

2. YAŞ

☐ 18'in altı ☐ 18 – 30 ☐ 31-40 ☐ 41-50 ☐ 51-60 ☐ 61 ve üstü

3. UYRUK: …….

4. YAŞADIĞI YER: …….

5. MEDENİ DURUMU

☐Evli ☐ Bekâr ☐ Boşanmış ☐ Dul ☐ Nişanlı ☐ Birlikte Yaşar

6. EĞİTİM DURUMU

☐İlkokul ☐ Ortaokul ☐ Lise ☐ Üniversite ☐ Master ☐ Doktora

7. MESLEK: …….

8. AYLIK MAAŞINIZ (Lütfen Belirtiniz)

☐ 1000TL ve altı ☐ 1000TL – 2000TL ☐ 2000TL – 3000TL ☐ 3000TL – 4000TL ☐ 4000TL – 6000TL

☐ 6000TL ve üzeri

9. GEMİ İLE SEYAHAT ETME SIKLIĞI

☐Ayda bir defa ☐ Ayda birkaç defa ☐ Her üç ayda bir ☐ Her altı ayda bir ☐ Yılda bir ☐ Yılda birden az

10. GEMİ İLE SEYAHAT ETME AMACI

☐İş ☐ Eğitim ☐ Tatil ☐ Diğer: …….

11. DAHA ÖNCE KAÇ FARKLI LİMAN KULLANDINIZ? ..... adet

Appendix B: Questionnaire Sample (English)

This study is a part of master thesis which is being carried out by Research Assistant Gülsen Dökmecioğlu and Assoc. Prof. Dr. Mustafa Tümer at EMU. We would like to kindly inform you that all individual responses will be kept confidential.

We would like to measure the service (performance) level of **Famagusta / Kyrenia /** (please circle) Port by considering your experiences and expectations. Please consider these statements below in different levels.

Perceived Service Level – Experienced service level
Expected Service Level – Desired service (performance) level

Please use the given scale below for your answers. For each statement please provide an answer that you feel describes you the best.
Please specify for each statement: (a) Circle the number related with each statement in the first column which reflects the level of service that you **experienced** while receiving the service and (b) Circle the number related with each statement in the second column which reflects the **desired** service level that you want to receive from the port.

1 ☹	2	3 😐	4	5 ☺
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

	Perceived Service Level					Expected Service Level				
TANGIBLES	☹		😐		☺	☹		😐		☺
Port has modern looking equipment.	1	2	3	4	5	1	2	3	4	5
Materials associated with the service (pamphlets, handbook or statements) are visually appealing.	1	2	3	4	5	1	2	3	4	5
Port facilities are up to date.	1	2	3	4	5	1	2	3	4	5
Port's terminal, embarkation/disembarkation and hygiene areas are adequate and sufficient.	1	2	3	4	5	1	2	3	4	5
Connection to other transportation means and parking spaces are adequate.	1	2	3	4	5	1	2	3	4	5
Appearance of the personnel is good.	1	2	3	4	5	1	2	3	4	5
Physical facilities of the port are visually appealing.	1	2	3	4	5	1	2	3	4	5
RELIABILITY	☹		😐		☺	☹		😐		☺
All functions are performed according to specifications.	1	2	3	4	5	1	2	3	4	5
When a passenger or port user has a problem, port procedures are able in solving it.	1	2	3	4	5	1	2	3	4	5
Port provides high quality services to the customers.	1	2	3	4	5	1	2	3	4	5
Port provides reliable services.	1	2	3	4	5	1	2	3	4	5
Port insists on error-free records.	1	2	3	4	5	1	2	3	4	5
Port performs services right the first time.	1	2	3	4	5	1	2	3	4	5
Port provides services at the promised time.	1	2	3	4	5	1	2	3	4	5
RESPONSIVENESS	☹		😐		☺	☹		😐		☺
Personnel in the port tell you exactly when services are to be performed.	1	2	3	4	5	1	2	3	4	5
Personnel in the port give you prompt service and solve any problem.	1	2	3	4	5	1	2	3	4	5
Personnel in the port always are willing to help me.	1	2	3	4	5	1	2	3	4	5
Personnel in the port never be too busy to respond to my requests.	1	2	3	4	5	1	2	3	4	5
ASSURANCE	☹		😐		☺	☹		😐		☺
Personnel in the port are consistently courteous to you.	1	2	3	4	5	1	2	3	4	5
You feel secure inside port's area.	1	2	3	4	5	1	2	3	4	5
The behavior of personnel in the port will instill confidence to you.	1	2	3	4	5	1	2	3	4	5
Personnel in the port have the knowledge to answer your questions.	1	2	3	4	5	1	2	3	4	5
You feel secure while you are conducting transactions in the port.	1	2	3	4	5	1	2	3	4	5
EMPATHY	☹		😐		☺	☹		😐		☺
Personnel in the port give passengers individual attention.	1	2	3	4	5	1	2	3	4	5
The port facilities operating hours are convenient to passengers.	1	2	3	4	5	1	2	3	4	5
Port personnel understand passengers' specific needs and personal requirements.	1	2	3	4	5	1	2	3	4	5
Port personnel deal with their customers in the best and heartedly way.	1	2	3	4	5	1	2	3	4	5
Port has personnel that pay individual attention to its customers.	1	2	3	4	5	1	2	3	4	5

For each statement, please provide an answer that describes you the most closely.

1 ☹	2	3 😐	4	5 ☺
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Overall Service Quality	☹		😐		☺
The overall quality of the services provided by my port is excellent.	1	2	3	4	5
Customer Satisfaction	1	2	3	4	5
After considering everything, I am extremely satisfied with my port.	1	2	3	4	5
My port always meets my expectations and gives value service.	☹		😐		☺
Repurchase Intention	1	2	3	4	5
I prefer this port for my transportation again.	☹		😐		☺
Word of Mouth	1	2	3	4	5
My friends speak positively about this port.	1	2	3	4	5
I recommend this port to my friends for their transportation.	1	2	3	4	5

DEMOGRAPHIC INFORMATION

Your responses will only be used for aggregate survey analyses and we will treat them with the strictest confidentiality. Individual responses will not be given to anyone for any purpose. For each item, please provide an answer that describes you the most closely.

1. **GENDER**
□ Male □ Female

2. **AGE**
□ Under 18 □ 18 – 30 □ 31-40 □ 41-50 □ 51-60 □ 61 and above

3. **NATIONALITY: …….**

4. **CITY OF RESIDENCE: …….**

5. **MARITAL STATUS**
□Married □ Single □ Divorced □ Widowed □ Engaged □ Living Together

6. **YOUR EDUCATION**
□Primary School □ Secondary School □ High School □ Undergraduate □ Masters □ Ph.D.

7. **OCCUPATION: …….**

8. **MONTHLY PERSONAL INCOME LEVEL (Please Specify)**
□ 1000TL and less □ 1000TL – 2000TL □ 2000TL – 3000TL □ 3000TL – 4000TL □ 4000TL – 6000TL
□ 6000TL and more

9. **FREQUENCY OF TRAVEL**
□Once a month □ Few times a month □ Every three months □ Every six months □ Once a year
□ Less than once a year

10. **PURPOSE OF TRAVEL**
□Business □ Education □ Holiday □ Other: …….

11. **NUMBER OF PORTS USED BEFORE** ……..

THANK YOU FOR YOUR CONTRIBUTION and COMPLETING THE SURVEY!!