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EFFECTS OF PERCEIVED SERVICE QUALITY OF VESSEL TRAFFIC SERVICES ON THE CORPORATE IMAGE: A STUDY ON THE TURKISH STRAITS

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ABSTRACT

Vessel Traffic Services (VTS) is one of the most important aids for ships in the dangerous waters. Due to the ever-increasing sea transport and thus the number of ships in this service, the importance of the services offered by VTS has increased more in the course of time. Despite the advanced technological infrastructure and the improved VTS, however the safety of sea traffic is still mostly based on human factor. Although in the relevant literature there have been some studies revealing the effects of VTS on the safety, there has been no research on the service quality. The aim of this study is, considering the views of ship masters, to analyze the effects of the VTS service quality perceptions on the corporate image. The objective of this study has been two-fold; developing a VTS service quality scale for shipmasters and through this scale measuring the perceptions of the service quality of the Turkish Straits Vessel Traffic Services (TSVTS), and measuring the effects of these perceptions on the corporate image. For the model of study SERVQUAL has been chosen. Firstly, in analyzing the perceptions, 20 experts from four diverse field have been interviewed and a pilot study has been carried out with shipmasters (n=72). The questionnaire, which has been conducted through shipmasters (n=192) who have used the Turkish Straits, has comprised 25 statements constituting two dimensions as "Perceived Service Quality (PSQ)" and "Corporate Image (CI)". The results reveal that there is a strong interrelationship between the perceptions of the TSVTS' service quality and corporate image for shipmasters. The VTS-PSQ scale developed through this research is expected to contribute to evaluating the VTS service quality and thus to the safe navigation through the relevant sea ways.

Keywords: *Vessel Traffic Services(VTS), Service Quality, Human Factor, Corporate Image, SERVQUAL.*

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GEMİ TRAFİK HİZMETLERİNDE ALGILANAN HİZMET KALİTESİNİN KURUMSAL İMAJ ÜZERİNDEKİ ETKİLERİ: TÜRK BOĞAZLARI ÜZERİNE BİR ARAŞTIRMA

ÖZET

Gemi Trafik Hizmetleri (VTS), tehlikeli sularda çalışan gemilerin en önemli yardımcılarından biridir. Her geçen gün artan deniz taşımacılığı ve dolayısıyla bu hizmetteki gemi sayısı nedeniyle VTS'nin sunduğu hizmetlerin önemi zaman içerisinde daha da artmıştır. Gelişmiş teknolojik altyapıya ve geliştirilmiş VTS'ye rağmen, deniz trafiğinin emniyeti hala büyük ölçüde insan faktörüne dayanmaktadır. İlgili literatürde VTS'nin emniyet üzerindeki etkilerini ortaya koyan bazı çalışmalar olmasına rağmen hizmet kalitesi ile ilgili herhangi bir araştırmaya rastlanmamıştır. Bu çalışmanın amacı, gemi kaptanlarının görüşleri dikkate alınarak, VTS hizmet kalitesi algılarının kurum imajı üzerindeki etkilerini analiz etmektir. Araştırma süreci; gemi kaptanları için bir VTS hizmet kalitesi ölçeğinin geliştirilmesi ve bu ölçek aracılığıyla Türk Boğazları Gemi Trafik Hizmetleri'nin (TSVTS) hizmet kalitesine ilişkin algılarını ve bu algıların kurumsal imaja etkilerinin incelenmesi olmak üzere iki aşamadan oluşmaktadır. Araştırmanın modelinin geliştirilmesi ilgili literatüre dayalı olarak yapılmış ve SERVQUAL modeli seçilmiştir. Öncelikle algıların analizinde dört farklı alandan 20 uzmanla görüşülerek gemi kaptanları (n=72) ile bir pilot çalışma yapılmıştır. Türk Boğazlarını kullanan gemi kaptanları (n=192) aracılığıyla gerçekleştirilen anket, "Algılanan Hizmet Kalitesi (PSQ)" ve "Kurumsal İmaj (CI)" olmak üzere iki boyutu oluşturan 25 ifadeden oluşmaktadır. Sonuçlar, gemi kaptanları açısından TSVTS'nin hizmet kalitesi ile kurumsal imaj algıları arasında güçlü bir ilişki olduğunu ortaya koymaktadır. Bu araştırma ile geliştirilen VTS-PSQ ölçeğinin, VTS hizmet kalitesinin değerlendirilmesine ve dolayısıyla ilgili deniz yollarında emniyetli seyire katkı sağlaması beklenmektedir.

Anahtar Sözcükler: *Gemi Trafik Hizmetleri (VTS), Hizmet Kalitesi, İnsan Faktörü, Kurumsal İmaj, SERVQUAL.*

1. INTRODUCTION

It would not be overestimating to state that service providing companies and institutions has recently started trying more to improve their service quality placing the customer satisfaction in the center. These struggles have created a new phenomenon focusing on customer evaluation, which reveals the overall trends in customer expectations. Thus, the companies that grasp these expectations and provide services accordingly have improved the quality of their services.

Vessel Traffic Services (VTS) are service providers established to contribute to the safe navigations of ships. VTS is a system which follows ships in places where vessel traffic is intensive, and provides these ships with certain recommendations regarding their navigations (NAVCEN, 2019). In other words, it is a system that, considering the effectiveness and efficiency of marine traffic, responds to the changing conditions of this traffic by means of regulating and planning it with the aim of raising the safety of the marine traffic within the area of its responsibility (KEGM, 2019).

Through the information it provides, VTS could be regarded as a complementary member of the staff on bridge in traffic organizations and navigational aids services. While navigating through certain dangerous water ways, in all problems encountered, ships are supported by VTS and get able to reach safe waters through the support they receive from VTS, which enables to incessantly detect the areas within the responsibility 24 hours a day and every day of the whole year. The support provided by VTS for ships also comprises creating awareness which helps escape from dangerous. While navigating through certain unfamiliar seaways, regarding any expected dangers and/or changes as well as the measures to be taken, ships are warned by VTS sometimes through recommendations and some other times through certain instructions.

Turkish Straits Vessel Traffic Services (TSVTS) have been in service since 2003 at Istanbul and Canakkale Straits, two of the most dangerous water ways on earth. TSVTS provides services along two such areas: Istanbul VTS with 55 nautical miles long and Canakkale VTS 78 nautical miles long, which have been declared to the relevant Maritime Authorities. In service since Dec. 31, 2008 the TSVTS has included the zone within the Traffic Separation Scheme of the 110 nautical miles long Marmara within its AIS/Radar/VHF scope (KEGM, 2015).

Since put into service, TSVTS has kept services incessantly 24 hours of everyday and has been carrying out its performances through 16 unmanned Traffic Monitoring Stations located at various points of the Turkish Straits, and various sensing stations line GPS, RDF, etc.

Although these service providers have improved the technology of the equipment and instruments they use,the safety of navigation has mostly been based on the human factor.

Despite the recently emerged focus on customer evaluations and thus customer satisfaction in the services provided, the services of the TSVTS have been evaluated neither by the relevant users; nor the

shipmasters passing through the Turkish Straits. Therefore, the purpose of this study is to fill this gap. To do this, by referencing relevant literature, a conceptual model has been developed to measure the service quality of the VTS. Then a questionnaire formed based on the interviews conducted with experts. Lastly the perceptions of the TSVTS service quality has been measured; and the effects of these perceptions on the corporate image have been scrutinized.

2. LITERATURE REVIEW

2.1. Service Quality

It is easy to identify the quality of a product in its physical structure and it's likely to get the right measurement; however, it is harder to measure the quality of services (Değermen, 2006: 14). The quality concept in service industry is not based on quantitative measurement. In the service industry, the processes of implementation and supervision of the quality concept are complex. In this industry, the quality could be evaluated when it is offered. This means that the quality is based on the performance of the personnel who has offered / supplied it. Unlike the inputs of a physical production, control over the inputs of human resources is not possible. Both measuring and identifying the service quality are difficult. Many of the identifications regarding service quality are based on two concepts "customer perceptions" and "customer expectations".

In defining the "service quality" certain concepts have widely been used. These concepts such as "technical quality", "functional quality", "expected quality" and "perceived quality" could help to better understand the "service quality" "Functional quality" stands for the customer's evaluation of the achievement exhibited during the supply of the services, whereas technical quality is what the customer gains out of the services provided. In other words, while the functional quality refers to the process, technical quality refers to the results (Değermen, 2006: 23). Referring to these two outlooks on quality in VTS could result in the following inferences: If vessel traffic service operator provides the ship bridge team with navigational information, and while doing this, if all the specifications of the ship have been taken into consideration and empathy has existed in this communication, and if this has been done in right time, then the functional quality of this service is considered to be high. Likewise, if the ship has escaped from any informed point of danger and been able to navigate safely by making use of the information received, then the technical quality is expected to be high.

2.1.1. Measuring the Service Quality

Conventional quality control methods used for tangible products cannot meet the requirements for measuring the service quality (Değermen, 2006: 31-32). As each kind of services has unique specifications and any customer who buys this service has various different expectations, measuring the perceptions regarding the service quality is a complex process. That's why different industries use different models. Despite numerous models, there has been no standardized model composed of the syntheses of the existing models. The relevant literature reveals that the models widely used in transport, maritime transport, and marine industry are as follows: "SERVQUAL" (SERVice QUALity) developed by Parasuraman et al. (1985), and "SERVPERF" (SERVice PERFormance) developed by Cronin and Taylor (1992) (Özdemir and Kuleyin, 2019: 959).

2.1.2. SERVQUAL Model

The SERVQUAL is based on the analysis of differences. The service quality is measured through the analysis of the differences gained by a two-fold measurement: Measuring the expectations and measuring the perceptions. In the former such five subdimensions are used on "Physical structures", "Reliability", "Responsiveness", "Assurance", and "Empathy"(Parasuraman et al. 1985). In the analysis process, the differences between the expectations and the perceptions are evaluated. If the expectations are higher than the perceptions, then as the service quality has not met the expectations, thus it is considered to be low; but if the perceptions are higher than the expectations, then the service quality is measured to be high.

2.1.3. SERVPERF Model

Cronin and Taylor (1992) has studied on the conceptualization of measuring the service quality and the relations between the customer satisfaction and selling intention. They have concluded that the perceived quality is the best determinant of the service quality (Seth et al. 2005: 920-921). The emergence of this model is attributed to the SERVQUAL. Cronin and Taylor have claimed that the method of analyzing the differences (between the expectations and perceptions) is not enough to measure the service quality, and they have proposed a new model is, in a sense, a shortened form of the SERVQUAL model (Seth et al. 2005: 920-921).

SERVPERF model has been implemented and verified in many industries like fights against insects, dry cleaning, banking and fast food (Cronin and Taylor, 1992: 59-67). The practices in transport and maritime industries will be discussed in the this part of the study. In a study carried out by Pantouvakis (2006) on the measurement of the perceptions of the passengers who have received services from a passenger ship of the services received, both SERVQUAL and SERVPERF methods have been used together. Another study in which both of these methods have been used together is the one carried out by Duque-Oliva and Mercado-Barboza (2011) on the measurement of the perceptions of the service quality of the Colombia Barranquila Air Traffic System. Miremadi et al. (2011) has studied on the measurement of the service quality perceptions regarding the service offered by ports. In this study, the statements used in the data collection have been adapted from the SERVQUAL method. Another study in which SERQUAL method has been used is by Sayareh et al. (2016) on the measurement of the service quality perceptions regarding the services offered by container terminals. Jeeradist et al. (2016) has studied on the factors affecting the service quality regarding the services offered by airports along with the factors affecting the image perceptions of the passengers. In this study also SERVQUAL method has been utilized.

A model for measuring the service performance, SERVPERF could be considered to be used for measurement of the service quality perceptions regarding VTS. It wouldn't, however, be satisfactory enough. The unique specifications of and the differences between VTS and all other service industries require that the general statements must be adopted to VTS, which is a complete performance service supplied by Vessel Traffic Service Operators (VTSO) for their customers. The limitations for this performance service are the infrastructure of the marine geographical areas, the infrastructure of communications, the infrastructure of observation zones, the qualification, education, problem solving competency and communication skills of the VTSO. Under the effects of such limitations, providing the ship traffic safely, fast and regularly is the performance measurement of the system.

While providing safe, fast and smooth marine traffic, VTSO use their problem-solving skills and exhibit extraordinary performance the measurement of which should be arranged with utmost care. Considering this need, the statements used in SERVPERF have been adopted in this study to measure the quality of the performance put forward by VTSO.

2.2. Corporate Image

The definition of the term "image" could be highlighted as follows: the picture reflecting the opinions, beliefs, impressions, feelings of institutions or individuals on a particular object or a phenomenon (Gültekin, 2005: 127). In other words, it is a set of opinions, impressions, viewpoints, or evaluation left by a service provider on those who have used or will use the service provided (Gümüş, 1995: 124).

The above highlighted definitions of the term "image" imply that it is not only a picture but also a means of communication, a kind of advertisement table reflecting your competencies, talents, who you are, what you do and how you fulfill your responsibilities and liabilities (Şimşek, 1999: 353). In a sense, it is the overall picture of a company or individual displayed to others; an overall reflection of the impressions and perceptions on the internal and external targets of an institution or an individual (Geçikli, 2012: 6).

The vision, mission, strategies, policies, plans of an institution, the wearing styles and behaviors adopted for the employees, and the manner internalized toward the customers and all the points of evaluation constitute the corporate image of an organization (İzci and Saydan, 2013: 202). In other words, corporate image reflects how external stakeholders view a company (Minkiewicz et al. 2011: 191). It stands for the impressions to company makes on everybody who has perceptions on the company no matter whether the perceivers are within the target market of the company or not (Onal, 2000: 47).

Corporate image is thought to affect the customer decisions and customer satisfaction. In other words, it could be stated that any customer who has favorable perceptions on the corporate image of a company is most likely to feel satisfied with the services provided by that company is most likely to feel satisfied with the services provided by that company (Andreassen and Lindestad, 1998: 11).

Grönroos (1984: 40) states that in case the services provided do not meet the expectations, the favorable corporate image perceived could compensate this gap.

In other words, any favorable corporate image could act as a filter for relevant service quality. Thus; any positive corporate image for VTS is thought to positively affect the service quality. Erdoğan et al. (2006: 57) has determined that the corporate image affects the perceived service quality and the customer satisfaction.

2.3. The Conceptual Model of the Study

The relevant literature reveals the effects of the service quality on the corporate image. The scope of this study first covers the extent of the reflections of the perceived quality of the services by ship masters provided by two VTS, Istanbul VTS and Canakkale VTS, on the corporate image. The dimensions and the corporate image scores of the two mentioned VTS have been compared and contrasted. The research model of the studycan be seen in Figure 1.

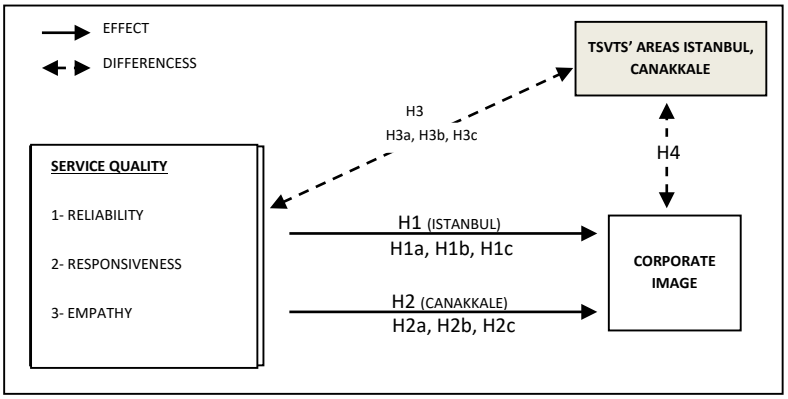

Figure 1: Research Model
Source: Authors

The main and sub hypotheses formed based on the model are as follows:

H1. The perceived quality of the services provided by the Istanbul VTS affects the corporate image positively.

H1a: The reliability of the Istanbul VTS affects the corporate image positively.
H1b: The responsiveness of the Istanbul VTS to wants of the shipmasters affects the corporate image positively
H1c: The empathy displayed by the Istanbul VTS on the shipmaster affects the corporate image positively.

H2: The perceived quality of the services provided by the Canakkale VTS affects the corporate image positively.

H2a: The reliability of the Canakkale VTS affects the corporate image positively.

H2b: The responsiveness of the Canakkale VTS to wants of the shipmasters affects the corporate image positively
H2c: The empathy displayed by the Canakkale VTS on the shipmaster affects the corporate image positively.

H3: The perceptions of the ships masters of the service quality differ based on the service-regions of the Turkish Straits Vessel Traffic Services (Istanbul -Canakkale).

H3a: The perceptions of the shipmasters of the reliability differ based on the service-regions of the Turkish Straits Vessel Traffic Services (Istanbul -Canakkale).
H3b: The perceptions of the shipmasters of the responsiveness differ based on the service-regions of the Turkish Straits Vessel Traffic Services (Istanbul -Canakkale).
H3c: The perceptions of the shipmasters of the empathy displayed differ based on the service-regions of the Turkish Straits Vessel Traffic Services (Istanbul -Canakkale).

H4: The views of the shipmasters on the corporate image of the TSVTS differ based on the service-regions (Istanbul VTS - Canakkale VTS).

3. METHODOLOGY

The methodology of this research is discussed, as follows, in such three-sub section as "population and sampling" and "data collection tool", and "limitations".

3.1. Population and Sampling

The Improbable-Random Sampling Method has been used. While calculating the size of the sample, the monthly average number of ships having passed through the Turkish Straits has been considered. According to the data provided by the Directorate General of Maritime Commerce, during the three months of 2019 (Feb. 01 - May 01, the period when research was carried out), 9,000 ships have passed through the Istanbul Strait and 10,000 through the Canakkale Strait. The participants may have passed through both of the straits without taking pilots, which must decrease the target population. Then the target population has been determined to be 3,500 shipmasters. There are several approaches in the literature to determine the sample size of the studies. While determining the sample size of this study, the sample size calculation formula accepted in the literature was used. From the table calculated in accordance with this

formula (Israel, 1992); for ±7% precision levels where confidence level is 95%, the sample size representing the target population of 3,500 was determined to be 192 shipmasters.

3.2. Data Collection Tool

The data collection tool of this research is discussed, as follows, in such two-sub section as "developing data collection tool" and "conducting the questionnaire".

3.2.1. Developing Data Collection Tool

The questionnaire developed by Duque-Oliva and Mercado-Barboza (2011) from SERVQUAL and SERVPERF on the measurement of the perceptions of pilots of air traffic service quality has been adapted and conducted in this study.

In this process, the steps of the developing experimental model have been followed. While developing a candidate questionnaire, semi-structured interviews have been conducted through the relevant experts: vessel traffic service operators (5), pilots (5), oceangoing ship masters (5), and academicians (5).

The interviews have been carried out at the places preferred by the experts, taking around one hour each and based on their permission, recorded; and in interactive manner. The questions have been formed to be both open-ended multiple choices. The questions have targeted the three sub-dimensions: reliability, responsiveness, and empathy, and comprised 12 statements, 8 statements, and 5 statements respectively. The pool of 25 statements for the said sub-dimensions have been established through five vessel traffic service operators from Canakkale VTS and a through literature review (Wakefield, 1994; Parasuraman et al. 1998; Bitner, 1992; Brady and Cronin, 2001). Finally, in determining the scope validity, and organizing the candidate questionnaire, the views of the experts from academicians have been called for help. Following the last corrections, the questionnaire items have been ready for conduction. In the questionnaire 7-Likert scale has been decided to get used (1-strongly disagree – 7-strongly agree).

Based on a factor analysis, having carried out a pilot study, the 22 statement and three sub-dimensioned questionnaires has been found to be reliable and valid[3].

As a result of the relevant literature review on corporate image measurement, the questionnaire used in a PhD study, "Determinants of Corporate Image Formation: A Consumer Level Modal Incorporating Corporate Identity Mix Elements and Unplanned Communication Factors" (Karaosmanoğlu, 2006) has been found suitable for this study. This questionnaire has been found to be proper for the service industry by the relevant experts during the interviews. The corporate image questionnaire used aims through three questions to measure the impressions the institution has made on the participant, the impressions the institutions has made on others, and the comparative impressions the participant has had from the institutions when compared with other institutions. These three questions have been asked through the questionnaire in 5-Likert scales (1-strongly disagree – 5-Strongly agree).

3.2.2. The Process of Conducting the Questionnaire

The questionnaire (see Appendix 1) has been online conducted through the ship masters, on a voluntary basis, who have used the TSVTS services within the last three months. The masters of the ships having passed through the Istanbul VTS and Canakkale VTS areas on any date(s) between Feb.01-May 01, 2019 have been reached through the relevant internet platforms, personal contacts, and human resource agents, and they have been provided with questionnaire forms through e-mail. Out of the 200 questionnaires, 192 have been acceptable responded, which means that the sampling target (n=192) has been reached. 98 of these responses have been from foreign shipmasters and 94 from Turkish ship masters (see Table 1).

[3] The whole process of developing data collection tool, formed by Ozdemir and Kuleyin (2019), was presented as "A Proposal for How to Measure the Perceived Service Quality of Vessel Traffic Services" at the 18th International Business Congress held by Osmaniye Korkut Ata University (Turkey) on May 02-04, 2019. This presentation has been published in the proceeding of the congress.

4. FINDINGS

4.1. Reliability Analysis

The data collected through the research have been subject to various statistical processed. First, whether the data comply with the nominal distribution has been analyzed. Through the SPSS 25 (Statistical Package for the Social Sciences), the Skewness and Kurtosis values have been gained. They have been found to be within the acceptable limits for the normal distribution. George and Mallery (2010) states that these values are to be between -2 and +2.

The internal consistency Cronbach Alpha tests for each of the statements regarding the service quality of Istanbul VTS and Canakkale VTS have been carried out. The results have been found as follows: 0,85 for Canakkale VTS corporate image/service quality and 0,90 for Istanbul VTS corporate image/service quality.

The profile information about the participants/shipmasters can be seen in Table 1. This table reveals that the average ages, the period of professional life, and the period of having worked as masters are higher with the foreign ship masters; whereas the number of passages through the two mentioned straits is higher with the Turkish ship masters.

Table 1: The Profile Information About the Participants/Shipmasters

	Turkish	**Foreign**	**Total**
Number of Participants	98	94	**192**
Average Ages	38,51	41,72	**40,10**
Total Service Years	14,44	19,04	**16,71**
Service Years as Master	7,03	9,04	**8,03**
Mean of Istanbul Strait Passage (years)	29,02	17,52	**24,12**
Mean of Canakkale Strait Passage (years)	29,54	24,12	**26,86**

Source: Authors

4.2. Findings Regarding the Service Quality

The perceptions regarding the reliability of the VTS are given in Table 2 (the perceived reliability). The table reveals that the perceptions of the foreign shipmasters are as follows: For Istanbul VTS PSQ-1 has received the lowest, and PSQ-5 has received the highest score. For Canakkale VTS PSQ-1 has again received the lowest, and PSQ-9 has

received highest scores. In the evaluation of the Turkish ship masters, for Istanbul VTS PSQ-8 the lowest, and PSQ-5 highest; for Canakkale, PSQ-2 the lowest, and PSQ-5 is highest.

The overall evaluation of the reliability reveals that for Istanbul VTS the lowest score is with PSQ-8 and highest one is with statement; for Canakkale VTS, these are PSQ-8 and PSQ-5 respectively. Whether there is a meaningful difference between the reliability scores for Istanbul VTS and Canakkale VTS, t-test has been done. The result reveals no meaningful difference. The analysis has given "equal variances not assumed" with sig. (2-tailed) = .133, which is bigger than .05; so, no difference appears the result for Canakkale VTS is as follows = sig.(2-tailed) = .079, which means there is no meaningful difference.

Table 2: The Perceived Reliability

	ISTANBUL VTS			**CANAKKALE VTS**		
Item No	**Mean TM/FM***	**Mean of Total**	**SD****	**Mean TM/FM***	**Mean of Total**	**SD****
PSQ-1	5,13/4,81	5,00	1,14	5,63/5,40	5,55	,95
PSQ-2	5,18/4,91	5,06	1,18	5,57/5,49	5,56	1,02
PSQ-3	5,24/4,92	5,10	1,15	5,72/5,60	5,68	,93
PSQ-4	5,29/4,93	5,13	1,29	5,85/5,61	5,75	1,04
PSQ-5	5,51/5,13	5,33	1,19	5,87/5,68	5,79	,97
PSQ-6	5,18/4,89	5,05	1,18	5,75/5,52	5,66	,93
PSQ-7	5,05/4,96	5,03	1,21	5,61/5,60	5,63	1,02
PSQ-8	4,98/4,92	4,99	1,21	5,70/5,53	5,66	1,10
PSQ-9	5,15/5,06	5,13	1,13	5,73/5,70	5,75	,92
PSQ-10	5,23/5,06	5,17	1,12	5,75/5,65	5,73	,95

*TM: Turkish Masters FM: Foreign Masters
**SD: Standard Deviation

The perceptions regarding the responsiveness of the VTS are given in Table 3. This table reveals that the lowest score from the foreign masters regarding Istanbul VTS has been received for PSQ-16 and the highest one for PSQ-18. These scores received from the Turkish masters are PSQ-16 and PSQ-18 respectively. For Canakkale VTS; the scores received from the foreign masters are PSQ-16 the lowest and PSQ-18 the highest. The scores received from the Turkish masters are PSQ-16 and PSQ-18 respectively.

The t-test conducted reveals that with sig.(2-tailed) = .985 regarding the responses from the foreign masters and with sig.(2-tailed) = .589 from

the Turkish masters, there is no meaningful difference between the responsiveness score for Istanbul VTS and Canakkale VTS.

Table 3: The Perceived Responsiveness

	ISTANBUL VTS			CANAKKALE VTS		
Item No	**Mean TM/FM***	**Mean of Total**	**SD****	**Mean TM/FM ***	**Mean of Total**	**SD****
PSQ-11	4,86/4,98	4,94	1,11	5,55/5,74	5,68	,96
PSQ-12	5,05/5,07	5,08	1,06	5,67/5,73	5,73	,87
PSQ-13	4,91/5,03	5,00	1,13	5,62/5,65	5,65	,99
PSQ-14	4,95/5,11	5,07	1,13	5,61/5,72	5,68	1,01
PSQ-15	5,12/5,03	5,09	1,10	5,68/5,72	5,72	,95
PSQ- 16	5,31/5,21	5,29	1,20	5,81/5,81	5,81	,96
PSQ-17	5,01/5,01	5,03	1,20	5,50/5,67	5,62	1,07
PSQ-18	4,71/4,87	4,83	1,25	5,39/5,64	5,55	1,09

*TM: Turkish Masters FM: Foreign Masters
**SD: Standard Deviation

The perceptions about the empathy of the VTS are indicated in Table 4. According to this table, the lowest score received from the foreign masters regarding Istanbul VTS has been for PSQ-21 and the highest for PSQ-20. The scores received from Turkish masters are for PSQ-21 and PSQ-22 respectively. The lowest score received from the foreign masters regarding Canakkale VTS is for PSQ-21 and the highest one is for PSQ-19. The scores received from Turkish masters regarding this VTS is for PSQ-19 and PSQ-20 respectively.

The t-test reveals that there is no meaningful difference between the empathy related perceptions regarding the Istanbul VTS and Canakkale VTS, with sig. (2-tailed) = .660 and sig. (2-tailed) = .815 respectively.

Table 4: The Perceived Empathy

	ISTANBUL VTS			CANAKKALE VTS		
Item No	**Mean TM/FM***	**Mean of Total**	**SD****	**Mean TM/FM**	**Mean of Total**	**SD****
PSQ-19	4,74/5,00	4,92	1,16	5,49/5,75	5,64	,99
PSQ-20	5,09/5,12	5,13	1,10	5,70/5,72	5,72	,91
PSQ-21	4,61/4,88	4,77	1,21	5,57/5,60	5,59	1,02
PSQ-22	5,17/5,08	5,15	1,05	5,67/5,68	5,70	,92

*TM: Turkish Masters FM: Foreign Masters
**SD: Standard Deviation

4.3. Findings Regarding the Corporate Image Perceptions

Table 5 reveals that the perceptions of the foreign masters regarding the corporate image of both Istanbul VTS and Canakkale VTS are the same; the lowest score is CI-1 and the highest one is CI-3. These scores received from the Turkish masters are CI-2 and CI-3 for Istanbul VTS and CI-3 and CI-1 for Canakkale VTS.

As for the overall scores: The lowest for Istanbul VTS is CI-2 and highest one is CI-3; for Canakkale VTS, they are CI-1 and CI-3 respectively.

Table 5: The Perceptions on the Corporate Image

	ISTANBUL VTS			CANAKKALE VTS		
Item No	**Mean TM/FM***	**Mean of Total**	**SD ****	**Mean TM/FM***	**Mean of Total**	**SD****
CI-1	3,57/3,63	3,61	,77	4,20/3,95	4,10	,64
CI-2	3,52/3,65	3,59	,77	4,09/4,16	4,15	,63
CI-3	3,59/3,76	3,71	,77	4,07/4,26	4,20	,68

*TM: Turkish Masters FM: Foreign Masters
**SD: Standard Deviation

4.4. Tests on the Hypotheses

H1: The perceived service quality of Istanbul VTS affects the corporate image positively.

Correlation test has been conducted to see whether there is a meaningful difference between the reliability and the corporate image. The Pearson Correlation value has been found to be 0.784, which means that there is a strongly positive relation. The Pearson Correlation value found regarding responsiveness is 0.720 and regarding empathy 0.749, showing a strongly positive relation.

H2: The perceived service quality of Canakkale VTS affects the corporate image positively.

The results of the correlation test implemented are as follows: Pearson Correlation value for reliability is 0.742, for responsiveness 0.598 and for empathy 0.553. This means that there is a strong relation between reliability and corporate image, but a moderate relation between responsiveness and corporate image as well as between empathy and corporate image.

H3: The perceptions of the ships masters of the service quality differ based on the service-regions of the Turkish Straits Vessel Traffic Services (Istanbul -Canakkale).

The scores regarding the perceptions of reliability, one of the sub-dimensions of the quality provided by the İstanbul VTS and Cannakkale VTS have been analyzed through Pearson Correlation Test. The Perason Correlation value has been found to be 0.853, which means that there is a positive and strong relationship between the scores of reliabilities at İstanbul VTS and Cannakkale VTS.

The Pearson Correlation value regarding responsiveness, another sub-dimension of the service quality, has been found to be 0.821, which means that there is a positive and strong relationship between the scores of responsiveness gained at Istanbul VTS and Canakkale VTS.

The Person value regarding empathy, another sub-dimension of the service quality, has been found to be 0.781, which implies that there is a positive and strong relationship between the scores gained at Istanbul VTS and Canakkale VTS.

H4: The views of ship masters on the corporate image of the TSVTS differ based on the service zones (Istanbul Strait - Canakkale Strait).

The Pearson Correlation Value of 0.753 found through the correlation test indicates that there is a strong relationship between the corporate images of the Istanbul VTS and Canakkale VTS.

5. DISCUSSION AND CONCLUSION

The results gained through this research regarding the perceptions of the foreign shipmasters and Turkish shipmasters seem to reveal certain differences. These differences could be highlighted as follows:

Perceptions on the reliability as the sub-dimension of the service quality regarding the Istanbul VTS: The highest score received from the foreign masters is on PSQ-5: VTS provides 7/24 365 days of uninterrupted services in the area of its responsibility. This means that VTS services are uninterruptedly provided for the foreign masters. The lowest score from the foreign masters is on PSQ-1: VTS provides trouble free communication via VHF system in the area of its responsibility. This implies that the communicative infrastructure of the Istanbul VTS is not advanced enough

to meet the needs of the foreign masters. From the points of the Turkish masters, the lowest score received is on PSQ-8: VTS Operators exhibit sincere interest in solving your problem. This means that the Turkish masters are not satisfied with the attitudes of the VTS Operators. On the other hand, the Turkish masters seem to be happy with the uninterrupted services provided by the Istanbul VTS (PSQ-5 has received the highest score).

Perceptions on the reliability regarding the services provided by the Canakkale VTS: From the point of the foreign masters, the communicative infrastructure is not advanced enough to meet the needs of the masters, like Istanbul VTS (see PSQ-1); on the other hand, the customers seem to be happy with the effortful struggle of the vessel traffic operators (see PSQ-9).

Overall evaluation on the reliability reveals that the masters in general are not happy with the attitudes displayed by the Istanbul VTS (PSQ-8 with the lowest score) but they are satisfied with the uninterrupted services. As for the Canakkale VTS: The masters are not happy with the not advanced communicative infrastructure but satisfied with the uninterrupted services (PSQ-5 with the highest score).

The overall evaluation of responsiveness in the service provided by the Istanbul and Canakkale VTSs: There seems to be no meaningful difference between the lowest and the highest scores. The lowest score is on the statement (see PSQ-18): VTSO respond to your additional info requirements, this means the service users are not satisfied with the attitudes displayed by the VTS in providing further needed information. The highest score is on PSQ-16: VTSO explain the reasons for suspending the traffic and delaying the vessels.

Perceptions on empathy in the services provided by the Istanbul and Canakkale VTSs: There is a difference between the perceptions of the foreign masters and those of the Turkish masters. The overall views of the Turkish masters reveal that the lowest score is on PSQ-21: VTSOs always treat you politely; the highest score is on PSQ-22: VTSOs use SMCP (Standard Marine Communication Phrases).

Perception on empathy in the services provided by Canakkale VTS reveal that the service users are happy with the matter of safety (PSQ-20: VTS makes feel safe in the area of its responsibility) but they are not satisfied with the treatment (attitudes) of the operators (the lowest score is on PSQ-21: VTSOs always treat you politely).

The clear-cut result received through this study that there is a strong relationship between the three basic sub-dimensions reliability, responsiveness, and empathy of the VTS service quality and the corporate image points out that increasing the relevant service quality will positively affect the corporate image. Hence, the performance carried out by VTSO using the infrastructure of the system should aim at not only providing safety but also increasing the service quality.

The data collected through this study reveals that the users of the services provided by VTS have some other expectations beyond safety only. Due to the strong relationship displayed between the mentioned three sub-dimensions and the corporate image, the sensitivity and expectations of hip masters in reliability, responsiveness and empathy should be taken into consideration in offering VTS.

Another point the results of this study emphasize is that in evaluating the VTS there seems to be no worthwhile distinction in the nationalities of the service consumers. Regardless of the nationality, the overall expectations of ship masters from VTS are primarily regarded with safety. Still another point of attention is that the problematic point with VTSO is not related with language but the style in communication.

The responses given to the open-ended questions make the expectations more obvious and insistent. The point focused is being treated with empathy and politely. The shortage in or lack of this expected style of communication could be attributed to the excessive load of work burdened on the shoulders of the operators at the intensive vessel traffic but inadequate anchorage areas plus the risky geographical locations. Despite all such unfavorable conditions, however, the insistent expectations should be taken into account and certain correcting / bettering remedies should be taken.

Alternative working conditions and plans and establishing certain alternative and additional local marine traffic centers could help lessen the burden mentioned.

Another important point revealed through the responses to the open-ended questions is concerning the inadequacy in the places for anchoring. This problem is attributed to the geographical specification of the Istanbul VTS. It is clear that in the recent past the relevant authorities tried to solve this problem by means of a better organization for anchoring points, but could not manage it. It seems, however, that a second trial might be a solution: classifying the vessel in terms of the reasons why they are waiting to anchor (e.g. for passage or supplying, etc).

A third aspect underlined in the responses to the open-ended question is that operators are supposed to identify and observe vessels more carefully and keep in closer touch with them. In other words, they should be well informed about and familiar with certain characteristic specifications of each vessel (e.g. length, speed, type, draft) and anticipate the likely dangers and risks the vessel might encounter and take precautions accordingly. The bridge team should be noticed and warned prior to risky situations: A probable solution to the shortage of taking precaution could be reorganizing the work hours of the operators accordingly and increasing the number of the sectors in order to lessen their workload.

The overall evaluation of the perceptions of the TSVTS service quality has enable to compare and contrast the scores for the Istanbul VTS and Canakkale VTS. The mod value of the latter seems to be positively 1 point higher than that of the former. This could be attributed to certain disadvantages of the Istanbul VTS, e.g. dangerous geographical position, more congested local traffic, and shortages in the anchorage points. The physical infrastructure of the two mentioned VTS have been established by same undertaker, at the same time and referring to the same criteria. They been operated with the operators having the same expertise and competencies. Thus, the mentioned difference could be attributed to the differences in geographical positioning and then the solutions should be sought accordingly.

The last point to be underlined based on the overall results of this study is that there has been a close relationship between the customer satisfaction and the corporate image. Thus, it should be noted that increasing the corporate image is most likely to contribute to the safer navigations of vessels through the Turkish Straits, one of the most dangerous passages in the world.

5.1 Academic and Managerial Implication

A thorough literature review reveals that this study has been the first in determining the service quality of VTS, in measuring the level of the satisfaction of ship masters regarding the services they have received from VTS, and in inspiring researchers to discuss how to improve the perceptions of the service quality particularly involving the TSVTS. Thus, the results gained through the study are thought to motivate and set a guideline for the future research in this topic.

5.2. Limitations

The samples determined for the research comprise the ship masters who have passed through the Istanbul Strait and Canakkale Strait. However, the pilots who have received services from the mentioned VTSs, the watchkeeping officers, and the shipmasters providing services within the local traffic have not been included in the sample group of this study. Involving these in the future research is most likely to contribute to the points of the discussion

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Appendix 1. The Measurement Items Used for VTS in this Study

No	Measures	Previous studies
Your Views on VTS in the Context of the Service Quality and Corporate Image: (Please indicate which VTS you are writing about (Çanakkale or İstanbul)		
……		
Please answer/mark the extent to which you agree with the following statements regarding the service quality of the ….... Vessel Traffic Service (VTS).		
(1-Strongly disagree, 2-Disagree, 3-Somewhat disagree, 4-No idea, 5- Somewhat agree, 6-Agree, 7-Strongly agree)		
Perceived Service Quality (PSQ)		
PSQ-1	VTS provides trouble-free communication via VHF system in the area of its responsibility.	Wakefield , 1994; Zeithalm and Bitner, 2000; Brady et al. 2002; Gronross, 1984; Parasuram an et al. 1988; Bitner, 1992; Brady and Cronin, 2001
PSQ-2	VTS makes easier to keep your planned route.	
PSQ-3	VTS provides good (fast and safe) coordination with vessels in the area of its responsibility.	
PSQ-4	VTS continuously monitors the traffic in the area of its responsibility.	
PSQ-5	VTS provides 7/24 365 days of uninterrupted services in the area of its responsibility.	
PSQ-6	VTS provides standard service in all sectors.	
PSQ-7	VTS gives clear instructions in right time.	
PSQ-8	VTSOs (Vessel Traffic Service Operators) exhibit sincere interest in solving your problems.	
PSQ-9	VTSOs make efforts for error-free services.	
PSQ-10	VTSOs serve you promptly.	
PSQ-11	VTSOs immediately reply at your first call.	
PSQ-12	VTSOs respond to your demands in optimum time.	
PSQ-13	VTSOs understand your specific needs and provide services accordingly.	
PSQ-14	VTSOs consider vessel characteristics (e.g. LOA, speed, etc.) and provide services accordingly.	
PSQ-15	VSTOs explain the reasons for the instructions given.	
PSQ-16	VSTO explain the reasons for suspending the traffic and delaying the vessels.	
PSQ-17	VTS provides service without discrimination between vessels.	
PSQ-18	VTSOs respond to your additional info requirements (safe waiting areas, areas traffic, estimated waiting times, etc.).	
PSQ-19	VTSO are always willing to serve you.	
PSQ-20	VTS makes feel safe in the area of its responsibility.	
PSQ-21	VTSOs always treat you politely.	
PSQ-22	VSTOs use Standard Marine Communication Phrases (SMCP) in VHF communication.	

Please answer/mark the extent to which you agree with the following statements regarding the corporate image of the …… Vessel Traffic Service (VTS). ***(1-Very unfavorable, 2- Unfavorable, 3-Neutral, 4-Favourable, 5- Very favorable)***		Karaosmanoğlu (2006)
Corporate Image (CI)		
CI-1	Please state your general impression about VTS	
CI-2	What do you think about what impression other captains (masters) have about VTS.	
CI-3	Please state your impression about VTS compared to other ones (VTS).	