**DOKUZ EYLÜL UNIVERSITY**
**GRADUATE SCHOOL OF SOCIAL SCIENCES**
**DEPARTMENT OF MARITIME BUSINESS ADMINISTRATION**
**MARITIME BUSINESS ADMINISTRATION PROGRAM**
**MASTER'S THESIS**

# SERVICE FAILURES AND RECOVERIES IN CONTAINER TERMINALS: AN APPLICATION FOR AEGEAN REGION

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**Supervisor**
**Assoc. Prof. Dr. Gül DENKTAŞ ŞAKAR**

**2023**

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**Assoc. Prof. Dr. Gül DENKTAŞ ŞAKAR**

**İZMİR-2023**

**APPROVAL PAGE**

## DECLARATION

I hereby declare that this master's thesis titled as "Service Failures and Recoveries in Container Terminals: An Application For Aegean Region" has been written by myself in accordance with the academic rules and ethical conduct. I also declare that all materials benefited in this thesis consist of the mentioned resources in the reference list. I verify all these with my honor.

06/01/2023

Sümeyra ÖZAYDIN

**ABSTRACT**

**Master's Thesis**

**Service Failures and Recoveries in Container Terminals: An Application for Aegean Region**

**Sümeyra ÖZAYDIN**

**DokuzEylül University**

**Graduate School of Social Sciences**

**Department of Maritime Business Administration**

**Maritime Business Administration Program**

**The importance of service quality has been emphasized in many studies in the field of service industry. Since service is an intangible concept, it is not possible to completely prevent service failures. In the literature, service failure is generally defined as the error that occurs during service delivery (Bitner et al., 1990; Colgate and Norris, 2001). It has been observed that the recoverystrategies taken against service failures affect the loyalty of customers as well as the quality and delivery of the service. Hart et al.(1990) indicate that a good recovery strategy managed after a service failure can generate greater customer loyalty than existed before the failure. Today, with the efforts to increase the service quality both in the sectoral environment and in the academic environment, what can be done against service failures and how they can maintain customer loyalty after service failure has begun to be examined.**

**Container terminals are the important part of the chain that forms the basis of international trade and has a critical mission today. With the increasing competition, the role of container terminals has also increased and new ways have been sought to increase the quality of the services provided. It is important for container terminals to determine customer demands that change and become more complexday by day in order to provide quality service output in line with these demands, and to take action when service failures are encountered. In this study, service failures encountered are examined from the perspective of the container terminal and the perspective of shipping line**

**employees. How recoverysolutions are developed or can be improved against these failures are among the aims of the research. In order to achieve the aim of the study, a critical incident technique was conducted by interviewing the container terminal and line employees in the Aegean Region, consisting of 58 people in total. The outputs obtained from the interviews were grouped and as a result of the analysis, it was observed that the service failures encountered and the recovery methods interacted with the business relations.**

**Keywords: Service Failure, Service Recovery, Container Terminals, Critical Incident Technique**

# ÖZET

**Yüksek Lisans Tezi**

**Konteyner Terminallerinde Hizmet Hataları ve Telafileri: Ege Bölgesi için bir Uygulama**

**Sümeyra ÖZAYDIN**

**Dokuz EylülÜniversitesi**

**Sosyal Bilimler Enstitüsü**

**Denizcilik İşletmeleriYönetimi Anabilim Dalı**

**DenizcilikİşletmeleriYönetimi Programı**

**Hizmet sektörü alanında yapılan pek çok çalışmada hizmet kalitesinin önemi vurgulanmıştır. Hizmet soyut bir kavram olduğu için hizmet hatalarının tamamen önlenebilmesi mümkün değildir. Literatürde hizmet hatası genel olarak hizmet sunumu sırasında ortaya çıkan hata olarak tanımlanmıştır(Bitner et al.,1990; Colgate and Norris, 2001). Hizmetin kalitesi ve sunumu kadar karşılan hizmet hatalarına karşı alınan telafi yöntemlerinin müşterilerin sadakatini ve bağlılığını etkilediği gözlemlenmiştir. Hart ve diğerleri(1990) bir hizmet hatasından sonra yönetilen iyi bir telafi stratejisinin hatadan önce var olandan daha fazla müşteri sadakati doğurabileceğini belirtmektedir. Günümüzde hem sektörel çevrede hem de akademik çevrede hizmet kalitesini artırmaya yönelik çalışmalarla birlikte hizmet hatalarına karşı neler yapılabileceğini, hizmet hatası sonrasında da müşterinin bağlılığını nasıl devam ettirebilecekleri incelenmeye başlanmıştır.**

**Konteyner terminalleri günümüzde uluslararası ticaretin temelini oluşturan, kritik bir göreve sahip zincirin önemli bir parçasıdır. Artan rekabetle birlikte konteyner terminallerinin rolü de artmış ve verilen hizmetlerin kalitesinin artırılması için yeni yollar aranmaya başlanmıştır. Konteyner terminallerinin günden güne değişen ve kompleks bir hal alan müşteri taleplerini belirlemeleri, bu talepler doğrultusunda kaliteli hizmet çıktısı sağlamaları ve hizmet hatalarıyla karşılaşıldığında alacakları aksiyon önem arz etmektedir. Bu çalışmada, karşılaşılan hizmet hataları konteyner**

**terminali perspektifinden ve hat çalışanları perspektifinden incelenmiştir. Bu hatalara karşı nasıl telafi yöntemleri geliştirildiği veya geliştirilebileceği araştırmanın amaçlarındandır. Çalışmanın amacına ulaşmak için toplamda 58 kişiden oluşan Ege Bölgesindeki konteyner terminalleri çalışanlarıyla ve hat çalışanlarıyla görüşmeler yapılarak kritik vaka incelemesi yapılmıştır. Yapılan görüşmelerde alınan çıktılar gruplandırılmış ve analizler sonucunda karşılaşılan hizmet hataları ile telafi yöntemlerinin iş ilişkileriyle etkileşimi olduğu gözlemlenmiştir.**

**Anahtar Kelimeler: Hizmet Hatası, Hizmet Telafisi, Konteyner Terminalleri, Kritik Olay Tekniği.**

**SERVICE FAILURES AND RECOVERIES IN CONTAINER TERMINALS: AN APPLICATION FOR AEGEAN REGION**

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## ABBREVIATIONS

| | |
|---|---|
| **CFS** | Container Freight Station |
| **EDI** | Electronic Data Interchange |
| **ERP** | Enterprise Resource Planning |
| **OOG** | Out of Gauge |
| **POD** | Port of Discharge |
| **QC** | Quay Crane |
| **TOS** | Terminal Operation Systems |

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# INTRODUCTION

Companies are under great pressure to provide excellent customer service while also meeting growing expectations (Smith et al.,1999). Failure acknowledgement and recovery have become more crucial responsibilities for service industry as awareness of service quality has grown. It can be understood from previous studies that service failures can lead to negative word of mouth, lost clients, poor image etc. (Lewis and Clacher, 2001: 20). Companies strive to reduce service failures that can arise for competition. On the other hand service failures can contribute to construct better relations with customers and provide increasing customer loyalty for the company. Therefore many companies and also container terminals have began to examine what can be done against service failures.

In this study, the issue of service failure in container terminals is investigated due to the significance of the topic and the lack of comparable studies in the literature. Given the significance of this issue to the maritime sector, it is believed that the study's results will help researchers.

This research consists of five chapters. First chapter includes literature review of service concept by defining characteristics of service and examining service quality approaches. It is stated that service is a intangible concept and unavoidable from service failures.

Second chapter defines service failure and recovery by explaining the importance of failure with concept of magnitude and frequency. It is explicated that it could be challenging to correctfailures in the service environment due to the underlying characteristics of the service industry. Thus, it is believed that service failure is almost inevitable.

Third chapter introduces container transportation and general knowledge about container ports and operations. This chapter also examines the port services for ships and cargoes, operations in container terminals, and container terminals in Aegean Region. It is explained in the chapter, no opportunity is left for human-based service failures with the new generation ports, which offer the chance to trade in an electronic environment and where robot systems are engaged.

Chapter four explains methodology of the research. Model of the study is showed and sampling and data collection steps are illustrated. Finally in chapter five, the information gathered from the critical incidents is examined, and the outcomes are described in detail. First, the descriptive data regarding to the respondent and interview components are provided. Also observations of participants were included. Interviewing employees of the container terminal and shipping lines in the Aegean Region was done using the critical incident technique. Lastly, the research's findings are emphasized and the hypotheses generated in accordance with the study's objective are put to the test.

# CHAPTER ONE
# SERVICE CONCEPT AND SERVICE QUALITY

## 1.1.DEFINITION OF SERVICE

Service is a comprehensive concept that is difficult to fully define."Services" are "all economic activities whose output is not a physical product, is generally consumed at the time it is produced, and provides added value in forms (such as convenience, amusement, timeliness, comfort, or health) that are essentially intangible concerns of its first purchase," according to Quinn et al. (1987: 50). There are so many service definitons in the literature according different perspectives.

According to Lovelock and Wirtz (2011:393), services are economic activities that generate value and offer advantages for consumers at certain times and locations. Gustafsson and Johnson (2003: 29) stated that the service organization should establish a flawless system of connected activities that solves client issues or offers unique experiences.

Service is defined as "any act or performance that one party might deliver to another that is fundamentally intangible and does not result in the ownership of anything," according to Philip Kotler (1994: 464). Its creation might be linked to a tangible product or not.

On the other hand, according to Grönroos (2000), services are an activity or sequence of activities that take place through contacts between customers and service staff and are supplied as solutions to client issues. Zeithaml et al. (1996: 38) define as service is non-physical human labor that provides direct benefits to consumers produced by humans through machines and systems or directly products.

The service sector is becoming an increasingly important sector with the changing socio-economic structure (Öztürk, 2000: 61).The reasons such as the increase in the welfare of the consumers, the more active women in the working life, the increase in the leisure time of the consumers and the increase in the complexity of the services can be shown in the increase in the importance given to the service sector (Kotler, 2002: 317).

## 1.2.CHARACTERISTICS OF SERVICE

There are a number of features that distinguish service from commercial goods. For example, goods are tangible, transferable and can be stored differently from the services. These differences also underlie the basis of the marketing problems seen in the service sector. (Bağcı, 2018: 11). Service businesses should pay attention to the features when creating a marketing program. There is general agreement that the four main characteristics of services (intangibility, inseparability, heterogeneity or variety, and perishability) separate them from tangible goods as described below (Kotler and Keller, 2011).

### 1.2.1. Intangibility

Every service is intangible. It is related to experience and gaining experience and the pleasure it gives or will give to the person who experiences it. It is not possible to have any service physically. Service is a phenomenon that is used and consumed, not owned. There are many features that distinguish services from products, and the intangibility is the most important and most distinctive of them.

"One of the major qualities of services that is commonly mentioned is intangibility. Because services are experiences rather than objects, they can't be seen, felt, tasted, or touched in the same way that products can"(Zeithaml et al. 1985: 33).

The shipping industry is referred to as a service industry (Branch and Stopford, 2013). Both tangible and intangible features might be present in the service. Point-to-point scheduling, on-time loading and delivery, availability of containers, freight, and digital solutions are examples of tangible features. The customer service agents' attitude, knowledge, communication punctuality, and reaction to service failures are examples of intangible qualities (Hirata, 2017: 15).

### 1.2.2. Inseparability

With the simultaneous consumption and production of services, as well as the direct participation of consumers, it has been shown that customers have certain effects on service organizations. It has been discovered that customers are also

service providers (Vargo andLusch, 2004). Like a result, customers are treated as part-time employees in the service industry (Bowen, 1986: 50).

### 1.2.3. Perishability

Another of the biggest features of the services is that it is not possible to make any stock. "Perishability" refers to the inability to store, resell, or return services (Gummesson 2007: 9). The inability to stock the service also separates products from services and implies that services cannot be stored. Products are first stored separately from services and can then be sold. Services are held when they are ready and cannot be sold later.

As Rust et al. (1996: 10) refer that “they are performed in real time.” Because services are perishable, marketers are forced to coordinate supply and demand. Because the value of the services is realized when they are needed. "This can make facility planning extremely challenging" (Rust et al. 1996: 10). It is not difficult to administer a service when demand is consistent.

There are two issues because of the perishability. The first is that services are time-sensitive, making them extremely perishable (Onkvisit and Shaw, 1991). In the event of insufficient delivery, the service consumer must wait, which might cause a fluctuation in service demand and supply (Hartman and Lindgren, 1993: 5).

### 1.2.4. Heterogeneity

Heterogeneity is the potential for significant service performance variations (Zeithaml et al., 1985:34) Because of the intangible character of services, heterogeneity arises as a challenge. Due to the fully human-made nature of service creation and delivery, it may not always be feasible to achieve the target quality level in all scenarios. Because people, unlike machines, cannot consistently deliver the same level of performance.

As a result, customers have a difficult time evaluating quality, and personnel have a difficult time measuring and controlling quality. In these circumstances, the views, attitudes, and expectations of present and future consumers are primarily used to measure and evaluate service quality (Gilmore, 2003: 10).

This feature causes a difficulty in services with a high labor content since the service is supplied by different persons and the outcome of the performance varies from person to person, and even the same person's performance might vary from day to day (Carman and Langeard, 1980; Wolak et al., 1998). On the contrary, heterogeneity gives some amount of flexibility, which service providers may use to differentiate themselves (Onkvisit and Shaw, 1991: 15; Wyckham et al., 1975: 16).

Customers have quality issues as a result of the changeable nature of the services, since they may not always receive the same service. The standardization of services can help to overcome this challenge. Over-standardization, on the other hand, may have a negative impact on the production of value. Customization, on the other hand, may be a useful approach for taking advantage of the heterogeneity (Hoffman and Bateson, 2008: 69).

## 1.3.SERVICE QUALITY

Creating a sense of unity on the concept of quality, which we are intertwined with in our daily lives, becomes very difficult with the effects of technological developments and globalization. The reason for this situation is that quality is considered as a multidimensional structure. As a result of individual and social priorities, both subjective and objective determinations necessitated different dimensions of quality. Compliance with the features and standards requested by the customers reveals that quality can be defined separately with various features and criteria (Yatkın, 2004: 1-2).

### 1.3.1. Definition of Service Quality

It is seen that the interest in quality in service businesses has increased gradually in the 1980s. It can be said that factors such as the International Service Quality Association (ISQA), Total Quality Management, European Foundation for Quality Management (EFQM) and European Quality Award, Malcolm Baldrige National Award and ISO 9000 Standards accelerated the increase in this interest (Gummerson, 1994: 20).

The extent to which a service satisfies a customer's wants and expectations is characterized as service quality (Lewis and Mitchell, 1990: 21). Service quality is described as the difference between what the customer expects from the service and how the service is perceived. When performance is lower, the perceived quality becomes unsatisfactory, resulting in dissatisfaction (Parasuraman et al. 1985: 45). Although a single encounter between the client and the service provider influences service quality, it is a composite of multiple interactions. Finally, service quality may be thought as an attitude and an overall impression formed by a series of interactions.

Furthermore, service quality may be described as a customer's evaluation of a service's superiority (Zeithaml, 1987). Unlike the quality of goods, which can be measured objectively using indicators such as number of defects and durability (Crosby 1979; Garvin 1983; Hjorth-Anderson 1984), the quality of services is based on three distinct characteristics: intangibility, heterogeneity, and inseparability of production and consumption (Parasuraman et al. 1985: 46).

Koç et al. (2014: 24 ) summarizes perceptions of service quality in following ways. It is more difficult for customers to evaluate services than to evaluate products.Service quality evaluations of customers are realized by comparing customer expectations with the service they actually receive.Customers' service evaluations are based on the processes of service delivery and all relationships, rather than the outcome of the service.

### 1.3.2. Importance of Service Quality

Quality is a crucial purchase decision criteria that influences the customer's decision. It has a considerable impact on market share and return on investment (Anderson and Zeithaml 1984; Philips et al. 1983), and it decreases production costs and increases productivity (Garvin, 1983: 67).

Service quality attracts the attention of managers and researchers since it has a significant influence on business performance. Service quality has numerous beneficial implications on giving customer satisfaction and establishing customer loyalty for firms who wish to acquire a competitive advantage over their competitors (Han and Baek, 2004: 208).

Service quality is considered to be a critical determinant of competitiveness. The attention to service quality enables an organization to differentiate itself from its competitors and thus gain a lasting competitive advantage (Yumusak, 2006: 34).While many businesses provide similar services to clients, the quality of service delivered to customers is what sets them apart(Parasuraman et al., 1985: 48)

Service quality is just as critical in the manufacturing sector as it is in the service industry. Technology-based competitiveness in production-based companies is now often regarded as extremely challenging. As a result, managers in the industrial sector strive to set themselves apart from those in the service industry. (Altan and Atan, 2004: 19)

### 1.3.3. Service Quality Approaches and Models

Theories of service quality that are controlled by multidimensional approaches have been divided into two groups;

- Nordic European,
- North American schools of thinking.

Grönroos (1984), Lehtinen (1991), and others lead the Nordic European School, whereas Parasuraman et al. (1985), Cronin and Taylor (1992), Brogowicz et al., (1990), and others lead the North American School.

It may be established that no universal agreement exists on the dimensions of service quality. In different research, different writers have identified distinct service quality dimensions.

#### 1.3.3.1. Grönroos' Service Quality Model

Grönroos (1984) assumed three aspects of service quality;

i. Technical Quality: It is the output obtained by the customer from the service provided. Technical quality is important in terms of perceived service quality. Although services have intangible features, technical quality can be measured by both employees and customers. Issues such as how long a bank customer waits for

their turn or whether a plane takes off on time give an idea about the evaluation of the technical quality of that service (Koç et al. 2014).

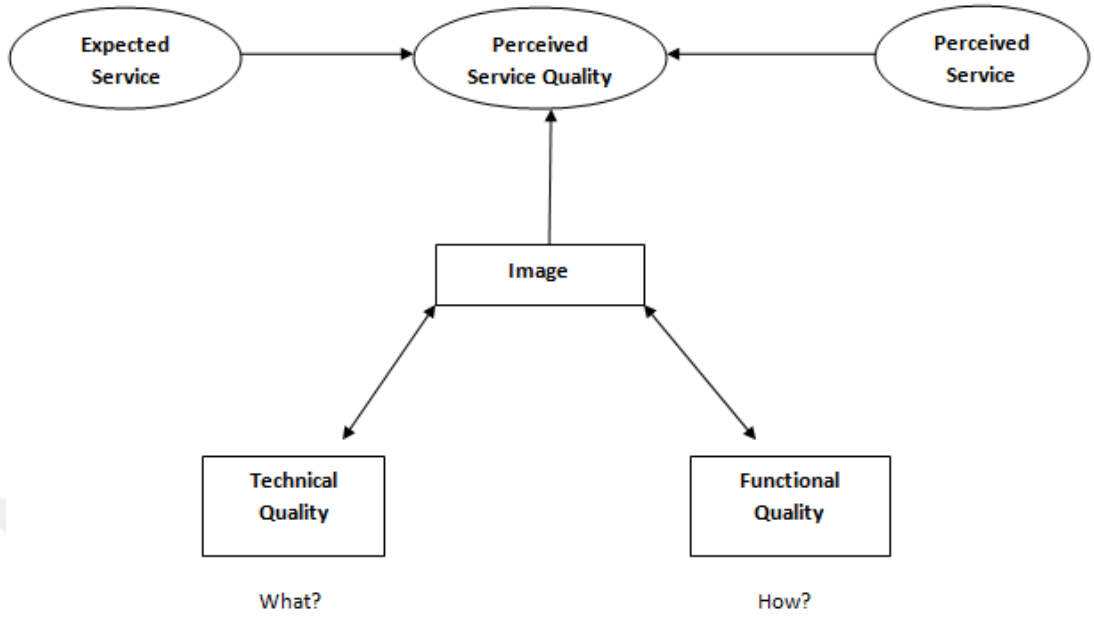
ii. Functional Quality: It is the process while the customer receiving the service.The customer evaluates how he or she benefits from the service and the overall service process, as well as which service he or she uses. This quality dimension of service is called functional quality (Şeker, 2018).

iii. Image: The combination of technical and functional quality creates the company's image. Corporate image is a result of how consumers perceive the company. The most important part of a service business is the services that its customers see and perceive. Therefore, the corporate image can be built on the technical quality and functional quality of the services (Şeker, 2018).

Dotchin and Oakland (1994: 39) state that although the technical quality is high, functional quality problems cannot be ignored by the executive. This causes a decrease in the overall quality and the image of the company. Grönroos(1984) specifies the factors of customer expectations asmarketing activities, traditions, ideology, communication with other consumers, previous experiences of the relevant service and presentes the service quality model in the following figure (Akdu, 2014: 24).

It can be seen in Figure 1 Grönroos uses technical quality to express "what" customers acquire through buyer-seller relationships and functional quality to explain "how" it is received. It is also emphasized that a company's image might influence its customers.

**Figure 1:** Grönroos Service Quality Model



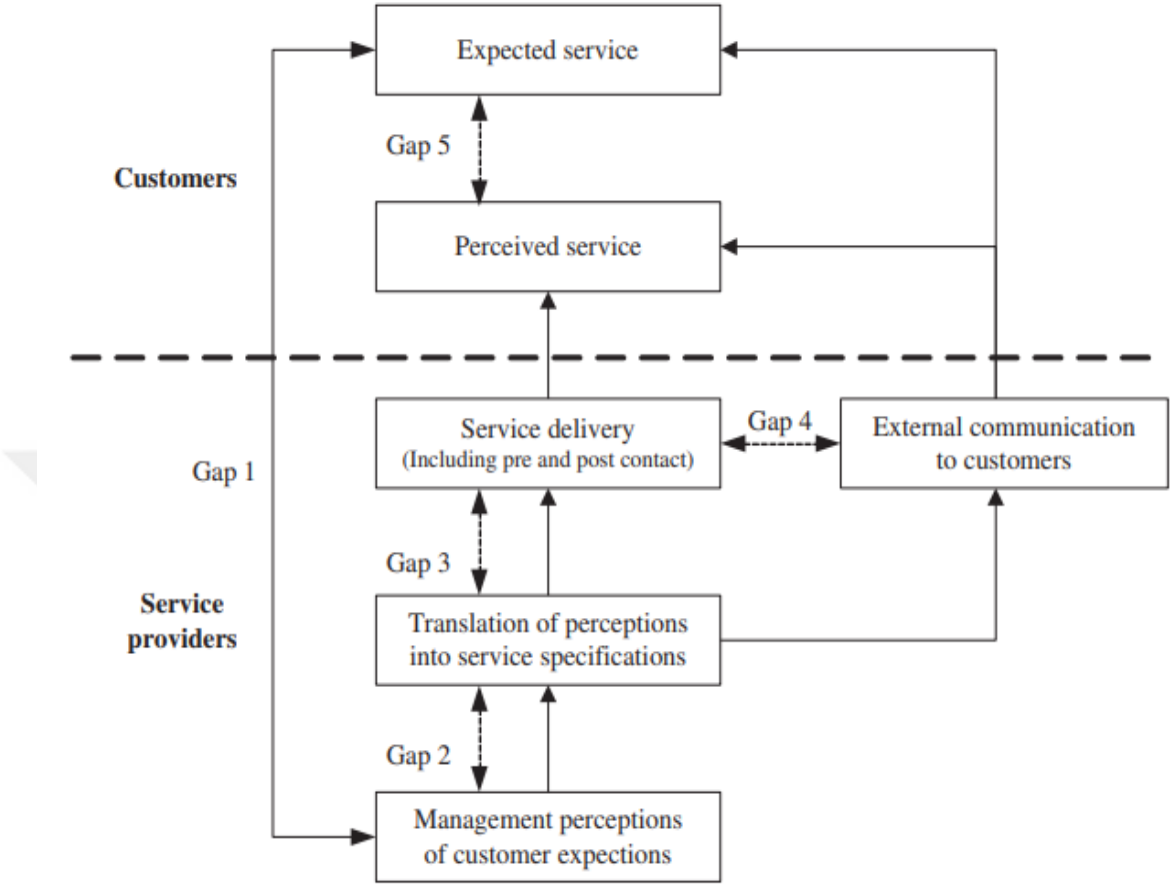

Source: Grönroos (1984)

According to the Grönroos model, service quality is determined by customer perception, and the process of service development has no impact on customer perception. Grönroos' model suggests that word-of-mouth and public relations are superior marketing instruments when compared to traditional marketing tactics.

### 1.3.3.2. GAP Model

The North American School's studies, lead by Parasuraman et al. (1985), are probably the most quoted and the subject of considerable discussion in the literature on service quality. Their initial observations suggested that service quality is a result of differences in customer expectations and perceptions of service across the quality dimensions. They developed Gap Analysis Model to identify the gaps between the perceived service and the expected service including five gaps and is shown in Figure 2.

**Figure 2:** GAP Model




Source: Parasuraman et al. (1985)

**Gap 1** - Gap between Management Perception and Customer Expectation

It refers to the discrepancy of consumer expectations and management's assessment of these expectations. It may be decreased by better marketing research and better information for customer's expectations. In order to prevent this gap, market research should be done in detail, a good communication network should be established between managers and employees who are in direct contact with the customer in the field. The quality standards established by the senior managers based on the market researches should be transferred to the employees who provide the service in the field in the best way (Değirmen, 2006: 25).

Factors causing this gap (Bulgan, 2002: 9);

- Lack of market research,
- Insufficient research findings,
- Lack of interaction between business and customers,
- Inability to transfer the information obtained from customers to the upper level due to lack of communication.

**Gap 2** - Gap between Service Quality Specification and Management Perception

It refers to inability of management to develop service quality target levels that match consumer perceptions and convert into feasible specifications. It may be decreased by procedures with effective planning. The business must allocate financing to quality, support quality and adopt quality as a goal. The duties within the enterprise should be standardized and appropriate hardware and software technologies should be used (Değirmen, 2006).

Factors causing this gap (Bulgan, 2002: 9);

- The top management in the business does not support quality sufficiently,
- The business objectives are not determined,
- Inadequate standardization and poor planning,
- Managers in the business believe that customer expectations cannot be met.

**Gap 3** - Gap between Service Quality Specification and Service Delivery

It refers to the situation where the service of the enterprise cannot be provided in accordance with the standards it has determined. It may be decreased if managers must conduct customer experience audits to ensure that their organization is meeting the requirements.

This gap is likely to be wide for services that involve direct contact with customers, are labor intensive, and are dispersed in many regions. According to the research of Parasuraman et al. (1985), there are seven conceptual factors that contribute to the third gap. These are (Altan et al. 2003: 7);

- Role ambiguity,

- Role conflict
- Unsuitable personnel for the job,
- Technology that is not suitable for the job,
- Inappropriate control systems,
- Perceived lack of control
- Reasons such as lack of teamwork

Lack of workforce, inadequacy in the selection of workforce, inadequate education and inappropriate job design may be effective in increasing this gap. Elimination of these inadequacies reduces the gap (Aydın, 2005: 28-32).

**Gap 4** - Gap between External Communication and Service Delivery

It refers to the rate at which businesses make promises and fulfill these promises in order to attract customers. This gap occurs when these presumed expectations aren't met at the moment of service delivery. It may be decreased by not over-promising to customers.

The amount of information provided to the customer and the high level of accuracy create realistic expectations about the service in the customer and eliminate the disappointment in the customer. The company's consistent service quality has a positive effect on the company profile and profitability in the long run (Değirmen, 2006: 25).

Factors causing this gap (Bulgan, 2002: 9);

- Inadequate communication between advertising and production departments in the enterprise,
- Inadequate communication between personnel management, marketing and production departments,
- Differences in policies or procedures between branches or departments,
- The tendency to make too many promises and exaggerated

**Gap 5** -Gap between Experienced Service and Expected Service

It refers to the gap between the expected service and the perceived service. It is also referred to as the customer gap in some studies. The four gaps described

above are shown as the reasons that create the fifth gap, which forms the basis of the Servqual model. When this gap is positive, that is, when the perceived service equals or exceeds the expected service, quality can be mentioned. If the perceived service is below expectations, it leads to poor quality. It may be decreased by better service quality and make sure to measure customer's perception of service by surveys. (Gotsis, 2016)

#### 1.3.3.3. SERVQUAL Model

In empirical studies (Servqual) conducted by Zeithaml et al. (1991), it has been revealed that some of 10 dimensions used to measure service quality have strong correlations within themselves. The authors decreased the 10 elements presented in their prior GAP model study to five quality dimensions. SERVQUAL is a five-dimensional measuring model that focuses on the difference between the client and the service provider. It contains five dimensions: reliability, responsiveness, assurance, empathy, and tangibility. Service quality is assessed as a difference in service perceptions and expectations across five primary categories (Banahene et al. 2017). Parasuraman et al. (1991) revised and improved their initial SERVQUAL instrument. However, scholars argued and critiqued the SERVQUAL model's applicability to other service industries.

SERVQUAL service quality dimensions defined below;

- Reliability: How does the firm manage client problems and needs? Do they conduct the appropriate services the first time and offer services on time? These factors have a significant role in service quality (Takan, 2000: 126);
- Assurance: Refers to service employees' expertise and kindness, including service and product knowledge
- Tangibility: Related to the physical characteristics of buildings and equipment, as well as appearance of personnel (refers to the equipment).
- Empathy: Includes individual concern of customers in a caring and helpful environment. Also, providing easy accessibility andstrong communication are important aspects of the empathy dimension.

- Responsiveness: Defined as a willingness to assist consumers with their requirements and to offer excellent customer service delivery.

Table 1 summarizes and gives essential components for five dimensions of service quality.

**Table 1:** Five Dimensions of Service Quality

| DIMENSIONS | DEFINITION |
|---|---|
| Reliability | Ability to deliver the promised service consistently and precisely |
| Assurance | Knowledge and kindness of employees, as well as their capacity to inspire trust and confidence |
| Tangibles | Appearance of physical buildings, equipment, employees, and written contents |
| Empathy | Personalised care, strong communication,simple access |
| Responsiveness | Willingness to assist clients and deliver good service |

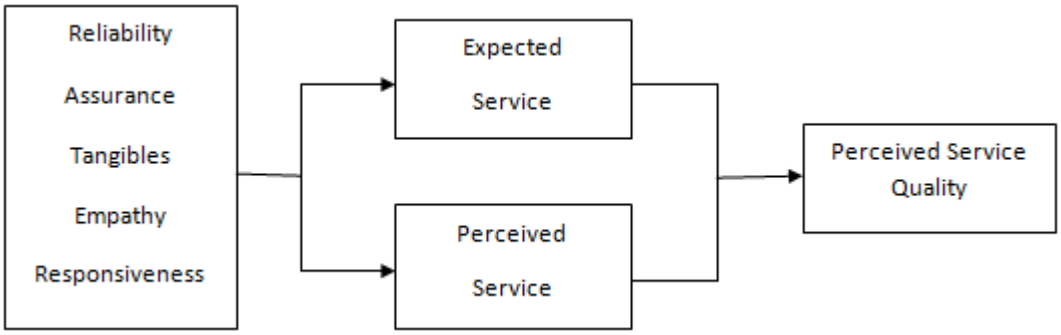
Source: Zeithaml et al. (1990)

In the researches on the quality of goods and services, answers to the following questions were sought (Parasuraman et al., 1993: 140-147):

- How is service quality evaluated by customers?
- Are customers making an all-encompassing evaluation? Or are they evaluating certain aspects of the service to reach an overall result?
- If they reach a conclusion by addressing certain dimensions, which dimensions do they use in the evaluation?
- Do these dimensions vary for different types of services and different customer segments?
- If customer expectations play a role in evaluating the quality of a service, what are the factors that create and influence these expectations?

Figure 3 expresses that the SERVQUAL model is based on the differences between the services a customer receives and what they expect to get. In this concept SERVQUAL is a model that has five dimension for measuring service quality.

**Figure 3:** SERVQUAL Model




Source: Adapted from Parasuraman et al. (1988)

Although this method has been extensively critiqued (e.g., Matzler's, 2002) view that the SERVQUAL model needs to be changed), it was and is for many the conventional idea of service quality based on customer perceptions (Nyeck et al. 2002; Ghotbabadi et al. 2012). However, Babakus and Boller (1992) claimed that measuring expectations does not give enough information compared to measuring service perceptions alone, which is consistent with the findings of Dabholkar et al (2000: 142).

Furthermore, when Cronin and Taylor (1992: 126) and later Brady and Cronin (2001) evaluated the service quality model, they only examined at perceptions rather than expectations. This approach can help find the gaps that exist between factors that impact service quality (Seth et al. 2005). SERVQUAL factors have discrepancies over time since they are not comprehensive for various applications (Dabholkar, et al., 1996; Shahin and Samea, 2010).

#### 1.3.3.4. SERVPERF Model

Although SERVQUAL is still a valid assessment in a variety of industries, Dabholkar et al. (1996) stated that it is not fit for the retail business. Several additional research arguments suggested that the SERVQUAL model is not comprehensive in a variety of applications (Dabholkar et al. 1996; Brady and Cronin, 2001; Shahin and Samea, 2010).

This model evaluates service quality based on consumer perceptions of the performance provided by the service provider (Cronin and Taylor, 1992: 126). Cronin and Taylor (1992) discovered inconsistencies in the SERVQUAL model's measures of perception and expectation, especially in the retail market.The model examines service quality in terms of reliability, responsiveness, assurance, tangibles, and empathy. SERVPERF was claimed to be a more accurate method for measuring service quality than SERVQUAL, although it was also criticised by other studies.

# CHAPTER TWO
# SERVICE FAILURE AND RECOVERY STRATEGIES

## 2.1. SERVICE FAILURE

Today's firms are under increasing customer service pressure (Smith et al. 1999: 356) and also changing expectations in order to offer their service perfectly. A customer could decide not to use the service again if it fails. Because of the fundamental features of the service business, it may be difficult to remove mistakes in the service context. Despite the fact that an increasing number of service organizations recognize the importance of service quality or customer satisfaction, service failure is viewed as nearly inescapable. According to Miller et al. (2000: 392), the primary purpose of a service provider is to offer the service correctly the first time. Service failures are unavoidable and it is difficult to prevent them completely (Choi and Mattila, 2008; DeWitt and Brady, 2003; Hart et al., 1990).

A well-managed recovery after a service failure, on the other hand, might result in higher levels of customer loyalty to a provider than existed before to the incident (Hart et al., 1990; Feinberg et al., 1990). As service quality demands grow, it is becoming increasingly critical for businesses to be able to remediate service failures. While the industrialization of many services has reduced the potential for failure, high contact personal services continue to be rich in crucial moments, the failure of which might damage a long-term customer and seller relationship (Palmer and Beggs, 2000: 519).

With the increased awareness of service quality, failure acknowledgment and management have become more important tasks for service operations managers. For the same reason, other writers have recognized the significance of failure identification in service interactions. According to previous research, service failures can cause bad word-of-mouth communication, lost clients, poor publicity for the service provider, staff unhappiness, and the direct expense of re-performing the service (Schlesinger and Heskett, 1991; Lewis and Clacher, 2001: 22).

Service failures are more common in high contact services with a high level of interaction between service users and service providers. According to Matilla and

Cranage (2005), service failures occur from time to time owing to human flaws, mainly in medium and high contact services.

By offering a systematic framework for later studies, Sparks (2001) made a significant contribution and provided the most thorough analysis of service failures and recovery. Her chapter had a big impact on developing the subject of research of service failures and recovery in the hotel and tourism industry. In particular, Sparks (2001) clarified ideas like justice and attribution from the viewpoint of service failures and recovery. Her dyadic viewpoint combined theories and concepts from marketing/consumer behavior and human resource management/organizational behavior.

Hewagama et al. (2019) demonstrated that the human resource practices and management styles employed in dyadic context served to enhance job competence, which was subsequently connected to job satisfaction and service-recovery performance using dyadic data from employees and managers in Sri Lankan hotels.

According to Zhang et al. (2020) based on dyadic perspective from 267 frontline staff and guests of five-star hotels, service recovery awareness is regarded as a demanding requirement that is favorably related to post-recovery satisfaction through job engagement.

In qualitative research, dyadic analysis enables researchers to more clearly understand and detect participant similarities and contrasts. Therefore, researchers can gain insight into how a dyad perceives its events rather than just the opinions of each individual participant (Manning & Kunkel, 2015).

### 2.1.1. Definition of Service Failure

A service failure, from the customer's perspective, is any circumstance in which something has gone wrong, regardless of who is to responsible. Basically service failure can be defined as service that does not meet the customer’s expectations. Due to the significant level of human participation in all enterprises, even the greatest organization cannot promise that their services will be error-free and that their clients will be satisfied every time (Gruber et al., 2011: 332).

Bitner et al., (1990); Hoffman et al., (1995); Colgate and Norris (2001); define service failure as mistake or error that arises during service delivery. Many

researchers have similar definition for service failure. When a service interaction falls short of the customer's expectations, this is referred to as service failure (Bell and Zemke, 1987; Andreassen, 2001; Sparks and Fredline, 2007). According to Lovelock and Wright (2002) service failure can be defined as customers' perception that one or more specific components of service delivery did not meet their expectations also Holloway and Beatty (2003: 97) states that service failure is the activity that take place as a result of a customer's perception of the initial service delivery behavior lacking in terms of the customer's expectations.

Some definitions indicate that service failures can be divided into two categories: outcome-oriented and process-oriented (Chuang et al., 2012; Keaveney, 1995; Zhu et al 2004). The result dimension of a service encounter refers to what consumers get from the service, on the other hand the process dimension refers to how service providers handle a service failure during the recovery process (i.e. how the service is supplied) (Weun et al., 2004; Duffy et al., 2006; Mattila, 2006).

A critical incident between the customer and the firm that has a substantial influence on the customer's consuming experience is referred to as a service failure (Bejou and Palmer, 1998: 15). Service failures, according to Keiningham et al. (2014: 417) and Kim et al. (2009: 56), are a major factor in the induction of customer dissatisfaction and cause a variety of unfavorable behavior effects toward the organization. Svari et al (2010: 33) also states out that service failures negatively affect customer behaviour and satisfaction.

Service failure and complaint management are key component of truth in the connection between a brand and a customer (De Matos et al., 2013; Grönroos, 1988) and, if managed properly, provide opportunity for companies to engage with customers and thereby develop brand relationships. Miller et al. (2000) also stated that a service failure provides an opportunity for the company to recover and achieve customer satisfaction.

It is stated that service failures mostly feed negative feelings and attitudinal intentions (Gregoire et al. 2009: 23). It is known that feedback is very useful for companies that have good communication with consumers. Therefore, it is important for companies to increase their complaints feedback and make it easier for

consumers to do so (Kotler and Keller, 2012: 131). In order to minimize failures, it is essential for consumers to express their expectations clearly (Harris et al. 2006).

### 2.1.2. Service Failure Types

To understand service failure, we must first know how the customer perceives the service. The value perceived by the customer results from a joint evaluation of the process and outcome of the service. The most important factor to consider in service failure and recovery is customer expectations. The fact that the customer thinks they are getting what they paid for the service starts with how the service should be and continues with the outcome of the service. Even if the service a customer receives is excellent in the result, if they go through a difficult process until they receive this service, this situation is not considered perfect by the customer. In the services, the process is just as crucial as the outcome (Bell and Zemke, 1987: 46).

The literature on service marketing has identified two types of service failures: one connected to the outcome and the other to the process (Bitner et al. 1990; Hoffman, 1995).

The term “process failure” refers to how consumers receive the service. In other words, process failure is how the core service is transmitted to the customer throughout service delivery, whereas “outcome failure” refers to what customers really receive from the service. According to Johnston (2001), outcome failure is caused by physical/instrumental elements, whereas process failure is caused by social/physiological variables. However the outcome failure motivates the service provider to put more effort into the recovery than process failure (Chou et al., 2009: 243). When a service failure occurs, the organization has two options: either restore customer happiness or ignore the issue and risk losing the client to another firm (Smith et. al, 1999).

In terms of service failure and recovery, since outcome failures are related to financial losses, orientation to financial resources in terms of service recovery may be more effective in providing customer satisfaction. Since process failures are also often associated with social losses, identifying recovery strategies that will provide socio-emotional benefits may lead to more satisfactory results for service businesses (Borah et al., 2019: 848-851).

On the other hand, McColl-Kennedy and Sparks (2003: 262) divide service failures into four categories:

- Service product failure
- Service provider failure
- Customer-related failure
- Failure outside the control of the service provider

### 2.1.3. Service Failure Magnitude

The magnitude or severity of a service failure refers to the extent of the problem experienced by a customer. The greater the severity of the failure, the larger the customer's sense of failure (Weun et al., 2004: 139). According to Hess et al. (2003: 141), the severity of the failure, also known as failure magnitude, may be described as "the loss that the customer experiences as a result of a failure."

Earlier literature has recommended that while considering service failure and recovery, the magnitude of the failure should be considered (Hart et al., 1990; Kelley et al., 1993; Webster and Sundaram, 1998). Various studies of service recovery attempts have found that the magnitude of the service failure is one of the parameters influencing customer satisfaction and has a substantial impact on consumer responses to service recovery (Weun et al., 2004).

The magnitude of the service failure is highly connected to the amount of the customer's loss, and as the size of the loss increases, the consumer becomes more dissatisfied since the exchange seems more unequal (Smith et al., 1999). Customers perceive bigger loss as a result of more significant service failures, and researchers show that a higher perceived severity of loss correlates to a lower satisfaction level (Harris et al., 2006: 326).

According to Weun et al (2004: 139), the magnitude of the service failure is predicted to impact post-recovery trust, commitment, and unfavorable word-of-mouth. Furthermore, because of the intense negative emotions associated with major service failures, more severe service failures should increase the risk of negative word-of-mouth (Richins, 1987: 27). Additionally, Wang et al. (2011: 517) discovered that the magnitude of service failure had a substantial negative effect with

customer loyalty. When a failure happens, the customer perceives value loss, which is reduced by the customer's sensitivity to each kind of failure (Zhu et al., 2004). Customers may lose economic (e.g., money, time) or social (e.g., prestige, esteem) resources as a result of service failure.

### 2.1.4. Service Failure Frequency

The term "frequency" reflects how service failures spread across the service delivery process (Maxham and Netemeyer, 2003: 59). The frequency of service failures may have an impact on customer satisfaction. The frequency and magnitude of service failure are both significant determinants influencing customer satisfaction, except for when service failure arises. Different types and magnitudes of service failures cause different degrees of loss for organizations; also, the greater the frequency, the greater the enterprise's profit loss. The companies should give more importance to high frequency and magnitude of service failures (Chen, 2014).

## 2.2.SERVICE RECOVERY

### 2.2.1. Definition of Service Recovery

Though offering seamless service should be the goal of all service marketers, problems are pervasive in the service business owing to its unique qualities (Berry and Parasuraman, 1991). That’s why it is necessary for a company to have effective policies in place to deal with circumstances when the consumer has experienced a service failure.

Service failure recovery actions are steps taken by the service provider to reimburse the customer for the loss incurred as a result of a defective service provision (i.e. service failure) (Bell and Zemke 1987 ; Gronroos, 1988). Becker (2004: 527) defines service recovery as activities taken by the company to change negative impressions into positive perceptions. Gustafsson (2009: 29) defines service recovery as the deployment of activities to change failures into a positive situation based on the recovery paradox.

Service recovery has been defined by Grönroos (1999) as the activities followed when a service fails. Whereas Zemke and Bell (2003: 32) describe service recovery as "a process with a beginning and an end". On the other hand, service recovery has been described as process of restoring good customer relationships following a negative event (Chua et al., 2010; Krishna et al., 2014; Rashid et al., 2014). Service recovery, according to (Miller et al., 2000; Maxham, 2001; Komunda and Osarenkhoe, 2012), involves measures aimed at resolving problems by changing negative client perceptions to positive ones. Also Keaveney (1995: 76) stated that the importance of the recovery is clear since given service failures and unsuccessful recoveries are the leading cause of customer switching behavior in service firms. According to Calisir et al. (2016), today's customers will always seek a better option if their present choice does not meet their demands. As a result, all companies must not only maintain but also improve their quality standards.

When a service failure occurs, service recovery becomes critical in order to improve customer satisfaction. The goal of service recovery activities is to satisfy consumers and reduce the probability of them switching to a competitor (Miller et al. 2000; McCollough et al. 2000). Effective service recovery may also promote consumer trust, loyalty, and willingness to repurchase in the future (Zhu et al., 2013: 513). A successful service recovery is critical for maintaining connections with consumers who indicated dissatisfaction during their original interaction (e.g., Maxham, 2001; Smith et al., 1999; Tax et al., 1998). The earlier recovery occurs, the greater the amount of increase in customer satisfaction is projected following service recovery (Boshoff, 1997: 119).

The service recovery literature supports two recovery aspects that are crucial to effective service recovery: outcome and process (Berry et al., 1985; Blodgett et al., 1997; McCollough et al., 2000; Mohr and Bitner, 1995; Smith et al., 1999; Tax et al., 1998). The outcome of service recovery is defined as the physical end result supplied to an originally unsatisfied client (i.e. "what is delivered"). The process of service recovery is defined as the way of reaction to recover from a poor customer experience. (i.e. "how is delivered").

Miller et al. (2000: 393) developed two categories of recovery techniques: tangible recovery and psychological recovery strategies. Tangible recoveries are

compensations for the expenses and issues caused by the service failure, and they may include product improvements, service extensions, or new advantages. Psychological recoveries comprise two sorts of actions: apologizing to clients and demonstrating empathy to clients (Bell and Ridge, 1992; Miller et al. 2000).

Also another kinds of service recovery classification are found in the literature as symbolic recovery, utilitarian recovery and mixed recovery. A symbolic interaction like an apology is part of the symbolic service recovery. The symbolic service recovery is also referred to as a process recovery by Zhu et al. (2004: 512). Utilitarian service recovery provides the consumer with an economic advantage like as compensation, a discount, etc. Mixed service recovery refers to two or more service recoveries applied, which is seen as a high level of service recovery efforts. The company might combine a symbolic approach (such as a apology or quality guarantee) with a utilitarian strategy (such as replacing the goods or service) (Chou et al., 2009: 243).

Each of the recovery strategies determined by the companies does not have the same effect on customer satisfaction.Depending on the kind of failure or the customer's expectations for recovery, this situation might also change. That’s why according to Boshoff (1997: 126) the strategies that enterprises can implement can be express as follows;

- Apology,
- Correcting failures by providing a fair solution,
- Compensation for the loss caused by failures,
- To provide compensation above the loss.

Service recovery is important because the level of satisfaction of consumers can be even higher than before the error with proper recovery (Maxham and Netemeyer, 2002). This is called the “service recovery paradox” in the literature. The notion in question means that the consumer satisfaction after the compensatory efforts of the company is more than before the error (Smith and Bolton, 1998: 357). A proper compensation affects the reactions of consumers following dissatisfaction (Colgate and Lang, 2001: 332).

According to the researches, 54-70% of the people who made a complaint to the company, who were resolved, said that they would shop from the company again (Kotler and Keller, 2012: 131).

### 2.2.2. Service Recovery Paradox

In the literature on services marketing, service recovery has received growing attention significantly (e.g., Tax et al. 1998; Smith et al. 1999; McCollough et al. 2000; Andreassen, 2001; Swanson and Kelley 2001). Because service failure leads to negative confirmation and discontent, it is argued that an adequate service recovery can return a disgruntled client to a satisfied condition.

Based on the importance of recovery efforts after service failure, the concept of 'service recovery paradox' was introduced by McCollough and Bharadwaj (1992) in the recovery literature (Maxham, 2001; McCollough et al., 2000; Zeithaml et al., 1996; Allen, 2014; Hart, 1993; Kelley et al. 1993; Smith and Bolton 1998), the service recovery paradox states that customers who have experienced service failure and compensated are more satisfied and more loyal than those who have never experienced service failures, and have positive discourse.

The concept of the recovery paradox is used to express that the customer satisfaction after recovery is greater than the satisfaction before the service failure. This satisfaction occurs as a result of the reaction of the enterprise to recover for the failure and the satisfaction with the recovery strategies applied. Thanks to the recovery paradox, it can be said that the businesses can regain their customers, that the regained customers will be more satisfied and that they will have long-term strong relationships with the business, thus reducing the compensation costs of the business (Vázquez et al., 2012: 87).

In some studies (Maxham 2001; Maxham and Netemeyer, 2002 etc.) service recovery paradox has begun to be questioned. While there are some studies that support this idea, there are also studies (Michel and Meuter 2008; Matos et al., 2007, etc.) that reject (Mount, 2012). There are some studies (Zeithalm et al., 1996; Kau and Loh 2006, etc.) that emphasize the importance of error-free service rather than successful recoveryafter a service failure.

Although the service recovery paradox is possible for the first-time error situations, the same situation may not be valid in the repetition of the error. In other words, customers' attitudes may change if the mistake is repeated (Gil et al., 2006:653).

### 2.2.3. Service Failure Recovery Theories

#### 2.2.3.1. Attribution Theory

Attribution theory was first revealed in Heider's (1958) book titled "The Psychology of Interpersonal Relations," which attempted to discover the relation of common sense concepts, including terms such as "intend", "want", "can", and "ought", used by individuals for describing behavior of individuals (Malle and Ickes, 2000). Furthermore, Heider (1958) emphasized the necessity of understanding people's interpretations of the world, and classified causes into two categories: personal causes and environmental or situational reasons. Weiner (1972, 1974) added some new causal dimensions such as stability and controllability to Heider's single dimensional (internal and external) classification, and Kelly's model served as a base for Weiner's classification. Although the attribution theory was put forward by Fritz Hedier (1958) and Harold H. Kelley (1973), this theory became widespread by Albert O. Hirschman (1970) (Ozekici, 2016).

Attribution theory is one of the most common theories covering service failures. It is a theory that arises from a need to understand the reasons of the events they face, to whom they attribute the observed event or action, and creates various ways of evaluating it (Xie and Heung, 2012: 736).In other words, attribution theory is concerned with the relationship between the potential consequences of post-event actions and the variables that create these outcomes. The major focus of attribution theory in this situation is on the event's cause. According to Weiner (2000), attribution theory focuses on explaining the cause of an event, situation, or result, as well as the consequences of causation.

Heider (1976) defines the attribution as follows, "Attribution is an aspect of our environmental cognition. Attribution occurs whenever you are aware of your surroundings." According to Weber and Sparks (2010) attribution theory is "the

process of evaluating occurrences by inferring from the experiences of people or the failures of others".

According to Bagozzi, the idea of exchange focuses on when things "go wrong" and the equality principle is broken, rather than why a consumer does something (Bagozzi, 1975). Consumers have been demonstrated to blame others for unpleasant product experiences (Folkes, 1988; Richins, 1985; Weiner, 1985). Attribution theory is concerned with the reasons for product failure and assigning blame. According to this idea, the perceived reason influences the unsatisfied consumer's response to a service failure (Boshoff and Leong, 1998: 36).

People can reach some judgements about their attributions they experience with the inferences they make. So the attributions can emerge as a factor affecting people's decision, emotion and behavior patterns (Mete, 2021: 539). Accordingly, Swanson and Kelley (2001) revealed in their study that customers' attributions can affect their complaining tendencies, their way of complaining, and their subsequent behavioral decisions.

#### 2.2.3.2. Justice Theory

Justice theory is psychologically based and claims that when individuals encounter a situation that they believe is unfair, they become angry because the principle of equality is not followed, and they seek recompense for the mistake in order to eliminate the discomfort created by the situation (Ekiz et al., 2008: 46).According to the literature, Theory of Justice and Perception of Equality are similar concepts that may be used alternatively and is derived from equity theory (Adams, 1965).

The theory of justice is based on customer satisfaction and future attitudes toward the firm, whether the consumer is treated properly and if he or she believes this fair treatment (McColl-Kennedy and Sparks, 2003:211).

Customers place great emphasis on the fairness of their production when evaluating their service compensation. These evaluations about the fairness of service compensations are one of the criteria for evaluating the business after service procurement. In addition, these evaluations affect the customer's intention to use the

services of that company again and to say a positive or negative word about that company (Yağcı and Doğrul, 2015:13).

The theory of justice provides a comprehensive framework from the beginning of the complaint process to its completion (Tax and Brown, 1998:65). The principle of fairness is that for businesses, the customer should respond according to the investment made in the business, the meaning of justice for the customer, service compensation should be in accordance with the service failure (Gustafsson, 2009).

Justice theory ensures a valuable conceptual framework for analyzing the relationship between each component of service recovery and satisfaction. Customers who suffer from service failure will seek service recovery or may decide to retaliate (e.g. negative word-of-mouth, switching behavior). In other words, equity theory recognizes the unsatisfied consumer as a victim who has been harmed by a service provider and is demanding restitution (Goodwin and Ross, 1992: 152).

Perceived justice is a three-dimensional structure, specifically, distributive justice, procedural justice and interactional justice (Choi and Choi, 2014; De Meyer et al., 2013;Homburg and Furst, 2005; Tax et al., 1998). The main features of the dimensions are highlighted as per below

- Distributive justice describes the sense of fairness on the actual outcome of service recovery (Blodgett et al., 1997: 203). The perceived fairness of the concrete consequence of the service interaction is referred to as distributive justice (Hocutt et al., 2006: 200). It has been defined using terms such as "equity" (Oliver and DeSarbo, 1988; Oliver and Swan, 1989; Chebat and Slusarczyk, 2005; Prasongsukarn, 2005; Kim et al., 2009) and "need" (Casado-Daz et al., 2006).Difficulties with evaluating distributive justice occur because consumers cannot discern between fairness, equality, and need, and it is difficult for service employees and customers to measure input and output value (Casado-Diaz et al., 2006:13).

- Procedure justice is concerned with management process control, timeliness (e.g., response time), accessibility and flexibility in procedure and corporate regulations (Blodgett et al., 1997; Tax et al., 1998; Maxham and Netemeyer, 2002).

The elements of procedural justice include, in order of significance to the customer,

i. accepting responsibility,
ii. speed,
iii. convenience,
iv. follow-up,
v. process control,
vi. adaptability, and
vii. knowledge of procedure" (Tax et al., 1998: 79).

- Interactional justice refers to the responsiveness and attitude of service workers during the service recovery and complaint management procedure. The fundamental components of interactional justice include civility, respect, explanation, helpfulness, and an attempt to address the customer's problem (Smith et al., 1999; Maxham and Netemeyer, 2002; McColl-Kennedy and Sparks, 2003). Interactional justice is also described as being based on the quality of interaction between two parties participating in a process in which one party provides a service and the other buys it (Ha and Jang, 2009:320). It has been shown to have an impact on service quality (Kennedy and Sparks, 2003; Del Rio-Lanza et al., 2009).

## 2.3. SERVICE FAILURE AND RECOVERIES IN SHIPPING SECTOR

The word "containerization," which refers to the movement of cargo between container ports via the use of containers, has been increasing steadily over the past 50 years. Because of the high level of automation in container terminals, cargo handling has become faster, the danger of cargo damage and theft has decreased, labor costs have decreased, and transportation and handling costs have become more competitive as a result of the economies of scale attained (Branch and Robarts, 2014). This makes service failure and recovery concepts important to continue to survive in th industry.

Service failure and recovery concept generally handled in airline, tourism and lodging industry but also some studies carried on logistics and shipping industry. Lai et al. (2020) emphasises that container shipping companies have been compelled to

lower logistics service failure rates in order to keep clients due to the rising demand for high-quality logistics services. It is recommended that container shipping companies use information technology for gathering and assimilation of logistics information internally and externally throughout the supply chain to enhance decision-making. This will reduce the number of logistics failures and improve service quality in the maritime logistics process.

For more than 50 years, liner shipping has been a significant player in the worldwide freight transport sector (Heaver, 2002: 210). The determinants of customer loyalty for liner shipping companies were examined in a number of earlier research (such as Chao and Chen, 2015), and it was discovered that service quality and satisfaction had a favorable effect on customer loyalty.

Although a lot of research in the field of liner shipping have looked at aspects that may affect customer satisfaction and loyalty toward liner shipping companies (e.g. Shin and Thai, 2014; Thai, 2015; Chao and Chen, 2015; Yuen and Thai, 2015), service recovery has never been taken into account in these models. Service failures are both frequent and unavoidable when operating an liner shipping companies due to weather, ship problems, equipment, and several other difficulties (Chao et al., 2018).

From a service supply chain view, Yıldırım (2015: 32) underlines the significance of service recovery after a failure. After a failure, not making an attempt to fix the issue lowers total customer satisfaction for both supply chain participants.

Oflaç (2011), using scenario-based experiments, investigated the dynamics of how customer brand perceptions and attributions are influenced by expectations, purchase criticality, and third-party logistics service providers. The results show that higher expectations are defending the brand and leading to increased third-party attribution. Criticality also plays a significant role in brand assessments and assumptions.

Gidener Ozaydin (2015) states that there is a significant correlation between the magnitude of the failure, customer satisfaction with the recovery, time for recovery, importance of third party logistics service providers to the customer based on transaction volume, duration of the prior relationship between the third party

logistics service providers and their customers, and relationship after service failure and recovery.

According to the literature, rather than the actual failure, consumers' evaluations of the effectiveness of the recovery are influenced by how the business authorities and employee behaved during the recovery process (Ha and Jang, 2009: 326).

The significance of the service concept for businesses has been discussed so far. Understanding the causes of service provider organizations' failures is becoming increasingly important as distance between businesses decrease and partnership-like connections take shape (Flores and Primo, 2008: 34). It is well known that customer loyalty and job stability are impacted by the level of service provided and the steps taken to solve service failures. The same is valid for container terminals. Thus the extent of services offered at container terminals will be looked at in the next chapter.

# CHAPTER THREE
# CONTAINER TERMINAL AND SERVICES

While maritime transport enables for large amounts of goods to be transported over long distances, it also allows for this transport to be carried out in the most cost-effective way. Maritime transport still maintains its advantageous position in many ways. Over 80% of worldwide trade in products is transported by sea, and this proportion is significantly greater in most developing countries (UNCTAD, 2021). Thus, the function of marine transport is seen as critical in a world that is two-thirds water and it continues to be the mode of transportation that serves the growing international trade the most.

Maritime transport emerges as a more suitable mode of transport, as the suitability of ports with advanced loading and unloading techniques in maritime transport contributes to the increase in this speed. Maritime transport is the mode of transport that creates the most economies of scale. It is very suitable for mass transportation. Seaway is preferred especially for the transportation of goods that are high in weight and low in value. Cargoes such as oil, metal ore, various chemicals, petroleum and its derivatives, coal are transported by sea in bulk. While such bulk cargoes are generally transported by non-scheduled flights, scheduled flights are preferred for general cargo transportation. With the development of container transportation, maritime transportation has become more attractive due to the more frequent preference of intermodal transportation (Deveci, 2002).

## 3.1.WORLD MARITIME TRANSPORTATION

"Transportation" is a fundamental convenience in benefiting from economic resources at national and international scales and in the development of these resources. Transportation provides the transferring of raw materials and finished materials from low usage areas to higher usage areas. Thus, transportation has facilitated the development of resources in the world in terms of both raw materials and finished goods. According to Topaloğlu (2007: 53); in today's transportation systems, road, rail, air, sea, pipeline and intermodal transportation in which at least two transportation systems are used areused. Among these systems used, maritime

transport has the highest share in terms ofquantity. Approximately 80% of world trade is carried out by sea transport. Compared to road transport, maritimeand rail transport offers various advantages such as less damage to the environment,reduction of urban traffic, lower transportation costs and efficient use of ports. Organization of maritime operations in international transportation can be madesimpler and safer than other types of transportation. Maritime transport; covers long-distance transport, short-distance sea transport and inland waterway transport (Ateş et al, 2010: 85).

Maritime transport is a sustainable method of transportation to minimize the damage of the voyages during economical and safe voyages. This situation has caused the world average maritime trade volume to increase approximately 20 times in the last 50 years, and that 85% of the world trade volume and 90% of oil expenditures are made by sea (Çetin, 2009).

The opportunities and different demands in maritime transportation, changes have started to be seen. In parallel with the technological developments, the increase in the speed of the ships and the increase in their size have made it easier to reach the markets at the other end of the world. With the integration of land, sea and air transportation, combined (intermodal) transportation, which allows the transportation of cargo from door to door, and especially maritime container transportation, has gained increasing importance (Ovalı and Çelik, 2009: 157).

**Table 2:** Features of Transportation Modes

| | **Railway** | **Roadway** | **Pipeline** | **Airway** | **Waterway** |
|---|---|---|---|---|---|
| **Door to door delivery** | Sometimes | Yes | Sometimes | No | Sometimes |
| **Price** | Low | High | Very low | Very high | Very Low |
| **Speed** | Slow | Fast | Slow | Very fast | Very Slow |
| **Reliability** | Mid | Mid | Very High | Very high | Low |
| **Need for Packaging** | High | Mid | No | Low | High |
| **Risk of damage** | High | Mid | Very Low | Low | Mid |
| **Flexibility** | Low | High | Very Low | Very Low | Low |
| **Environmental effect** | Low | High | Low | Mid | Low |

Source: Gourdin, 2006

Maritime transport has been the impulsive force behind the development and growth of global trade due to the benefits it brings (especially cost advantage). Table 2 compares various modes of transportation in terms of many criteria. When all forms of transportation are considered, marine transportation has the lowest transportation unit cost and pricing model.

## 3.2.WORLD CONTAINER TRANSPORTATION

Malcolm P. McLean, who is thought to have invented container shipping, came up with the concept of an alternate form of transportation while managing a small shipping business at the port of Haboken. His concept served as the foundation for modern container shipping. The "Ideal X" ship is referred to as the first container carrier ship in the field of container transportation. 56 containers were loaded into this ship from the port of Newark on April 26, 1956, and they sailed towards the port of Houston. On the other hand, the ship built specifically to transport containers was a 1956 conversion of a tanker ship carrying 60 containers. It is the cargo-carrying ship called "Maxton" (Erdal, 2008: 3).

Maritime container transportation has emerged to meet the need for the transportation of general cargo loads, which will remain small compared to conventional bulk cargo transportation. Until the 1960s, small quantities of cargo that could be transported in containers were transported free, tied together or baled in ship holds. Transports made in this way consisted of a process that was costly, requiring intensive labor and port operations took a very long time. In addition to these negativities, containers that are still used today were designed to eliminate the negativities experienced due to the inability of transport companies to generate income from the transport business and to reduce costs (Demirlioğlu, 2008: 12).

Demand for marine transportation has caused enterprises in this sector to expand their fleets, and some have included the maritime sector to their strategic business units. Tonnage increased in the 1970s as a result of the arrival of very big ships, notably oil tankers. Smaller ships carried out container shipping throughout the 1970s and 1980s. As technology progressed, economies of scale became dominant in marine transportation, and vessel capacity began to expand in the 2000s. Decreased

costs, falling transportation fees, and the ever-increasing cost-benefit ratio in transactions have led to the steady increase in the use of containers in maritime freight transportation since the mid-1960s. The first offshore container service entered service in 1966. Since then, maritime container transportation has been widely used in the transportation of all kinds of cargo, especially high-value cargoes (Demirlioğlu, 2008: 13).

According to Drewry Maritime Research (2022), global container port traffic would grow by 6.8 percent in 2021, totaling 857 million TEUs as indicated in Table 3 below. As can be understood from below Table 3, Asia's ports continued to play a significant role as accounting for 62.5 percent of global container port traffic. With approximately two-thirds of the throughput, Asia retained its position as the worldwide container port traffic center. Based on the table, Europe ranked second and North America ranked third in terms of throughput rates. Ocenia has the least amount of throughput.

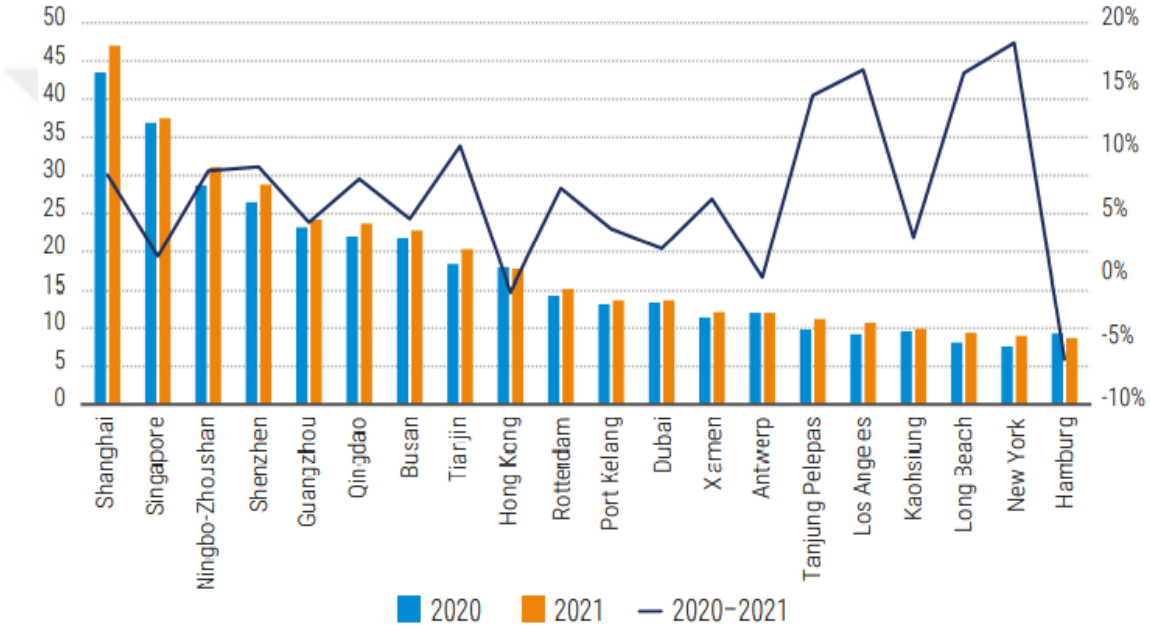
**Table 3:** World Container Throughput by Region

| | **20-foot equivalent units** | | **Annual percentage change** |
|---|---|---|---|
| | **2020** | **2021** | **2020 - 2021** |
| **Asia** | 506 | 535 | 6% |
| **Europe** | 136 | 143 | 5% |
| **North America** | 67 | 77 | 14% |
| **Latin America and the Caribean** | 49 | 55 | 11% |
| **Africa** | 30 | 33 | 10% |
| **Oceania** | 13 | 14 | 8% |
| **World total** | **802** | **857** | **7%** |

Source: UNCTAD, 2022

As seen also in Figure 4, Asia has nine of the top ten throughput ports in the world, headed by Shanghai, Singapore, and Ningbo-Zhoushan. The Port of Shanghai, as a leading port, heads the list by reaching cargo volume capabilities by more than 45 million container units each year. The Port of Singapore handles around 20% less of what the gaint port of Shanghai does.The port of Ningbo-Zhoushan, the oldest seaport in China, has economic trade with over 590 ports from more than 100 countries and regions in the world (https://www.shiphub.co/).

**Figure 4:** Leading 20 Global Container Ports, 2020–2021




Source: UNCTAD, 2022

### 3.3.CONTAINER TRANSPORTATION IN TURKEY

Ports are becoming increasingly important in Turkey, which is on the main routes of global maritime trade. Furthermore, none of our present container ports have the technological infrastructure to serve as a hub-transfer port, as well as enough container stowage spaces and connections to multi-modal transportation networks. Turkish ports with railway connection benefit not just Turkey, but also serve as a gateway to the Middle East, the Caucasus, Asian nations without a seaport, and the Commonwealth of Independent States, given their geographical location (Maritime Trade Statistics, 2021).

Turkey is located between Asia and Europe. Turkey's strategic location on major north-south and east-west transportation routes strengthens the significance of Turkish ports. Shipowners add these ports to their itineraries since they have key transfer ports such as Izmir and Mersin. Furthermore, Turkish ports have risen to prominence in terms of ship material and fuel supply (https://www.eia.gov/). As a transit point for fuel supply , Istanbul has had an important place in this sector across Europe.

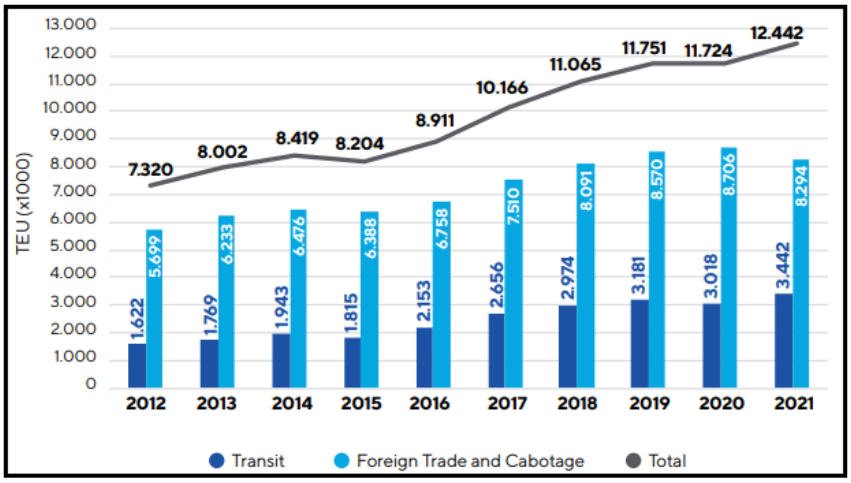
**Table 4**: Container Throughput in Ports (Million TEU)

| Years | World | Turkey | Percentage(%) |
|---|---|---|---|
| 2012 | 630.1 | 7.3 | 1.2 |
| 2013 | 661.4 | 8.0 | 1.2 |
| 2014 | 694.2 | 8.4 | 1.2 |
| 2015 | 705.6 | 8.2 | 1.2 |
| 2016 | 716.4 | 8.9 | 1.2 |
| 2017 | 771.7 | 10.2 | 1.3 |
| 2018 | 810.1 | 11.1 | 1.4 |
| 2019 | 825.3 | 11.6 | 1.4 |
| 2020 | 815.6 | 11.7 | 1.4 |
| 2021 | 868.6 | 12.5 | 1.4 |

Source: Turklim, 2022

In recent years, it is seen in Table 4 that the container throughput in Turkey has increased relatively compared to the container handling rate in the world.Total container throughput is 12.442.449 TEUs as of 2022. Figure 5 shows foreign trade and cabotage container throughput is at 8.294.003 TEUs and transit container throughput is 3.441.872 TEUs. The overall volume of container cargo subject to foreign trade and cabotage handled in Turkey decreased by 4.7%. The 14.1% increase in transit container handling resulted in a 6.1% increase in total container cargo handled at our ports year on year (Turklim,2022: 88).

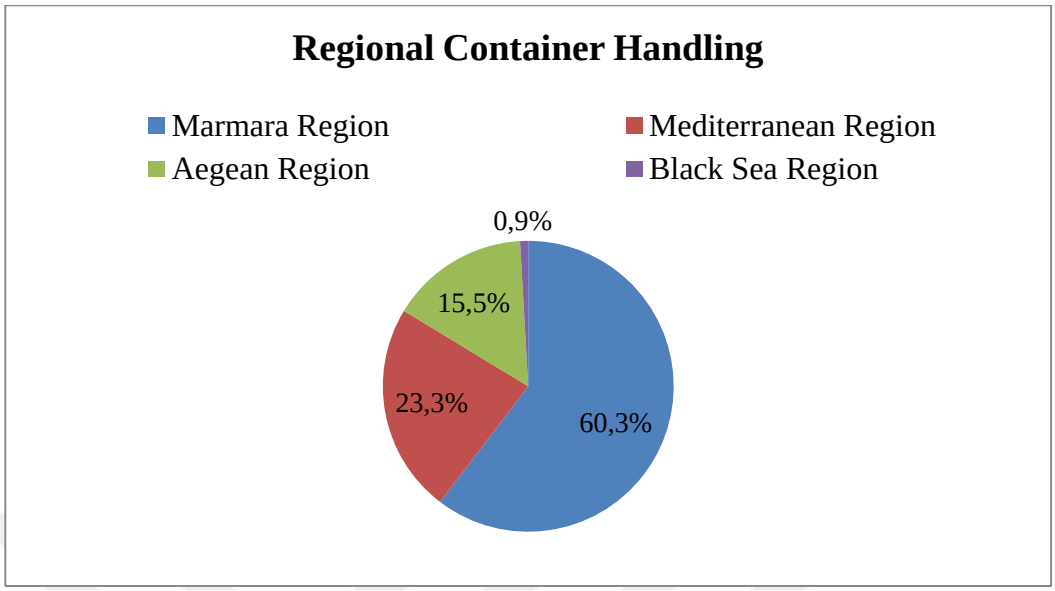
**Figure 5:** Development of Container Throughput in Turkey




Source: Turklim, 2022

Figure 6 shows that ports in the Marmara Region have the highest container throughput rate, at 60.3%. The Mediterranean Region ports are followed by the Marmara Region ports with 23,2% and the Aegean Region ports with 15,5%. The Black Sea region's ports account for 0.9% of overall container throughput (Turklim, 2022: 87).

**Figure 6**: Regional Container Handling in Turkey




Source: Turklim, 2022

In 2021, an average of 85% of Turkey's foreign trade was handled out by sea through our ports, which comprise the most essential infrastructure of maritime transport. The Marmara Region has developed into an important transit hub, especially for freight going towards the Black Sea. The ports of the Marmara Region handle 84.8% of the transit cargo handled in our country. The East Mediterranean area, which includes MIP Mersin, Limak Iskenderun, and Assan ports, comes in second with a 14.2% share. The ports with the largest transit container traffic in 2021 were Asyaport, Marport, Kumport, and MIP Mersin International Port (Turklim, 2022).

### 3.4. DEVELOPMENTS OF PORTS

According to Baird (2000), ports host mega- ships with a carrying capacity of 10,000-12,000 TEU and reach large sizes in a short time. And the ship traffic of the ports is increasing day by day. The key point of a container port; It is the efficient transportation of a large number of containers in the port area from the ship area to the stacking area. High efficiency and the ability to meet the flow of containers from

the land side to the quay and vice versa at the lowest cost are the most important aspects for ports to compete with other ports.

It is also an important issue to be able to give confidence to maritime companies to adhere to the delivery time in port operations and to make the handling on time.Wang and Cullinane (2006: 29) 's findings, handling service providers in ports have a weaker bargaining share than shipping agents. In addition, container ports have to provide more efficient and cost-effective services. They must meet stringent demands for faster service and higher quality.

Economically, world trade is moving towards higher value-added products. Countries create added value by developing their own raw materials, developing and emerging countries export more processed products. The world trend is based on trading higher value goods transported in containers. When the historical development of the ports is followed; It is seen that this is due to the increasing trade and the technical changes of the ships. Because, the existence of both causes has been experienced in recent years (Fan et al., 2021)

Oral et al. (2005) highlighted developments that generate new possibilities for container ports as well as changes that create threats and challenges. According to this analysis, the following advancements generate new opportunities:

- The growth of the logistics, transportation and maritime transportation market all over the world in favor of container transportation,
- Increasing of multiple transport businesses and operations,
- Growth of the world container ship fleet,
- Increasing location superiority of ports close to main routes,
- Increasing technology of service facilities in ports,
- Advances in informatics and
- Automation in port operations.

In parallel with the developments in container ships, container ports have also entered a serious development process since the 1960s. These changes are mostly experienced in the fields of management, organization, operations and equipment. The increase in demand for container terminals has also affected the designs of these terminals over time. An efficient terminal design needs to be implemented to meet the continuous increase in container transportation. Personnel and equipment used in

the port, as well as thelevel of information system used, have a very important place (Esmer, 2008: 242). Correlating with the recent increase in international trade volume as a result of globalization, competition between ports around the world has increased as a result of closely related factors such as the development of new technologies such as containerization, digitalization, the increasing capacity of container ships, the demand for cheaper and better quality services, and horizontal mergers in the business (Keceli and Aydoğdu, 2015: 103).

Because of the topographical layout of our port regions and the limited growth areas, our port enterprises are forced to utilise their current capacity more effectively and efficiently. Improving communication and operational procedures is one method to increase efficiency. Digitalization is an essential instrument that must be used at this stage. However, while digitalization is required for effective communication with customs officials, ship operators, agents, forwarders, road and rail organizers, and shippers, it is not sufficient. The phenomena becomes much more essential at ports, which serve as a hub port for the reproduction and distribution of information (Turklim, 2022).

The use of informatics infrastructure has become a necessity, especially tomanage the increasing load volume. However, the efficient operation of the informatics infrastructure does not mean that all operations handle flawlessly. The information systems used in the ports have a supportive feature for the operation (Esmer, 2008: 240).

It is seen that important ports in the world have started to carry out their operations through central systems. There are many complex factors for port, ship and yard planning and this requires a lot of manpower. It has been revealed that the number of physical labor in the teams can be reduced thanks to the central planners in the ports. However it is concerned that in case of a problem, the absence of physical employee in yard may cause problems. That is whyit is concerned the idea of operating ports in more than one locationfrom a central location. Therefore, the need for standardization in all areas of centralized digitalization is critical (Butcher, 2020).

According to Butcher (2020) the necessity for standardization is crucial, and it must encompass all of the following aspects:

- Automated terminal gates,
- Security systems technology,
- Terminal operation systems (TOS),
- Enterprise resource planning (ERP),
- Equipment operations and
- Data communication

## 3.5.GENERATIONS OF PORTS

While ports were previously labor-intensive economic systems, industrialisation modified their functions to manufacturing regions in order to decrease transportation costs. Ports became industrial development hubs in the nineteenth and twentieth centuries, requiring greater areas, more specialized equipment, and more raw materials (Musso, 2009: 55).

In line with Alderton (2005)'s evaluations on the development of container terminals, the evolution process in ports after the Second World War has been classified as port generations by UNCTAD. These processes, as a traditional understanding, started with the aim of providing only handling services, and at the last point reached, they became centers that act in line with industrial and commercial purposes in a way that includes all kinds of logistics activities and added value services (Paixão and Marlow, 2003: 191).

UNCTAD (1999) defined 4GP as service quality, information technology (IT), community environmental impact, port cluster, maritime cluster, logistics hub, inland, and waterside, referring to vertical and horizontal integration port strategies. Under the same criteria, Flynn and Lee (2010: 498) developed the term fifth generation port (5GP). Whereas 4GP is motivated by internal profit, 5GP is motivated by customer-centric community interests. Flynn and Lee (2011: 498) proposed a new port categorization system with five categories, as listed below;

- Level One – Cargo ports
- Level Two – Logistics Ports
- Level Three – Supply chain management (SCM) ports (bilateral e-ports)
- Level Four – Globalized E-ports

- Level Five – Customer-centric community ports

With the new generation ports, which provide the opportunity to trade in the electronic environment and where robot systems are activated, no opportunity is left for human-based service failures. Each of the generations will be discussed in the following sections to provide a better understanding of the general features of port development.

### 3.5.1. The First Generation Port

These ports are structures where only cargo handling operations are carried out. In this type of ports, a classical port management approach has been adopted, focusing on the main activities of the port and not taking into account the value added activities (Indian Ports Association, 2007).

Activities carried out in these ports can be listed as providing necessary shelter to the ship, providing traffic services, providing anchorage, mooring services, loading, unloading and storing cargoes. The port is not an active element of the logistics chain and is isolated from commercial activities. There are no ports left that can be included in this generation in developed countries.

### 3.5.2. The Second Generation Port

These ports participate in commercial operations such as packaging, labeling, and physical distribution, which raise the value of the cargoes. Industrial activity areas have been developed in the hinterland regions. Another feature of second-generation ports is the strong collaboration between ports and enterprises in trade and transportation, as well as between ports and towns (Alderton, 2008: 80; Beresford et al., 2004: 94).

Organizational distinctions occurred between second-generation ports and first-generation ports. Second generation ports functioned as the residence for the cargo transformation facilities of privileged port clients due to their qualities as industrial zones. Despite being clear and simple, ports and their users began to build relationships. However, the link between ports and their users was not yet fully established since it occurred randomly rather than in an orderly manner. Nonetheless,

when compared to first-generation ports, operational productivity had increased significantly (UNCTAD, 1994).

### 3.5.3. The Third Generation Port

Third generation ports are the product of containerization and intermodal transportation, thus globalization. In the 1980s, ports became dynamic nodes in the "international production/distribution network". The development of intermodal transport has led to changes in the basic functions of ports (Hayuth, 1987; 60). More specialized, variable and integrated port services have emerged from previous port generations. Ports have focused on value-added logistics services alongside traditional ship and cargo handling services (Pettit and Beresford, 2009; 254).

The main features of third generation ports can be listed as follows (Port of Rotterdam Authority, 2007).

- They aim to be an active intermediary aiming to be involved in all processes of trade rather than being a passive service provider in their management approach,
- They have modern handling equipment,
- They dominate industrial, environmental and marketing-oriented services,
- They are the center for logistics and distribution services.

Administratively, the third-generation ports have submitted various revisions. Port documentation was made more efficient by reducing critical operations and obtaining technology platforms to carry out effective information exchange, which was one of the primary challenges in previous port generations. The implementation of EDI (Electronic Data Interchange) was crucial in simplifying the system and achieving high efficiency for port documentation. According to Bichou and Gray (2004: 53) technology and know-how were key change agents in the period of third generation ports.

### 3.5.4. The Fourth Generation Port

A fourth-generation port was described by the UNCTAD in 1999. Quality of port services, IT use, building the port community, the presence of the port cluster

and logistic center, the quality of links with the hinterland on the land side and the foreland on the seaside are some of the criteria that have been taken into account (Kaliszewski, 2018: 7).

To summarize these ports in line with the definitions of fourth generation ports; It is explained according to external developments, port functions, spatial expansion of ports, the social organization of ports and the strategies of port organizations and managements. The highlights are; the operation of fourth generation ports in global terminal networks with the effective use of information and communication systems, the development of social port organizations that are environmentally friendly and giving importance to port-city relations, the creation of cooperations with the supply chain side by providing advanced logistics services, and accordingly the port managements of ports and cities. It acts as a facilitator in the integration of the supply chain (Karataş Çetin, 2012).

According to Marlow and Paixao (2003: 190), two main characteristics of fourth generation ports are "leanness" and "agility". It is argued that leanness is essential because it enables the optimization of all port activities, which can save costs at the operational level. According to the authors, increasing the connections between internal and external business environments also calls for agility as a strategy.

### 3.5.5. The Fifth Generation Port

According to Flynn et al. (2011), fifth-generation ports are customer and community-oriented port systems. Customer-centric, community-focused ports are other terms for 5th generation ports. The role of port stakeholders to social and environmental issues is an essential indication of 5th generation port responsibility. Fifth-generation ports not only serve as global marine transportation hubs, but they also have a positive influence on the social environment and nature protection (Kaliszewski, 2018: 23). Ports can only be competitive and successful in the long run if they work together with stakeholders and get their support.

Fifth-generation ports must collaborate closely with local, regional, and national government agencies to resolve disputes, establish priorities that allow uninterrupted cargo interchange between the port and its hinterland, maintain a high

level of security, be cost-effective, and have progressively less external environmental effects. To achieve long-term growth, a 5GP must develop a strategy and handle local challenges. However, the current rules for classifying ports into generations are insecure. It appears that criteria for yet another port generation, related to how they operate in the next 50 years, should be developed (Kaliszewski, 2018: 23).

### 3.6. PORT AND TERMINAL CONCEPT

Firstly port and terminal concept must be explained. Because the ports are referred to by the name of the type of cargo they handle if they are specialized in handling a particular type of cargo, in other words, if they have a single terminal. Each port facility that handles a certain cargo is referred to as a terminal (For example: container terminal, passenger terminal, etc.). Ports might have several terminals or a single terminal. The ports have six terminals: a passenger terminal, a liquid bulk terminal, a ro-ro terminal, a dry bulk terminal, a container terminal, and a general cargo terminal (Esmer, 2019: 83).

In terms of their traditional roles, ports may be characterized in a number of ways. In the traditional sense, ports are primarily described as geographical interfaces that can transfer cargo or passengers between ships and the shore (Alderton, 1995). In a similar manner, ports are often defined as locations where goods and passengers are moved from land to ship or ship to land (Talley, 2012: 473).

Port definitions are generally made according to the functions of the ports. Ports are the areas where ships dock and anchor and have the necessary equipment for the transfer of cargo from ship to land and from land to ship. Port is a safe water area with sufficient depth for ships to enter and a land area connected to it . It can be defined as the area where the necessary customs, warehouse, port organization and service facilities are located, as well as meeting other needs such as full protection. According to another definition, port can also be defined as a terminal or field that includes the places where the cargoes are loaded and/or unloaded from the ships, where the ships are waiting for their turn or where they are asked or forced to wait,

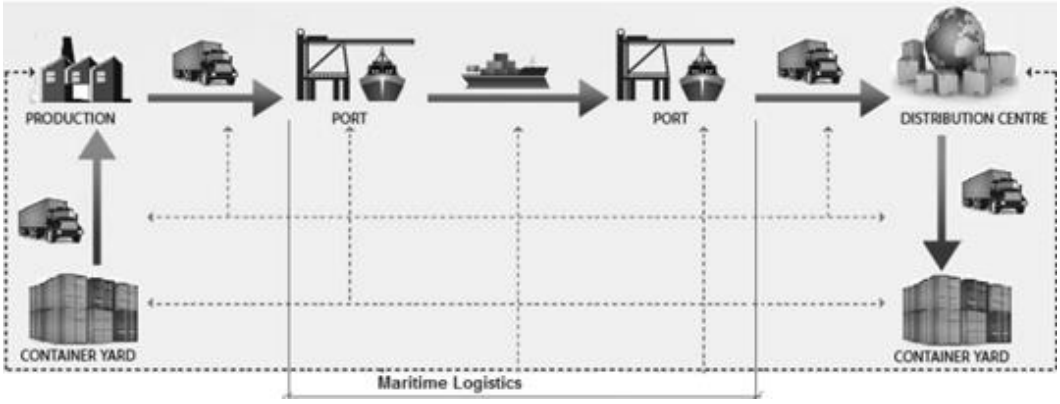
and it also has opportunities for other modes of transportation, and with this feature, it can also integrate between transportation modes (Esmer, 2009: 8).

Musso et al. (2006: 172) provide another definition of ports, emphasizing trade and economic points of view:

> *The port may be considered a public service that is generally useful to the economy, justifying the tax system being utilised for the purpose of funding the investments required. The port may be considered a business system that operates within a highly competitive market and requires investment projects to be selected with efficiency.*

Ports serve as not just transportation facilities but also as industrial hubs. Ports serve not just as a logistical hub for national economies, but also as a point of entry for commodities into global trade. As a result, ports actively contribute to the establishment of maritime trade demand. Ports and terminals serve as significant gateways and logistical sites in international commerce between production and consuming points, as seen in the Figure 7 below (Nicolae et al., 2016: 217).

**Figure 7 :**Position of Ports in Shipping Cycle




Source: Adopted from Nicolae et al. (2016)

According to Esmer (2019: 9), in addition to the fundamental functions of ports, they also provide support services such as supplying food, clean water, fuel, and replacement parts to ships, causing industrial mobility in their region, and serving as the meeting point of transportation modes in the supply chain. The main functions of ports in general can be listed as per below (Esmer and Karataş-Çetin, 2013: 380):

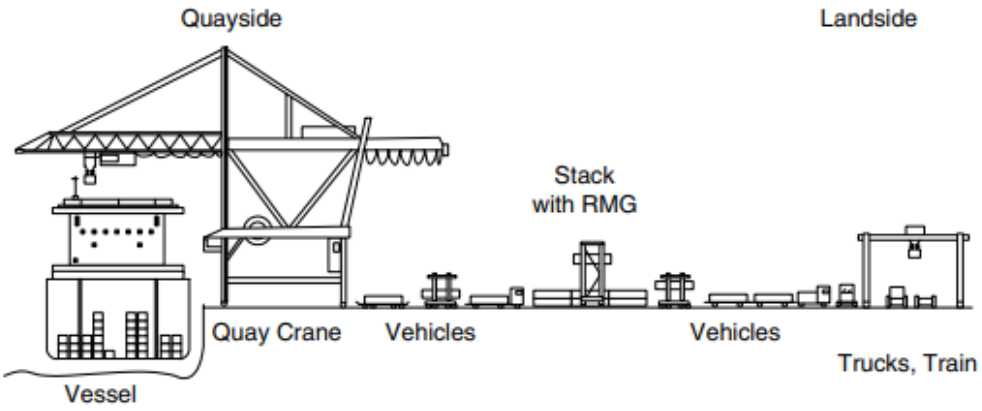
- Liaison: To provide a communication medium between cargo owners, competent authorities, intermediaries and all port users,
- Shelter: Providing shelter for the ship in storms and adverse sea conditions, anchoring the ship and mooring services,
- Organizing activities such as pilotage and tugboats for berthing so that the ships can reach the port safely,
- Supply: Supplying ship supplies, spare parts, ship fuel, clean water and crew,
- Security: To ensure the safety of life and property against theft and piracy,
- Loading-Unloading, Transshipment: Carrying out loading-unloading and load transfer activities from ship to ship, from ship to land and from land to ship at ports, to perform ship-to-ship and intermodal transfers,
- Storage, Distribution and Collection: To have structures with closed-open storage area and volume suitable for the load type, to have cranes that can handle all types of different loads, and to have intermediate carrier equipment that will enable the transfer of the load between the crane-warehouse-truck,
- National Inspections: Customs clearance of cargo and securing public health,
- Human Resources: To ensure the organization of labor in the port, to provide seafarers for ships, to organize certificate and crane operators programs for ships, to conduct international port management seminars and conferences,
- Social-Cultural Events: Organizing maritime fairs, cultural events and entertainments,
- Environmental Protection: Receiving waste from ships, having a treatment plant.

As can be understood from the functions described above, ports should be designed and operated in such a way as to fulfill these functions at the most effective level. In order for businesses to take part in global competition today, they need to perform their transportation activities in the most appropriate way. Ports are the most important transportation infrastructure in maritime transportation, which is the sub-component of global supply chain and logistics.

## 3.7. CONTAINER TERMINAL OPERATIONS

Simply a container terminal consists of the dock area where the ships dock, the areas where the containers are temporarily stored, the apron where the containers are transported and the gates where the trucks enter and exit. Apart from these areas, it consists of the buildings that have railway connections, CFS areas, closed storage areas, belonging to agencies and service providers except for the port administration. During the transhipment of the container, a number of activities are carried out on behalf of the "ship operator and the shipper or the buyer" at the terminal. In general, we can classify these services in three different activities: the arrival of the container, the storage (stacking) of the container and the departure of the container from the port (Thomas et al., 2007: 15). The schematic figure of container handling can be seen in Figure 8.

**Figure 8:** Transportation and Handling Chain of a Container




Source: Stenkeen et al., 2004

Terminal operations differ according to the container terminal features and the handling systems used (Emecen and Heydarova, 2008). Terminal operations, which are the foundation of port services, will be examined under four headings in this section. These are vessel operations, yard operations, gate operations and CFS operations.

### 3.7.1. Vessel Operations

Vessel operations are operations for ships arriving or departing for service or shelter at a port. “Anchoring of the ship, berthing, leaving the pier, maneuvers in the port area” are included in this operation. These services are mainly provided not by the port operator, but by the companies that provide pilotage, tugboat and mooring services (Esmer and Çetin, 2013: 402). Loading and unloading operations consist of various sub-processes, such as unloading the import containers from the ship with quay cranes (QC) when the ship arrives at the port, and placing them on the transport vehicles in order to stack them for a certain period of time with the help of cranes (Vis and Koster, 2002: 2-3). Vessel operation is a combination of three kind of operations. These operations includedischarging operations, loading operations and shifting operations.

Discharge Operations: Depending on the terminal system, taking the containers from the ship with a crane and placing them on the vehicle is called discharging. After the berthing of the ship, the completion of the necessary legal controls, the opening of the lashings and the planning of the containers to be discharged to the yard, the gantry cranes put the containers on the terminal trucks and the stacking of the containers with the cranes in yard is called the vessel discharge operation (Tumis, 2008: 107).

Loading Operations: It is the process from the stacking of the containers to be loaded on the ship until the completion of the operation when they are loaded on the ship. These containers include full transit containers that have entered the port area as full exports, have been discharged from another ship before, or all empty containers to be exported (Tumis, 2008: 113).

Shifting Operations: This operation is called briefly changing the position of the container on the ship. Shifting is an undesirable operation since it will be a cost factor and is done for compelling reasons. There may be different reasons for shifting. The most common of these reasons are: planning fault, misstowage, changing the discharge port of the container while the ship is sailing, changing the order of the port calls, loading the container into another port slot due to the lack of a suitable place for loading on the ship, and damage. Shifting is done in two ways as “ship to ship” and “ship-shore-ship”(Tumis, 2008:115).

### 3.7.2. Yard Operations

These operations include the transportation of containers from the dock to the yard &from the yard to the dock, their relocation within the yard, their transfers between terminals and are perhaps the most intense of the subsystem activities (Esmer, 2008: 242). The increase in container usage rates and ship sizes in maritime transportation, which has grown with globalization, makes the storage space in container terminals limited (Lee and Yu, 2012). As the ever-increasing container volumes have to be stored in the fields, the constant and limited resources of the field areas have increased the importance of the storage subsystem in recent years (Steenken et al., 2004; Rijsenbrij and Wieschemann, 2011).

Main components of container yard operations are a series of intra-terminal movements (Thomas et al., 2007):

- Returning import containers from the container yard to CFS for unloading and then returning empty containers to specific storage locations (e.g, empty container yards),
- Export movements; transporting empty containers to CFS for stuffing and transferring the stuffed containers to stack awaiting the arrival of the ship,
- Movements between the container area and the customs and port health inspection areas,
- Transporting damaged containers to a designated area for container inspection and repair and returning them to stacks.

### 3.7.3. Gate Operations

Trucks coming to the terminal from outside usually arrive at the terminal gate with containers loaded or empty. The data of the container carried by the trucks arriving full are checked at the terminal gate entrances. The areas to which the empty trucks will be directed in the terminal are determined before entering the gate.These trucks entering the terminal are then directed to areas where they will unload their containers or buy new containers. In container storage areas where yard cranes are

used, loading and unloading operations related to trucks are carried out in special loading areas immediately adjacent to the container blocks (Steenken et al., 2004: 6).

In gate operations, four different standard applications are followed according to the status of the container: full entry (in-gate), empty entry, full exit (out-gate) and empty exit. Apart from these, there are also transactions that the container called 'pre-gate' carries out at the registry office before entering the port. Today, queues can be taken over the internet for 'pre-gate' transactions in many ports. In this way, the cargo entering the port area does not have to wait in line to apply for the 'pre-gate' process. The container whose container number or bill of lading number is submitted, if registered, is ready to enter the port area after inspection (label, damage, seal control). Gate operations have great importance for the healthy execution of operations in the port area (Esmer, 2019).

### 3.7.4. CFS Operations

CFS is an abbreviation for 'Container Freight Station', which is a station or warehouse where a number of products or goods are stored in preparation for shipment in one or more containers. The commodities in a CFS generally belong to a number of different clients, and the shipment is frequently done via LCL shipments. LCL (Less container load) shipments occur when the exporters don’t have enough cargo to fill one container full (an FCL) (https://www.tradefinanceglobal.com).

CFS receiving services are a collection of services given between the receipt of cargo from exporters and the packaging of it into containers.

CFS Services include:

- Empty container transport from a container yard to a container freight station,
- Container stuffing,
- Container drayage from the container freight station to the container yard,
- Tallying,
- Creating a dock receipt or a shipping order,
- The transportation of cargo into and out of a container freight station,
- Container stuffing, sealing, and marking for labeling and identification,

- Ordinary container sorting and stacking before to or after shipping,
- Creating an internal load strategy for containers,

Exports will be delivered to the designated CFS for packaging, and imports will be picked up after unpacking at the designated CFS.

At the Container Freight Station, all cargo destined for a single destination will be consolidated and put into a single container. For example, the CFS may combine ten individual LCL shipments to Singapore from various clients into a single 40′ container and then send this one container.

Line bills of lading will be used for LCL shipments, and they will include the words CFS/CFS. As a result, from the CFS at the port of load to the CFS at the port of discharge, the shipping line is responsible (https://www.tradefinanceglobal.com).

### 3.8. CONTAINER TERMINAL SERVICES

Far from sheltering ships in ports to avoid being affected by bad weather conditions, ports are now basically the logistics centers where cargo is transferred from one mode of transport to another, where cargo is stored in the terminal area and value-added services are provided to the cargo.

Over time, the structure, type and size of the ships have changed depending on the demand. In this respect, ports and coastal facilities serving ships have also grown in capacity and have developed technologically and administratively. Rapid technological developments in maritime transport and the integration of air, sea and road transport systems It also led to the development of equipment and terminal services (Kuleyin et al., 2013).

Ports, which constitute the nodal point in the fulfillment of many activities in the transportation chain; Besides their basic functions such as loading/unloading, tugboat, and storage, they are in contact with many organizations or individuals such as shippers, exporters, importers, logistics companies, state authorities, banks, insurance companies. With this feature, ports provide important contributions to the country's economy by providing the coordination of many commercial and legal transactions as well as the transfer of cargo (Bichou, 2009).

With the growing globalization in the world, the role of transportation is increasing significantly. Due to its technological and economic advantages in increasing transportation, the rate of container transportation, which is one of the types of sea freight transportation, is increasing. The importance of efficient operation of container ports in container transportation is so important that cannot be ignored.

In port management, the product consists of the services provided at the port. In this sense, services are produced in port enterprises, not products. The services provided at the ports form the basis of all marketing activities at the ports. At this point, the port operator should determine well what the customer expects from a port. An effort to get to know the customer will facilitate the selling of the port service (Holocher, 1990: 13)

According to Esmer (2013), the leading determinants of port service supply can be grouped into 4 groups as follows:

- Charge potential of the hinterland
- Transport infrastructure of the back area
- Condition of infrastructure and superstructure facilities in the port
- Cargo handling condition of equipment

The most important factor among all these determinants is the load potential of the port back area. The background, which is a determinant of port supply, has a special position in port supply and demand. While the background of a port is an important determinant in the planning of port supply with its socio-economic structure, the background is a factor affecting port demand for the same reasons.

As can be seen in Table 5, port services can be provided directly by the port user requesting the service by bringing his cargo or ship to the port. The mandatory use of the direct distribution system in the ports increases the control of the ports over the port user. In this way, ports can directly obtain customer needs and expectations, feedback on the service provided, as they directly communicate with customers (Esmer and Karataş-Çetin, 2013: 79).

**Table 5:** Direct Service Provision in Ports

| | LOAD SERVICES BUYER | SHIP SERVICES BUYER |
|---|---|---|
| PORT BUSINESS | Uploaders<br>Freight Receiver<br>Agencies<br>Tenants<br>Shipowners | Shipowners<br>Owners |

Source: Esmer and Karataş-Çetin, 2013

Those who demand the services provided to the cargo in a port operator may be those who load the cargo on the ship or receive the cargo on the ship, the agents acting on behalf of the cargo owner or the cargo buyer, as well as the ship's charterers and shipowners, although rare. The services provided to the ships at the ports are requested by the shipowner.

It is necessary to divide the services provided in ports into two groups as services provided to ships and to cargo. In addition, there are services that are obligatory to be provided in the port area. Although the port operator does not provide these services, it has qualities that directly affect customer satisfaction. At this point, according to Esmer (2013), the services provided at the ports are evaluated in three basic scopes as seen below;

- Services provided to the cargo and its related parties,
- Services provided to ships and their related parties,
- Mandatory services given to cargo and ships

Traditionally, the most basic service provided by the port is the "shelter" service, which includes providing a sheltered area to the ship in bad weather conditions. This service is also one of the first reasons for the existence of the ports. In addition to this basic service, the main services produced at the ports are the cargo handling service, which is also called the cargo handling service. It is unloading, loading, transporting and storing in the port area. However, in today's competitive market conditions, it is not possible for a port operator to operate by only providing

these services. Other services supporting basic services are also requested from the ports. Some of these supportive services are provided by the port operator. Some of them are given within the borders of the port, not by the port operator, but by the institutions, organizations and businesses that are in contact with the port (Cerit, Deveci and Esmer, 2013: 397).

The existing port facilities at the ports and the general services provided before and after a ship berths at the port are shown in Table 6 below. In addition, services provided for cargoes and services that create additional value for the cargo by the port are also listed.

**Table 6:** Port Services

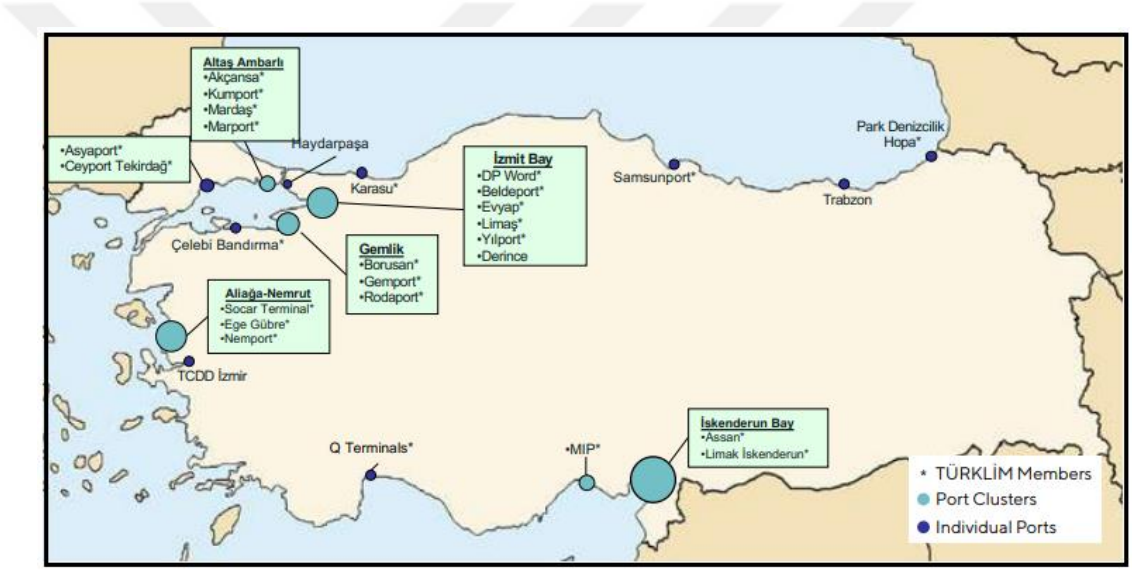
| **Services for Cargo and Cargo Interests** | | | **Services for Ship and Ship Interests** | | |
|---|---|---|---|---|---|
| *Basic Services* | *Supportive Services* | *Added-Value Services* | *Basic Services* | *Supportive Services* | *Added-Value Services* |
| • Cargo Handling Operations<br>• Stowing<br>• Shifting<br>• Transshipment<br>• Marking<br>• Weighing<br>• Storage<br>• Inland Transport<br>• Security Services | • Warehouse/ Storage Services<br>• Dangerous Goods Handling<br>• Equipment and Vehicle Renting<br>• Container Stuffing and Unstuffing Operations<br>• Container Washing<br>• Container Sweeping<br>• Refrigerated Container Energy and Monitoring Service | • Office Services<br>• Transportation<br>• Catering Services<br>• Intermediate Transportation<br>• Information and communication<br>• Consolidation<br>• Deconsolidation<br>• Lashing<br>• Dunnage<br>• Packaging<br>• Marking<br>• Barcoding<br>• Sanitary<br>• Surveillance<br>• Container Repair and Maintenance<br>• Container Tracking<br>• Car Park | • Pilotage<br>• Towage<br>• Mooring<br>• Harboring<br>• Loading<br>• Unloading<br>• Stowing<br>• Transshipment<br>• Opening/ closing of hatches<br>• Waste disposal | • Supply Services<br>• Maintenance and Repair Services<br>• Security Services | • Office Services<br>• Catering Services<br>• Energy Supply<br>• Communication<br>• Car Park |

Source: Esmer, 2019: 27

## 3.9.CONTAINER TERMINALS IN TURKEY

The importance of ports is gradually increasing in Turkey, which is on the way of the main lines of world maritime trade. There are 28 ports that provide service to container in Turkey that can be seen below Figure 9. There are 17 container ports in the Marmara Region, 3 in the Black Sea Region, 4 in the Aegean Region and 4 in the Mediterranean Region. According to Turklim (2022), total container throughput is 12.442.449 TEUs in Turkey's container ports.

**Figure 9**: Ports/Terminals Handles Container in Turkey




Source: Turklim, 2022: 87

**Table 7:** Top 10 Port Authority in Turkey that Handles the Most Containers

| | **Ambarlı** | **Mersin** | **Kocaeli** | **Tekirdağ** | **Aliağa** | **Gemlik** | **Iskenderun** | **Izmir** | **Antalya** | **Samsun** |
|---|---|---|---|---|---|---|---|---|---|---|
| **2012** | 3.023.960 | 1.250.873 | 630.153 | 1.627 | 413.573 | 686.245 | 83.207 | 695.799 | 179.351 | 27.303 |
| **2013** | 3.318.129 | 1.367.134 | 807.756 | 1.602 | 466.010 | 669.305 | 148.017 | 683.608 | 216.221 | 33.362 |
| **2014** | 3.444.926 | 1.483.945 | 899.104 | 784 | 536.517 | 708.365 | 185.359 | 678.756 | 188.932 | 48.443 |
| **2015** | 3.061.501 | 1.428.300 | 988.906 | 129.259 | 580.251 | 685.605 | 228.297 | 649.567 | 178.389 | 54.987 |
| **2016** | 2.780.168 | 1.406.400 | 1.143.007 | 680.270 | 641.844 | 693.163 | 375.033 | 679.905 | 172.064 | 52.106 |
| **2017** | 3.122.504 | 1.553.841 | 1.315.991 | 936.481 | 794.342 | 799.122 | 448.082 | 637.902 | 199.892 | 65.927 |
| **2018** | 3.169.535 | 1.662.361 | 1.597.621 | 1.084.196 | 944.705 | 854.698 | 512.299 | 610.908 | 190.840 | 69.235 |
| **2019** | 3.104.883 | 1.854.312 | 1.715.194 | 1.413.961 | 1.132.480 | 861.657 | 680.120 | 541.679 | 150.678 | 67.426 |
| **2020** | 2.887.807 | 1.948.695 | 1.800.642 | 1.444.035 | 1.275.520 | 843.119 | 710.587 | 436.385 | 109.408 | 106.281 |
| **2021** | 2.942.549 | 2.106.936 | 1.967.945 | 1.812.024 | 1.389.367 | 911.611 | 678.459 | 516.375 | 116.954 | 100.881 |

Source: https://www.turklim.org

As also according to table above, The Marmara Region's ports have the biggest container throughput rate, at 60.3%. The ports of the Mediterranean Region are followed by those of the Marmara Region (23%) and the Aegean Region (15%). The ports in the Black Sea area account for 0.9% of total container throughput (Turklim, 2022). Table 8 shows container throughput rate in order of last years.

**Table 8:** Container Throughput in Turkish Ports that Handle Containers

| Rank | Ports | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|
| 1 | MIP | 1.722.711 | 1.939.029 | 2.009.724 | 2.097.349 |
| 2 | ASYAPORT | 1.117.749 | 1.353.409 | 1.437.921 | 1.802.517 |
| 3 | MARPORT | 1.573.600 | 1.679.340 | 1.557.391 | 1.503.254 |
| 4 | KUMPORT | 1.258.294 | 1.281.850 | 1.210.780 | 1.211.515 |
| 5 | GEMPORT | 524.652 | 547.190 | 570.427 | 682.064 |
| 6 | DP WORLD | 575.869 | 616.749 | 676.731 | 666.174 |
| 7 | EVYAP | 464.756 | 499.908 | 509.757 | 599.566 |
| 8 | YILPORT | 551.726 | 564.531 | 524.065 | 566.447 |
| 9 | NEMPORT | 390.071 | 430.014 | 484.371 | 544.568 |
| 10 | IZMIR | 647.715 | 605.727 | 531.687 | 529.131 |
| 11 | EGE GUBRE | 298.045 | 380.790 | 460.297 | 488.507 |
| 12 | LIMAKPORT | 317.961 | 388.328 | 478.614 | 476.627 |
| 13 | SOCAR TERMINAL | 277.000 | 311.162 | 307.250 | 357.314 |
| 14 | MARDAS | 351.849 | 139.580 | 114.069 | 222.640 |
| 15 | ASSANPORT | 225.496 | 248.594 | 244.643 | 214.484 |
| 16 | BORUSAN | 245.499 | 206.395 | 176.117 | 138.491 |
| 17 | Q TERMINALS | 186.290 | 148.750 | 123.983 | 116.786 |
| 18 | SAMSUNPORT | 74.129 | 87.840 | 97.998 | 102.155 |
| 19 | RODA PORT | 86.464 | 99.668 | 82.226 | 92.408 |
| 20 | DFDS | | | | 67.645 |

| | | | | | |
|---|---|---|---|---|---|
| 21 | HAYDARPASA | 56.067 | 45.565 | 41.586 | 27.221 |
| 22 | LIMAS | 16.311 | 17.914 | 17.687 | 25.812 |
| 23 | AKCANSA | 10.530 | 26.512 | 12.522 | 16.776 |
| 24 | CELEBI BANDIRMA | 35.695 | 18.581 | 13.340 | 6.981 |
| (TEU) | **Turklim Total** | 10.352.293 | 10.988.558 | 11.109.913 | 12.003.819 |
| (TEU) | **Turkey Total** | 11.065.236 | 11.750.660 | 11.723.887 | 12.442.449 |
| (%) | **Turklim Share** | %93,6 | %93,5 | %94,8 | %94,9 |
| (%) | Other Private Ports | %0,1 | %0,9 | %0,3 | %0,7 |
| (%) | Private Ports' Share | %93,7 | %94,5 | %95,1 | %95,5 |
| (%) | Public Ports* | %6,3 | %5,5 | %4,9 | %4,5 |

Source: Turklim, 2022: 89

* Izmir and Haydarpaşa Ports, Derince Port and Trabzonport, which are not TURKLIM members, have not been added to the list

MIP Mersin International Port retained its first place in 2022, handling 16.8% of all cargo handled in Turkey, with over 2 million TEU containers moved. With 1.8 million TEU, ASYAPORT port came in second, while MARPORT port came in third with 1.5 million TEU. With 1.2 million TEU, KUMPORT became the fourth port to handle over one million containers.

## 3.10. CONTAINER TERMINALS IN AEGEAN REGION

In Aegean Region four ports give services for container handling. According to Turklim throughput figures (2022), Nemport comes first and is followed by TCDD Port of Izmir, TCE EGE and SOCAR Terminal.

### 3.10.1. SOCAR Terminal

Petlim Limancilik Ticaret A.S. (Petlim) was founded on November 22, 2010. The first phase of the port with 800 thousand TEU was completed on 06.12.2016 as part of the strategic partnership engaged into with APM Terminals in container port operation, and it was begun to be operated by APM Terminalleri Liman Isletmeciligi

A.S. On July 4, 2018, the port's second phase was opened, and the port began operating at full capacity.

On December 27, 2018, SOCAR Turkey Enerji A.S. bought all of the shares held by APM Terminalleri Liman Isletmeciligi A.S., resulting in the Company's trade name being changed to "SOCAR Aliaga Liman Isletmeciligi A.S." SOCAR Aliaga Liman Isletmeciligi A.S. now operates the port (SOCAR Aliaga Terminal).

SOCAR Aliaga Terminal, with a 700-meter integrated dock structure and a minimum water depth of 16 meters, is the first port management in the Aegean Region to handle ships with a capacity of 18.000 TEU. The terminal is the largest in the Aegean Region, with a processing capacity of 1.5 million TEU containers.

The terminal has also a general cargo dock that is 150 meters long and reaches a depth of 10 meters, as well as a logistics space of 42 hectares and 6 hectares on the port reach and support services area, respectively, for container storage (https://www.socarterminal.com).

**Table 9:** Technical Features of SOCAR Terminal

| | |
|---|---|
| Handling Capacity: | 1,500,000 Container (TEU/Year) |
| Total Port Area: | 420,000 m² |
| Unbonded Area: | 20,000 m² |
| Closed Warehouse | 225 m² |
| Customs Warehouse(Open): | 400,000 m² |
| Truck Parking Area (Pre-gate) | 30,000 m² |
| Berth Length | 700 mt container dock &<br>150 mt general cargo dock |
| Max Draft | 16 mt container dock &<br>10 mt general cargo dock |
| STS: 3 | RTG: 10 |
| Reach Stacker: 3 | Empty Container Handler: 3 |
| Terminal Truck: 26 | |

Source: Turklim, 2022.

**Figure 10:** A View from SOCAR Terminal



Source:https://www.socarterminal.com/

### 3.10.2. Nemport

Nemport is the first private container port of the Aegean Region, with increasing container handling volume since 2010. According to Turklim (2022), Nemport completed 2021 with 544,568 TEUs throughput, becoming the Aegean Region's port that handles the most containers. Also they continue to invest new equipments by receiving five RTGs in 2022. It is stated that new gantry crane will be invested in upcoming year.

Nemport is one of the few ports entitled to receive the Green Port / Eco Port certificate and on other hand the first terminal with railway connection in the Aliaga region.

**Table 10:** Technical Features of Nemport

| | |
|---|---|
| Handling Capacity | 750,000 Container (TEU/Year) |
| General Cargo Capacity | 1,000,000 (Tons/Year) |
| Total Port Area | 160,000 m² |
| Customs Warehouse(Open) | 100,000 m² |
| Truck Parking Area | 5,000 m² |

| | |
|---|---|
| Berth/Pier Length & Width | 1080 mt & 40 mt |
| Max Draft | 21,5 mt |
| STS: 2 | RTG: 10 |
| MHC: 5 | Reach Stacker: 8 |
| Empty Container Handler: 5 | Terminal Truck: 30 |

Source: Turklim, 2021

**Figure 11:** A View from NEMPORT




Source: https://www.nemport.com.tr/

### 3.10.3. TCE EGE

TCE EGE Container Terminals has provided services at the Ege Gubre Sanayi facility since 2009. TCE EGE is located 55 kilometers from Izmir city center. TCEEGE Container Terminals is a 100% owned subsidiary of Ege Gubre Sanayi A.S. (http://www.tceege.com.tr)

TCE EGE provides general cargo and bulk cargo services in addition to container services. Based on container througput in 2021, TC EGE comes in 11th in Turkey and comes in 3rd in Aegean Region with 488,507 TEU (Turklim, 2022).

**Table 11:** Technical Features of TCE EGE

| | |
|---|---|
| Handled Cargoes | Container, General & Bulk Cargo |
| Handling Capacity | 1,000,000 (TEU/Year) |
| General Cargo Capacity | 2,500,000 (Ton/Year) |
| Bulk Cargo Capacity | 5,000,000 (Ton/Year) |
| Total Port Area | 485,000 m² |
| Customs Warehouse(Open) | 350,000 m² |
| Entrepod Warehouse | 16,615 m² |
| Warehouse | 10,125 m² |
| Truck Parking Area | 5,000 m² |
| East Berth/Pier Length & Width | 367x40 m |
| West Berth/Pier Length & Width | 417x30 m |
| Max Draft | 20 m |
| STS: 2 | RTG: 6 |
| MHC: 5 | Reach Stacker: 4 |
| Empty Container Handler: 2 | Terminal Truck: 32 |

Source: Turklim, 2021

**Figure 12:** A View from TCE EGE



Source:http://www.tceege.com.tr

### 3.10.4. Port of Izmir

The port is the most important container port used by foreign trade companies in the south of Marmara Region, the west of Central Anatolia and the Mediterranean Region, for their export and import transactions. Various types of cargo, especially containers, can behandled at the port.

Port of Izmir (TCDD Izmir Alsancak Port) is a public terminal and located inside the Izmir city with railway connection. Based on container througput in 2021, Port of Izmir comes in 10th in Turkey and comes in 2nd in Aegean Region with 529,131 TEU (Turklim, 2022).

**Table 12:**Technical Features of Port of Izmir

| | |
|---|---|
| Handled Cargoes | Container, General Cargo, Bulk Cargo |
| Container Handling Capacity | 1.164.917 (TEU/Year) |
| General and Bulk Cargo Capacity | 1,369,000 (Ton/Year) |
| RoRo Capacity | 372,000 (Truck/Year) |

| | |
|---|---|
| Total Port Area | 635,000 m² |
| Total Container Berth Length | 1410 m |
| Max Draft | 10 m |
| STS: 5 | RTG: 10 |
| MHC: 7 | Reach Stacker: 15 |
| Empty Container Handler: 8 | Terminal Truck: 25 |

Source: Turklim, 2022

**Figure 13:** A View from Port of Izmir



Source: https://www.denizbulten.com/

# CHAPTER FOUR
# METHODOLOGY

## 4.1. AIM OF THE RESEARCH

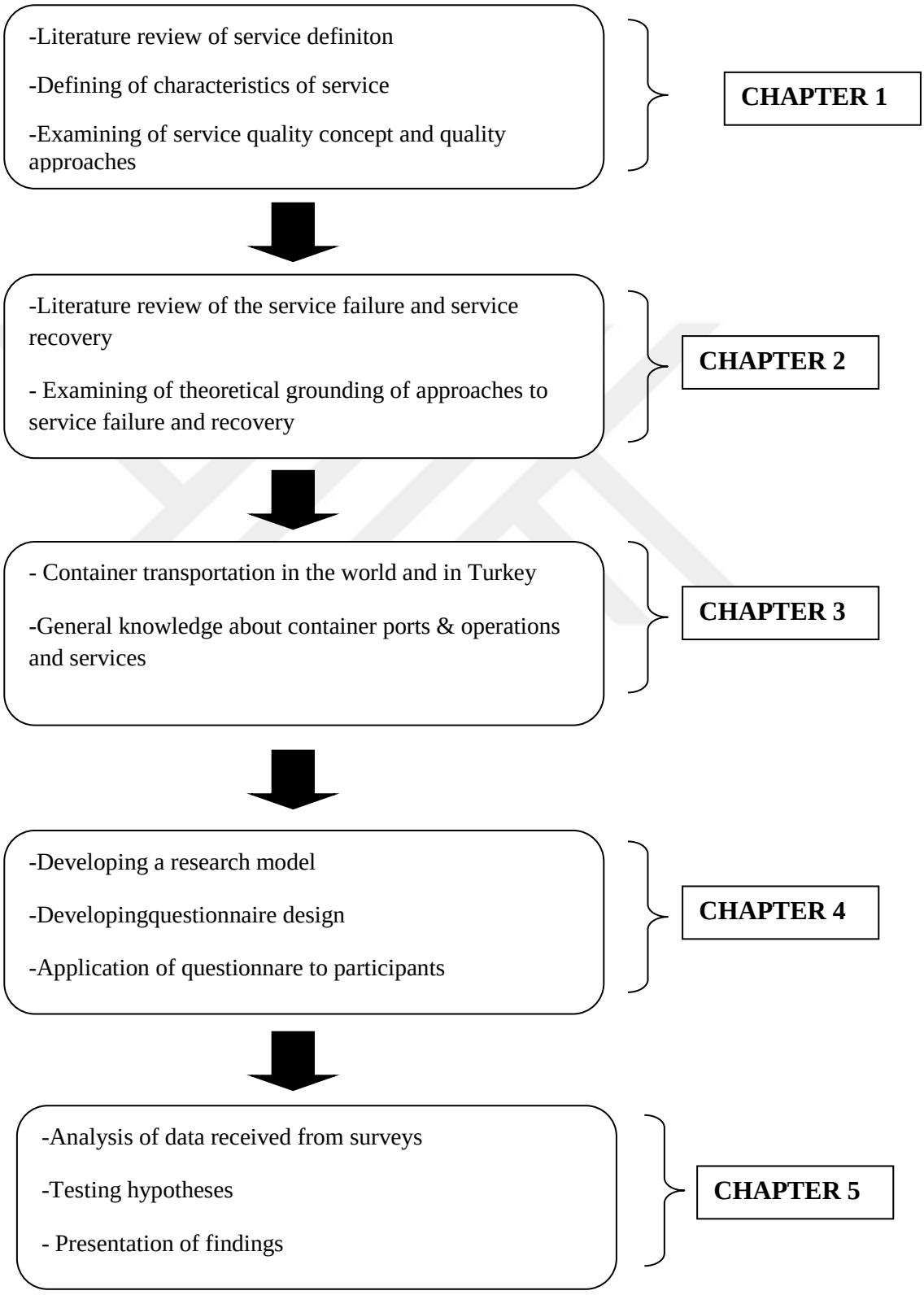
Container terminals are an essential part of the supply chain network. They are critical to a country's growth and development, as well as to global economic and commercial links. This crucial role of ports in international trade enforces them to adaptation for a competitive market and the development of policies that improve service quality. According to Keaveney (1995), the first reason why businesses lose customers is service failures. Garcia and Perez (2011) states that the main reason for losing customers is not the occurance of service failures, but the lack of effective recovery for these failures. It is necessary to detect service failures and take corrective measures in order to reduce service failures, which are so important, and to maintain long-term profitability (Chang and Chuang, 2012: 818). Today's enterprises understand that they can only survive in a competitive environment if they can maximize service quality while minimizing service failures.

The main purpose of the research is to define, classify and analyse service failures in perspective of shipping lines and container terminals. Though, similar research in the context of service failure in container terminals serving the marine sector was not found.The objectives of the study are determined as follows:

- To define and understand the concept of service failure in the context of container terminals
- To find out the most common service failures and their causes. Thus enterprises can take actions against service failures.
- To evaluate shipping lines' and container terminals' perceptions with respect to magnitude and frequency of service failures.
- To examine the relationship between shipping lines and container terminals after service failure
- To provide possible implications of the results and offer suggestions for future research directions

## 4.2.PROCESS OF THE SEARCH

**Figure 14:**Process of the Research

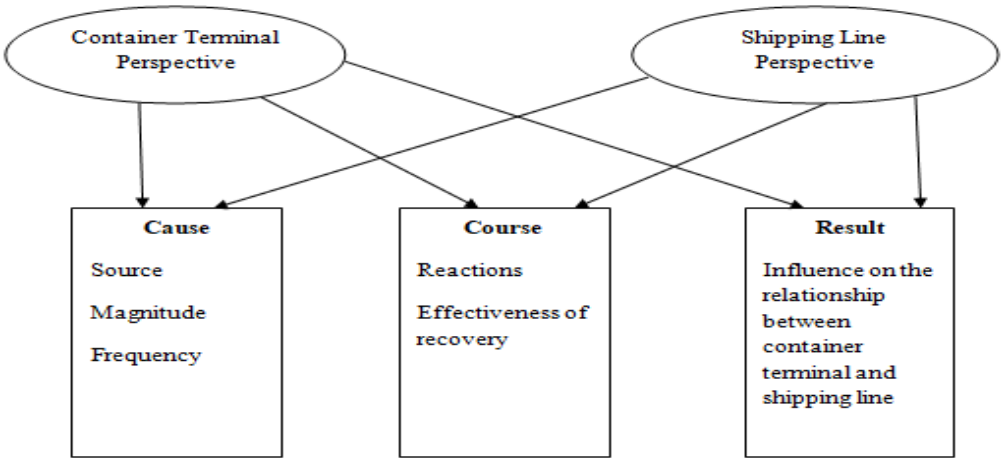


The research process design of the research has shown in Figure 14 above. In chapter one, the literature of the service concept is examined. Service and service quality concepts are defined. Characteristics of service and why service quality is important are mentioned. Also service quality approaches are reviewed. In chapter two, service failure and service recovery concepts are examined. Service failure types and magnitudes and also theoretical aproaches are identifed. In chapter three, general information about container ports are handled. Container terminal operations and services, container transportation in the world and in Turkey are reviewed. In chapter four, methodology of the study is explained with questionnare design, sampling and collection of data. In the last chapter hypotheses are developed and findings are explained.

## 4.3. MODEL OF THE RESEARCH

In this study conceptual framework is composed on basis of Edvardsson's model. There are three steps in Edvardsson's approach for studying service failures and recoveries. These are the causes, courses, and outcomes. This model was developed by Edvardsson (1988:191) to investigate service failures and recovery procedures in the mechanical engineering business from the perspective of the sales firm. Below Figure 15 draws analytical model of the study.

**Figure 15:** Model of the Research




Source: Adopted from Edvardsson (1988)

In this study it has been focused on three stages. Based on the cause stage, source, magnitude and frequency of service failures are discriminated because companies must learn how to manage service failures and identify the various causes of failure. Also magnitude and frequency of service failures are investigated in the study.

Course of the research is related with reactions of participants to service failures. Reactions of service providers mean service recovery procedures to rectify service failures. Besides effectiveness of recovery is investigated from terminal perpective and line perspective.

The result stage is related with influence on the relation between container terminal and shipping line. It is asked to participants and sorted as “ruptured”, “diminished”, “not changed” and “improved”. On the other hand the study containsage, title, years of experience and education degree.

## 4.4.CRITICAL INCIDENT TECHNIQUES

Flanagan introduced The Critical Incident Technique (CIT) to the social sciences in 1954. In the services literature, critical incident technique (CIT) is a common study approach and a type of "story telling" that "offers a rich source of data by permitting respondents to select which events are the most important to them for the issue being examined" (Gremler, 2004:73).

A critical incident is one that has a major impact on an activity or phenomena, either favorably or adversely (Bitner et al. 1990; Grove and Fisk, 1997). Critical events can be obtained in a variety of methods (individual interview, group interviews, questionnaire and record forms.), but in service research, participants are typically asked to tell a story about a past experience (Gremler, 2004: 74).

Bitner et al. (1990) applied this approach to differentiate between the most and least pleasant employee behaviors at hotels, restaurants, and airlines as evaluated by relevant consumers. CIT is used as a guiding tool in a four-stage process to improve the quality of service given in enterprises (Lockwood, 1994);

- Collection of critical incidents
- Analysis of critical incidents

- Determination of critical incidents severity
- Taking measures to enhance service quality

### 4.4.1. Advantages and Disadvantages of CIT

Critical incident technique has advantages and disadvantages as mentioned in many studies. Advantages can be listed as follow. According to Edvardsson (1998: 190), the participant's point of view is expressed in their own words. Bitner et al (1990: 76) states that gives more information and can be used to clarify a phenomena. Also Burns et al (2000: 183) expressed that may simply be altered for understanding the experiences of others.

Despite the benefits of using CIT in different researches, there has been notable criticism of the method. For instance CIT method has been questioned in terms of reliability and validity (Chell, 1998). Because according to Gabbott and Hogg (1996: 497) incidents might be misunderstood. Problems may also occur as a consequence of ambiguity in group labeling and coding rules in a specific research (Weber, 1985: 32).

In this study, CIT is used to categorize service failure incidents that result in complaints from customers who received service at container terminals and also examined only negative critical incidents. This method has been used to learn and categorize the causes of service failures in detail, to reveal sources, and to learn how to take action against service failures.

### 4.4.2. Qustionnare Design

Based on Edvardsson’s model, questionnare form was designed in the frame of cause, course and result. As in many studies, it was used for negative incidents in this study as well (Edvardsson, 1998; Bejou et at., 1996). 58 interviews were carried on with container terminal and shipping line personnel in order to define service failure and actions for recovery. The interviews lasted an average of 45-60 minutes. Please see the appendices for interview details.This study were figured out from both

container terminal perspective and line perspective because according to Solomon et al. (1985) service encounters are binary.

Firstly demographic questions were asked to participants. Gender, age, education level, position, industry experience, and number of years employed by the current company are the responders' profile details. All questions can be seen in detail in the appendices. After demographic questions, the interview respondents were asked to tell a service failure and actions given with open-ended questions. They were also questioned to rate the magnitude of the failure on a 10-point scale with anchors of minor mistake=1 and major mistake=10, as well as the frequency of the failure on a 10-point scale with anchors of very frequent=1 and very rare=10.

The interview questions were prepared by examining the questions in previous studies and adapting them to the Edvardsson's model. Recovery actions against service failure were asked to respondents and wanted to rate fulfilment degree on a 5-point scale with ancors of very dissatisfied=1 and very satisfied=5. Also participants were wanted to express how the relations were affected by failure. Participants rated the relationship after service failure and recovery as "ruptured", "diminished", "not changed" and "improved". Smiliar questions were asked to both side (container terminal and shipping line) from the perpective of them (find in Appendix).

### 4.4.3. Sampling

In order to get appropriate and valid answers during the data collection process, first of all, the person who experienced the critical event is asked to remember this event differently from other events and to give specific and detailed information about the event. There is no definite rule about how many critical incidents will be collected during the implementation phase of the CIT. It is important how well the events collected here explain the subject under investigation. It is stated that even 50 critical events may be sufficient to create a category. As no limit for proper sample size, optimum amount of critical incidents for a research can be planned anywhere between 50-100 to several thousand (Lipu et al., 2007).

Because business-to-business service encounters are dyadic, this research examines both shipping line and container terminal perspectives in studying service failures and recoveries (Solomon et al., 1985: 102). The office employees of container terminals in Izmir from operation, documentation, customer service, finance and marketing departments are determined as the sample of the study. As mentioned in chapter three, there are four contaniner terminals in Aegean Region in Turkey. Also container shipping line employees are included from various departments in contact with container terminals into the study. Telephone interviews with participants were conducted in order to get permission to perform the study.Interviews have been conducted via in-depth interviews, telephone, online surveyand email. Participants' details can be seen below Table 13 and Table 14. Interviews conducted with terminal employees took 1342 minutes/22.3 hours in total. On the other hand, interviews conductedwith shipping line employees took 1392 minutes/23.2 hours in total. Totally 58 service failure and recoveries were received from container terminals and shipping line employees.

**Table 13:**Interview Details of Container Terminal Employees

| Participant # | Title of Participants | Type of Interview | Date | Duration |
|---|---|---|---|---|
| Participant 1 | Customer Services Specialist | In Depth Interview | 23.06.2022 | 55 minutes |
| Participant 2 | Yard Planning Specialist | Via Telephone | 7.12.2022 | 35 minutes |
| Participant 3 | Planning Shif Lead | In Depth Interview | 10.11.2022 | 70 minutes |
| Participant 4 | Customer Services Specialist | Online Survey | 3.10.2022 | 45 minutes |
| Participant 5 | Vessel Operation Specialist | In Depth Interview | 24.07.2022 | 50 minutes |
| Participant 6 | Yard Planning Specialist | In Depth Interview | 7.12.2022 | 65 minutes |
| Participant 7 | Planning Specialist | Via Telephone | 29.10.2022 | 47 minutes |
| Participant 8 | Yard Planning Specialist | Via Email | 18.11.2022 | - |
| Participant 9 | Gate Clerk | In Depth Interview | 4.09.2022 | 55 minutes |
| Participant 10 | Operations Manager | In Depth Interview | 2.12.2022 | 80 minutes |
| Participant 11 | Gate Clerk | Online Survey | 29.11.2022 | 35 minutes |
| Participant 12 | Gate Clerk | Via Email | 13.11.2022 | - |
| Participant 13 | Gate Clerk | In Depth Interview | 13.11.2022 | 45 minutes |
| Participant 14 | Gate Clerk | Via Telephone | 28.07.2022 | 40 minutes |
| Participant 15 | Accounting Specialist | Online Survey | 17.09.2022 | 40 minutes |
| Participant 16 | Accounting Specialist | In Depth Interview | 18.10.2022 | 60 minutes |
| Participant 17 | Accounting Specialist | Via Email | 3.07.2022 | - |
| Participant 18 | Commercial Asst. Specialist | In Depth Interview | 18.10.2022 | 80 minutes |

| | | | | |
|---|---|---|---|---|
| Participant 19 | Sales Executive | Online Survey | 18.09.2022 | 55 minutes |
| Participant 20 | Billing Team Lead | Online Survey | 7.12.2022 | 50 minues |
| Participant 21 | Yard Planning Specialist | Online Survey | 30.06.2022 | 45 minutes |
| Participant 22 | Planning Intendent | In Depth Interview | 9.08.2022 | 75 minutes |
| Participant 23 | Yard Planning Specialist | In Depth Interview | 9.08.2022 | 60 minutes |
| Participant 24 | Planning Specialist | Via Telephone | 18.06.2022 | 30 minutes |
| Participant 25 | Planning Specialist | In Depth Interview | 30.10.2022 | 50 minutes |
| Participant 26 | Operation Planner | Via Email | 15.10.2022 | - |
| Participant 27 | Planning Specialist | In Depth Interview | 4.08.2022 | 75 minutes |
| Participant 28 | Shift Intendent | Via Telephone | 29.10.2022 | 45 minutes |
| Participant 29 | Operation Planner | Online Survey | 14.11.2022 | 55 minutes |

Source: Created by the author

**Table 14:** Interview Details of Line Employees

| Participant # | Title of Participants | Type of Interview | Date | Duration |
|---|---|---|---|---|
| Participant 1 | Port Services Specialist | Via Telephone | 9.08.2022 | 29 minutes |
| Participant 2 | Vessel Operations Specialist | In Depth Interview | 18.06.2022 | 60 minutes |
| Participant 3 | Vessel Operations Senior Specialist | In Depth Interview | 13.11.2022 | 65 minutes |
| Participant 4 | Vessel Operations Specialist | In Depth Interview | 27.07.2022 | 55 minutes |
| Participant 5 | Port and Terminal Operations Specialist | Via Email | 25.06.2022 | - |
| Participant 6 | Vessel and Port Operations Specialist | Online Survey | 12.09.2022 | 35 minutes |
| Participant 7 | Vessel Operations Team Leader | In Depth Interview | 17.10.2022 | 75 minutes |
| Participant 8 | Vessel Operations Specialist | In Depth Interview | 16.07.2022 | 55 minutes |
| Participant 9 | Transhipment Services Specialist | Via Telephone | 18.09.2022 | 36 minutes |
| Participant 10 | Vessel Operations Specialist | In Depth Interview | 2.07.2022 | 60 minutes |
| Participant 11 | Transhipment Services Team Leader | Online Survey | 25.06.2022 | 40 minutes |
| Participant 12 | Transhipment Services Assistant Specialist | In Depth Interview | 26.08.2022 | 65 minutes |
| Participant 13 | Port Services Specialist | Via Telephone | 23.06.2022 | 45 minutes |
| Participant 14 | Port Services Specialist | In Depth Interview | 8.08.2022 | 60 minutes |
| Participant 15 | Port Services Specialist | In Depth Interview | 8.08.2022 | 50 minutes |
| Participant 16 | Port Captain | In Depth Interview | 30.09.2022 | 55 minutes |
| Participant 17 | Port Captain | Via Telephone | 13.11.2022 | 48 minutes |

| | | | | |
|---|---|---|---|---|
| Participant 18 | Port Services Assistant Specialist | Online Survey | 12.09.2022 | 35 minutes |
| Participant 19 | Customer Service Agent | Via Email | 22.09.2022 | - |
| Participant 20 | Customer Services Specialist | In Depth Interview | 23.11.2022 | 75 minutes |
| Participant 21 | Customer Experience Specialist | In Depth Interview | 17.10.2022 | 80 minutes |
| Participant 22 | Customer Services Specialist | In Depth Interview | 7.12.2022 | 60 minutes |
| Participant 23 | Customer Experience Specialist | In Depth Interview | 23.11.2022 | 70 minutes |
| Participant 24 | Port Services Specialist | Via Telephone | 17.10.2022 | 42 minutes |
| Participant 25 | Port Services Specialist | Via Email | 10.09.2022 | - |
| Participant 26 | Port Services Specialist | Via Telephone | 7.12.2022 | 32 minutes |
| Participant 27 | Sales Representative | In Depth Interview | 15.10.2022 | 60 minutes |
| Participant 28 | Cost Control Specialist | Online Survey | 22.09.2022 | 40 minutes |
| Participant 29 | Sales Representative | In Depth Interview | 9.08.2022 | 65 minutes |

Source: Created by the author

### 4.4.4. Data Collection

According to Gremler (2004: 72), data collection for service failures can be carried out via email and internet. The data in the study was assembled with in depth interviews by e-mail and online surveys. Critical incidents were collected by asking open-ended questions to participants and guided interviews. Respondents were aimed to tell critical incidents with open ended questions, and aimed to reveal demographic information of participants with closed ended questions. 19 questions in total were prepared in the light of these aims.

58 service failure and recovery incidents gathered from participants and each interview took around 45-60 minutes. Interviews were completed between June and December 2022. Some of the interviews had to be done online or via phone or via online surveys because today companies still continue to work remotely.

### 4.4.5. Data Analysis Technique

Questions were sent to 80 people for the research, 66 of them provided feedback. Eight of received forms were eliminated from evaluation because improper for critical incident technique. Analysis was made on the remaining 58 pieces. The collected data is organized by the researcher in two stages. The first stage is to categorise specified events, and the other stage is to classify the critical events obtained according to these categories (Hoffman et al., 1995: 51).The gathered incidents are categorized, merged, and analysed. Because all incidents in a classification must be related to incidents in other categories. The categories should represent especially the cause of critical incident. Critical incidents also sorted in terms of source of service failure, magnitude of service failure and satisfaction with recovery actions.

MAXQDA was used to analyse all info coded from incidents. MAXQDA is a software that facilitates the evaluation, analysis and reporting all kinds of data (text, multimedia etc.) facilitating both qualitative and quantitative information. On the other hand it provides frequency chart and makes analysis easier.

# CHAPTER FIVE
# FINDINGS OF THE STUDY

## 5.1.DESCRIPTIVE STATISTICS

The main characteristics of the dataset used in the study are displayed in this section using descriptive statistics. Descriptive statistics help to summarize the dataset by describing the data sample and its measures.

### 5.1.1. Profile of Respondents

Gender, age, education levels, work experience in the industry, and year worked with the company are all profile details of the respondents. The following tables provides the profile statistics for the respondents.

**Table 15**: Gender of Container Terminal Respondents

| Gender | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| **Female** | 4 | 13,8 | 13,8 |
| **Male** | 25 | 86,2 | 100 |
| **Total** | 29 | 100 | |

Source: Created by the author

**Table 16:** Gender of Line Respondents

| Gender | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| **Female** | 10 | 34,5 | 34,5 |
| **Male** | 19 | 65,5 | 100 |
| **Total** | 29 | 100 | |

Source: Created by the author

Based on the gender distribution from both perspective, we can say that the female employee rate is less in container ports. While the rate of female workers in lines is 34.5%, it draws attention as 13.8% in the ports. Although it is tried to reach equal numbers of male and female employees from each department, it has been determined that the number of female employees is very low or not at all, especially in the operation departments.

**Table 17**: Age of Container Terminal Respondents

| Age | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| **18-24** | 2 | 6,9 | 6,9 |
| **25-34** | 16 | 55,2 | 62,1 |
| **35-44** | 11 | 37,9 | 100 |
| **Total** | 29 | 100 | |

Source: Created by the author

**Table 18:** Age of Line Respondents

| Age | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| **18-24** | 2 | 6,9 | 6,9 |
| **25-34** | 18 | 62,1 | 69 |
| **35-44** | 9 | 31 | 100 |
| **Total** | 29 | 100 | |

Source: Created by the author

It was observed that the majority of the employees on both sides belonged to the 25–34 age range after taking their age groupings into consideration. It has been noted that this category makes up 62% of line employees and 55% of terminal employees.

**Table 19:** Education Level of Container Terminal Respondents

| Education | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| **High School** | 1 | 3,4 | 3,4 |
| **Associate Degree** | 7 | 24,1 | 27,6 |
| **Bachelor's Degree** | 21 | 72,4 | 100 |
| **Total** | 29 | 100 | |

Source: Created by the author

**Table 20:** Education Level of Line Respondents

| Education | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| **Associate Degree** | 2 | 6,9 | 6,9 |
| **Bachelor's Degree** | 26 | 89,7 | 96,6 |
| **Master Degree** | 1 | 3,4 | 100 |
| **Total** | 29 | 100 | |

Source: Created by the author

When Tables 19 and 20 are examined, it is seen that the majority of the employees on both sides have a bachelor degree. It is noteworthy that among the port employees, they have high school graduate. While Line employees don’t have high school graduates, it is seen that one of the interviewees has a master's degree.

**Table 21:** Experience in the Industry of Container Terminal Respondents

| Experience in the industry | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| **0-4 years** | 1 | 3,4 | 3,4 |
| **5-9 years** | 20 | 69 | 72,4 |
| **10-14 years** | 7 | 24,1 | 96,6 |
| **15-19 years** | 1 | 3,4 | 100 |
| **Total** | 29 | 100 | |

Source: Created by the author

**Table 22:** Experience in the Industry of Line Respondents

| Experience in the industry | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| **0-4 years** | 3 | 10,3 | 10,3 |
| **5-9 years** | 12 | 41,4 | 51,7 |
| **10-14 years** | 10 | 34,5 | 86,2 |
| **15-19 years** | 4 | 13,8 | 100 |
| **Total** | 29 | 100 | |

Source: Created by the author

When the years of the participants in the sector are evaluated, it is seen that 69% of the terminal employees and 41% of the line employees have 5-9 years of experience.

**Table 23:** Experience in the Current Companyof Container Terminal Respondents

| Experience in the current company | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| **0-4 years** | 8 | 27,6 | 27,6 |
| **5-9 years** | 21 | 72,4 | 100 |
| **Total** | 29 | 100 | |

Source: Created by the author

**Table 24:** Experience in the Current Companyof Line Respondents

| Experience in the current company | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| **0-4 years** | 7 | 24,1 | 24,1 |
| **5-9 years** | 20 | 69 | 93,1 |
| **10-14 years** | 2 | 6,9 | 100 |
| **Total** | 29 | 100 | |

Source: Created by the author

When the years that the participants worked in their current enterprise are analysed, it can be understood the vast majority of employees have 5-9 years of experience on both sides.It was observed that only two of the line employees interviewed had 10-14 years of experience.

### 5.1.2. Container Terminal Perspective

The descriptive data of the study are presented in a systematic way by placing the container terminal's perspective first and Line's perspective second. Following the classification of the container terminal and line, the cause, course, and effect phases of the approach are described to give a clear understanding of the facts.

**Table 25:** Failure Type: Container Terminal Perspective

| Failure Type | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| **Outcome Failure** | 17 | 58,6 | 58,6 |
| **Process Failure** | 12 | 41,4 | 100 |
| **Total** | 29 | 100 | |

Source: Created by the author

Table 25 shows that 58.6% of the failure types are outcome failure. As it mentioned earlier outcome failure is caused by physical/instrumental elements and related to financial losses. Outcome failures encountered cause more economic loss from the terminal point of view and companies should pay more attention to such errors in order to reduce economic loss.

**Table 26:** Failure Category: Container Terminal Perspective

| Failure Category | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| **Operation** | 8 | 27,6 | 27,6 |
| **Customer Service** | 15 | 51,7 | 79,3 |
| **Sales/Marketing** | 2 | 6,9 | 86,2 |
| **Finance/Accounting** | 4 | 13,8 | 100 |
| **Total** | 29 | 100 | |

Source: Created by the author

There are four different failure classifications as operation, customer service, sales and marketing and also finance and accounting. Table 26 represents that when we grouped the failures, it was seen that the most of the failures belonged to the customer service group and then to the operation group.

**Table 27 :** Magnitude of Service Failure: Container Terminal Perspective

| Magnitude | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| **Minor 1** | | | |
| **2** | 1 | 3,4 | 3,4 |
| **3** | 4 | 13,8 | 17,2 |
| **4** | 2 | 6,9 | 24,1 |
| **5** | 8 | 27,6 | 51,7 |
| **6** | 4 | 13,8 | 65,5 |
| **7** | 5 | 17,2 | 82,8 |
| **8** | 3 | 10,3 | 93,1 |
| **9** | 1 | 3,4 | 96,6 |
| **Major 10** | 1 | 3,4 | 100 |
| **Total** | 29 | 100 | |

Source: Created by the author

When the participants were asked about the magnitude of the failure, 27.6% of them stated 5 according to the magnitude. In the second place, magnitude 7 was indicated with a rate of 17.2%. Accordingly, it is seen that the failures encountered have a significant degree.

**Table 28 :** Frequency of Service Failures: Container Terminal Perspective

| Frequency of Service Failure | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| **1** | | | |
| **2** | 1 | 3,4 | 3,4 |
| **3** | 7 | 24,1 | 27,6 |
| **4** | 4 | 13,8 | 41,4 |
| **5** | 4 | 13,8 | 55,2 |
| **6** | 6 | 20,7 | 75,9 |
| **7** | 5 | 17,2 | 93,1 |
| **8** | 1 | 3,4 | 96,6 |
| **9** | 1 | 3,4 | 100 |
| **10** | | | |
| **Total** | 29 | 100 | |

Source: Created by the author

Participants were asked about the frequency of service failures they encountered. 24.1% of the participants evaluated it as 3 points. No participant rated the frequency as 1 or 10. Many participants see the failure as important, even if they do not encounter very often.

**Table 29:** Recovery Actions: Container Terminal Perspective

| Recovery Actions | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| **Smybolic** | 11 | 37,9 | 37,9 |
| **Utilitarian** | 7 | 24,1 | 62,1 |
| **Mixed** | 2 | 6,9 | 69 |
| **No Recovery** | 9 | 31 | 100 |
| **Total** | 29 | 100 | |

Source: Created by the author

When the data obtained as a result of the interviews were evaluated, it was seen that the most symbolic compensation was applied against service failures. Symbolic recovery includes symbolic interaction like apology. Most participants said they received an apology for the failure.

**Table 30:** Satisfaction from Recovery: Container Terminal Perspective

| Satisfaction Level | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| **Very Dissatisfied** | 5 | 17,2 | 17,2 |
| **Dissatisfied** | 12 | 41,4 | 58,6 |
| **Neutral** | 4 | 13,8 | 72,4 |
| **Satisfied** | 7 | 24,1 | 96,6 |
| **Very Satisfied** | 1 | 3,4 | 100 |
| **Total** | 29 | 100 | |

Source: Created by the author

Although they stated that they were mostly apologized, most of the participants stated that they were not satisfied with the recovery method. Container terminal participants were dissatisfied with the rate of 41,4%, on the other hand 24,1% were satisfied and only 3,4% were very dissatisfied. They believe that apologizing is not a solution.

**Table 31:** Relations with Shipping Line after Service Failure and Recovery

| Relation Level | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| **Diminished** | 5 | 17,2 | 17,2 |
| **Not Changed** | 18 | 62,1 | 79,3 |
| **Improved** | 6 | 20,7 | 100 |
| **Total** | 29 | 100 | |

Source: Created by the author

As shown in Table 31, it is understood that the relations of the participants did not change after the service failure and recovery.While a small part of the participants stated that their relationship was diminished, none of the participants stated that their relationship ruptured.

**Table 32:** Relation Between Digitalisation and Service Failure: Container Terminal Perspective

| Relation | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| **Yes** | 5 | 17,2 | 17,2 |
| **No** | 24 | 82,8 | 100 |
| **Total** | 29 | 100 | |

Source: Created by the author

As stated in Table 32, only 17.2% of the participants believe that digitalisation causes service failure, while 82.8% believe that it does not cause service failure. The majority of responders think digitalization considerably simplifies their work rather than making it more difficult.

Participant #23 stated that "I belive that it has a positive effect. It has greatly facilitated our work and reduced human failures. But sometimes it condemns you to system. In case of a interruption in the system, the operation may stop."

**Table 33:** Relation Between Covid 19 Pandemic and Service Failure: Container Terminal Perspective

| Relation | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| **Yes** | 5 | 17,2 | 17,2 |
| **No** | 24 | 82,8 | 100 |
| **Total** | 29 | 100 | |

Source: Created by the author

On the other hand, the participants were asked whether they encountered any service failures due to Covid 19 pandemic or not. Although the participants did not state that the pandemic had an effectdirectly, they stated that they encountered some problems after the pandemic. Some answers are as follows;

Participants #22 states “Working hours were returned to 2 shifts during the intense pandemic time. As a result of long working hours, human errors started to increase.”

Participants #10 states “Employees were adversely impacted mentally in addition to working long hours.”

In the next section, descriptive statistics of Line employees were shown and explained.

### 5.1.3. Shipping Line Perspective

The same questions that were asked to the employees of the container terminal were asked to the line employees from the Line perspective. In total, responses were received from 29 participants.

**Table 34:** Failure Type: Line Perspective

| Failure Type | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| **Outcome Failure** | 16 | 55,2 | 55,2 |
| **Process Failure** | 13 | 44,8 | 100 |
| **Total** | 29 | 100 | |

Source: Created by the author

Table 34 shows the figures are close to one another when the failuretypes are compared. It has been shown that outcome failure accounts for 55.2% of total failures.As in the perspective of the container terminal, it has been seen that the outcome failure is in the majority here. Failures encountered cause more economic loss from both point of view.

**Table 35:** Failure Category: Line Perspective

| Failure Category | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| **Operation** | 23 | 79,3 | 79,3 |
| **Customer Service** | 3 | 10,3 | 89,7 |
| **Sales/Marketing** | 2 | 6,9 | 96,6 |
| **Finance/Marketing** | 1 | 3,4 | 100 |
| **Total** | 29 | 100 | |

Source: Created by the author

Service failures have been divided into 4 groups as operation, customer service, sales/marketing and finance/marketing. Looking at Table 35 from the line perspective, it was understood that the most service failures belonged to the operation group.

**Table 36:** Magnitude of Service Failure: Line Perspective

| Magnitude | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| **2** | 1 | 3,4 | 3,4 |
| **3** | 2 | 6,9 | 10,3 |
| **4** | 2 | 6,9 | 17,2 |
| **5** | 7 | 24,1 | 41,4 |
| **6** | 4 | 13,8 | 55,2 |
| **7** | 5 | 17,2 | 72,4 |
| **8** | 3 | 10,3 | 82,8 |
| **9** | 5 | 17,2 | 100 |
| **Total** | 29 | 100 | |

Source: Created by the author

When asked to describe the failure's magnitude, 24.1% of the participants responded as 5 when describing it. A magnitude 7 was detected at a rate of 17.2%, placing it in second place.

**Table 37:** Frequency of Service Failure: Line Perspective

| Frequency of Service Failure | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| **2** | 4 | 13,8 | 13,8 |
| **3** | 11 | 37,9 | 51,7 |
| **4** | 6 | 20,7 | 72,4 |
| **5** | 2 | 6,9 | 79,3 |
| **6** | 1 | 3,4 | 82,8 |
| **7** | 3 | 10,3 | 93,1 |
| **8** | 1 | 3,4 | 96,6 |
| **9** | 1 | 3,4 | 100 |
| **Total** | 29 | 100 | |

Source: Created by the author

Participants were asked to rate the frequency of service failures they encountered from 1 to 10. In Table 37, 37.9% of the participants evaluated the frequency as 3. Accordingly, it can be said that they do not encounter service errors very often.

**Table 38:** Recovery Actions: Line Perspective

| Recovery Actions | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| **Symbolic** | 9 | 31 | 31 |
| **Utilitarian** | 12 | 41,4 | 72,4 |
| **Mixed** | 6 | 20,7 | 93,1 |
| **No Recovery** | 2 | 6,9 | 100 |
| **Total** | 29 | 100 | |

Source: Created by the author

Table 38 makes it obvious that, from the line perspective, utilitarian recovery is the most popular recovery technique.The customer receives a financial benefit from utilitarian service recovery, such as compensation, a discount, etc. Most of the participants stated that they would be given a compensation or a discount in some tariffs in the year-end agreements as recovery for failure.

**Table 39:** Satisfaction from Recovery: Line Perspective

| Satisfaction Level | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| **Very Dissatisfied** | 3 | 10,3 | 10,3 |
| **Dissatisfied** | 12 | 41,4 | 51,7 |
| **Neutral** | 2 | 6,9 | 58,6 |
| **Satisfied** | 12 | 41,4 | 100 |
| **Total** | 29 | 100 | |

Source: Created by the author

The number of people who are satisfied with the recovery and the number of people who are dissatisfied appear to be equal in the Table 39. It is realized that utilitarian recovery approach both satisfied and dissatisfied at the same rate of participants from line perspective.

**Table 40:**Relations with Terminal after Service Failure and Recovery

| Relations | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| **Diminished** | 5 | 17,2 | 17,2 |
| **Not Changed** | 15 | 51,7 | 69 |
| **Improved** | 9 | 31 | 100 |
| **Total** | 29 | 100 | |

Source: Created by the author

Table 40 indicates that the majority of the participants reported that their relationship with the terminal did not change after service failure and recovery actions.The secondary majority reported that their relationship with the terminal improved after service failure and recovery. This also shows and confirms the service recovery paradox in this sample.

**Table 41:** Relation Between Digitalisation and Service Failure: Line Perspective

| Relation | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| **Yes** | 9 | 31 | 31 |
| **No** | 20 | 69 | 100 |
| **Total** | 29 | 100 | |

Source: Created by the author

As can be seen from the line perspective in Table 41, the majority of the participants believe that digitalization does not cause service failure. Participants #3 expressed that "More technology brings more system faults, integration issues, etc. In the event of a cyberattack, operations in ports come to a standstill or even stop. In the past, we experienced this situation in a port in Aliağa."

**Table 42:** Relation Between Covid 19 Pandemic and Service Failure: Line Perspective

| Relation | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| **Yes** | 4 | 13,8 | 13,8 |
| **No** | 25 | 86,2 | 100 |
| **Total** | 29 | 100 | |

Source: Created by the author

Line employees were also asked if covid 19 had an effect on service failures. Almost all of them stated that it had no effect. But some extreme examples are given here as well. Participant #1 stated that "The operation period were extended due to the decreasing number of personnel. This caused the ships to leave late and the cargo to arrive late."Participants #2 said "Operations slowed partially due to lack of operators in ports".

## 5.2.QUALITATIVE OUTCOMES

In this part of the study, qualitative outcomes include cause, course and result attributes of failures and contribute to understand the grand scheme.

### 5.2.1. Cause of the Service Failure

All answers for both perspectives were categorized and analyzed accordingly. Firstly failure types were classified as outcome failure or process failure. Process failure means how the core service is delivered to the customer throughout service delivery, while outcome failure means what services customers really acquire and related to financial losses.

**Table 43:** Failure Types: Both Perspectives

| Failure Type | Line Perspective | Terminal Perspective | Total |
|---|---|---|---|
| Outcome Failure | 16 | 17 | 33 |
| Process Failure | 13 | 12 | 25 |
| Total | 29 | 29 | 58 |

Source: Created by the author

Table 43 summarizes failure types from both perspectives to compare clearly. Based on the table, the most outcome failure was experienced by line perspective and terminal perspective. Companies should pay more attention to such failures in order

to reduce economic loss since outcome failures frequently lead to increased financial loss.

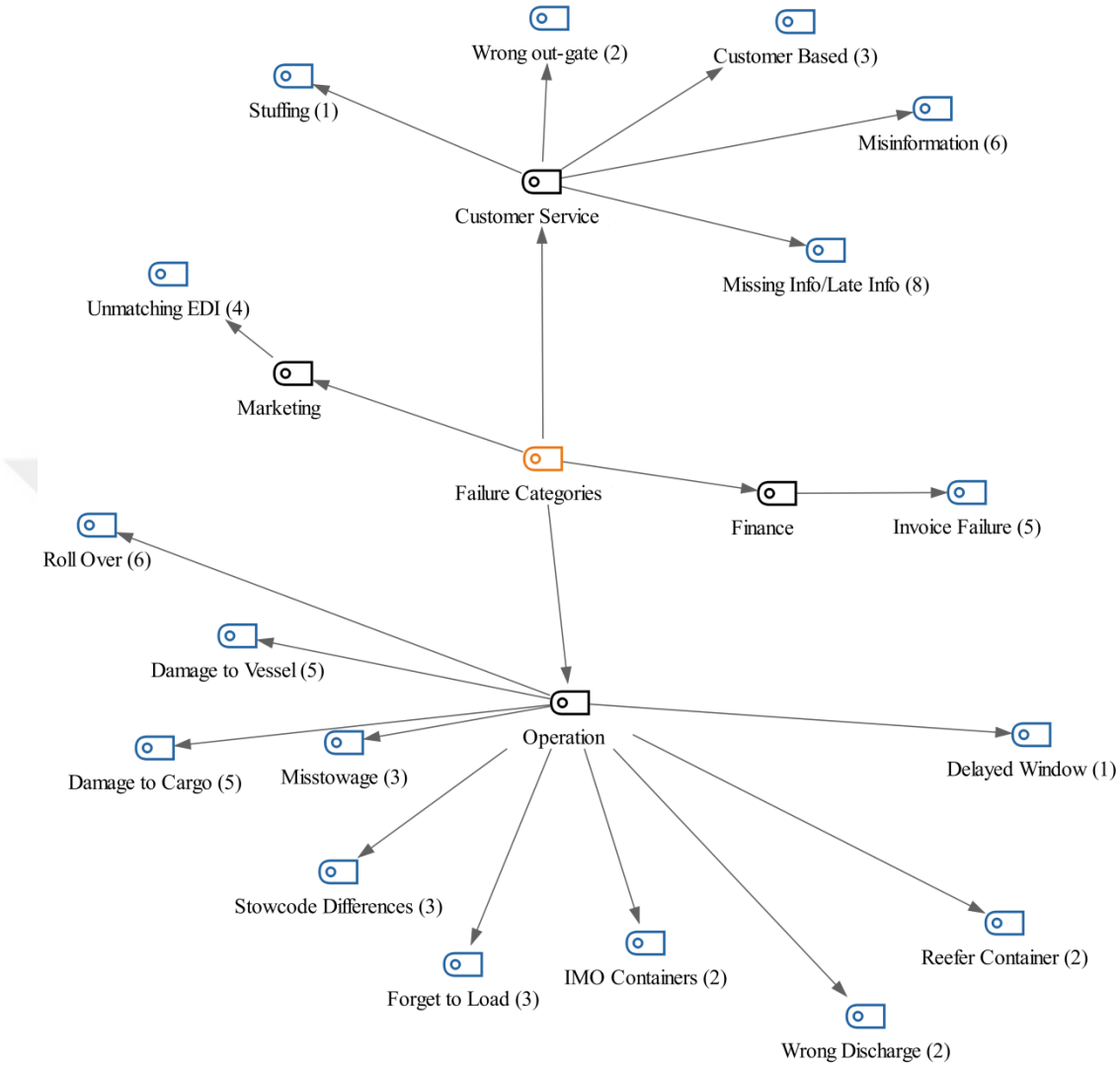
**Table 44:** Failure Categories: Both Perspectives

| **Failure Category** | **Line Perspective** | **Terminal Perspective** | **Total** |
|---|---|---|---|
| Operation | 23 | 8 | 31 |
| Customer Service | 3 | 15 | 18 |
| Sales/Marketing | 2 | 2 | 4 |
| Finance/Accounting | 1 | 4 | 5 |
| **Total** | 29 | 29 | 58 |

Source: Created by the author

Failures encountered are grouped as operations, customer service, sales/marketing, finance/accounting. As seen in Table 44, the most common group on the line perspective is operational failure. On the terminal side, failures were encountered mostly in the customer service category. Figure 16 prepared in MAXQDA shows the failures more comprehensively with their categories.

**Figure 16:** Failure Categories: Both Perspectives



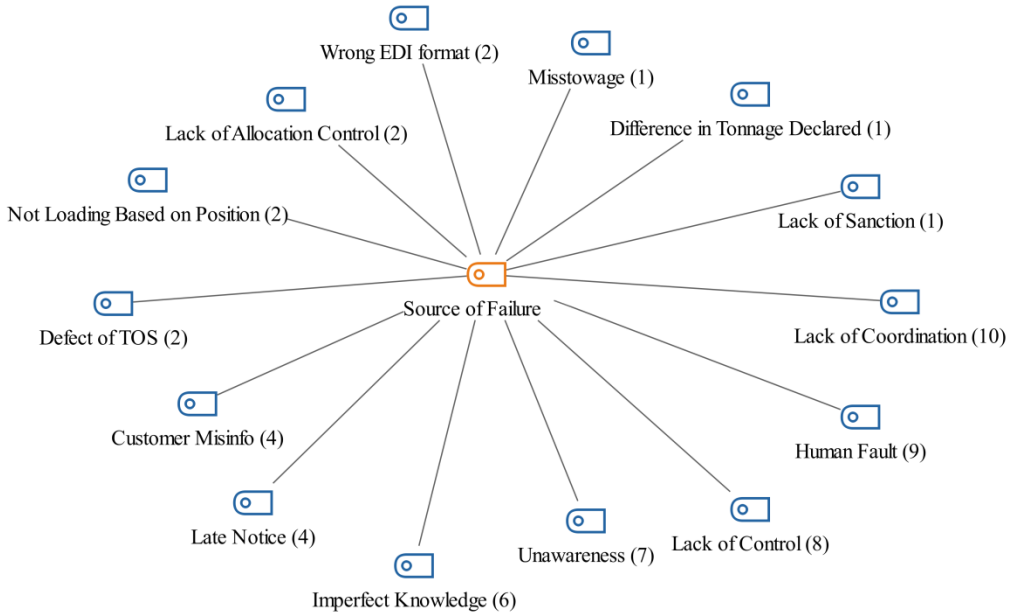

Source: Created by the author

It can be said that there are many sub-branch service failures under main groups. Damage to cargo or damage to vessel is a common failure and has an important magnitude degree operationally. In addition, it is stated as a common service failure that containers roll over of container POD after gate-in to terminal. Roll over also causes extra movement, expense and time loss in the field. It can be said roll overs sometimes cause prolongation of vessel operations and lower performance.

Missing information or misinformation is an another kind of service failure. Participant #5 gave a vital example: “Line has incorrectly transmitted the OOG overflow dimensions to terminal. When the cargo is loaded into the hold of vessel, it is noticed that the hatch cover is not close during vessel operation. Thus vessel’s departure is delayed a few hours.” This example also illustrates the importance of correct information flow.

Unmatching EDI and invoice failure are other kinds of failure. Some participants indicate that unmatching EDI can cause disturbingproblems. When the EDI mappings of the terminal and the line do not match, the terminal cannot make the vessel plan and start the operation. Therefore, the use of EDI in the same mapping is one of the factors considered important by the participants.

**Figure 17:** Source of  Service Failures: Both Perspectives




Source: Created by the author

Figure 17 shows source of service failures from both perspectives.  The majority of failures were brought on by lack of coordination, human fault, lack of knowledge, late notice, misinformation and etc. Some participants drawn attention to less frequent but important mistakes. For example, participants #22 attracted notice to the lack of vessel allocation control.

*The agency's failure to track vessel allocations can effect us negatively. Receiving all incoming bookings without checking the allocation of the vessel onto current week's vessel. When the vessel operation is planned, almost half of the containers are canceled from the vessel. This causes too much transhipment during operation. Unnecessary transhipment during the operation both decreases the performance of the vessel and delays the departure of the vessel as the operation time will be prolonged. Indirectly, the berthing of the ship behind is also delayed. Our other customers are also in a difficult situation, embarrassment occurs against them. After the ship departs the port, housekeeping is required in the yard.*

### 5.2.2. Course of Service Failure

Table 45 presents the recovery codes, and Figure 17 shows the associated code map.While the most common compensation method in terminal perspective is symbolic compensation, it is seen that it is utilitarian compensation in line perspective.At least the mixed recovery method is encountered.

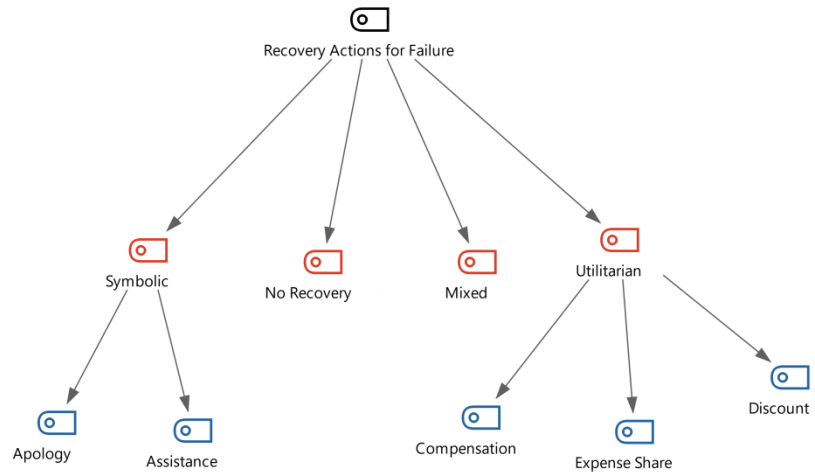
**Table 45:** Recovery Actions for Service Failures: Both Perspectives

| Recovery Actions | Line Perspective | Terminal Perspective | Total |
|---|---|---|---|
| **Symbolic** | 9 | 11 | 20 |
| **Utilitarian** | 12 | 7 | 19 |
| **Mixed** | 6 | 2 | 8 |
| **No Recovery** | 2 | 9 | 11 |
| **Total** | 29 | 29 | 58 |

Source: Created by the author

As shown in Figure 18 recovery methods were categorised as symbolic, utilitarian, mixed and no recovery. Symbolic recovery has sub codes with apology and assistance. Utilitarian recovery includes compensation and expense share.

**Figure 18:** Recovery Actions for Service Failures:  Both Perspectives

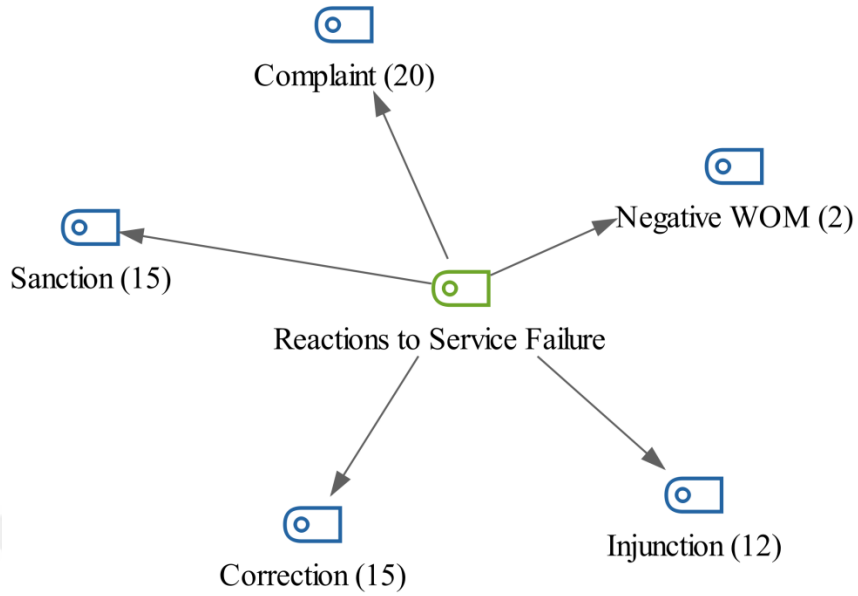



Source: Created by the author

### 5.2.3. Result of Service Failure

Participants were asked what their reaction was to service failure. Answers were grouped as complaint, sanction, correction, injuction and negaive word of mouth.  In Figure 19, it was observed that the most general reaction was complaint. More than one reaction was given to some failures.

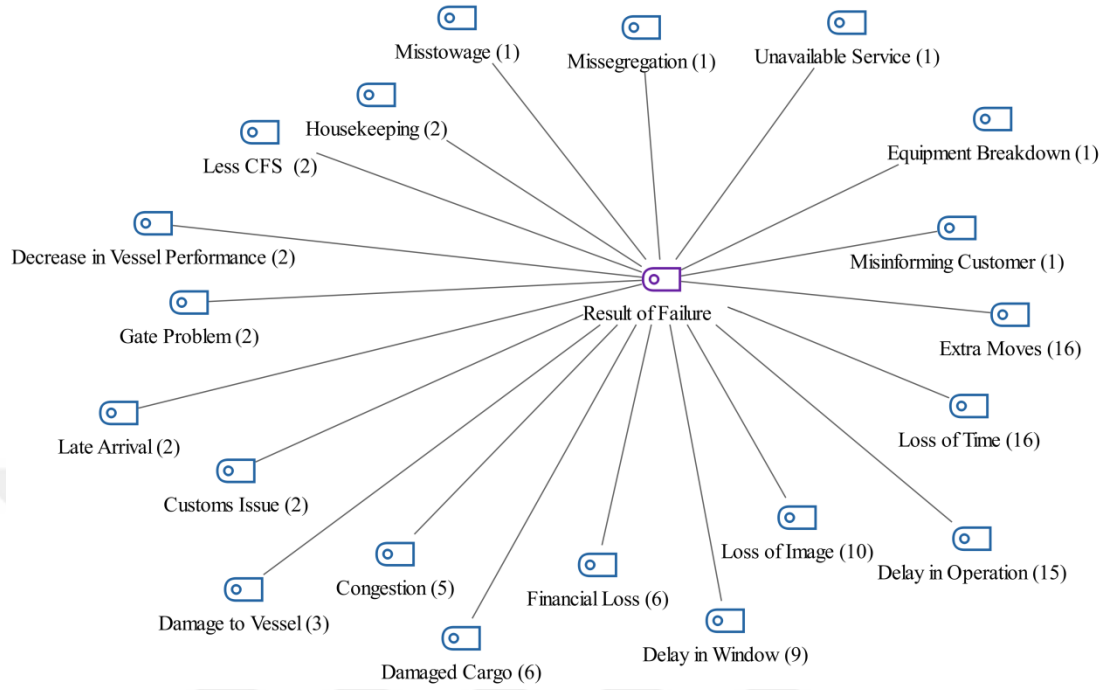
**Figure 19:** Reactions to Service Failure: Both Perspectives




Source: Created by the author

Figure 20 draws all groups of service failure result. Many of the failures have been found to cause unnecessary transshipment movement in terminal yard, extended operation time, wasted time, and in some cases damage to the vessel or cargo. All of this also means a waste of money. It was stated by the participants that in some cases, it also caused a loss of image against other customers.

**Figure 20:** Result of Service Failures: Both Perspectives




Source: Created by the author

## 5.3.HYPOTHESIS TESTS

### 5.3.1. Container Terminal Perspective

#### 5.3.1.1. Chi-Square Test

The following is a list of all hypotheses from the container terminal perspective for the chi-square test.

$H_1$ = Failure type affects relationship with the shipping line after service failure and recovery

$H_2$ = Failure category affects relationship with the shipping line after service failure and recovery

$H_3$ = Recovery actions affects relationship with the shipping line after service failure and recovery

$H_4$ = There is a connection between digitalisation and service failure frequency

$H_5$ = There is a connection between Covid 19 pandemic and service failure frequency

**Table 46:** Failure Type and Relations with Shipping Line Chi-Square Test

| | **Diminished** | **Not Changed** | **Improved** | **Total** |
|---|---|---|---|---|
| **Outcome Failure** | 2 | 11 | 4 | 17 |
| **Process Failure** | 3 | 7 | 2 | 12 |
| **TOTAL** | 5 | 18 | 6 | 29 |

Source: Created by the author

Based on the Pearson Chi-Square tests, the hypothesis reflects 0,921 Value, 2 df, and Asymp. Sig.(2-sided) 0,631. P value=0,631>0,05. Accordingly,

$H_1$ = Failure type affects relationship with the shipping line after service failure and recoveryis not supported.

**Table 47:** Failure Categories and Relations with Shipping Line Chi-Square Test

| | **Diminished** | **Not Changed** | **Improved** | **Total** |
|---|---|---|---|---|
| **Operation** | 1 | 6 | 1 | 8 |
| **Customer Service** | 3 | 10 | 2 | 15 |
| **Sales/Marketing** | 0 | 0 | 2 | 2 |
| **Finance/Accounting** | 1 | 2 | 1 | 4 |
| **TOTAL** | 5 | 18 | 6 | 29 |

Source: Created by the author

Based on the Pearson Chi-Square tests, the hypothesis reflects 9,025 Value, 6 df, and Asymp. Sig.(2-sided) 0,172. P value=0,172>0,05. Accordingly,

$H_2$ = Failure category affects relationship with the shipping line after service failure and recoveryis not supported.

**Table 48:** Recovery Actions and Relations with Shipping Line Chi-Square Test

| | | Relations with Shipping Line | | | |
|---|---|---|---|---|---|
| | | **Diminished** | **Not Changed** | **Improved** | **Total** |
| **Recovery Actions** | **Smybolic** | 3 | 7 | 1 | 11 |
| | **Utilitarian** | 0 | 4 | 3 | 7 |
| | **Mixed** | 0 | 0 | 2 | 2 |
| | **No Recovery** | 2 | 7 | 0 | 9 |
| | **TOTAL** | 5 | 18 | 6 | 29 |

Source: Created by the author

Based on the Pearson Chi-Square tests, the hypothesis reflects 14,274 Value, 6 df, and Asymp. Sig.(2-sided) 0,027. P value 0,027<0,05. Accordingly,

$H_3$ = Recovery actions affects relationship with the shipping line after service failure and recoveryis supported.

**Table 49:** Digitalisation and Service Failure Frequency Container Terminal Perspective Chi-Square Test

| | | Digitalisation Effect | | |
|---|---|---|---|---|
| | | **Yes** | **No** | **TOTAL** |
| **Frequency of Service Failure** | 2 | 0 | 1 | 1 |
| | 3 | 2 | 5 | 7 |
| | 4 | 1 | 3 | 4 |
| | 5 | 1 | 3 | 4 |
| | 6 | 1 | 5 | 6 |
| | 7 | 0 | 5 | 5 |
| | 8 | 0 | 1 | 1 |
| | 9 | 0 | 1 | 1 |
| | **TOTAL** | **5** | **24** | **29** |

Source: Created by the author

Based on the Pearson Chi-Square tests, the hypothesis reflects 2,635 Value, 7 df, and Asymp. Sig.(2-sided) 0,917. P value 0,917>0,05. Accordingly,

$H_4$ = There is a connection between digitalisation and service failure frequency is not supported

**Table 50:** Covid 19 Pandemic and Service Failure Frequency Container Terminal Perspective Chi-Square Test

| | | COVID 19 Pandemic Effect | | |
|---|---|---|---|---|
| | | **Yes** | **No** | **TOTAL** |
| **Frequency of Service Failure** | 2 | 1 | 0 | 1 |
| | 3 | 0 | 7 | 7 |
| | 4 | 0 | 4 | 4 |
| | 5 | 0 | 4 | 4 |
| | 6 | 1 | 5 | 6 |
| | 7 | 2 | 3 | 5 |
| | 8 | 0 | 1 | 1 |
| | 9 | 1 | 0 | 1 |
| | **TOTAL** | 5 | 24 | 29 |

Source: Created by the author

Based on the Pearson Chi-Square tests, the hypothesis reflects 14,750 Value, 7 df, and Asymp. Sig.(2-sided) 0,039. P value 0,039<0,05. Accordingly,

$H_5$ = There is a connection between Covid 19 pandemic and service failure frequency is supported.

#### 5.3.1.2. ANOVA Tests

The following is a list of all hypotheses from the container terminal perspective for ANOVA test.

$H_6$ = Failure magnitude diverges with regard to the relationship with shipping line after service failure and recovery

$H_7$ = Relationship with shipping line after service failure and recovery diverges with regard to the failure frequency

$H_8$ =Relationship with shipping line after service failure and recovery diverges with regard to the satisfaction from the recovery

**Table 51:** Failure Magnitude and Relations with Shipping Line

| | N | Mean | Std. Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| **Diminished** | 5 | 5,8 | 2,77489 | 3 | 10 |
| **Not Changed** | 18 | 5,5556 | 1,6169 | 3 | 8 |
| **Improved** | 6 | 5,8333 | 2,48328 | 2 | 9 |
| **Total** | 29 | 5,6552 | 1,95075 | 2 | 10 |

p value=0,944>0,05

Source: Created by the author

$H_6$ = Failure magnitude diverges with regard to the relationship with shipping line after service failure and recoveryis not supported.

**Table 52:** Failure Frequency and Relations with Shipping Line

| | N | Mean | Std. Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| **Diminished** | 5 | 5,2 | 2,48998 | 3 | 9 |
| **Not Changed** | 18 | 5,4444 | 1,6881 | 2 | 8 |
| **Improved** | 6 | 3,8333 | 1,16905 | 3 | 6 |
| **Total** | 29 | 5,069 | 1,81129 | 2 | 9 |

Source: Created by the author

p value=0,168>0,05

$H_7$ = Relationship with shipping line after service failure and recovery diverges with regard to the failure frequencyis not supported and no more research was done.

**Table 53:** Satisfaction Level from the Recovery and Relations with Shipping Line

| | N | Mean | Std. Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| **Diminished** | 5 | 1,8 | 0,83666 | 1 | 3 |
| **Not Changed** | 18 | 2,2222 | 0,8782 | 1 | 4 |
| **Improved** | 6 | 4,1667 | 0,40825 | 4 | 5 |
| **Total** | 29 | 2,5517 | 1,15221 | 1 | 5 |

Source: Created by the author

p value=0,00<0,05

$H_8$ =Relationship with shipping line after service failure and recovery diverges with regard to the satisfaction from the recoveryis supported.

Since the homogeneity value of 0,284 greater than 0.05, a post hoc analysis was carried on. The post hoc tests are displayed in below table.

**Table 54:** Post Hoc Analysis for Satisfaction from Recovery and Relations with Shipping Line

| Relations with Shipping Line | | Mean Difference | Std. Error | Sig. |
|---|---|---|---|---|
| **Diminished** | **Not Changed** | -0,42222 | 0,40569 | 0,588 |
| | **Improved** | -2,36667* | 0,48594 | 0 |
| **Not Changed** | **Diminished** | 0,42222 | 0,40569 | 0,588 |
| | **Improved** | -1,94444* | 0,37831 | 0 |
| **Improved** | **Diminished** | 2,36667* | 0,48594 | 0 |
| | **Not Changed** | 1,94444* | 0,37831 | 0 |

Source: Created by the author

### 5.3.2. Shipping Line Perspective

#### 5.3.2.1. Chi-Square Test

The following is a list of all hypotheses from the shipping lineperspective for the chi-square test.

$H_9$ = Failure type affects relationship with the container terminal after service failure and recovery

$H_{10}$ = Failure categoryaffects relationship with the container terminal after service failure and recovery

$H_{11}$ = Recovery action affects relationship with the container terminal after service failure and recovery

$H_{12}$ = There is a connection between digitalisation and service failure frequency

$H_{13}$ =There is a connection between Covid 19 pandemic and service failure frequency

**Table 55:**Failure Type and Relations with Container Terminal Chi-Square Test

| | | **Relations with Container Terminal** | | | |
|---|---|---|---|---|---|
| | | **Diminished** | **Not Changed** | **Improved** | **Total** |
| **Failure Type** | **Outcome Failure** | 4 | 11 | 1 | 16 |
| | **Process Failure** | 1 | 4 | 8 | 13 |
| | **Total** | 5 | 15 | 9 | 29 |

Source: Created by the author

Based on the Pearson Chi-Square tests, the hypothesis reflects 10,311 Value, 2 df, and Asymp. Sig.(2-sided) 0,006. P value 0,006<0,05. Accordingly,

$H_9$ = Failure type affects relationship with the container terminal after service failure and recoveryis supported.

**Table 56:**Failure Categories and Relations with Container TerminalChi-Square Test

| | | Relations with Container Terminal | | | |
|---|---|---|---|---|---|
| | | **Diminished** | **Not Changed** | **Improved** | **Total** |
| **Failure Category** | **Operation** | 3 | 15 | 5 | 23 |
| | **Customer Service** | 2 | 0 | 1 | 3 |
| | **Sales/Marketing** | 0 | 0 | 2 | 2 |
| | **Finance/Marketing** | 0 | 0 | 1 | 1 |
| | **Total** | 5 | 15 | 9 | 29 |

Source: Created by the author

Based on the Pearson Chi-Square tests, the hypothesis reflects 14,159 Value, 6 df, and Asymp. Sig.(2-sided) 0,028. P value 0,028<0,05. Accordingly,

$H_{1\ 0}$ = Failure categoryaffects relationship with the container terminal after service failure and recoveryis supported.

**Table 57:**Recovery Actions and Relations with Container TerminalChi-Square Test

| | | Relations with Container Terminal | | | |
|---|---|---|---|---|---|
| | | **Diminished** | **Not Changed** | **Improved** | **Total** |
| **Recovery Actions** | **Symbolic** | 2 | 4 | 3 | 9 |
| | **Utilitarian** | 1 | 8 | 3 | 12 |
| | **Mixed** | 1 | 2 | 3 | 6 |
| | **No Recovery** | 1 | 1 | 0 | 2 |
| | **Total** | 5 | 15 | 9 | 29 |

Source: Created by the author

Based on the Pearson Chi-Square tests, the hypothesis reflects 4,404 Value, 6 df, and Asymp. Sig.(2-sided) 0,622. P value 0,622>0,05. Accordingly,

$H_{1\ 1}$ = Recovery action affects relationship with the container terminal after service failure and recoveryis not supported.

**Table 58:** Digitalisation and Service Failure Frequency Shipping Line Perspective Chi-Square Test

| | | **Digitalisation Effect** | | |
|---|---|---|---|---|
| | | **Yes** | **No** | **Total** |
| **Frequency of Service Failure** | **2** | 1 | 3 | 4 |
| | **3** | 4 | 7 | 11 |
| | **4** | 1 | 5 | 6 |
| | **5** | 2 | 0 | 2 |
| | **6** | 0 | 1 | 1 |
| | **7** | 1 | 2 | 3 |
| | **8** | 0 | 1 | 1 |
| | **9** | 0 | 1 | 1 |
| | **Total** | 9 | 20 | 29 |

Source: Created by the author

Based on the Pearson Chi-Square tests, the hypothesis reflects 6,595 Value, 7 df, and Asymp. Sig.(2-sided) 0,472. P value 0,472>0,05. Accordingly,

$H_{1\ 2}$ = There is a connection between digitalisation and service failure frequency is not supported.

**Table 59:** Covid 19 Pandemic and Service Failure Frequency Shipping Line Perspective Chi-Square Test

| | | COVID 19 Effect | | |
|---|---|---|---|---|
| | | **Yes** | **No** | **Total** |
| **Frequency of Service Failure** | **2** | 0 | 4 | 4 |
| | **3** | 1 | 10 | 11 |
| | **4** | 3 | 3 | 6 |
| | **5** | 0 | 2 | 2 |
| | **6** | 0 | 1 | 1 |
| | **7** | 0 | 3 | 3 |
| | **8** | 0 | 1 | 1 |
| | **9** | 0 | 1 | 1 |
| | **Total** | 4 | 25 | 29 |

Source: Created by the author

Based on the Pearson Chi-Square tests, the hypothesis reflects 8,740 Value, 7 df, and Asymp. Sig.(2-sided) 0,272. P value 0,272>0,05. Accordingly,

$H_{1\ 3}$ =There is a connection between Covid 19 pandemic and service failure frequency is not supported.

### 5.3.2.2. ANOVA Tests

The following is a list of all hypotheses from the shipping line perspective for ANOVA test.

$H_{1\ 4}$ = Failure magnitude differs with regard to the relationship with container terminal after service failure and recovery

$H_{1\ 5}$ =Relationship with the container terminal after service failure and recovery differs with regard to the failure frequency

$H_{1\ 6}$ =Relationship with the container terminal after service failure and recovery differs with regard to the satisfaction from the recovery

**Table 60:** Failure Magnitude and Relations with Container Terminal

| | N | Mean | Std. Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| **Diminished** | 5 | 6,8 | 1,48324 | 5 | 9 |
| **Not Changed** | 15 | 6,6 | 2,32379 | 2 | 9 |
| **Improved** | 9 | 5,1111 | 1,16667 | 3 | 7 |
| **Total** | 29 | 6,1724 | 1,9833 | 2 | 9 |

Source: Created by the author

p value=0,152>0,05

So $H_{1\ 4}$ = Failure magnitude differs with regard to the relationship with container terminal after service failure and recovery is not supported.

**Table 61:**Failure Frequency and Relations with Container Terminal

| | N | Mean | Std. Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| **Diminished** | 5 | 4,4 | 1,67332 | 3 | 7 |
| **Not Changed** | 15 | 3,8 | 1,97122 | 2 | 8 |
| **Improved** | 9 | 4,4444 | 2,00693 | 3 | 9 |
| **Total** | 29 | 4,1034 | 1,89633 | 2 | 9 |

Source: Created by the author

p value=0,687>0,05

$H_{1\ 5}$ =Relationship with the container terminal after service failure and recovery differs with regard to the failure frequency is not supported.

**Table 62:** Satisfaction Level from the Recovery and Relations with Container Terminal

| | N | Mean | Std. Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| **Diminished** | 5 | 2 | 1,22474 | 1 | 4 |
| **Not Changed** | 15 | 2,3333 | 0,8165 | 1 | 4 |
| **Improved** | 9 | 4 | 0 | 4 | 4 |
| **Total** | 29 | 2,7931 | 1,11417 | 1 | 4 |

p value=0,00<0,05

Source: Created by the author

$H_{1\ 6}$ =Relationship with the container terminal after service failure and recovery differs with regard to the satisfaction from the recovery is supported. Homogeneity variance is 0,008<0,05, thus post hoc analysis was not carried on.

**Table 63:** Tests of Normality

| | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|
| | Statistic | df | Sig. | Statistic | df | Sig. |
| Failure Type | 0,382 | 29 | 0 | 0,628 | 29 | 0 |
| Failure Category | 0,322 | 29 | 0 | 0,796 | 29 | 0 |
| Recovery Actions | 0,225 | 29 | 0,001 | 0,781 | 29 | 0 |
| Experience in the industry | 0,404 | 29 | 0 | 0,715 | 29 | 0 |
| Experience in the company | 0,452 | 29 | 0 | 0,561 | 29 | 0 |
| Magnitude of Service Failure | 0,149 | 29 | 0,1 | 0,966 | 29 | 0,45 |
| Frequency of Service Failure | 0,149 | 29 | 0,098 | 0,939 | 29 | 0,093 |
| Satisfaction from Recovery | 0,27 | 29 | 0 | 0,875 | 29 | 0,003 |
| Relations with Shipping Line | 0,315 | 29 | 0 | 0,778 | 29 | 0 |
| Digitalization effects on service failures | 0,501 | 29 | 0 | 0,46 | 29 | 0 |
| Covid19 effects on service failures | 0,501 | 29 | 0 | 0,46 | 29 | 0 |

Source: Created by the author

Conducting a parametric test requires the fulfilment of certain assumptions. The first assumption is that the data is normally distributed. In order to check the normality of the data collected, descriptive statistics were produced. The test of normality Kolmogrov – Smirnova and Shapiro – Wilk were used, and sig values were under 0,05. So, Skewness and Kurtosis were also used to judge the normality of data. Though a normal distribution has both skewness and kurtosis values equal to

zero (Field, 2009; Malhotra, 2008), for psychometric purposes, skewness and kurtosis values between -2 to +2 are acceptable (George & Mallery, 2010; Khan, 2015) and the values of this research are between acceptable range.

## 5.4.RELIABILITY OF THE RESEARCH

Reproducibility of study findings is a key component of reliability in qualitative research. Internal reliability concerns if other researchers can reach the same conclusions using the same data, whereas external reliability concerns whether study findings can be achieved in the same way in comparable situations (Sığrı, 2021: 137). A crucial aspect of validity in qualitative research is the detailed reporting of the data gathered and the explanation of how the researcher arrived at the findings (Yıldırım and Şimşek, 2016).

It can be summarized what has been done in this approach to improve reliability with in the study.

- The steps of the research process and methodology are detailed in depth,
- The procedures for data collection, processing, analysis are outlined in detail,
- At different points throughout the investigation, the opinions of others were also gathered. While coding for the questions, several experts in the related subject were specifically engaged,
- Respondents from various departments with a variety of experiences were involved in the study.
- The participant quotes provided evidence in support of the outcomes from the interviews.
- The research findings are thoroughly explained and graphically shown using the MAXQDA 2020 program to enable comparisons.

## 5.5. FINDINGS OF THE RESEARCH

It is considered very important for businesses to ensure customer satisfaction in order to compete in the market under increasing competitive conditions. There have been many studies on service failures and recovery, but the majority of these studies (e.g., Bitner, Booms, & Tetreault, 1990; Hoffman, Kelley, & Rotalsky, 1995; Lin, Huang, & Huang, 2003) centered on classifying service failure and recovery and defining the connections between service failure, service recovery, and other variables (e.g., Ha & Jang, 2009). Particularly in service failure and service recovery classifiying research, the critical incident technique (CIT) is a qualitative research methodology that has been employed.

Main findings can be summarized and highlighted as follows,

- It is remarkable how few women employees work in container terminals than the employees in shipping lines especially in operation departments.
- Operation and customer service departments experience more service failures than other departments. This could be as a result of the quick responses in these departments.
- Line perspective and terminal perspective both had the highest rates of outcome failure. As outcome failures typically result in greater financial loss, firms should give greater consideration to these failures to avoid economic loss.
- This research has revealed that using many recovery techniques is one of the most efficient recovery approaches.
- Although participants stated that they were mostly apologized, most of the participants stated that they were not satisfied with the recovery method. Mostly believe that apologizing is not a solution and looking for a permanent solution.
- The majority of respondents believe that digitization significantly simplifies their work rather than making it more difficult.
- Most of respondents stated that Covid-19 adversely impacted mentally and also human based failures increased due to working long hours in lockdown period.

- It has been understood that missing or misinformation plays a significant role in the occurrence of service failures. For this reason, it is believed by the participants that businesses should prioritize information management.

After analyzing all hypotheses, the summary figure is as follow,

| HYPOTHESES (For Terminal Perspective) | Results |
|---|---|
| **H1:** Failure type affects relationship with the shipping line after service failure and recovery | Not supported |
| **H2:** Failure category affects relationship with the shipping line after service failure and recovery | Not supported |
| **H3:** Recovery actions affects relationship with the shipping line after service failure and recovery | Supported |
| **H4:** There is a connection between digitalisation and service failure frequency | Not supported |
| **H5:**There is a connection between Covid 19 pandemic and service failure frequency | Supported |
| **H6:** Failure magnitude diverges with regard to the relationship with shipping line after service failure and recovery | Not supported |
| **H7:** Relationship with shipping line after service failure and recovery diverges with regard to the failure frequency | Not supported |
| **H8:** Relationship with shipping line after service failure and recovery diverges with regard to the satisfaction from the recovery | Supported |
| **H9:** Failure type affects relationship with the container terminal after service failure and recovery | Supported |
| **H10:** Failure category affects relationship with the container terminal after service failure and recovery | Supported |
| **H11:** Recovery action affects relationship with the container terminal after service failure and recovery | Not supported |
| **H12:** There is a connection between digitalisation and service failure frequency | Not supported |
| **H13:** There is a connection between Covid 19 pandemic and service failure frequency | Not supported |
| **HYPOTHESES (For Line Perspective)** | **Results** |
| **H14:** Failure magnitude differs with regard to the relationship with container | Not |

| | |
|---|---|
| terminal after service failure and recovery | supported |
| **H15:** Relationship with the container terminal after service failure and recovery differs with regard to the failure frequency | Not supported |
| **H16:** Relationship with the container terminal after service failure and recovery differs with regard to the satisfaction from the recovery | Supported |

## 5.6. LIMITATIONS AND FURTHER RESEARCH

The research has only been applied to the enterprises based in the Aegean Region due to timing and rules implemented by the companies after Covid - 19 restrictions. Because of the Covid - 19 restrictions, it was difficult to communicate with some remote workers and get their answers. Therefore, study findings could be relevant to pandemic circumstances. The research may be reproduced in future researches in normal circumstances, and the collected results can be compared.

Since the study's data were gathered from 4 container terminals in the Aegean Region, there is a reduction in the ability to generalize the findings. Future study samples might be chosen from various cities, or even from several nations. So it is possible to do research for cross-national comparability.

Only negative critical instances were the subject of this investigation. Future research may therefore consider both positive and negative critical incidents and may also examine the positive ones.

## CONCLUSION

Today, the importance of service quality has been understood in all sectors. In order to increase quality and ensure continuity, companies aim to minimize service failures.In this study, service failures encountered in container terminals and how to develop or improve recovery methods against these failures are examined. The CIT has been used in this study's analysis of service failures and recovery. CIT allows respondents to choose the incidents that are most important to them in relation to the phenomena under investigation, providing a rich supply of data.

The concept of service is discussed in the firstchapter. The definition of service, the importance of quality, character features and service quality approaches are examined.It can be said that service quality is observed to be a crucial determinant of competitiveness based on the literature. For this reason, companies aim to minimize service failures that may occur for a stronger competition.In the second chapter, the definition of service failure in the literature is investigated. Service failure types, magnitude and frequency have been defined and their importance for companies has been tried to be explained.In addition, studies on service failure in the shippingindustry are mentioned.It has been understood that although service failuressometimes cause customer losses but sometimes customer loyalty can be increased with a good recovery methods.

In the next section, container ports are discussed in detail. Ports are now generally accepted as the most important logistical facilities included into the international supply chains that affect international trade. Today, a port's functions are much more sophisticated than they were in the past (Flynn et al., 2011).In addition to serving their core function of combining the sea and land for the transfer of cargo, ports also have a range of logistical responsibilities to their customers (Yıldırım and Deveci, 2016). In the light of this approaches, the quality of the servicessupplied at terminals and the recovery methods they receive against service failures become important.

In this study, service failures encountered in container terminals were asked and grouped within themselves. The failure categories from container terminal and shipping line points of view were first categorized after the data gathering using CIT.

From both points of view it is seen that outcome failure is the most common failure type. Line employees stated that they encountered operational failures mostly, while terminal employees stated that they encountered customer service failures mostly.It has been observed that the relations between the line and the terminal have not been ruptured due to any service failures. Because these relations are based on important agreements that will last for years. For this reason, instead of ending the relationship, it focuses on solving problems, compensation, and finding solutions that will satisfy the other party.

While the most common recovery method in terminal perspective is symbolic recovery, it is seen that it is utilitarian recovery in line perspective. According to the literature, different failure types determine how recovery approaches are put into practice. Also, symbolic recovery techniques for process failures and utilitarian recovery techniques for outcome failures are predicted. This research did not discover any proof to confirm this. In previous studies, it is seen that symbolic recovery is generally adopted as a recovery method. Symbolic recovery includes apology and assistance. This recovery approach may be preferred due to its easiness to apply.

The participants emphasized that their relationship improved after service failure and recovery. This also shows and confirms the service recovery paradox in this sample.

The participants were also asked about the source of the failures, apart from the recovery approaches, and it was aimed to take precautions against future failures.According to the answers received from the participants, the accuracy of the information flow is one of the most important criteria for both perspectives.

On the other hand, the participants were asked about the effects of digitalization and covid 19 pandemic on service failures. According to the majority of respondents, digitalization does not cause more service failures. Some participants stated that they experienced problems such as integration problems, difficulties in adapting to new systems, and being forced into the system. Participants stated that although Covid-19 does not have a direct effect on service failure, they observed an increase in working hours due to lack of personnel and therefore human-based

failures. In addition, the participants emphasized that the pandemic faged the employees out psychologically and physically due to long working hours.

Based on the importance of the subject and the lack of similar studies in the literature, in this study, the issue of service failure in container terminals is examined. In the study, service failures, service recovery methods, satisfaction level after service failure and recovery are mentioned. Considering that the previous studies in shipping industry, especially in the field of container terminals are limited, therefore, this study was based on people who experienced service failures related to container terminals due to the related studies are insufficient in the literature. Based on the importance of this issue in the shipping industry, it is thought that the data obtained as a result of the study will guide business managers.

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# APPENDICIES

**Appendix 1:** Critical Incidents Collecting Form: Container Terminal Perspective

## EGE BÖLGESİNDEKİ KONTEYNER TERMİNALLERİNDE HİZMET HATALARI VE TELAFİ YÖNTEMLERİ ÜZERİNE KRİTİK OLAYLAR ÇALIŞMASI

Bu araştırma konteyner terminallerinde karşılaşılan hizmet hatalarını, bu hatalara karşı nasıl telafi yöntemleri geliştirildiğini veya geliştirilebileceğini incelemek için hazırlanmıştır. Bu çalışmanın sonuçları Dokuz Eylül Üniversitesi Denizcilik İşletmeleri Yönetimi yüksek lisans öğrencisi Sümeyra ÖZAYDIN'ın Doç. Dr. Gül DENKTAŞ ŞAKAR danışmanlığındaki yüksek lisans tezinde kullanılacaktır. Sorulara vereceğiniz cevaplar gizli tutulacaktır. Katılımınız için şimdiden teşekkürler.

### KONTEYNER TERMINALI BAKIŞ AÇISI

1. Cinsiyetiniz ?
   Kadın ( )
   Erkek ( )

2. Yaşınız ?
   18 – 24 arası ( )
   25 – 34 arası ( )
   35 – 44 arası ( )
   45 – 59 arası ( )
   60 ve üzeri ( )

3. Eğitim Durumunuz ?
   İlköğretim ( )
   Lise ( )
   Ön Lisans ( )
   Lisans ( )
   Yüksek Lisans ( )
   Doktora ( )

4. Kaç yıldır denizcilik sektöründe çalışmaktasınız?
   0 – 4 yıl arası ( )
   5 – 9 yıl arası ( )
   10 – 14 yıl arası ( )
   15 – 19 yıl arası ( )
   20 yıl ve üzeri ( )

5. Şuanki şirketinizde kaç yıldır çalışmaktasınız?
   0 – 4 yıl arası ( )
   5 – 9 yıl arası ( )
   10 – 14 yıl arası ( )
   15 – 19 yıl arası ( )
   20 yıl ve üzeri ( )

6. Görev tanımınız nedir?

7. Geçmişte birlikte çalıştığınız hatlardan kaynaklı bir hizmet hatasını detaylı bir şekilde anlatabilir misiniz ? Tam olarak ne oldu?

8. Sizce bu hatanın kaynağı neydi?

9. Karşılaşılan hizmet hatası ne gibi sorunlara yol açtı ?

10. Bu hizmet hatasının büyüklüğünü oluşturduğu sorunlar bakımından puanlayabilir misiniz ? (1:Minör, 10: Majör)

    1 2 3 4 5 6 7 8 9 10

11. Bu hizmet hatası karşısında sizin tepkiniz ne oldu, nasıl bir aksiyon aldınız?

12. Son 1 yıl içinde hizmet hatasıyla karşılaşma sıklığınızı aşağıdaki puanlamaya göre belirtir misiniz ? (1: Nadiren, 10: Çok sık)

    1 2 3 4 5 6 7 8 9 10

13. Hizmet hatasıyla karşılaştığınız line bu hatayı telafi etmek için ne yaptı ?
14. Line ın bu hizmet hatasını telafi etme şekli sizi memnun etti mi ?

( ) Hiç memnun kalmadım ( ) Memnun kalmadım ( ) Kararsızım

( ) Memnun kaldım ( ) Çok memnun kaldım

15. Yaşadığınız bu hizmet hatasından sonra line ile ilişkileriniz nasıl etkilendi ?

( ) Koptu ( ) Zayıfladı ( ) Değişmedi ( ) Kuvvetlendi

16. Son yıllarda hızla ilerleyen dijitalleşmenin hizmet hatalarına olumlu ya da olumsuz ne gibi etkileri olduğunu düşünüyorsunuz?

17. Sizce dijitalleşme daha çok hizmet hatasına sebebiyet verir mi ?

Evet ( ) Hayır ( )

18. Tüm dünyada etkisini derinden hissettiren pandemi sürecinde yukarıda bahsettiğiniz hatalar dışında pandemi kaynaklı herhangi bir hata ile karşılaştınız mı? Karşılaştıysanız anlatabilir misiniz ?

19. Sizce pandemi daha fazla hizmet hatasının yaşanmasına neden oldu mu ?

Evet ( ) Hayır ( )

**Appendix 2:** Critical Incidents Collecting Form: Line Perspective

## EGE BÖLGESİNDEKİ KONTEYNER TERMİNALLERİNDE HİZMET HATALARI VE TELAFİ YÖNTEMLERİ ÜZERİNE KRİTİK OLAY ÇALIŞMASI

Bu araştırma konteyner terminallerinde karşılaşılan hizmet hatalarını, bu hatalara karşı nasıl telafi yöntemleri geliştirildiğini veya geliştirilebileceğini incelemek için hazırlanmıştır. Bu çalışmanın sonuçları Dokuz Eylül Üniversitesi Denizcilik İşletmeleri Yönetimi yüksek lisans öğrencisi Sümeyra ÖZAYDIN'ın Doç. Dr. Gül DENKTAŞ ŞAKAR danışmanlığındaki yüksek lisans tezinde kullanılacaktır. Sorulara vereceğiniz cevaplar gizli tutulacaktır. Katılımınız için şimdiden teşekkürler.

### LINE BAKIŞ AÇISI

1. Cinsiyetiniz ?
   Kadın ( )
   Erkek ( )

2. Yaşınız ?
   18 – 24 arası ( )
   25 – 34 arası ( )
   35 – 44 arası ( )
   45 – 59 arası ( )
   60 ve üzeri ( )

3. Eğitim Durumunuz ?
   İlköğretim ( )
   Lise ( )
   Ön Lisans ( )
   Lisans ( )
   Yüksek Lisans ( )
   Doktora ( )

4. Kaç yıldır denizcilik sektöründe çalışmaktasınız?
   0 – 4 yıl arası ( )
   5 – 9 yıl arası ( )
   10 – 14 yıl arası ( )
   15 – 19 yıl arası ( )
   20 yıl ve üzeri ( )

5. Şuanki şirketinizde kaç yıldır çalışmaktasınız?
   0 – 4 yıl arası ( )
   5 – 9 yıl arası ( )
   10 – 14 yıl arası ( )
   15 – 19 yıl arası ( )
   20 yıl ve üzeri ( )
6. Görev tanımınız nedir?

7. Geçmişte birlikte çalıştığınız konteyner terminalleriyle yaşadığınız kritik bir hizmet hatasını detaylı bir şekilde anlatır mısınız ? Tam olarak ne oldu?

8. Sizce bu hatanın kaynağı neydi?

9. Karşılaşılan hizmet hatası ne gibi sorunlara yol açtı ?

10. Bu hizmet hatasının büyüklüğünü oluşturduğu sorunlar bakımından puanlayabilir misiniz ? (1:Minör, 10: Majör)

    1 2 3 4 5 6 7 8 9 10

11. Bu hizmet hatası karşısında sizin tepkiniz ne oldu, nasıl bir aksiyon aldınız?

12. Son 1 yıl içinde hizmet hatasıyla karşılaşma sıklığınızı aşağıdaki puanlamaya göre belirtir misiniz ? (1: Nadiren, 10: Çok sık)

    1 2 3 4 5 6 7 8 9 10

13. Hizmet hatasıyla karşılaştığınız konteyner terminali bu hatayı telafi etmek için ne yaptı ?

14. Konteyner terminalinin bu hizmet hatasını telafi etme şekli sizi memnun etti mi ?

( ) Hiç memnun kalmadım ( ) Memnun kalmadım ( ) Kararsızım

( ) Memnun kaldım ( ) Çok memnun kaldım

15. Yaşadığınız bu hatadan sonra konteyner terminali ile ilişkileriniz nasıl etkilendi ?

( ) Sona erdi ( ) Zayıfladı ( ) Değişmedi ( ) Kuvvetlendi

16. Son yıllarda hızla ilerleyen dijitalleşmenin hizmet hatalarına olumlu ya da olumsuz ne gibi etkileri olduğunu düşünüyorsunuz?

17. Sizce dijitalleşme daha çok hizmet hatasına sebebiyet verir mi ?

Evet ( ) Hayır ( )

18. Tüm dünyada etkisini derinden hissettiren pandemi sürecinde yukarıda bahsettiğiniz hatalar dışında pandemi kaynaklı herhangi bir hata ile karşılaştınız mı? Karşılaştıysanız anlatabilir misiniz ?

19. Sizce pandemi daha fazla hizmet hatasının yaşanmasına neden oldu mu ?

Evet ( ) Hayır ( )