Journal of Turkish

Operations Management

Quality function deployment implementation on service sector

Gamze Unsal[1], Yucel Ozturkoglu [2*]

[1]Graduate Student, Yasar University, İzmir
 e-mail: gamzekarakoc88@gmail.com, ORCID No: http://orcid.org/ 0000-0001-5547-8789
[2] Logistics Management, Yaşar University, İzmir
e-mail: yucel.ozturkoglu@yasar.edu.tr, ORCID No: http://orcid.org/ 0000-0002-9569-8178

*Corresponding Author

Article Info	Abstract
	In order to survive in the face of increasing competition, businesses need to plan and design the products they produce or the services they offer in a way that will meet the demands, needs and expectations of their customers. Quality Function Deployment (QFD) is a method that helps companies get to know their customers and respond to their needs and expectations as soon as possible. The basis of the method is to listen to the voice of the customers. The aim of this study is to reveal how QFD is applied in the retail industry. For this reason, one of the leading companies in the retail sector, the QFD process was tried to be applied and thus the validity of the QFD process in the selected business was examined. In line with the results, contributions were made to both the literature and the executive level.

1. Introduction

Rapid speed technology has brought along rapid change and global integration. As a result, this created an intense competitive environment and they had to adapt to change in order to survive in this competitive environment. In such an emergence, different models have emerged to obtain payment from the market and develop. One of these models is Total Quality Management (TQM).

TQM aims to provide not only goods and services, but also management with a holistic approach. According to TQM, whether it is the quality or the degree of satisfaction of the customer, along with the use of the product or service. Another exhausted state whether it has reached total quality.

Quality Function Deployment (QFD) emerged in Japan in the late 1960s as a tool used in TQM. It has formed a basic structure in the development of products and services based on the concept of customer quality. QFD is "a structured product planning and development method that evaluates a development team to clearly identify the wishes and needs of the customer and then systematically evaluate each proposed product or service capacity in terms of its impact on meeting those needs" (Cohen, 1995). QFD is a structured product planning and development method that evaluates a development team to clearly identify the wishes and needs of the customer and then systematically evaluate each proposed product or service capacity in terms of its impact on meeting those needs (Cohen, 1995). Knowledge of customer needs is a "must" condition for a company to maintain and increase its market position. Accurate market predictions are of little value if the requirements cannot be incorporated into the design at the right time. The team should take the time to understand customer wishes and plan the project more thoughtfully. The aim of the QFD is to include the "voice of the customer" at all stages of the product development cycle, from production to the market.

In retailing, which is an important function of the logistics sector where the competitive environment is intense, it is very important to meet customer demands and needs, which are called the voice of customers. While these requests and needs are met, companies should not compromise on existing quality standards. Therefore, the issue of quality in the retail sector is of vital importance for companies. With the effect of global competition, the conditions of competition are getting more severe day by day. However, companies have started to attach great importance to quality in the retail sector, where customer demands and needs are constantly rising. Companies are able to determine customer requests more accurately by using the QFD method, and by applying these requests correctly in the service sector, they get the most beneficial results for the company.

When the literature is examined, many studies have been done on quality improvement in the retail sector, which is an important branch of logistics.

However, there are not many quality studies in the big markets, which are the lifeblood of the retail industry. In particular, there is no study in which QFD is applied in retail merchandising. Therefore, this study QFD implementation for Turkey's largest retail store chain in Izmir with a brand new store to be opened will be made. The main contribution of the study is to propose meaningful suggestions for managerial implications about quality concept for retail business.

The rest of the paper is consist of six sections. Next section involves an overview of literature review of the related topic. Section 3 addresses the methodology of the QFD model. The implementation of the model is presented in Section 4. The results of study and managerial suggestions for organizations are given in Section 5. At the end, study finalized with Conclusion part.

2. Literature Review

Literature review for this study includes two sub-sections. Firstly, literature review related to QFD in service sector, secondly literature review related logistics services are presented.

2.1 Literature Review for QFD in Service Sector

The QFD method is one of the most frequently used methods in many both production and service sectors. In general, this method has been used to improve service quality (Chowdhury & Quaddus, 2016). QFD method is an important part of health care institutions. The quality of the services offered by hospitals, which is one of the leading service sectors, is very important (Hasibuan et al., 2019). The expectations and needs of the hospital's customers are determined. The necessary arrangements are made in the service provided around the information obtained and the expectations and needs of the customer profile are tried to be met. The most important benefit of QFD method to hospital enterprises is to make the patient and the hospital speak the same language. It also allows the institution to easily meet the changing expectations of patients.

QFD is also used in transportation, another sector. Today's technological and economic developments have revealed the concept of globalization. The competitive environment is being moved to a global level. Globally, competition forces companies and products to do better and deliver them as soon as possible and deliver them in the highest quality way. Transportation is one of the factors affecting the economic and social activity of society. With the increase in the number of people, it has also led to problems such as traffic density. That's why transportation service quality calculations have been made. For example, Furqon et al. (2019) was investigated quality function distribution analysis in transportation services in Indonesia. As a result of the research, it has been determined that QFD is useful for companies providing transportation services. Making calculations taking into account customers' expectations helps to use time efficiently. Because a demand forms a cluster with the demand of other customers over time. QFD helps prevent time wasting.

As in other sectors, competition in the financial world is increasing day-by-day (Adiandari et al., 2020). To achieve customer attraction, banks should provide differences in the service offered compared to the competitors. It is important to make improvements based on the historical data. Banks and credit companies need to pay more attention to the relationship with different customer groups in order to increase competitiveness and improve customer relations. (Novokreshchenova et al., 2016). It has been proven as a result of the surveys that the use of quality management tools in the services provided to the customer increases the satisfaction of the customers and the competitiveness of the bank.

Table 1. Literature Table for QFD in Service Sector

Sector	Aim of the Paper	Author(s)
Transportation Industry	Improving service quality in highway passenger transportation.	Pakdil & Kurtulmuşoğlu (2014)
Service Innovation	They determined the strengths and weaknesses of the company by targeting the voice of the customer.	Yothinsirikul &Thawesaengskulthai (2017)
Health Sector	QFD was applied to increase customer satisfaction while meeting the increasing patient demand.	Lee et al. (2015)
Healthcare and Public Service	Aims to determine and provide services that individuals may need in societies with an elder age.	Chen (2016)
Healthcare	Aims to improve services provided in m-health sector in Bangladesh.	Chowdhury et al. (2016)
Electricity and Public Infrastructure	Aims to provide better services to customers since they are aware of quality.	Jahanzaib et al.(2016)
Hospitality	Aims to classify customer ratings and needs to achieve a better level of service.	Kuo et al. (2016)
Transportation	They defined the customer voice of the transportation sector and increased the service quality for on-time undamaged delivery.	Nikfalazar (2016); Karaoğlu et al. (2020)
Financial Sector	Increase customer service level on financial sector	Novokreshchenova et al. (2016)
Smart Services	Improving smart services provided and cover different fields in Dubai.	Zawati & Dweiri (2016)
Healthcare	To develop as the specific framework for assessing and analyzing the experimental results. QFD was used to identify and turn decision-makers, suppliers, patients and local communities ' needs into both service and construction design for Project K, a healthcare network in the UK.	Dehe & Bamford (2017)
Food Industry (Meal Ordering System)	To develop of a systemic and analytical software architecture using incorporation of quality function deployment technology, and schematic approaches.	Wang et al. (2017)
Postal and Shipping Service	To analyze the characteristics of respondents in Indonesia.	Khairunnisa et al.(2018)

Healthcare	To develop concept of dialysis service risk management methods due to the role of healthcare organization assessment in sustaining system performance.	Maalej et al. (2018)
Transportation Services	To improve the quality of logistics activities.	Furqon et al. (2019)
Healthcare	Determine the how patient define the quality.	Hasibuan et al. (2019)
Banking Services	Increase the quality of e-banking services.	Adiandari et al. (2020)

As a result, as mentioned above, QFD can be seen almost anywhere in the service sector. The general purpose of applying quality management to these sectors is to improve the quality of service and ensure customer satisfaction. The through to the method applied, it reduces the time it takes to deliver products or services to the customer. It is a very effective method for product planning and development. Reduces the start and development costs of the service to be offered. Customer satisfaction increases. It also provides analysis of competitors, offering products and services at more competitive prices.

2.2 Literature Review for QFD in Logistics Management

Quality function deployment is an approach to quickly and effectively recognize and prioritize the preferences of the customers. QFD is customer driven and converts customer needs into acceptable product and service technical requirements. This translation process is sometimes referred to as the 'customer's voice (Wang et al., 2017).

QFD was originally developed for producer designs. (Huang & Hsu, 2016). In the relevant literature, QFD has been studied in areas that integrate the operations of 3PL service provider, logistics, cargo services, and warehouse and supplier selection in order to achieve the efficient service quality. According to Çakılcı & Öztürkoğlu (2020), examined the focuses on consumers who emphasize the service-providing dimensions of logistics centers by considering potential customer requirements of logistics center. Moreover, this research discusses, categorizes and prioritizes customer expectations of logistics center and general features of logistics center operation.

Service quality plays a critical role in success and customer satisfaction in today's globalized and competitive cargo and postal market (Çalışkan et al., 2016). To serve the better service quality Murugesan et al. (2020) investigate a model to explore the definition and technique of QFD to be integrated into post-service operations in India to meet the better quality of service. Besides, Murugesan et al. (2020) stated that, using quality metrics, QFD directs a formal, well-organized, and standardized way of achieving end-user requirement integration. Ulkuniemi et al. (2011) made a research to develop a QFD based logistics service design system to combine HOQ (Quality House) technology and modular logic to assist in the design of high-quality, high-service logistics services. Furthermore, Jain and Khan (2016) study to select the best reverse logistics service provider for injection molding parts manufacturing company using a QFD.

QFD is also, used to model technical requirements to fulfil compare logistics service quality (Awasthi et al., 2018).QFD has been applied widely in third party logistics providers (3PL's). For instance, Lee and Lin (2006) to classified 3PL companies into three types according to their organization characteristics with QFD. Ho et al. (2012) to investigated how to choose optimal 3PLs, using by quality function deployment method. Perçin and Min (2013) suggest that QFD and fuzzy decision-making methodology best way for solving 3PL evaluation/selection problem.

QFD methodologies have been used to transportation and warehouses. There is a research that suggested, a quality function-based deployment system is proposed to effectively regulate the risks and manage the protection of the HazMats transport process in China. (Yang et al., 2018). The risk factors were collected from the related research

literature by a cross-functional QFD team, historical data on incidents, feedback from transportation companies and customer complaints on HazMats transport service.

To have excellent performance in the warehouse, it is important to tackle human needs in order to eliminate the errors (Ekinci et al., 2021). Dewa et al. (2017) integrated to quality function deployment (QFD) to warehouse operations. QFD has been very successful in warehouse development where consumer voices are identified and then related to what is considered technological responses.

Table 2. Literature Review Related to QFD in Retail &Logistics Sector

Aim/Scope	Author(s)
To decide a distribution company's location decision in selecting an optimal location with QFD.	Chuang (2002)
To classifies 3PL companies into three types according to their organization characteristics with QFD.	Lee & Lin (2006)
To analyze the performance of China Airlines and apply house of quality chart.	Wang et al. (2017)
To develop to handle the voice of customer for evaluation and selection of 3PL service provider.	Rajesh et al. (2011)
To integrate QFD logic to help in designing logistics services with high quality and a large service variety.	Ulkuniemi et al. (2011)
To select optimal 3PLs, using by house of quality method.	Ho et al. (2012)
To suggest a QFD and fuzzy decision-making methodology for solving 3PL evaluation/selection problem.	Perçin & Min (2013)
To propose a methodology to develop logistics service providers.	Karaoglu et al. (2020)
To develop an integrated approach, combining QFD and Taguchi loss function method for selecting 3PL strategically.	Sharma & Kumar (2015)
To examine the service quality of international distribution centers.	Huang & Hsu (2016)
To select the best reverse logistics service provider for injection molding parts manufacturing company using a QFD.	Jain & Khan (2016)
To maximize service quality in the public and private transportation.	Kurtulmuşoğlu et al. (2016)
To improve QFD to maritime supply chain resilience and take customer requirements.	Lam & Dai (2015)
To analyzes technical requirements a QFD-based for achieving sustainable warehouse.	Uztürk & Büyüközkan (2016)
To integrate an uncertain QFD for meet the customer requirements.	Yang et al. (2016)
To enhance a model of improvement that can link the performance of warehouses modified to deployment of quality functions.	Dewa et al. (2017)
To suggests a decision support model for selecting logistics providers based on implementation of the quality feature for agricultural supply chain in France.	Yazdani et al. (2017)

To develop logistics service quality management.	Awasthi et al. (2018)
To implement QFD to the prevent the risk level of a HazMats transportation company in China.	Yang et al. (2018)
To apply QFD in India post service operations.	Murugesan et al. (2020)

To conclude, QFD methodology tools are used to better understand and turn customer requirements into service designs, and to manage service quality control. (Lam & Dai, 2015). With the improved needs of different area, QFD is looking to be more important in business life.

3. Methodology: Quality Function Deployment

Nowadays customers has a multiple available options to select similar products and services. Customers makes their selections based on the quality or value. Companies are working on a tools to define their customer's wants and needs and turning them into specific designs and process plans to satisfy the customer's needs. QFD is a method and collection of tools used to efficiently identify customer requirements and turn them into comprehensive technical specifications and plans for producing the goods that meet those needs. QFD consist of six different steps; 1) Identifying voice of the customer; 2) identifying technical requirements; 3) correlation matrix of technical requirements; 4) relationship matrix of customer wants and technical requirements; 5) target and gaps (planning matrix); 6) technical evaluation (Karaoglu et al., 2020).
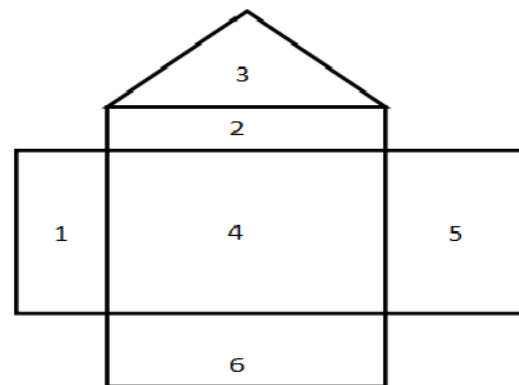
Figure 1. QFD template

Voice of Customer (1): Customer requirements and importance degrees of them are determined. With various ways such as surveys and interviews, customer needs and wants are determined. There is a priority scale between one to ten. Lower points are less important while the higher points are the most.

Technical Requirements (2): Related requirements are classified that can afford the customer needs and wants (voice of customer). The goal of the technical requirements is to define 'How' to respond to the customer requirements. This part of the QFD will help demonstrate how the existing product or service currently satisfies customer wants.

Correlation Matrix of the Technical Requirements (3): The correlation matrix will identified how technical requirements help and hinder each other. These relations are shown by symbols. 'P' refers to positive and 'N' refers to negative. Based on these P and N symbols, correlation of different requirements are determined.

Relationship Matrix of Customer Wants and Technical Requirements (4): This matrix show how strongly each of the design parameters affects the customer need. In this matrix, scoring system is used. The system includes three score which is 1, 3 and 9 refers to weak, medium and strong respectively. The requirements that has no relation with each other are shown blank.

Targets and Gaps (Planning Matrix) (5): In this part, Companies evaluate themselves to find out in what stage they and their competitors to satisfy customer expectations. They scores themselves and their competitors 1 to 5 and they determine their target score. 5 represents the highest level of customer satisfaction. Their target score can be the same with the current score as it can be higher. In this matrix, improvement ratios are founded by diving the current scores to their target scores. With the multiplying of priority scores, improvement ratio and sales point which is always constant, priority rating is founded. At the end this part, percentage of priority rating is determined;

Improvement Ratio = Target Score / Current Score
Priority Rating = Improvement Ratio * Priority Scores * Sales Point
 Percentage of Priority Rating = Priority Rating / $\sum$(Total Priority Rating) * 100

Technical Evaluation (6): The last step in the formation of the QFD is the bottom of the house. This foundation is referred to as the technical matrix. In this part, technical and normalized technical priorities are founded.

Technical Priority = $\sum$(Percentage of Priority Rating * Relationship Scores)
Normalized Technical Priority = (Technical Priority / $\sum$Total Technical Priority)*100

4. Implementation

The research was done on a retail firm. In the study, it was aimed to maximize the service quality of the company according to customer expectations in the retail company. As a result of the creation of the quality house, the most important technical characteristics have been addressed and improved. Questionnaire method was used in the study. The survey was conducted in June 2020 with the permission of the company authorities. The research was carried out in İzmir Karşıyaka branches of the retail firm. Before starting the research, survey questions were prepared according to customer requests and requirements. These questions were asked to customers who shop during the retail company's branch visits. The research was applied to 150 people.

When the findings about the demographic structure are examined, 70 of the customers who answered the questionnaire are female and 80 of them are male. It is observed that there are 65 customers in the age range of 35-44, 42 customers in the age range of 25-34, 33 customers in the age range of 45-54 and 10 customers in the age range of 18-24. The number of customers who shop between one and three days a week is 105. The number of customers who shop between four and seven per week is 45. The average budget rate is between 50 and 500 TL.

Table 3. Importance Level of the Customer Requirements

		Importance Level
	Freshness	5
	Cost	4
Customer Requirements	Personnel Attitude	4
	Variation	5
	Cleaning	4

The calculation relations of the Quality house we have established are as follows:

➢ Progress rate: Firm Target / Firm Today

Freshness: 5/4=1,25; Cost: 5/3=1,66; Personnel Attitude: 5/4=1,25; Variation: 5/5=1;

Cleaning: 5/5=1

➢ Point of Sale Score: Indicates the customers' interest in the service they receive. This value

is based on the expectation that can show the best sales performance. It shows whether an improvement in customer requests will bring an increase in the sales point score column, in other words, an increase in sales. Generally, the following Table 4 is used for evaluation.

Table 4. Potential for Advancement in Sales

Potential for improvement	Score
Significant progress	1.5
Progress	1.2
Current status (status quo)	1.0

➢ Importance Score: (Importance Level*Progress Rate* Point of Sale Score)

Freshness: 5*1,25*1,2=7,5; Cost: 4*1,666*1,5=10; Personnel Attitude: 4*1,25*1,2=6; Variation: 5*1*1*=5; Cleaning: 4*1*1=4

➢ Percent Importance Level: (Importance Score/Total Importance Score)*100

Freshness: (7.5/32,5)*100=23,076323; Cost: (10/32,5)*100=30,769; Personnel Attitude: (6/32,5)*100=18,461; Variation: (5/32,5)*100=15,385; Cleaning: (4/32,5)*100=12,308

➢ Technical Importance Level: $\sum$ (Percent Importance Level *Relationship Score)

(5*23.076323)+ (2*30.7692) + (4*12.3076) =226.153

➢ Normalized technical importance level: (Technical importance level/Total technical

importance level)*100

(226.15385/2369.2308)*100=9.54

As a result of the calculations mentioned in detail above, a quality house was created. As seen in Figure 2, customer requests are classified under five headings. A total of ten technical requirements have been identified to meet these requests. The current position of the company and the position of its competitors have been determined by experts in line with the determined customer requirements. In the light of this information, necessary calculations have been made. In the next section, which customer requirements and technical characteristics come to the fore will be determined according to the quality house created and a road map will be presented to the company authorities.

5. Discussion the Results

The target customers of the stores were determined primarily throughout the study, and customer requests and needs were determined by applying a structured questionnaire for these customers. During the completion of the surveys, face-to-face interviews were made with the customers. Data on what customer requests and needs are, how important they are, and how the business performs at this point has been obtained with this study.

When scored according to the degree of relationship, removing the remaining products in the grocery section at the end of the day, the score is 5 in terms of product freshness, it is very strong relationship, the score is 2 in terms of cost, and the score is 4 in terms of weak relationship and cleanliness, and there is a strong relationship. The fact that the market employee has received the necessary training in the information and communication system shows that there are 3 medium relationship personnel in terms of cost and 5 very strong relations in terms of personnel attitude.

The purchase of deformed products from the service aisle, whose color and smell have changed, from the aisle show that there is 5 very strong relations in terms of product freshness and cleanliness, 3 medium relations in terms of cost, 4 strong relations in terms of personnel attitude. Highlighting discounted and promoted products on the counter and making the necessary promotion show that there is a very strong relationship in terms of cost 5 and a strong relationship in terms of staff attitude 4. Price tags must be constantly checked. 5 There is a very strong relationship in terms of cost and staff attitude. There are 5 very strong relationships in terms of cost and diversity and 4 strong relationships in terms of personnel attitude to prevent loss by keeping track of products and stocks in the best way. Announcing certain days of the week or certain date intervals of the month as discount days has a very strong 5 in terms of cost and a strong relationship in terms of staff attitude 4.

The attire of the employees should be clean, and the staff should wear the clothing provided by the company, apron, cap, plastic gloves and name badge. There is a very strong relationship in terms of staff attitude and cleanliness. There are 2 weak relationships in terms of cost and 4 strong relationships in terms of staff attitude, preventing the formation of in-store queues by increasing the number of cashiers in the store. There are 2 weak relationships in terms of product freshness, 5 very strong relationships in terms of cost, 4 strong relationships in terms of personnel attitude and 3 medium relationships in terms of diversity. There is a P (positive) relationship between removing the products left in the grocery aisle at the end of the day and buying products from the service aisle that are deformed, approached to date, and whose color and smell have changed. There is a P (positive) relationship between the fact that the market employee has received the necessary training in the information and communication system and the employees' attire should be clean and the personnel should wear the clothing provided by the company and wear their apron, cap, plastic gloves and name badge. There is an N (negative) relationship between the fact that the market employee has received the necessary training in the information and communication system and the number of cashiers in the store is prevented from forming in-store queues. There is an N (negative) relationship between the purchase of deformed products with a change in color and smell from the service aisle and the sale of products with a discount by placing them on the front of the aisle. There is an N (negative) relationship between price tags must be constantly checked and product tracking and stocks are carried out in the best way to prevent loss. At the end of the study, customer cost request has emerged. In order to bring customer cost demand to the forefront, improvements should be made in the two high technical requirements first. The high technical requirements table is given in Table 5 below.

Table 5. Technical Requirements Data

Technical Requirements	Summation of the Technical Requirements
Purchasing from shelves of products which have changed color and odor, degraded and expired.	343,07
Selling products which have approached expiration date with discount by putting on the front side.	320

The QFD model implemented in the retail firm provided useful data as detailed above. This has provided many benefits for the firm in general. With this research, the company creates a data source for design and process development that will meet future needs. With this application, total cost reduction can be achieved in the company with the highest customer expectations in the company. With the application of the QFD method, the retail company can establish good relations with customers in the service sector. In addition, the company's efforts to improve the quality and the opinions of the customers are taken into account in these studies, and positive approaches towards the company are developing in the service sector.

In retailing, which is an important function of the logistics sector where the competitive environment is intense, it is very important to meet customer demands and needs, which are called the voice of customers. While these requests and needs are met, companies should not compromise on existing quality standards. Therefore, the issue of quality in the retail sector is of vital importance for companies.

With the effect of global competition, the conditions of competition are getting more severe day by day. However, companies have started to attach great importance to quality in the retail sector, where customer demands and needs are constantly rising (Gençtürk & Öztürkoğlu, 2020).
. Companies are able to determine customer requests more accurately by using the QFD method, and by applying these requests correctly in the service sector, they get the most beneficial results for the company.

6. Conclusion

In this study, it is tried to show in detail the application of QFD method in a retail company. The company has a leading position in the service sector. Customer needs have been listed and the company name has been kept confidential in line with the company's request.

By researching the service offered by the retail company examined in the application section, a general information about the company has been obtained. The firm has been examined in terms of quality function deployment, which is the main subject of the application, and the degree of interaction with other competitors has been observed.

The degrees of importance are calculated in line with the customers' requests. Product freshness was evaluated on 5, cost 4, staff attitude 4, variety 5, and cleanliness 4 out of 5. As a result of the surveys, the most important 10 criteria among the technical requirements chosen by the customers were determined, and the relationship between customer requests and technical requirements was determined. This relationship degree is scored between 1 and 5 based on the Japanese system scoring, and the current and target values of the firm are determined. Based on this scoring, the severity, progress rate, point of sale score and percentage importance scores were determined. In the next step, the technical importance level has been calculated. According to the results, normalized technical importance was calculated. And the correlation matrix between technical needs of our quality house, namely the roof, has been drawn. Those that we found positive relationship with P and negative relationship between them are shown by symbol of N. When the technical importance is examined, the two technical requirements with the lowest score are to increase the number of cashiers in the store, preventing the formation of in-store queues, and the employees' attire should be clean, and the personnel should wear the clothes provided by the company and wear their apron, cap, plastic gloves and name badge.

	NORMALİZE TEKNİK ÖNEM DERECESİ	TEKNİK ÖNEM DERECESİ	TEMİZLİK	ÇEŞİTLİLİK	PERSONEL TUTUMU	MALİYET	ÜRÜN TAZELİĞİ
MÜŞTERİ İSTEKLERİ							
ÖNEM DERECESİ		2369.3297691	4	5	4	4	5
MANAV REYONUNDA GÜNÜN SONUNDA KALAN ÜRÜNLERİ KALDIRMAK	9.545454545	216.1539462				2	5
MARKET ÇALIŞANININ BİLGİ VE İLETİŞİM SİSTEMİ KONUSUNDA GEREKLİ EĞİTİMİ ALMIŞ OLMASI	7.792207792	184.6153846			5	3	
HİZMET REYONUNDAN DEFORME OLMUŞ, TARİHİ YAKLAŞMIŞ, RENGİ VE KOKUSU DEĞİŞMİŞ ÜRÜNLERİN REYONDAN ALINMASI	14.48051948	343.0769231		5	4	3	5
TEZGAHTAKİ İNDİRİMLİ VE PROMOSYONLU ÜRÜNLERİ ÖN PLANA ÇIKARMAK VE GEREKLİ TANITIMI YAPMAK	9.61038961	227.6923077			4	5	
FİYAT ETİKETLERİ SÜREKLİ KONTROL EDİLMELİDİR	10.38961039	246.1538462			5	5	
ÜRÜN TAKİBİ VE STOKLARI EN İYİ ŞEKİLDE YAPILARAK YOK SATILMASINI ENGELLEMEK	12.85714286	304.6153846		5	4		5
HAFTANIN BELİRLİ GÜNLERİNİ VE YA AYIN BELİRLİ TARİH ARALIKLARINI İNDİRİM GÜNÜ OLARAK DUYURMAK	9.61038961	227.6923077			4	5	
ÇALIŞANLARIN KILIK KIYAFETİ TEMİZ OLMALIDIR VE PERSONEL ŞİRKETİN VERDİĞİ KIYAFETİ GİYİP, ÖNLÜĞÜNÜ,KEPİNİ, PLASTİK ELDİVENİNİ VE YAKA KARTINI TAKMALIDIR	6.493506494	153.8461538			5	5	
MAĞAZADA KASA PERSONELİNİN SAYISINI ARTIRARAK MAĞAZA İÇİ KUYRUKLARIN OLUŞMASINI ENGELLENMESİ	5.714285714	135.3846154			4	2	
SON KULLANIM TARİHİ YAKLAŞMIŞ ÜRÜNLERİ REYONUN ÖN TARAFINA KOYARAK İNDİRİMLİ SATMAK	13.50649351	320	3	4	5	2	
FİRMA BUGÜN			5	5	4	3	4
FİRMA HEDEF			5	5	5	5	5
İLERLEME ORANI			1	1	1.25	1.666666667	1.25
SATIŞ NOKTASI PUANI			1	1	1.2	1.5	1.2
ÖNEM PUANI		32.5	4	5	6	10	7.5
YÜZDE ÖNEM		100	12.30769231	15.38461538	18.46153846	30.76923077	23.07692308

Figure 2. QFD Results

The highest value was determined as the purchase of products that are deformed from the service aisle, whose date has approached, and whose color and smell have changed, from the aisle, and the next important value has been determined to be selling the products with a near expiry date on the front of the aisle at a discount. Accordingly, it has attracted our attention that the primary technical requirements in the retail company are cost and cleaning factors.

Contribution of Researchers

Both Gamze Unsal and Yucel Ozturkoglu designed and gave contribution the Introduction, Conclusion, Discussion sections.

Conflict of Interest

The authors declared that there is no conflict of interest.

References

Adiandari, A., Winata, H., Fitriandari, M., & Hariguna, T. (2020). Improving the quality of Internet banking services: An implementation of the quality function deployment (QFD) concept. *Management Science Letters*, *10*(5), 1121-1128. doi: https://doi.org/ 10.5267/j.msl.2019.10.029

Awasthi, A., Sayyadi, R., & Khabbazian, A. (2018). A combined approach integrating gap analysis, QFD and AHP for improving logistics service quality. *International Journal of Logistics Systems and Management, 29(*2), 190. doi: https://doi.org/10.1504/ijlsm.2018.089171

Çalışkan, A., Karacasulu, M., & Öztürkoğlu, Y. (2016). Hizli moda markalarinda çevik ve esnek tedarik zinciri yönetimi. *Manisa Celal Bayar Üniversitesi Sosyal Bilimler Dergisi*, *14*(4), 49-74.

Chen, S. H. (2016). Determining the service demands of an aging population by integrating QFD and FMEA method. *Quality & Quantity*, *50*(1), 283-298. doi: https://doi.org/10.1007/s11135-014-0148-y

Chuang, P. T. (2002). A QFD approach for distribution's location model. *International Journal of Quality & Reliability Management*, *19*(8/9), 1037-1054. doi: https://doi.org/10.1108/02656710210438113

Chowdhury, M. M. H., & Quaddus, M. A. (2016). A multi-phased QFD based optimization approach to sustainable service design. *International Journal of Production Economics*, *171*, 165-178. doi: https://doi.org/10.1016/j.ijpe.2015.09.023

Cohen, L. (1995). *Quality function deployment: how to make QFD work for you*. Prentice Hall.

Çakılcı, C. & Öztürkoğlu, Y. (2020).Analysis of sustainable E-logistics activities with analytic hierarchy process. *Journal of Business Research-Turk*, *12*(1), 489-497. doi: https://doi.org/10.20491/isarder.2020.857.

Dehe, B., & Bamford, D. (2017). Quality Function Deployment and operational design decisions–a healthcare infrastructure development case study. *Production Planning & Control*, *28*(14), 1177-1192. doi: https://doi.org/10.1080/09537287.2017.1350767

Dewa, P. K., Pujawan, I. N., & Vanany, I. (2017). Human errors in warehouse operations: an improvement model. *International Journal of Logistics Systems and Management*, *27*(3), 298-317.

Ekinci, E., Çayır, B., Arifoğlu, B., & Öztürkoğlu, Y. (2021). An Overview of Agri-food Supply Chains in the Covid-19 Pandemic Period. *Journal of Turkish Operations Management*, *5*(1), 630-640.

Furqon, C., Sultan, M. A., & Putri, S. I. (2019, May). Quality Function Deployment Analysis on Transportation Services. In 1st International Conference on Economics, Business, Entrepreneurship, and Finance (ICEBEF 2018). Atlantis Press.

Gençtürk, S., & Öztürkoğlu, Y. (2020). Yeni nesil perakendecilik: KOVID-19 sürecinde marketten eve hizmet inovasyonu araştırması. *Journal of Entrepreneurship and Innovation Management, 9*(2), 49-69.

Hasibuan, A., Parinduri, L., Sulaiman, O. K., Suleman, A. R., Harahap, A. K. Z., Hasibuan, M., ... & Daengs, G. A. (2019, November). Service Quality Improvement by Using the Quality Function Deployment (QFD) Method at the Government General Hospital. In *Journal of Physics: Conference Series, 1363*(1), 012095). IOP Publishing.

Ho, W., He, T., Lee, C. K. M., & Emrouznejad, A. (2012). Strategic logistics outsourcing: An integrated QFD and fuzzy AHP approach*. Expert Systems with Applications, 39(*12), 10841–10850*.* doi: https://doi.org/10.1016/j.eswa.2012.03.009

Huang, S.-H. S., & Hsu, W.-K. K. (2016). An assessment of service quality for international distribution centers in Taiwan – a QFD approach with fuzzy AHP. *Maritime Policy & Management, 43*(4), 509–523. doi: https://doi.org/10.1080/03088839.2015.1134829

Jahanzaib, M., Idrees, M., Wasim, A., Hussain, S., & Aziz, H. (2016). A framework for implementing quality function deployment for utility services. *Journal of Business and Management*, *18*(4), 92-99. doi: https://doi.org/10.9790/487X-1804029299

Jain, V., & Khan, S. A. (2016). *Reverse logistics service provider selection: A TOPSIS-QFD approach. 2016 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM)*. doi: https://doi.org/10.1109/ieem.2016.7797987

Karaoglu, P., Mert, T., Kork, M. B., Türkmen, F. B., Özkan-Özen, Y. D., & Öztürkoğlu, Y. (2020, September). Improving the Operations in a Logistics Company: A Case Study in Turkey. In *The International Symposium for Production Research* (pp. 876-887). Springer, Cham.

Khairunnisa, N., Munandar, J. M., & Najib, M. (2018). Customer Satisfaction and Loyalty on Customer Delivered Value of Postal and Shipping Service. *International Journal of Research and Review*, *5*(11), 15-27.

Kuo, C. M., Chen, H. T., & Boger, E. (2016). Implementing city hotel service quality enhancements: Integration of Kano and QFD analytical models. *Journal of Hospitality Marketing & Management*, *25*(6), 748-770. doi: https://doi.org/10.1080/19368623.2016.1096225

Kurtulmuşoğlu, F. B., Pakdil, F., & Atalay, K. D. (2016). Quality improvement strategies of highway bus service based on a fuzzy quality function deployment approach. *Transportmetrica A: Transport Science, 12*(2), 175202. doi: https://doi.org/10.1080/23249935.2015.1117535

Lam, J. S. L., & Dai, J. (2015). Environmental sustainability of logistics service provider: an ANP-QFD approach. *The International Journal of Logistics Management*, *26*(2), 313-333. doi: https://doi.org/10.1108/IJLM-08-2013-0088

Lee, T. R., & Lin, J. H. (2006). Utilizing quality function deployment to select customer voice-based quality improvement technique for 3PL companies. *International Journal of Enterprise Network Management, 1*(2), 179. doi: https://doi.org/10.1504/ijenm.2006.011703

Lee, C. K. M., Ru, C. T. Y., Yeung, C. L., Choy, K. L., & Ip, W. H. (2015). Analyze the healthcare service requirement using fuzzy QFD. *Computers in Industry*, *74*, 1-15. doi: https://doi.org/10.1016/j.compind.2015.08.005

Maalej, S., Halouani, N., & Chabchoub, H. (2018). A linguistic reliable quality function deployment method for the healthcare sector. *International Journal of Multicriteria Decision Making*, *7*(3-4), 276-297.

Murugesan, V.S., Sequeira, A. H., Jauhar, S. K., & Kumar, V. (2020). Sustainable postal service design: integrating quality function deployment from the customer's perspective. *International Journal of System Assurance Engineering and Management, 11*(2), 494-505. doi: https://doi.org/10.1007/s13198-019-00906-6

Nikfalazar, S. (2016). Statistical process control application on service quality using SERVQUAL and QFD with a case study in trains' services. *Total Quality Management Journal*, *28*(2), 195-215. doi: https://doi.org/10.1108/TQM-02-2014-0026

Novokreshchenova, N. A., Novokreshchenova, O. A., & Terehin, S. E. (2016). Improving bank's customer service on the basis of quality management tools. *European Research Studies*, *19*(3), 19-38.

Pakdil, F., & Kurtulmuşoğlu, F. B. (2014). Improving service quality in highway passenger transportation: a case study using quality function deployment. *EJTIR, 2014*(4), 375-393.

Perçin, S., & Min, H. (2013). A hybrid quality function deployment and fuzzy decision-making methodology for the optimal selection of third-party logistics service providers. *International Journal of Logistics Research and Applications, 16*(5), 380–397. doi: https://doi.org/10.1080/13675567.2013.815696

Rajesh, R., Pugazhendhi, S., Ganesh, K., & Muralidharan, C. (2011). AQUA: Analytical model for evaluation and selection of Third-Party Logistics service provider in supply chain. *International Journal of Services and Operations Management*, *8*(1), 27. doi: https://doi.org/10.1504/ijsom.2011.037439

Sharma, S. K., & Kumar, V. (2015). Optimal selection of third-party logistics service providers using quality function deployment and Taguchi loss function. *Benchmarking: An International Journal*, *22*(7), 674-690. doi: https://doi.org/10.1108/BIJ-02-2014-0016

Ulkuniemi, P., Pekkarinen, S., & Lin, Y. (2011). QFD-based modular logistics service design. *Journal of Business & Industrial Marketing*, *26*(5), 344-356. doi: https://doi.org/10.1108/08858621111144406

Uztürk, D., & Büyüközkan, G. (2016, December). A QFD approach for sustainable warehouse design. In *XIV. International Logistics and Supply Chain Congress* (pp. 257-265).

Wang, Y. H., Lee, C. H., & Trappey, A. J. (2017). Service design blueprint approach incorporating TRIZ and service QFD for a meal ordering system: A case study. *Computers & Industrial Engineering*, *107*, 388-400. doi: https://doi.org/10.1016/j.cie.2017.01.013

Yang, S., Liu, J., Wang, K., & Miao, Y. (2016). An Uncertain QFD Approach for the Strategic Management of Logistics Services. *Mathematical Problems in Engineering, 1–10.* doi: https://doi.org/10.1155/2016/1486189

Yang, Q., Chin, K.-S., & Li, Y.-L. (2018). A quality function deployment-based framework for the risk management of hazardous material transportation process. *Journal of Loss Prevention in the Process Industries, 52*, *81–92.* doi: https://doi.org/10.1016/j.jlp.2018.02.001

Yazdani, M., Zarate, P., Coulibaly, A., & Zavadskas, E. K. (2017). *A group decision making support system in logistics and supply chain management. Expert Systems with Applications, 88*, 376–392. doi: https://doi.org/10.1016/j.eswa.2017.07.014

Yothinsirikul, W., & Thawesaengkulthai, N. (2017). Application of quality function deployment and servqual for design service innovation. In *Proceeding 7th International Seminar on Industrial Engineering and Management*.

Zawati, O. A. L., & Dweiri, F. (2016, December). Application of Quality Function Deployment to improve smart services applications, Dubai public entity as a case study. In *2016 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM)* (pp. 881-885). IEEE.