The Investigation of 4.5G Service Quality Using the SERVQUAL Method in the Gaziantep

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Abstract

SERVQUAL is a scale used to determine the quality of telecommunication services. This scale aims to measure the difference between the service users by comparing their expectations from the service and their level of perception of the service they receive. With the widespread use of 4.5G, mobile operators have started to focus their infrastructure investments, tariffs, and advertisements on mobile data speeds and services (watching videos, playing online video games, instant messaging, etc.). The mobile services offered by the operators are affected by different factors such as the coverage power of the operator in that region, the time-dependent traffic of the customers, and the weather conditions. Therefore, differences can be observed between the mobile services offered by the operators to their customers and the quality of the services that the customers can access. In the study, it was aimed to measure 4.5G service quality in Gaziantep with SERVQUAL method. This method is a data collection method that enables participants to reveal their satisfaction with using a product or service. The population of the research consists of individuals over the age of 18 who live in Gaziantep in 2023 and use a GSM operator. Interview questions were presented to approximately 600 people and 406 people out of 600 agreed to answer. The sample of the study consists of 406 participants randomly determined from the universe. SERVQUAL scale was used as data collection tool in the study. The scale consists of 22 items and 5 sub-dimensions. Quantitative data analysis methods were used in the analysis of the research data. In this context, the research data were analyzed with the SPSS24 data analysis program. In the analyzes, first of all, information on the demographic characteristics of the participants, percentage and frequency distributions were presented. Due to the normal distribution of the data, the parametric statistical techniques used in the analysis of which the independent sample t-test and ANOVA test. As a result of the research, it was determined that the 4.5G satisfaction levels of the participants were lower than 3.5G. With 4.5G, it was determined that the satisfaction level with the file/video download speed was positive. According to the gender variable of the participants, the expected and actual service quality perceptions are showing similarity. The realized trust perceptions of the participants have income of 8500 TL or less are lower. It was determined that the participants who chose the operator due to Environmental Advice and Service Quality had a high perceived reliability perception of the operator, and a low perceived enthusiasm (willingness).

Keywords
4.5G, Quality of Service, GSM Operators, SERVQUAL Method

1. Introduction
In the globalizing world, technological developments and developments in the field of communication are examined in various disciplines. Although the developments have different outputs, people should be able to reach, benefit from and evaluate their experiences. In this context, while there are no great difficulties in determining and measuring indicators related to quality and performance in the field of production, the situation is different for the service industry, and measurements related to services may not be always easy. In a way, this is about measuring the benefit of the service. Therefore, it is important to make general evaluations about the perception of service in this regard. Improving or improving the quality of the service provided constitutes the first stage of service quality. An

institution or firm can follow effective strategies about what to do when it has the right information regarding the level of service quality it offers. For this purpose, it is seen that different methods are used for service quality measurement (Eleren et al. 2007).

Service quality is examined by taking service providers and the consumers who benefit from the offered service into consideration. In this case, the relations between the opinions and practices of the enterprises about quality are important. In addition, the differences between the service that consumers benefit from and the "real service" are examined with the "conceptual service quality model" (Parasuraman et al. 2007). With the traditional understanding, production is about the competence of a community in the production of agricultural products first and then raw materials, and the completion of the development of industrial products, and service sectors. However, this understanding has changed today. Today, the service sector emerges with a hierarchical structure within itself. In this structuring process, communication constitutes the infrastructure of other fields. With the effect of globalization, communication networks have developed to cover the world and it is aimed to maximize interactions. According to this, when the sectors that interact with the investments made in the infrastructure of communication are taken into account, quality and quantity become important in all studies (Kurt 2007). In this context, it is seen that quality and quantity have become important and a transition to a competitive approach has been achieved in the telecommunication sectors in different countries around the world. Trends in telecommunication technology have led to serious reforms in the field of telecommunication over time. Accordingly, it is seen that the sector has been re-evaluated with its roles in terms of national, economic and social security. With these evaluations, the telecommunication sector enables the creation of profitable and productive investment areas with the contributions of the private sector and different segments (Yıldız 2012).

1.1 Objectives

In this research, it is aimed to evaluate the 4.5G Service Quality of GSM Operators. For this reason, the research also aims to offer a different perspective to researchers and practitioners. For this purpose, the following research questions have been determined;

1. What is the distribution of the participants according to the GSM services that they prefer?
2. What are the reasons of participants for preferring a particular GSM operator?
3. What is the distribution satisfaction level of participants on 4.5G connection compared to 3G connection?
4. Do participants' perceptions of (expected and realized) service quality differ significantly according to the gender variable?
5. Do participants' perceptions of (expected and realized) service quality differ significantly according to the reason for preference of a GSM operator?
6. Is there a significant difference between the expected service quality and the realized service quality?

2. Literature Review

The basic telecommunication services required by the public and private sector customers include the transfer of information. These are the basic level services that provide the transfer of data or voice from the sender to the receivers, with only the transport potential and in their simplest form, along a transmission line. At the same time, services that include voice transmission and worldwide services are included in the class of basic telecommunication services. Access to these services is provided by a subscription contract and is open to everyone (Kent 2012).

Telecommunication industry is undergoing changes with the development of technology. In this respect, while the limitations in the sector are eliminated, telecommunication systems should be moved to the digital world and the transformation should take place. The wide range of products in the field of telecommunication and these products are becoming an indispensable part of life. With the increase and expansion of service quality, there is a supply-demand balance of the markets in the field of use.

The service is an output of the production phase and is offered by machines or humans. Services are non-physical products that are produced and consumed simultaneously. An offered service has different features such as "abstract", "variable" and "inseparable" (Parasuman et al. 1985). The first job to be done in the service sector, which has its own characteristics, is to determine the differences between the qualities of the services planned to be offered and other sectors and to ensure that these differences are understood. When a product is purchased by the consumer, its physical properties are evaluated in terms of posture, appearance, aesthetics, taste and smell. However, factors such as "reliability", "attitude" and "behaviors" are important when receiving services.

Consumers have a key role in ensuring the continuity and success of businesses or companies (Bozdağ et al. 2003; Douglas and Connor 2003). "Quality" is an indispensable concept for the services offered in this respect. In the definitions of quality; "degree of excellence", "compliance with requirements", "the sum of features of a good or

service based on its ability to meet specified or potential needs", "suitability for use", "fit for purpose", "to be free from all kinds of errors and defects" and it is considered as "making customers happy" (Hoyle 2007). Leaders in the field of manufacturing evaluate quality because it is "product-oriented" and "meets standards".

The service sector is an important field for every country. This area provides benefits for countries both socially and economically. In this respect, being successful for businesses or companies operating in the service sector means that service quality is provided (Eleren et al. 2007). It can be stated that the developments in the economic, social and technical fields throughout the world have gradually increased the economic power and efficiency of the service sector. While service quality is defined as "an attitude that emerges as a result of a long-term performance evaluation", "a result of consumers' expectations and perceptions from the service", researches reveal that the evaluation of service quality by consumers is more difficult than evaluating the quality of goods (Mohammad 2007). On the other hand, the frequency that occurs between the success or failure of a business is related to service quality (Eleren et al. 2007). In today's intensely competitive environment, the most important condition for the survival and success of businesses is to provide quality services that meet customer expectations.

It is seen that the interest in service quality is increasing day by day, and it has a serious place in public, private and academic research (Yağcı and Duman 2006), (Özpolat and Tunç 2021). The main elements that make up the service quality can be expressed as "expectation of the service recipient" and "perception" (Sevimli 2006).

3. Methods

In the research, scanning model, one of the descriptive research models, was used. In this context, it is aimed to reveal the perceptions of the participants about the quality of service that they expect and actually obtain regarding 4.5. Also, these perceptions were revealed by associating them with some demographic variables. The population of the research consists of individuals over the age of 18 who live in Gaziantep in 2023 and use a GSM operator service. The sample of the study consists of 406 participants who returned to the questionnaire.

4. Data Collection

The SERVQUAL scale developed by Beyaz (2013) was used as the scale of this research. The scale consists of 22 dimensions and 5 sub-dimensions. The alpha reliability coefficient of the scale (α) was found to be 0.81. These sub-dimensions are concrete features, responsiveness, reliability, trust, and empathy. Quantitative data analysis methods were used in the analysis of the research data. In this context, the research data were analyzed with the SPSS24 data analysis program. In the analysis, first of all, information on the demographic characteristics of the participants, percentage and frequency distributions were presented. According to Kolmogorow-Smirnov test and Shapiro-Wilk tests, it was accepted that the data showed normal distribution (p>.05). Due to the normal distribution of the data, the independent sample t-test and ANOVA test, which are parametric statistical techniques, were used in the analyses.

5. Results and Discussion

5.1 Numerical Results

Table 1. Comparison of Participants' Perceptions of Expected Service Quality by Gender Variable with Independent Sample t-Test

	Gender	N	Mean	Standard Deviation	t	df	p
Concrete Features	Women	240	16,4583	,68328	,506	404	,613
	Man	166	16,4217	,76468			
Reliability	Women	240	21,2833	1,59068	-,482	404	,630
	Man	166	21,3614	1,62986			
Enthusiasm	Women	240	16,8833	,94345	,839	404	,402
	Man	166	16,8072	,83059			
Confidence	Women	240	16,3750	1,54737	1,042	404	,298
	Man	166	16,2169	1,43589			
Empathy	Women	240	20,9917	,75983	1,112	404	,267
	Man	166	20,9036	,81819			
Expected Service Quality	Women	240	91,9917	3,11158	,890	404	,374
	Man	166	91,7108	3,14317			

The perceptions of the participants regarding the expected service quality according to the gender variable were compared with the independent sample t-test. As a result of the analysis, there was no significant difference in the total scores of concrete features, reliability, enthusiasm, trust, empathy and expected service quality (p>,05). On the other hand, it can be said that the expected service quality perceptions of the participants are similar according to the gender variable.

Table 2. Comparison of Participants' Perceptions of Realized Service Quality by Gender Variable with the Independent Sample t-Test

	Gender	N	Mean	Standard Deviation	t	df	p
Concrete Features	Women	240	15,7667	1,09723	2,917	404	,214
	Man	166	15,6506	1,03787			
Reliability	Women	240	20,5583	2,18322	-,664	404	,507
	Man	166	20,6988	1,96166			
Enthusiasm	Women	240	16,3667	1,25384	-1,831	404	,068
	Man	166	16,5904	1,14454			
Confidence	Women	240	15,6000	1,76626	1,380	404	,168
	Man	166	15,3614	1,62986			
Empathy	Women	240	20,4417	1,59914	1,099	404	,272
	Man	166	20,2771	1,29627			
Realized Service Quality	Women	240	88,9333	4,61892	,843	404	,400
	Man	166	88,5783	3,42936			

The perceptions of the participants regarding the service quality realized according to the gender variable were compared with the independent sample t-test. As a result of the analysis, there was no significant difference in the total scores of concrete features, reliability, enthusiasm, trust, empathy and realized service quality (p>,05). On the other hand, it can be said that the realized service quality perceptions of the participants are similar according to the gender variable.

Table 3. Comparison of Participants' Perceptions Regarding Expected Service Quality According to the Variable of the GSM Operator Used by ANOVA Test

	GSM Operator Preferred	N	Mean	Standard Deviation	df	F	p
Concrete Features	Vodafone	142	16,4789	,69157	2	1,522	,219
	Turk Telekom	158	16,3671	,75168			
	Turkcell	106	16,5094	,69344			
Reliability	Vodafone	142	21,3380	1,48700	2	,033	,968
	Turk Telekom	158	21,2911	1,65996			
	Turkcell	106	21,3208	1,68776			
Enthusiasm	Vodafone	142	16,9437	,96591	2	2,300	,102
	Turk Telekom	158	16,7342	,88453			
	Turkcell	106	16,9057	,81098			
Confidence	Vodafone	142	16,3944	1,54808	2	1,015	,363
	Turk Telekom	158	16,1772	1,49530			
	Turkcell	106	16,3962	1,45196			
Empathy	Vodafone	142	21,0141	,91470	2	1,435	,239
	Turk Telekom	158	20,8734	,72035			
	Turkcell	106	21,0000	,67612			
Expected Service Quality	Vodafone	142	92,1690	3,32191	2	2,517	,082
	Turk Telekom	158	91,4430	3,07340			
	Turkcell	106	92,1321	2,86880			

The perceptions of the participants on Service Quality according to the GSM Operator used were compared with the ANOVA Test. As a result of the analysis, it was determined that there was no significant difference in concrete features, reliability, responsiveness, trust, empathy and overall service quality scores ($p > .05$).

Table 4. The Comparison of the Realized Service Quality Perceptions of the Participants According to the Variable of the GSM Operator Used by the ANOVA Test

	GSM Operator Preferred	N	Mean	Standard Deviation	df	F	p
Concrete Features	Vodafone	142	15,8169	1,13375			
	Turk Telekom	158	15,9241	1,11472	2	,997	,370
	Turkcell	106	15,7358	,95919			
Reliability	Vodafone	142	20,8028	2,11459			
	Turk Telekom	158	20,5823	2,04788	2	1,074	,343
	Turkcell	106	20,4151	2,13304			
Enthusiasm	Vodafone	142	16,3662	1,25183			
	Turk Telekom	158	16,5443	1,12638	2	,806	,448
	Turkcell	106	16,4528	1,28828			
Confidence	Vodafone	142	15,5493	1,73237			
	Turk Telekom	158	15,6203	1,71397	2	1,454	,235
	Turkcell	106	15,2642	1,68071			
Empathy	Vodafone	142	20,4930	1,39780			
	Turk Telekom	158	20,3671	1,49885	2	,983	,375
	Turkcell	106	20,2264	1,56925			
Realized Service Quality	Vodafone	142	89,0282	4,05274			
	Turk Telekom	158	89,0380	4,26642	2	1,993	,138
	Turkcell	106	88,0943	4,15080			

The perceptions of the participants on service quality according to the GSM Operator used were compared with the ANOVA Test. As a result of the analysis, it was determined that there was no significant difference in concrete features, reliability, responsiveness, trust, empathy and overall service quality scores ($p > .05$).

Table 5. Comparison of Participants' Perceptions of Expected and Realized Service Quality with the t-Test

Service Quality Dimensions	N	Mean	Standard Deviation	t	df	p
Concrete Features (Expected)	406	16,4433	,71698			
Concrete Features (Realized)	406	15,8374	1,08329	9,254	405	,000
Reliability (Expected)	406	21,3153	1,60527			
Reliability (Realized)	406	20,6158	2,09412	5,519	405	,000
Enthusiasm (Expected)	406	16,8522	,89874			
Enthusiasm (Realized)	406	16,4581	1,21390	5,360	405	,000
Confidence (Expected)	406	16,3103	1,50300			
Confidence (Realized)	406	15,5025	1,71378	7,185	405	,000
Emphaty (Expected)	406	20,9557	,78442			
Emphaty (Realized)	406	20,3744	1,48332	7,009	405	,000
Expected Service Quality	406	91,8768	3,12372			
Realized Service Quality	406	88,7882	4,17275	11,786	405	,000

Expected and realized service quality perceptions of the participants were compared with the related sample t-test. Accordingly, it was determined that the realized service quality in terms of concrete features, reliability, responsiveness, trust, empathy and service quality perception total scores was lower than the expected service quality perception levels ($p \leq .05$).

5.2 Results and Analysis
When the distribution of the participants according to the used GSM operator variable is examined, it is determined that 35% use Vodafone, 38.9% use Turk Telekom, and 26.1% use Turkcell operator as presented in Figure 1.
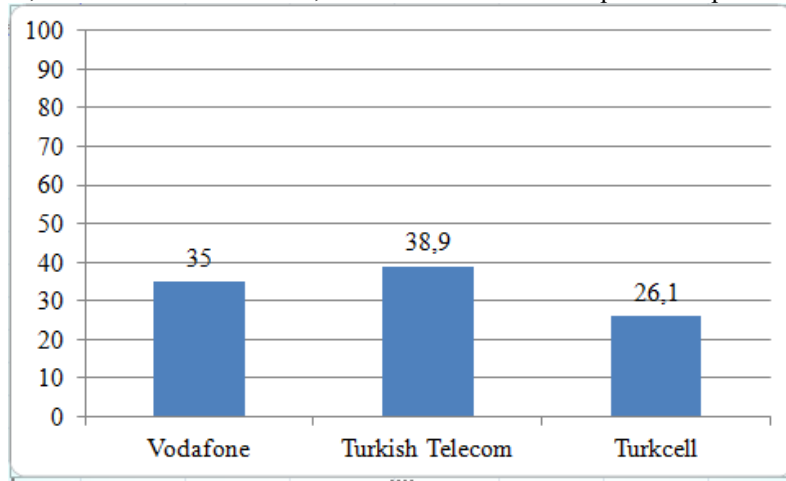

Figure 1. Distribution of Participants by GSM Operator Variable Used

Accordingly, the users prefer the operator they use because of these; the service quality and pricing (60.6%), service quality and coverage quality (24.1%), their own experience (8.4%), environmental advice and their own experience (4.9%), environmental advice and service quality (2%).
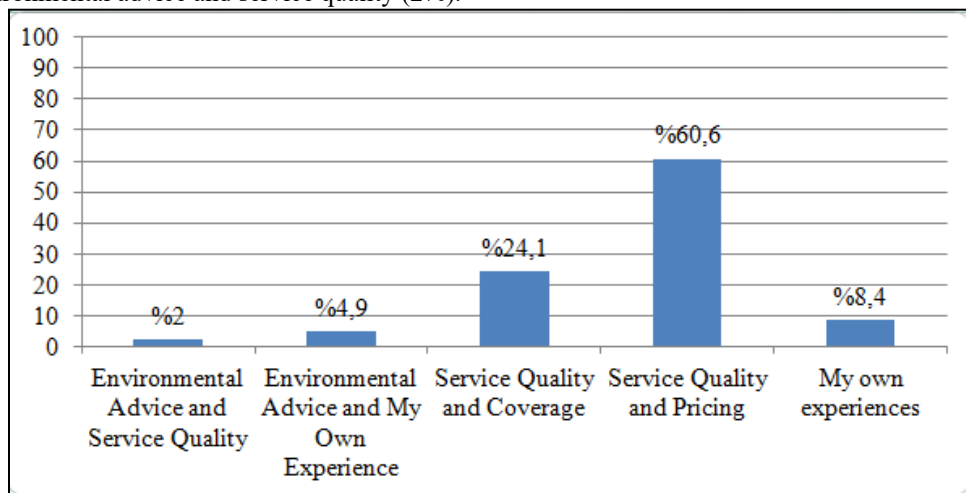

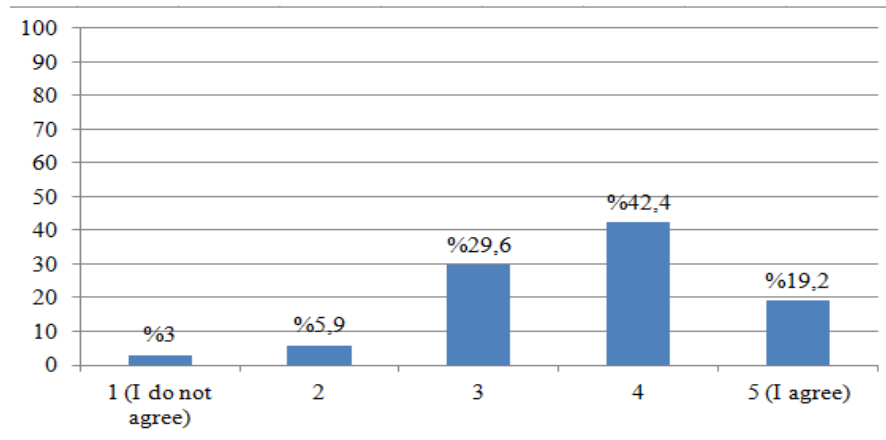Figure 2. Distribution of Participants by GSM Operator Preference Variable

Figure 3. Distribution of Participants by Satisfaction Rank with 4.5G Connectivity Compared to 3G Connection

When the distribution of the participants according to the degree of satisfaction differences during the switch from 3G connection to 4.5G connection, 3% of them were not satisfied at all, and 19.2% of them were very satisfied. Compared to the 3G connection, it can be said that a significant part of the participants is more satisfied with the 4.5G connection.

The findings obtained in the study were compared with various research findings in the literature. In a similar study, Beyaz (2013) conducted research to examine the service quality of GSM operators. In the study, there was no difference in service quality perceptions arising from the operator preference of the participants. It was stated that the service quality perceptions of the participants did not differ according to the age. Hotamışlı and Eleren (2012) examined the perceptions of GSM operators about service quality in their research. As a result of the analysis, although there was no difference between the expectations from the operators, there was a difference due to the realized/perceived features. In addition, it was observed that the participants could not fully obtain the service quality they expected in any dimension. While there is a difference in the perceptions of service quality due to the education level of the customers, there is no difference due to gender. In the research conducted by Gül and Yapraklı (2019) on the effect of service quality of GSM operators call centers on brand loyalty, it is seen that service quality is expressed as physical characteristics, reliability, assurance, empathy and responsiveness. Accordingly, it has been seen that service quality can be evaluated in five categories. In the study, it was seen that the participants had medium level perceptions due to responsiveness, empathy, brand loyalty, and above medium level due to compatibility. In addition, the effect of service quality on brand loyalty was examined, and in this context, it was concluded that reliability, enthusiasm and empathy were associated with brand loyalty. In the study conducted by Tayyar and Işık (2013) on the examination of the relationship between service quality and other variables in the GSM sector, it was stated that variables such as satisfaction with the services offered and service quality are important and that they affect the increase of customers' loyalty to businesses and ensuring continuity. In the study conducted by Aydınlı and Arslan (2016) on the effect of service quality dimensions on satisfaction in the business sector, it was determined that there is a relationship between satisfaction with the services offered and customer satisfaction and loyalty. Similarly, in the research conducted by Zanco and Kaya (2015) on the research of university students' reasons for choosing a GSM operator, it was stated that the operator preferences of the participants differed according to their gender, and the service quality, price, coverage area and close environment factors did not differ according to gender. On the other hand, women were more affected by advertisements than men. Similar to the research findings, Haque et al. (2010) stated that variables such as service quality, age, gender, advertisement and product quality are effective in their research on the factors affecting the GSM operator preferences of users. Similar to the findings, in the study conducted by Okeke (2014), it was concluded that variables such as advertisements, network quality, price and service quality are important in the operator preferences of the participants.

6. Conclusion

Within the scope of the research, an application was made in Gaziantep to measure the 4.5G service quality measurement of GSM operators with SERVQUAL analysis method. In the study, it was determined that the participants were generally satisfied with the operators and this situation did not differ according to gender. In

addition, it is concluded that the realized service quality in terms of concrete features, reliability, responsiveness, trust, empathy and service quality perception total scores is lower than the expected service quality perception levels. It has been determined that 4.5G satisfaction level of the participants are lower than the 3G connection.

It was determined that the satisfaction of the participants was generally positive according to the service quality offered by the GSM operators, but there were also negative perceptions. Efforts can be made to improve these perceptions. In addition, it has been observed that the realized service quality is lower than the expected service quality. In this respect, it is important for businesses to try to provide services focused on customer expectations.

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