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Article

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MEASURING QUALITY IN AUTOMOBILE AFTERSALES: AutoSERVQUAL SCALE

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Abstract

It is becoming more important to accurately measure the level of quality in services and especially automobile related services such as after sales service. This study aims to generate a survey to measure the service quality in automobile aftersales services, eventually to be called AutoSERVQUAL. The roadmap for this survey generation process starts by examining the service quality measurement scales in literature first and then continues by the adaptation process of SERVQUAL over automobile aftersales customers. Each and every step in survey generation processes is explained starting from expert interviews and finally statistical analyses. Starting with 45 candidate questions, the study offers a 28 item scale that can measure service quality in after sales car services with high reliability. The scale can be extended to cover aftersales services in general for any type of product and also could be used as input to other models such as QFD and MADM. The scale should also be empirically tested in other countries with specific requirements for after sales services.

Keywords: AutoSERVQUAL, SERVQUAL, automobiles, after sales, services

JEL Classification: M11, M31

Introduction

There are many sector adapted service quality scales but there is not a density in terms of scale generation on automobile aftersales found in the literature, thus this study will be a milestone for the area of service quality in automobile aftersales services. The survey generated from this study will be for use in the automobile aftersales sector. SERVQUAL is the most popular and is intensively used in many service quality measurement problems in the literature (Parasuraman, Zeithaml and Berry, 1988; 1994). The SERVQUAL scale consist of 22 items which is used by many academics to measure the service quality in a variety of industries, such as acute care hospital, tire retailing, business school placement

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center, dental services (Carman, 1990), car services (Bouman and van der Wiele, 1992), restaurants (Lee and Hing, 1995), health sector (Youssef, Nel and Bovaird, 1995), holiday resorts (Tribe and Snaith, 1998), internet web-sites (van Iwaarden et al., 2003), university computer labs (Hughey, Chawla and Khan, 2003), banking (Cui, Lewis and Park, 2003), and airline sectors (Gilbert and Wong, 2003). SERVQUAL has been used alongside other important service measurement surveys including ServPerf, The B&W (Bouman and van der Wiele) Model.

Companies continuously need to monitor the needs and satisfaction levels of the customers in order to make informed decisions about their operations at the level of manufacturing facility, distribution network or service network. Measuring satisfaction for durable products like cars or electronics requires detailed questionnaires. For services the detailed questionnaires have long been used with the pioneering work resulting in the SERVQUAL scale. In this study, as Cronin and Taylor (1992) stated, perception side of SERVQUAL is examined and modified by various steps to reach an AutoSERVQUAL scale. In the subsequent sections we explain the steps including Focus Group Interviews, Item Generation Process, Content and Reliability Analysis. Next section continues with the literature review of service quality measurement scales.

1. Literature review: service quality measurement

SERVQUAL is a name which is originated from the combination of the first letters of Service Quality. In this scale, service quality is determined by the discrepancy between a customer's expectations of a service offered and the perceptions of the same customer's about the service he/she received, by asking the customer questions about both his/her perceptions and expectations (Parasuraman, Zeithaml and Berry, 1988).

SERVQUAL measure is differentiated from satisfaction because it uses the term perceived in place of the actual service received. SERVQUAL is a valid, reliable and applicable survey for the services sector and it is ready for the use of the companies and organizations that work in the services sector. Measuring quality in services is more difficult than production thus the importance of the SERVQUAL is mainly a result of its capability to measure the quality of the services provided. Results are determined by customer perceptions, so the customers and providers of a service may differ in terms of their perceived level about the services' quality. SERVQUAL is the most popular survey for measuring the service quality in the literature. There are other alternatives; nevertheless, neither of them is used as much as SERVQUAL. The scale has 22 questions on five dimensions; the full questionnaire in two versions as expectation and perception formats is reported by Parasuraman, Zeithaml and Berry (1988).

Literature has many examples of developed versions of the SERVQUAL applied in various industries. One such sector is online services where different scales have been generated to measure service quality in electronic services, a very recent example being the E-S-Qual scale extended to online banking services (Akkucuk and Teuman, 2016). In the area of airline transportation, SERVQUAL has been extended to measure customer satisfaction from e-ticketing on airlines' websites (Elkhani, Soltani and Jamshidi, 2014). In a recent review article Pizam, Shapoval and Ellis (2016) state that "SERVQUAL has been used in hundreds of studies, including numerous studies in the hospitality and tourism industries". Galeeva (2016) has extended the model to measure quality in higher education settings and also offered a

solution for the main criticism of SERVQUAL in terms of the use of difference scores. In some studies, the exact SERVQUAL items are used but in some the elements are changed, Blesic, Cerovic and Dragicevic use 15 original questions and 9 new questions in their study on service quality of hotels (2011). While it is true that recent studies using SERVQUAL focus on hospitality sector (Rauch et al., 2015; Min, 2016) there is one recent study by Cho et al. (2016) that applies a SERVQUAL like questionnaire in order to build a House of Quality for the electronic services sector. The number of questions used is equal to the SERVQUAL questionnaire (22) although they are adapted to electronic after sales services (actually the adaptation could be valid for any after sales service).

Weitz and Wensley (2002) inform about another advantage of SERVQUAL. They state that this method signals the companies the perceptions and needs of the customers apart from measuring the quality. Pikkemaat and Peters (2006) evaluate SERVQUAL as having the purpose of identifying the gap between customer perceptions and expectations. Lastly, Fedoroff and Courage (2009) explain the importance of employee opinions with respect to customer expectations. The most popular service quality measurement scale after SERVQUAL in the literature is ServPerf. Cronin and Taylor (1992) introduced the ServPerf scale as an opposition to the researchers who were studying on the SERVQUAL scale. The conceptual basis of the scale was questioned and they stated that SERVQUAL was confusing directly with the concept of service satisfaction. Then, the expectation (E) component of SERVQUAL is not used in this new scale and the performance (P) component is used alone. This new scale is named as ServPerf scale in the literature and the assessment procedure was adapted to the case of travel agencies (Moisescu and Gica, 2014) and also a fuzzy ServPerf model combined with ELECTRE III was used to comparatively evaluate service quality of international airports in Sicily (Lupo, 2015).

On the other hand, the creators of the ServPerf provided empirical evidence across four industries besides the theoretical arguments. They used the data of fast food, dry cleaning, pest control and banks to prove the ability of their new performance-only instrument. ServPerf comes from the performance component of original SERVQUAL scale, thus it includes 22 items. This single item scale explained better variance (Cronin and Taylor, 1992). Another advantage of this new scale is that it decreases the number of questions and the time for filling the questionnaire. This signals the popularity of this scale in the literature across several authors (Mazis, Antola and Klippel, 1975; Churchill and Surprenant, 1982; Woodruff, Cadotte and Jenkins, 1983; Bolton and Drew, 1991; Boulding et al., 1993; Gotlieb, Grewal and Brown, 1994; Hartline and Ferrell, 1996). There has also been criticism of the scale in terms of unidimensionality, use of the difference scores for the gap model and the negative item wording used for some questions (Babakus and Boller, 1992).

Moreover, the important issue here is the ideas of founders of SERVQUAL about this popular scale. Even, Zeithaml observed in a study that their results were directly influenced only by perceptions (Boulding et al., 1993), which is regarded as a positive criticism about the ServPerf. The ServPerf versus SERVQUAL debate is ongoing in the literature. Recently, there are many supporters of both groups which consider one method to be more superior over the other.

Another frequently used measure in various sectors, including automobile services, is the Customer Satisfaction Index (CSI). Each and every automotive brand has its own Customer Satisfaction Index to measure the satisfaction level of their brands' customer. Customer satisfaction index is an instrument which examines a number of items related to the service

provided by the organization; the customers are required to rate each of the items according to their encounter with the services provided (perceptions only). The number and the type of questions may vary between organizations. Each of them is pre-weighted by the organization instead of the customers. Customer satisfaction has an important effect on the repurchase in the new car retail market heavily. The overall performance of the dealers is examined by these scores and many criteria are determined by the manufacturers regarding the quotas and incentives for their dealers according to these results.

2. Research design: item generation

Quality and Efficiency are the two bases for being competitive in terms of automobile aftersales services. For the measurement of aftersales services quality SERVQUAL is selected by the authors as the starting point in survey generation which, in addition to showing the level of service quality, also signals firms the critical ways to better trace the customer perceptions and expectations over time (Weitz and Wensley, 2002). In automobile aftersales sector, besides measuring the service quality, to understand the customer expectations and perceptions is also very important.

The advantages/disadvantages and literature examples of each of the other important alternative is discussed in previous sections. As seen, in literature SERVQUAL is adopted by many sectors, and there are many studies about this adoption process. The scale is modified in nearly all studies accordingly with the sector and country studied. Thus, in our study to analyze the quality of automobile aftersales services in Turkey, the same processes will be performed. This section includes the academic steps to reach an AutoSERVQUAL which will be ready for Turkish automobile aftersales customers. Furthermore, the scale developed in this research will provide information to the automobile aftersales service providers concerning their customers' perceptions and expectations to a new examination system. The implementation of the new system aims to increase the level of service quality as perceived by customers. Based on the literature, the dimensions that can be included in our study are the same as the five dimensions above. These assumptions are coming from the literature review about the service quality and automotive industry, but may be changed after the research is completed. Our study aims to understand the details of the dimensions from the results of studies including focus groups, expert opinions and surveys. Ultimately, we hope to see the modified version of SERVQUAL, which will be applicable for Turkey. This part will explain the academic steps about how the AutoSERVQUAL is developed.

For the purpose of our study we chose a qualitative research design. By exploratory research, we will try to calibrate the SERVQUAL scale to understand the dimensions of service quality in automobile aftersales services in Turkey and with future research this scale may also be valid for the international after sales automotive sector or the aftersales sector in general. In exploratory studies; besides the focus group interviews, there are different study methods as case study method, verbal protocol analysis, cognitive mapping, Critical Incident Technique (CIT), participant observation and individual depth interviews alternatives. In focus groups, group interaction and synergy makes the sum of knowledge greater than separate individual opinions. The distinguishing feature of focus groups is the explicit use of group interaction to produce data and insight that would be less accessible without the interaction found in a group (Morgan, 1997).

Focus groups generate greater depth of information on an issue than a general count of single opinions gleaned from a survey (Carson et al., 2001). As a result, Focus Group study has been our selection as a starting point. In our study, in accordance with the purposes of the research, three focus groups were used in order to generate ideas about the construct. Carson et al. (2001) state that most focus group research seeks some element of homogeneity so that opinions stem from a factor of commonality among participants. This can be of age group, lifestyle, consumption patterns, expertise or experience. According to Morgan (1997), a range of six to ten is the rule of thumb for group size even though these are no strict lower and upper boundaries. Carson et al. (2001) affirm that the contemporary view of an appropriate number of respondents in each group is five to eight. Saturation is the criterion in determining the number of groups. Saturation is the point at which additional data collection no longer generates new understanding.

We formed three focus groups, consisting of six, six and seven people. The first six people were automotive service business professionals still working on the leading automotive brands in Turkey and ranged between the ages of 33 and 45. They are working in the service departments of different automotive distributors and their main business is to check the processes of their service dealers all over Turkey. Moreover, they all own a car so they were both the business professionals and aftersales customers in automobile services sector. The second focus group of six people was the automobile aftersales customers in a car service waiting for their cars to be repaired and were aged between 22 and 54, and. The advantage here is that each respondent, even each person in this group was an aftersales service customer and had fresh ideas about the service given to their cars. The third focus group consisted of automobile service station employees and managers who work in the field of aftersales. This last group consisted of seven people, aged between 29 and 42. The first group consisted of five males and one female; the second group consisted of three males and three females, whereas the third group consisted of three males and four females.

As a moderator, following advice in the literature, the researcher controlled both the dynamics of the group discussion and the topics that were discussed. He was careful about not biasing the participants' responses. The researcher tried not to involve too much with group discussions and did not impose his own sense of what is important and let the members speak their opinions freely about automobile services and the service quality dimensions. Focus Group Interviews are done to generate knowledge from multiple perspectives, so to get the advantage of this method, the meeting was recorded. These records will be used for both content analyses and scale development. Despite the same purpose of the questions, they are a bit reworded in other questions to pick the issue up again. Following open-ended questions were the focal points during the focus group interviews:

Q₁: What are your most important expectations of the car service that you bring your car? (Try to describe your preferences)

Q₂: Think about the service station that you bring your car, and talk about the conditions which are done by them, to fail to meet your expectations?

Q₃: What are your most essential expectations when you consider the service given to your car in aftersales service stations?

Q₄: Can you please share any other aftersales service-related issues that you consider important about car service business? (Any problems you faced or suggestions/comments)

In the development of the scale that seeks to measure aftersales service quality through the five aforementioned dimensions, we followed the recommendations of Robinson, Shaver, and Wrightsman (1991) about scale construction and evaluation. They state that the first step for scale builders, and the first dimension on which their work can be evaluated, is writing or locating items to include in a scale. They also assume the scale builder to know the research field for constructing an instrument which would cover the main theoretical constructs good enough which will also be useful for other studies. They state minimal considerations for constructing a scale as:

- **Proper Sampling of Content:** Sampling of items is an important process and needs a careful study about the details of the content. Here, the experience of the researcher is very important. In our study, one of the researchers has experience of more than ten years in automobile aftersales business which is an important advantage, but the item generation process is done by the help of business professionals and the second author of the paper.

- **Simplicity of Item Wording:** Wording of the items is another important area which determines the success of the scale generated. We observed in the literature that less complex and less “stuffy” items bring better results. Converse and Presser (1986) and Sudman and Bradburn (1982) have such recommendations.

- **Item Analysis:** This last process is a very broad process which requires an understanding of the researcher by the respondents. Talking with the same language in terms of the researched subject is very important.

The data coming from Focus Groups have been collected by recording of the answers, and decoded by writing each opinion to a piece of paper. The variables that are produced by group members are used to develop a questionnaire about the components of service quality in automobile aftersales services, and to generate a scale for Turkish automobile aftersales customers, which is called AutoSERVQUAL and will be tested quantitatively in the course of the research. To make use of the ideas generated from both focus groups, a detailed understanding of the variables is needed. According to Morgan (1997), neither the group nor the individual constitutes a separable unit of analysis. Instead, our analytical efforts must seek a balance that acknowledges the interplay between these two levels of analysis. Three common ways of coding focus group transcripts are available in the literature by noting: (a) all mentions of a given code, (b) whether each group's discussion contained a given code, or (c) whether each individual participant mentioned a given code.

Descriptive counting is especially useful in research projects that compare distinctively different groups to determine how often various topics are mentioned at different times. The ideas coming from focus groups are analyzed and the results are interpreted in light of the research construct. There are at least three overlapping sorts of activities that go into data analysis: data reduction, data display and the drawing and verifying of conclusions (Griggs, 1987). Data reduction is a method of organizing data to make them more meaningful. This step is one of the most important ones and is not ignoring data, or throwing it away. Here, the aim is to bring the data to a manageable position. The focus group results are examined with data reduction purposes. To generate the items, expert opinions from sector professionals and service managers are used to categorize items.

The focus group results are organized into different topics to make the data more understandable. In other words, we grouped the statements that have a similar pattern of meaning together. This is needed, because, according to Griggs (1987), showing the data and analysis in one place make it easier to compare different sets of data and to see where further analyses are called for. To determine a base for item categorization is not organized

by only the authors' capability, here the professionals from automobile aftersales sector and opinions of the experts were important decision variables for item categorization. Reliability and validity analysis can be conducted, only after items that share similar patterns are grouped, so the data display was needed before the verification. The steps of content analysis on the research construct are carried out based on Golden and Zimmer's (1988) article. After careful analysis of the results of open ended questions we end up with the 45 questions which will be used for the initial questionnaire that will be administered to a group of 250 customers. The questions and the codes that will be used for the remaining sections of the paper are provided in the next section.

3. Sampling process and item deletion

Item generation is explained above and the dimension distribution of the items is also done by expert opinion of a group which consisted of three people, two business professionals and one academician except the author. Expanded SERVQUAL, in other words pilot study of AutoSERVQUAL included 45 questions from five same dimensions as given in Table no. 1. The list includes the original 22 SERVQUAL items and "extra" items that result from the focus groups which are marked with the prefix "ek".

Table no. 1: Item pool of 45 questions for the AutoSERVQUAL survey

1) Tangibles (8 items) <i>Up-to-Date Equipment (TAN1)</i> <i>Quality of Physical Facilities (TAN2)</i> <i>Neat Dressed Staff (TAN3)</i> <i>Compatible Physical Materials (TAN4)</i> <i>Parking Convenience (ekTAN1)</i> <i>Take Advantage of Technology (ekTAN2)</i> <i>Certificate of Quality Standards (ekTAN3)</i> <i>Comfortable Waiting Lounge (ekTAN4)</i>	2) Assurance (9 items) <i>Trustable Staff (ASS1)</i> <i>Feel Safe in Transactions (ASS2)</i> <i>Politeness of the Staff (ASS3)</i> <i>Adequate Support from the Producer (ASS4)</i> <i>Knowledgeable Staff (ekASS1)</i> <i>Trained Staff (ekASS2)</i> <i>Informative Explanations (ekASS3)</i> <i>Reasonable Pricing (ekASS4)</i> <i>Guaranteed Maintenance (ekASS5)</i>
3) Responsiveness (10 items) <i>Telling Customers Exactly the time of Service (RES1)</i> <i>Quick Solution to Problems (Prompt Service) (RES2)</i> <i>Concerned Staff (Willing to help customers) (RES3)</i> <i>Not Being Too Busy to Respond to Customers (RES4)</i> <i>Compatible Staff (ekRES1)</i> <i>Adequate Transportation Facilities (ekRES2)</i> <i>Qualified Labor Force (ekRES3)</i> <i>Replacement Vehicle during Repair (ekRES4)</i> <i>Equal Treatment (ekRES5)</i> <i>Attentive Service (ekRES6)</i>	4) Reliability (10 items) <i>Delivery of the Service at the Time Promised (REL1)</i> <i>Sincerity of the Staff (Sympathetic and Reassuring) (REL2)</i> <i>Trustworthiness (REL3)</i> <i>Keeping Promises (REL4)</i> <i>Keep Accurate Records (REL5)</i> <i>Accurate Detection of the Failure (ekREL1)</i> <i>Use of Original Products (ekREL2)</i> <i>Repairing According to Procedures (ekREL3)</i> <i>Reliable Repairing (ekREL4)</i> <i>Personal Information Security (ekREL5)</i>
5) Empathy (8 items) <i>Individual Attention (EMP1)</i> <i>Employees' Personal Attention (EMP2)</i> <i>Understanding the Needs of the Customers (EMP3)</i>	<i>Focus on Customer Expectations (EMP4)</i> <i>Convenient Operating Hours (EMP5)</i> <i>Payment Options (ekEMP1)</i> <i>Offering Gifts and Promotions (ekEMP2)</i> <i>Delivery Quality (ekEMP3)</i>

To reflect the Turkish aftersales customer population better, stratified random sampling method is selected. A professional agency was contracted under Turkish Council of Higher Education research budget and after agreeing on the final form of the survey the agency employees carried out the data collection using the personal interview method. AutoSERVQUAL scale has to reflect the ideas of consumers all over Turkey. The numbers of respondents from each of the 12 regions of Turkey are chosen according to the share of the region's population to the Turkish population as shown in Table no. 2. Number of respondents from all regions of Turkey is included in this study. According to Youthmedia (the company that undertook the data collection) 611 consumers were approached, 416 accepted to answer the questionnaire and after the screening question finally we were left with 250 usable questionnaires.

Table no. 2: Number of Respondents in the Pilot Study

District	Population	Ratio	Number of Respondents
İstanbul	14,377,018	18.50%	46
Western Marmara	3,351,582	4.31%	11
Aegean	10,023,549	12.90%	32
Eastern Marmara	7,332,137	9.44%	24
Western Anatolia	7,499,242	9.65%	24
Mediterranean	9,906,771	12.75%	32
Middle Anatolia	3,886,251	5.00%	13
Western Black Sea	4,493,559	5.78%	14
Eastern Black Sea	2,566,840	3.30%	8
Northeast Anatolia	2,206,326	2.84%	7
Middle East Anatolia	3,801,911	4.89%	12
Southeast Anatolia	8,250,718	10.62%	27
Total	77,695,904		250

According to the information gathered from our Research Company, in-home and mall interviews were the most expensive alternatives, and our study is conducted in these two categories. As Trivedi and Malhotra (1993) state, face-to-face interviews are high in response rates and are more convenient for high number of questions. These advantages determined our survey method selection for the pilot study of AutoSERVQUAL.

Researchers need not go so far as to factor-analyze their data to select items to be included or discarded, but an item inter correlation matrix (on perhaps a small subsample or pretest sample) can be a simple and convenient surrogate for determining which items to include, particularly when using most of the statistical packages available for personal computers (Robinson et al., 1991). A four stage elimination procedure was applied in order to reduce the number of variables. First, we eliminated the items highly correlated items, next comes

overall factor and reliability analysis, then factor and reliability analysis for five separate dimensions is applied, and finally overall factor and reliability analysis with the remaining variables determines the scale. In the first step, Inter-Item Correlation Matrix of all items is used. Thus, highly correlated items are assumed to measure similar concepts, so the elimination is started by these items. Highly correlated items are mainly from the same dimensions, so this is a result of questions with excess detail. By the expert opinions of a group consisting of four people, including the authors and two aftersales business professionals the eliminated questions because of their high correlation scores are: ASS1, ASS2, EMP2, EMP4, ekASS2, ekASS4, ekASS5. Table 2 provides Item Total statistics after this elimination. Using the item-total correlations in this table TAN1, TAN2, TAN3, TAN4 are also eliminated.

Table no. 3: Item Total Statistics of the 38 items after elimination in first stage

Item-Total Statistics	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
TAN1	168.78	126.172	0.248	0.928
TAN2	168.91	125.851	0.202	0.929
TAN3	169.04	125.384	0.171	0.931
TAN4	169.41	128.789	-0.027	0.94
REL1	168.45	123.02	0.541	0.925
REL2	168.49	122.725	0.492	0.926
REL3	168.4	123.534	0.629	0.925
REL4	168.38	123.056	0.673	0.924
REL5	168.42	122.502	0.685	0.924
RES1	168.42	122.309	0.677	0.924
RES2	168.47	121.68	0.622	0.924
RES3	168.43	122.005	0.732	0.924
RES4	168.49	120.998	0.71	0.923
ASS2	168.82	126.073	0.306	0.927
ASS3	168.83	125.899	0.324	0.927
EMP1	168.62	120.374	0.611	0.924
EMP3	168.46	122.073	0.608	0.924
EMP5	168.46	121.647	0.701	0.924
ekTAN1	168.93	124.682	0.402	0.926
ekTAN2	168.97	123.393	0.434	0.926
ekTAN3	168.94	124.145	0.347	0.927
ekTAN4	168.92	124.789	0.449	0.926
ekREL1	168.54	121.446	0.524	0.925
ekREL2	168.46	121.326	0.755	0.923
ekREL3	168.53	121.584	0.57	0.925
ekREL4	168.46	121.712	0.717	0.924
ekREL5	168.47	121.808	0.659	0.924
ekRES1	168.43	122.455	0.683	0.924
ekRES2	168.46	121.519	0.711	0.924
ekRES3	168.42	122.181	0.704	0.924

Item-Total Statistics	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
ekRES5	168.48	121.455	0.709	0.924
ekRES6	168.46	121.952	0.71	0.924
ekASS1	168.9	124.487	0.466	0.926
ekASS3	168.93	124.316	0.369	0.927
ekASS4	168.9	124.407	0.383	0.927
ekEMP1	168.45	122.296	0.571	0.925
ekEMP2	168.46	121.952	0.653	0.924
ekEMP3	168.41	122.62	0.648	0.924

In the first stage of the scale purification process coefficient alpha is calculated for the entire 45-item instrument (Cronbach, 1951), according to Churchill's (1979) recommendations. In the first step, the multi-item correlation scores decreased the number of items to 38. By these results of the first phase of our reliability analysis, now second step is overall factor and reliability analysis. Berthon, Ewing and Hah (2005) describe the elimination of all items whose corrected item-to-total correlation is less than 0.40 in their study, in our study the consensus is eliminating the items that have the value less than 0.30, resulting in the removal of four items. Thus, the second phase of our scale purification includes the elimination of the items whose corrected item total correlation is less than 0.30, which results by the exclusion of a further four items. This process left a total of 34 items by the end of the second step.

In the second step, four items are deleted according to their Corrected Item-Total Correlation value (TAN1, TAN2, TAN3, TAN4). Third step is the factor and reliability analysis for five separate dimensions (the results are not shown here to save space). Here, the only elimination comes from Reliability Dimension because of the Rotated Matrix of Reliability Dimension. All other dimension has no problem in Rotated Component Matrix figures except Reliability, which shows no problem after the elimination of REL1, REL2 and REL3. Finally, overall factor and reliability analysis by the remaining items is processed by SPSS and the results made three more dimensions to be eliminated, which make the number of remaining dimensions reach the number of 28. Pilot study of AutoSERVQUAL had 45 questions from five dimensions whereas after the factor and reliability analysis, this number is now 28, including all five dimensions.

Conclusions

Companies need to increase their sales together with increasing profits. Aftersales services are centrally important for both increasing sales and increasing profits. Monitoring the satisfaction level of customers is the main issue in terms of successful aftersales services. Durable products including cars need detailed questionnaires like SERVQUAL; however, there was not a scale in the literature that directly targets automobile aftersales services. Thus, AutoSERVQUAL serves the purpose of measuring automobile aftersales services and is a pioneer for automobile aftersales area in literature. Car dealers require high investments and high investments require high profits. The best way to create a sustainable profit making business system comes with successful sales and aftersales relationship. It is more difficult to measure and understand the customer in terms of the quality of the service provided. So, AutoSERVQUAL is adopted academically for this purpose to measure and monitor the satisfaction of automobile aftersales customers.

There are many versions of SERVQUAL in the literature adopted for different business sectors but this study is the first one which adapts to automobile aftersales industry. This adoption process took more than a year to collect the relevant data and process it by the opinions of academic and business professionals. The results will also be used by some of the automotive firms in our country including the top five firms in their further surveys. Also, AutoSERVQUAL scale is being used in continuous funded academic research to classify specific brands in the Turkish automotive firms in terms of quality they present to their customers. AutoSERVQUAL has five dimension same as the original SERVQUAL scale, in processed version Tangibles dimension includes four modified variables, Reliability dimension includes, one modified and one original SERVQUAL items and four added items. Responsiveness dimension consist of three original SERVQUAL items, one of them is modified and five added items. Assurance and Empathy dimensions accommodate two original SERVQUAL items with three recently added items. Following these changes, updated AutoSERVQUAL for Turkish automobile aftersales customers is as given in Table no. 4.

Table no. 4: 28 questions for the AutoSERVQUAL survey

1) Tangibles (4 items) <i>Entry Exit and Parking Convenience</i> (ekTAN1) <i>Take Advantage of Technology</i> (ekTAN2) <i>Certificate of Quality Standards</i> (ekTAN3) <i>Visually Appealing Waiting Lounge</i> (ekTAN4)	2) Assurance (5 items) <i>Feel Safe in Transactions</i> (ASS2) <i>Politeness of the Staff</i> (ASS3) <i>Knowledgeable Staff</i> (ekASS1) <i>Informative Explanations</i> (ekASS3) <i>Reasonable Pricing</i> (ekASS4)
3) Responsiveness (8 items) <i>Telling Customers Exactly the time of Service</i> (RES1) <i>Concerned Staff (Willing to help customers)</i> (RES3) <i>Not being too Busy to Respond to Customers</i> (RES4) <i>Compatible Staff</i> (ekRES1) <i>Adequate Transportation Facilities</i> (ekRES2) <i>Qualified Labor Force</i> (ekRES3) <i>Equal Treatment</i> (ekRES5) <i>Attentive Service</i> (ekRES6)	4) Reliability (6 items) <i>Delivery of the Service at the time Promised</i> (REL1) <i>Keep Accurate Records</i> (REL5) <i>Accurate detection of the Failure</i> (ekREL1) <i>Use of Original Products</i> (ekREL2) <i>Reliable Repairing</i> (ekREL4) <i>Personal Information Security</i> (ekREL5)
5) Empathy (5 items) <i>Individual Attention</i> (EMP1) <i>Delivery Quality</i> (ekEMP3)	<i>Payment Options</i> (ekEMP1) <i>Offering Gifts and Promotions</i> (ekEMP2) <i>Understanding the Needs of the Customers</i> (EMP3)

As it can be observed the questions may also be extended to after sales of other industries such as electronics. The Cho et al. (2016) study includes exactly the same number of questions as the SERVQUAL but some questions are repeated in a similar fashion (such as “A variety of materials and equipment are visually appealing” and “facilities are visually appealing”). Also there is no mention of transportation and parking as in that study. The question in our survey about “Adequate Transportation Facilities” can also be adapted to other after sales services. In auto after sales it is very important because the consumer would need an alternative car, a taxi cab or other means of transportation for a while during the repair. Any other electronics device would also require “a replacement” during the course of the repair (a smart phone for example). This item can be generalized to any after sales service by simply involving a phrase “providing replacement device during repair” which was eliminated in our study. Gifts and promotions are also important nowadays since

the customer experience journey can be made more exciting with these items. Quality standards of the service station (such as visibly placed ISO certifications) can also play a role in a customer's satisfaction with the service experience and this is one of our novel introductions to the SERVQUAL model.

We should also talk about some drawbacks of our study. The criticism on the unidimensionality of the scale may still be valid. It is suggested by some scientists that if alpha is too high it may suggest that some items are redundantly testing the same question (Tavakol and Dennick, 2011). Some authors have suggested a maximum alpha level of 0.90 (Streiner, 2003). In future studies on automobile aftersales or general after sales for electronics or other appliances (with a minor change about the transportation question) we could observe different empirical results. Use of different brand names in the future studies and larger consumer groups, perhaps with a focused data collection in service centers, could better confirm the dimensions proposed.

Uses of the AutoSERVQUAL scale in Quality Function Deployment (QFD) studies, or incorporating fuzzy approaches in combination with Multi Attribute Decision Making methods can also be potential application areas of the scale and deserve future attention. Companies can use satisfaction and quality assessments in ranking or awarding their service stations and AutoSERVQUAL scale can be used as input to further MADM applications.

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