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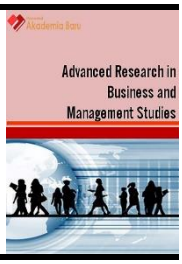

Customer Perception and Satisfaction Levels of Service Quality at Petrol Service Station

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ABSTRACT

The retail operator is consistently facing problems of retaining existing customers to remain competitive. However, customer satisfaction level towards the service provided by the retail operator eventually does not meet the customer perception. To overcome this, service quality (SQ) study towards the organization should be implemented to improve their performance. This research's primary focus is to identify a measurable scale for customer satisfaction to measure the correlation between customer perception and actual satisfaction so that enhancement of current service quality can be rationalized where SERVQUAL, Pearson's Correlation and Gaps Model methodologies are employed using statistical program IBM SPSS Statistics. Stimulated correlation from the data gathered from the SERVQUAL questionnaire will indicate the correlation between variables and highlight possible solutions. The findings from the analysis shows that customer expectations are far more significant than customer perceptions. Gaps Model has shown the usefulness of targeted overall mean gap, and significant values has shown the correlations between variables. The result from this research aims to improve the current service quality implemented by the retailer which in near future will helps them to grab and sustain more potential customers soon.

Keywords:
Customer satisfaction level; customer perception; SERVQUAL; Pearson's Correlation; Gaps Model

1. Introduction

The impact of dynamic market conditions, advertise powers, exceedingly focused markets, and globalization immediately affects retail administrators to be exceptionally aggressive to support their attractiveness locally and universally. The extraordinary rivalry in the business sectors has improved organizations looking for strategies to hold existing clients to stay aggressive. Along these lines, it is exceptionally hazardous for organizations that neglect to think about the significance of advertising. Promoting is essential in commercializing thoughts and innovations effectively. Fruitful showcasing gives critical contributions to the association's general procedures, maintenance, and drawing in the client, and upgrade deals.

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According to Malaysia Oil and Gas Industry Review in 2013, Malaysia's oil holds are the fifth biggest in Asia-Pacific, demonstrated to have oil stores of 4 billion barrels as of January 2013. In guaranteeing a long haul achievement of the oil and gas industry and expecting to be the leading oil and gas center in the Asia Pacific, the Malaysian government contributes to the strategies and macroeconomic arranging [1]. Besides, in 2010, duty and venture motivating forces under the Petroleum Income Tax Act (PITA) were acquainted with energizing oil and gas exploration exercises.

There are numerous petroleum retailers in Malaysia available such as Petroleum Nasional Berhad (Petronas), Petron Malaysia (Petron), Shell Malaysia Trading Sdn Bhd (Shell), Boustead Petroleum Marketing Sdn Bhd (BHPetrol), and Chevron Malaysia Ltd (Caltex) [2]. Most petroleum retail operators use customer service as a point of differentiation to gain their revenue. Automatic Pricing Mechanism (APM), which is now weekly, dictated the maximum price tag for petroleum products [3, 4]. Nevertheless, the petrol retailers have incurred up to 60% significant losses due to the Full Movement Control Order (FMCO) [5]. Petronas 5-Year Financial Summary has proven the decrease in total revenue as appeared in Figure 1.

The customer is the essence, the reason for existence, for all mentioned petroleum retailers in Malaysia. It is, therefore, necessary that all retail activities must be measured from a customer's perspective. Most companies have many internally generated checks and balances, but customers' perception of the service provided is rarely measured in any structured format. Therefore, it is needed to measure customer perspective to the primary service the fuel pump retailers provide to produce customer satisfaction.

There are eight dissertations and researchers used as a role model to this study cited from 2014 to recent years. Those dissertations and researchers include the Consumer Brand Engagement (CBE) for social media by Linda [6], Key Performance Indicators (KPIs) for retail supply chain performance by Neeraj [7], online survey for large service organizations by Fang [8], SERVQUAL for liner shipping by Yuen [9], SERVQUAL for railway sector by Miranda [10], SERVQUAL for the Malaysian banking sector by Osman [11], SERVQUAL in Malaysian medical institution by Ismail [12] and SERVQUAL for consumer entitlement in sports sector by James [13].

This research has been laid out in applying SERVQUAL to measure customers' perception towards selected petroleum retailers [14]. Received responses are then compared to their satisfaction with petroleum retailers. All responses are statistically analyzed, and gaps between customer perception and satisfaction are identified. This research gives insight into what the customer intended from petroleum retailers and highlights the falling short.

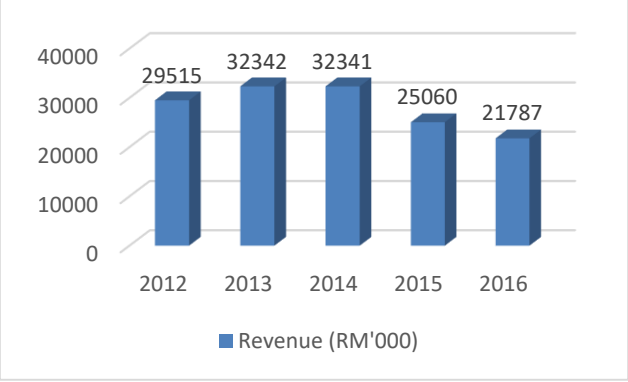

Fig.1. Petronas 5-Year Financial Summary [15]

2. Study Methodology

Overall, the research framework comprises of; (1) data collection from primary data extracted from questionnaires and interviews, (2) data pre-processing, which includes reliability test, validity test and normality test, (3) data analysis which utilizes correlation test and Gaps Model, and (4) result which will initially prove the correlations and proposed improvement of SQ. Details of the research framework are as appeared in Figure 2.

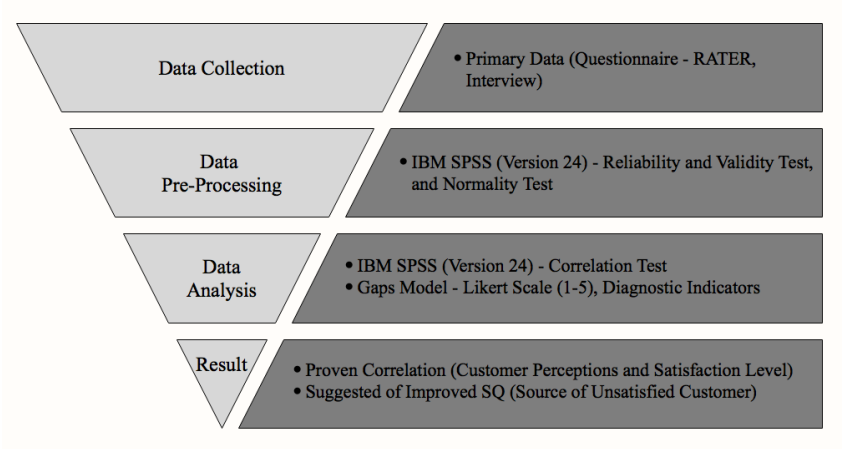

Fig. 2. Research Framework

2.1 Data Collection

This study uses only primary data, which is gathered directly from respondents by giving the research questionnaire. Primary data is a unique information source, that is, one in which the information is gathered first-hand by the researcher for an explicit research reason or venture utilizing either self-managed overviews, interviews, field perception, and tests [16]. The research questionnaire is distributed to respondents using Google Form through WhatsApp and direct interactions with the customer.

2.1.1 Sampling method

This research utilizes an experimentally assessable population. Due to time limitations plus budgetary constraints and physical limitations, it is a savvy way to pick the correct purchasers to be considered, and when done effectively, a measurable report will uncover bits of knowledge around a whole target population [17]. Three factors that have to be determined are; (1) the margin of error, (2) the desired confidence level, and (3) the population proportion, with the formula as follow:

$n = p\,(1-p)\left(\frac{z}{E}\right)^2$, where:

n = the sample size needed
p = the population prevalence or proportion (in proportion of one; if 20%, p is = 0.2)
z = the value corresponding to the desired confidence level (z statistic of 95%, which is conventional, z value is 1.96)
E = the margin of error (in proportion of one; if 10%, E = 0.10)

This investigation utilized the proper proportion of 0.5 with a 95% confidence level and 10% margin of error, which will require 97 respondents to complete this study.

2.1.2 Research Questionnaire

The original SERVQUAL measuring instrument was adapted, taking into account the theory of original dimensions making up customer satisfaction, in some cases deleting specific questions and in others adding questions per dimension [18]. Additional dimensions were added, which are safety and security. The study ended up with a 21-item questionnaire instead of the original 22-items developed by SERVQUAL with variables to be measured: tangibles, reliability, responsiveness, awareness, empathy, plus safety and security. Indicators used in the Likert Scale are within the range of 1 to 5.

2.1.3 Informal Interview

These social interactions are a constituent part of participant observation, which ethnographers employ the leading data generation method. The ethnographer aims to understand a particular phenomenon better or ascertain how things work in a particular cultural context. It is therefore crucial for the researcher to begin to use informal conversations in order to gain trust, establish a rapport, and form an empathetic, non-hierarchical set of relationships, where he/she puts him or herself in the role of the participant and attempts to see the situation from their perspective. They will then continue to use conversations as an ongoing means of creating data that answer their research questions, where the aim is to hear people "tell it as it is" in an everyday context more naturally and less artificially [19].

2.2 Data pre-processing

Statistical Product and Service Solution (SPSS) version 24 programming suite will conduct all statistical analysis. SPSS Inc, Illinois, USA, produces this measurable programming program. The statistical analysis will be directed utilizing appropriate graphical illustrations such as histograms, pie and bar charts, and descriptive statistics using the frequency table. Variety of dispersion measurements such as standard deviations, range, and value of maximum and minimum, plus measurement of central location such as arithmetic means will likewise be determined and connected where fitting.

2.2.1 Reliability and validity test

Validity, or correlation coefficient test and reliability, or internal consistency test are utilized to determine whether the questionnaire result is valid and reliable so that it can be used for measurement. Cronbach's Alpha is a modified form of Split Half Reliability testing. Cronbach (1951) developed the following equation for the mean split-half reliability coefficient (bases on the less restrictive assumption), a quantity which he called coefficient Alpha, α;

$$\propto = \frac{N \,.\bar{c}}{\bar{v}+(N-1)\,.\bar{c}}\text{, where:}$$

α = the Cronbach alpha coefficient
N = the number of items
$\bar{c}$ = average covariance between items-pairs
$\bar{v}$ = average variance

According to Glen [20], Pearson's Product-Moment Correlation Coefficient or Pearson R Test, r, for a sample and ρ, for a population is being utilized to decide whether there is the connection between questions or quality between factors [20]. The coefficient's amount varied depending on the number of correspondents (n) and desired significance level. It might be helpful to graphically recognize what these relationship or correlations look like, as shown in **Figure 3**.

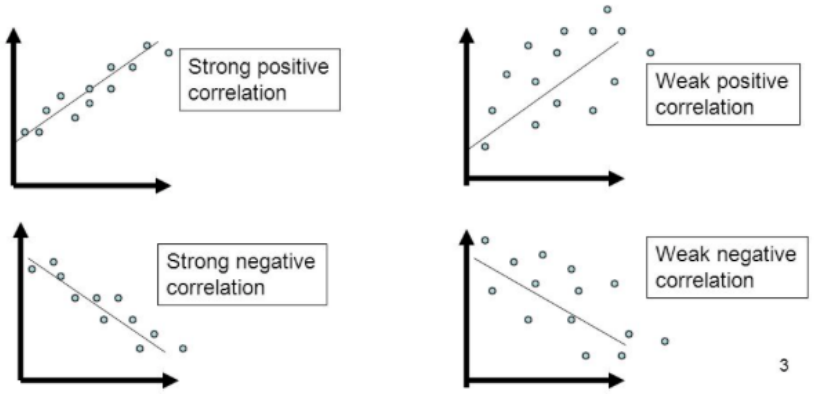

Fig.3. Graphical Correlation [20]

This investigation concluded that the questionnaire is **reliable** when **Cronbach's Alpha**, α **is** $\geq$ **0.700**, and the individual question is eligible to be measured or **valid** when the **Pearson's Correlation, r is -1.0 < r < +1.0**.

2.2.2 Normality test

Referring to statistical analysis, normality tests are utilized to decide whether a typical dispersion very much demonstrates a data and to register how likely it is for a random variable fundamental the data collection or set to be regularly circulated or distributed [21,22]. The researcher has utilized numerical methods with distinct insights with measurable or statistical tests to inspect normality: skewness and Kurtosis. Skewness is a third institutionalized minute that estimates the level of symmetry of a likelihood dispersion [23]. As in Figure 4, Kurtosis is based on the fourth central moment, which measures the thinness of tails or "peakiness" of a probability distribution relative to a standard bell curve [23]. The researcher utilized lists for the **acceptable limit** within a range of $\pm$ **2** [24,25].

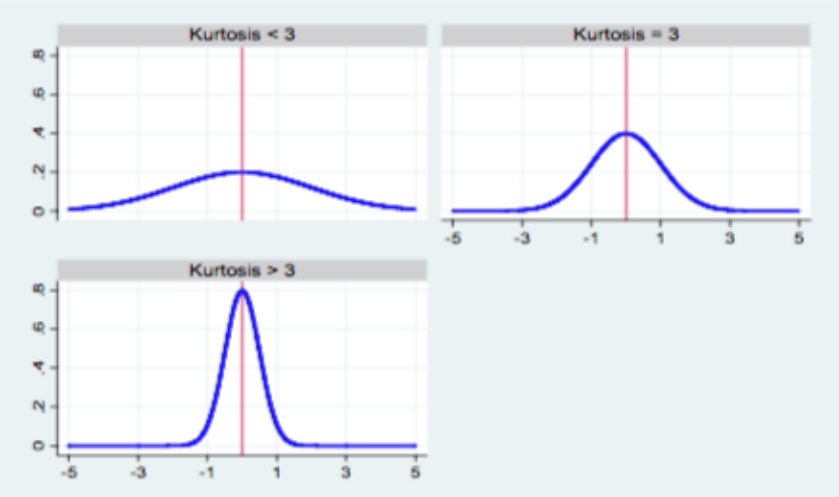

Fig.4. Probability Distributions with Different Kurtosis [23]

2.3 Data Analysis

2.3.1 Correlation test

Correlation test of Hypothesis test is a statistical strategy used in settling on measurable choices utilizing experimental data in which looks at information explicit estimation of a measurement to the measurement's sampling dissemination as inferred by the theorized estimations of a measurable theory [26,27]. The researcher has concluded that the specified analysis test in this study to determine the equation and to test the hypothesis are: (1) T-test and (2) Analysis of Variance (ANOVA).

2.3.1.1 T-test

The t-test is portrayed as a statistical test that looks at whether the means of the population for two samples extraordinarily contrast from each other, utilizing t-distribution, which is utilized when the standard deviation is not known, and having a small sample size [28,29]. It is an apparatus to investigate whether the two samples are drawn from a similar populace.

It is concluded that the **difference is significant** when the value of **the critical value** is **lower** than **the t-test statistics (|t|)** and the t-test table for the calculated |t| value indicates the level of significance or (p-value) which corresponds to the risk.

2.3.1.2 Analysis of variance (ANOVA)

ANOVA is s a statistical technique, usually utilized in every one of those circumstances where an examination is to be made between means of two populace implies [29], while conducting the test simultaneously. ANOVA is an approach to determine if experiment results or surveys within testing groups are significant, either rejecting the null hypothesis or accepting the alternate hypothesis [30].

The researcher has also concluded that this study will likely use **one-way ANOVA** to accept or reject the null hypothesis, which has multiple independent variables (IVs) levels. One-way or two-way refers to the number of IVs in the ANOVA test, while groups or levels are different in the same IVs [30].

2.3.2 Gaps model

The SQ or Gaps Model model was produced by American creators, A. Parasuraman, Valarie A. Zeithaml, and Len Berry, somewhere in the range of 1983 and 1988 out of a deliberate research program. The model recognizes the primary measurements (or parts) of SQ; proposes a scale for estimating service quality (SERVQUAL), and recommends conceivable reasons for SQ issues. An outline of the best way to quantify SQ utilizing SERVQUAL appears in **Figure 5**.

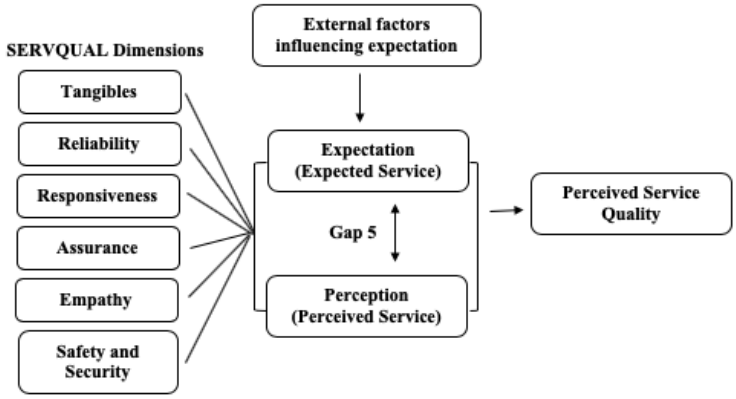

Fig.5. Measuring SQ using SERVQUAL[31]

3. Result and Discussion

3.1 Demographic analysis

The demographical information collected in this study are as follows; (1) gender, (2) age range, (3) status of employment, (4) distance from the service station, and (5) ownership of the vehicle. Demographic analysis is summarized in **Table 1**. Summarization of demographic analysis is divided into; (1) segmentation, (2) independent variables (IVs), (3) value (n), and (4) percentage (%).

Table 1
Summarization of Demographic Analysis

Segmentation	Independent Variables, (IVs)	Value (n)	Percentage (%)
Gender	a. Male	a. 82	a. 74
	b. Female	b. 29	b. 26
Age, years old	a. < 20	a. 0	a. 0
	b. 20 – 29	b. 5	b. 4
	c. 30 – 39	c. 84	c. 76
	d. 40 – 50	d. 17	d. 15
	e. > 50	e. 5	e. 5
Level of Employment	a. Unemployed	a. 42	a. 38
	b. Employed	b. 69	b. 62
Level of Unemployment	a. Housewife or Household husband	a. 4	a. 9
	b. Full time student	b. 10	b. 24
Level of Unemployment	c. Retired	c. 13	c. 31
	d. Looking for a job	d. 15	d. 36
	e. Others	e. 0	e. 0
Distance, km	a. < 1	a. 0	a. 0
	b. 1 – 4	b. 32	b. 29
	c. 5 – 9	c. 51	c. 46
	d. 10 – 14	d. 13	d. 12
	e. > 15	e. 15	e. 13
Vehicle Ownership	a. You	a. 71	a. 64
	b. Your wife	b. 24	b. 22
	c. Your husband	c. 16	c. 14
	d. Your company	d. 0	d. 0
	e. A car hire company	e. 0	e. 0
	f. Others	f. 0	f. 0

3.2 Hypothesis Analysis

3.2.1 Validity and reliability test

The research questionnaire is distributed to 111 respondents who utilize services provided by the petroleum retailer. The variable is viewed as reliable when the Cronbach's Alpha α is 0.700 or above. Based on Pearson's Correlation table with the total respondent of 100, the corrected item-total correlation for each indicator has to be the same or more than 0.197 to be considered a valid indicator. Due to the question that the safety and security variable is only one, it is assumed its reliability and validity are assured. Validity and Reliability analysis is summarized in **Table 2**.

All in all, the result for reliability test has shown the value of Cronbach's Alpha, α is **0.754 < α < 0.937** for customer expectations and **0.873 < α < 0.949** for customer perceptions. As for validity test, the value of corrected item-total correlation, r is **0.455 < r < 0.914** for customer expectations and **0.656 < r < 0.899** for customer perceptions. Therefore, all of the indicators are included to be processed into the t-test and ANOVA in SPSS.

Table 2
Reliability and Validity Test Result

Variable	Expectations		Perceptions	
	Cronbach's Alpha	Corrected item-total correlation	Cronbach's Alpha	Corrected item-total correlation
Tangibles-1	0.935	0.693	0.926	0.796
Tangibles-2		0.908		0.854
Tangibles-3		0.914		0.812
Tangibles-4		0.799		0.869
Tangibles-5		0.716		0.737
Tangibles-6		0.818		0.656
Reliability-1	0.844	0.831	0.873	0.810
Reliability-2		0.808		0.763
Reliability-3		0.519		0.702
Responsiveness-1	0.937	0.888	0.883	0.841
Responsiveness-2		0.892		0.812
Responsiveness-3		0.832		0.676
Assurance-1	0.754	0.455	0.949	0.899
Assurance-2		0.588		0.866
Assurance-3		0.618		0.871
Assurance-4		0.552		0.878
Empathy-1	0.841	0.631	0.900	0.791
Empathy-2		0.731		0.806
Empathy-3		0.718		0.844
Empathy-4		0.697		0.676

3.2.2 Normality test

Due to the question for the safety & security variable is only one, it is assumed its normality of data is assured. Skewness and Kurtosis were taken into account simultaneously when the researcher was testing the normality of data. The researcher used indices for acceptable limits of (2 for both Skewness and Kurtosis test. Normality analysis is summarized in **Table 3** and **Table 4**.

The result for the normality test has shown that the value of skewness is less than zero, which is **-0.939 < skewness < -1.771**. It is proven that the data is **left-skewed** and having **more observations on the right**. Additional to it, the kurtosis result has shown two conclusions as follow: (1) kurtosis less than zero, which is **-0.036** that proven the data distribution has **a lower peak and thicker tails**, and (2) more than zero and near to three, which is **0.587 < Kurtosis < 3.571** that proven the data

distribution has **a higher peak and thinner tails**. Therefore, all of the indicators are included to be processed into the t-test and ANOVA in SPSS.

Table 3
Normality Test Result (Expectations)

Statistics	Skewness	Kurtosis
Mean (e-Tangibles)	-1.540	2.116
Mean (e-Reliablity)	-1.140	0.587
Mean (e-Responsiveness)	-1.515	1.370
Mean (e-Assurance)	-1.097	-0.036
Mean (e-Empathy)	-1.771	2.518

Table 4
Normality Test Result (Perceptions)

Statistics	Skewness	Kurtosis
Mean (p-Tangibles)	-1.083	2.442
Mean (p-Reliablity)	-1.018	1.512
Mean (p-Responsiveness)	-0.939	1.723
Mean (p-Assurance)	-1.441	3.571
Mean (p-Empathy)	-1.055	2.168

3.2.3 Gap analysis

The descriptive statistics for the main body of the questionnaire are highlighted in **Table 5**, at which the level of customer expectation of service is higher (**mean = 4.66)** than the level of the customer perception of service (**mean = 4.20**). The result per dimension in terms of customer expectations and perceptions are recorded in the following **Table 6** and **Table 7**, at which it can be seen that in all dimensions, customer expectations **are more significant** than customer perceptions. These gaps between dimensions are visually quantified and portrayed in **Figure 6**, at which the most significant two gaps are empathy and safety & security. The positive results indicate that customer expectations across all dimensions are far greater than their perceptions of service at the service station.

Table 5
Overall Customer Expectation and Perception Satisfaction Mean Scores

	Descriptive Statistics
	Mean
Mean (Expectations)	4.6598
Mean (Perceptions)	4.2008

Table 6
Overall Customer Expectation Mean Scores

	Descriptive Statistics
	Mean
Mean (e-Tangibles)	4.6425
Mean (e-Reliability)	4.4985
Mean (e-Responsiveness)	4.6577
Mean (e-Assurance)	4.6959
Mean (e-Empathy)	4.7545
Mean (e-Safety and Security)	4.7300

Table 7
Overall Customer Perception Mean Scores

	Descriptive Statistics
	Mean
Mean (p-Tangibles)	4.2012
Mean (p-Reliability)	4.1892
Mean (p-Responsiveness)	4.1922
Mean (p-Assurance)	4.2297
Mean (p-Empathy)	4.1734
Mean (p-Safety and Security)	4.2500

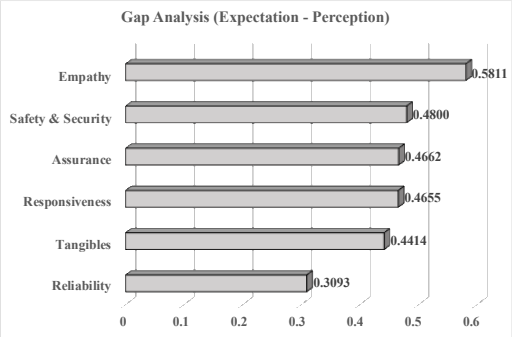

Fig.6. Overall Gap Analysis

Table 8
Gap Analysis Test Result

Variable	Mean		Gap
	Expectation	Perception	
Tangibles-1	4.74	4.30	0.44
Tangibles-2	4.62	4.20	0.32
Tangibles-3	4.66	4.17	0.49
Tangibles-4	4.68	4.15	0.53
Tangibles-5	4.57	4.18	0.39
Tangibles-6	4.59	4.21	0.38
Reliability-1	4.49	4.23	0.26
Reliability-2	4.46	4.19	0.27
Reliability-3	4.55	4.15	0.40
Responsiveness-1	4.64	4.23	0.41
Responsiveness-2	4.67	4.14	0.53
Responsiveness-3	4.67	4.21	0.46
Assurance-1	4.68	4.23	0.45
Assurance-2	4.68	4.28	0.40
Assurance-3	4.74	4.24	0.50
Assurance-4	4.73	4.18	0.57
Empathy-1	4.68	4.15	0.53
Empathy-2	4.81	4.20	0.61
Empathy-3	4.83	4.18	0.65
Empathy-4	4.88	4.16	0.53
Safety and Security - 1	4.73	4.25	0.48

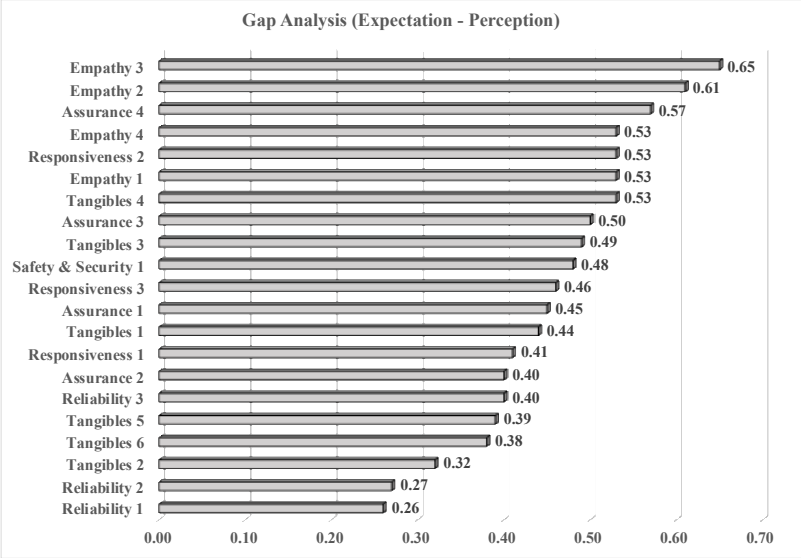

Fig.7. Gap Analysis

The following tables analyze each dimension separately by the questions that make up that dimension, mainly focusing on the gaps between expectations minus perceptions. The questions themselves are listed per dimension in **Table 8**. The overall sample means difference (expectation minus perception) above 0.46 will be coloured green to indicate the main concern towards the service provided.

Based on **Table 8** and **Figure 7**, it can be concluded that all items (questions) reflect **a positive difference** between expectations minus perceptions. In addition to being positive, almost **10 questions** are placed in **green coloured** as they all reflect larger gaps than the overall average of 0.46. All these questions are put **in the top half of differences**, while the balance of **11 questions** will be **the bottom half of differences**.

3.2.4 t-test
3.2.4.1 Hypothesis 1

Due to the sample size in each case is over 30, the central limit theorem applies, and we can use a parametric hypothesis test, namely paired t-test, the result of which are indicated in **Table 9** and **Table 10**. As shown in **Table 9** and **Table 10**, all differences in sample means are positive. Since the *p-value* (last column) is less than 0.05 (significance level) which is ***p-value* = 0**, the null hypothesis (Hypothesis 1) in all cases is **rejected,** indicating that the mean expectation satisfaction value is significantly greater than the mean perception satisfaction value at a 5% significant level.

Table 9
Paired T-Test (Top Half of Differences)

		Paired Samples Test
		Sig (2-tailed)
Pair 1	A 19 – B 19	0.000
Pair 2	A 18 – B 18	0.000
Pair 3	A 16 – B 16	0.000
Pair 4	A 17 – B 17	0.000
Pair 5	A 20 – B 20	0.000
Pair 6	A 4 – B 4	0.000
Pair 7	A 11 – B 11	0.000
Pair 8	A 15 – B 15	0.000
Pair 9	A 3 – B 3	0.000
Pair 10	A 21 – B 21	0.000

Table 10
Paired T-Test (Bottom Half of Differences)

		Paired Samples Test
		Sig (2-tailed)
Pair 1	A 12 - B 12	0.000
Pair 2	A 13 - B 13	0.000
Pair 3	A 1 - B 1	0.000
Pair 4	A 10 - B 10	0.000
Pair 5	A 9 - B 9	0.000
Pair 6	A 14 - B 14	0.000
Pair 7	A 5 - B 5	0.000
Pair 8	A 6 - B 6	0.000
Pair 9	A 2 - B 2	0.000
Pair 10	A 8 - B 8	0.000
Pair 11	A 7 - B 7	0.000

3.2.4.2 Hypothesis 2

As shown from **Table 11**, the level of differences across both genders is not significantly different (Hypothesis 2) as all *p-values* are more than 0.05 (significant level), which is **0.228 < *p-value* < 0.748**, the null hypothesis (Hypothesis 2) in all cases is **accepted** indicating that there are no significant differences between gender regarding their expectations and perceptions at a 5% significant level.

Table 11
Independent T-Test by Gender

	Independent Samples Test
	Sig. (2-tailed)
Diff (Tangibles)	0.368
Diff (Reliability)	0.748
Diff (Responsiveness)	0.228
Diff (Assurance)	0.705
Diff (Empathy)	0.272
Diff (Safety and Security)	0.592

3.3.5 ANOVA
3.3.5.1 Hypothesis 3

The appropriate parametric test, namely the ANOVA is applied because the predictor for age has more than 2 levels (less than 20, 20 to 29, 30 to 39, 40 to 50, and more than 50). As shown from **Table**

12, the level of differences across all age group are not significantly different (Hypothesis 3) as all *p-values* are more than 0.05 (significant level), which is **0.100 < *p-value* < 0.749**, the null hypothesis (Hypothesis 3) in all cases is **accepted** indicating that there are no significant differences between age regarding their expectations and perceptions at a 5% significant level.

Table 12
ANOVA Test Statistics by Dimension by Age

	Independent Samples Test
	Sig.
Diff (Tangibles)	0.194
Diff (Reliability)	0.128
Diff (Responsiveness)	0.371
Diff (Assurance)	0.100
Diff (Empathy)	0.745
Diff (Safety and Security)	0.749

3.3.5.2 Hypothesis 4

Once again, ANOVA is applied because the predictor for distance has more than 2 level (less than 1, 1 to 4, 5 to 9, 10 to 14, and more than 15). As shown from **Table 13**, the level of differences across all distance group are not significantly different (Hypothesis 4) as all *p-values* are more than 0.05 (significant level) which is **0.105 < *p-value* < 0.645**, the null hypothesis (Hypothesis 4) in all cases is **accepted** indicating that there are no significance differences between distance regarding their expectations and perceptions at a 5% significant level.

Table 13
ANOVA Test Statistics by Dimensions by Distance

	Independent Samples Test
	Sig.
Diff (Tangibles)	0.516
Diff (Reliability)	0.311
Diff (Responsiveness)	0.105
Diff (Assurance)	0.645
Diff (Empathy)	0.324
Diff (Safety and Security)	0.372

4. Recommendation

The recommendations arising from the mean differences of expectation minus perception levels **above the overall mean difference of 0.46** are as follow:

(a) **Tangibles (3 and 4)**. The management needs to improve the appearance of their convenience store, which offers heuristics (color, lighting, and music) to create a more appealing atmosphere. Additionally, they should also investigate their representative clothing regulation strategy as a worker's appearance can make a positive or negative impression that ponders Petronas picture and culture.

(b) **Responsiveness (11)**. The retailer's employee must be seen as more of a "Forecourt Relations Officer", a marketing representative of the organization rather than a customer service attendant (CSA). His primary responsibilities should include acknowledging customers,

informing them of the “deals offer” in the convenience store, directing them to pumps when they become available, and generally creating goodwill between the organization and the customer.

(c) **Assurance (15 and 16)**. The organization's Customer Service Training (CST) should enforce their employees the information, abilities, and skill required to build consumer loyalty. Besides, the authoritative can likewise actualize the Service Award as it is a good part of an association's general representative acknowledgment endeavors.

(d) **Empathy (17, 18, 19 and 20)**. When a client has a problem, the CSA refers it to the management more often than not. It must be seen as a chance for service recovery, when problems arise, an opportunity for the service station to distinguish itself from the competition. Therefore, controlled empowerment of staff is one of the solutions. The end state is when the CSA can resolve the client’s problem without the intervention of management.

(e) **Security (21)**. Standard Operating Procedures (SOP) for most private security companies use service stations as a “stand-off” point with their armored vehicles and their employees on the forecourt ready to respond to an emergency in the surrounding vicinity. This agreement could all be formalized with the local police station personnel patrol to the service station according to the schedule, and in return, the person could have complimentary coffee or carwash for the police vehicles. This creates a visible security presence on the forecourt and should make customers feel safer when utilizing the facility.

5. Conclusion

The researcher has generalized the research conclusion into; (1) reliability and validity of measuring instrument, and (2) general statistical information as follows.

The SERVQUAL measuring instrument as adapted to the petroleum industry using Market Pulse Audit and input gathered from a focus of senior executives has proven to be a reliable measuring instrument in terms of internal consistency and for both expectation and perception dimensions and the overall expectation and perception scales as the corrected item-total correlation for each indicator have shown to be more than 0.197. This is also validated by the various Cronbach coefficient Alpha per dimension, which are larger than 0.700. The overview result of the reliability and validity test is shown in **Table 2**. The study's internal validity is again supported with minimum problems during the survey phase of the project, indicating that the questions used together with the questionnaire layout itself were well understood.

In conclusion, the statistics point to significant differences between population means across both the expectation and perception groups. This is highlighted by the results in Table 9 and Table 10, at which the p-value is less than 0.05. The null hypothesis in all cases is rejected, indicating that the mean expectation satisfaction value is significantly greater than the mean perception satisfaction value at a 5 percent significance level across all dimensions. On the other hand, the stats also show that these differences in means are not accounted for by gender differences (**Table 11**), or age differences (**Table 12**), or even distance differences (**Table 13**). The result indicates *p-value* in all the above cases is **more than 0.05**. Therefore, the null hypothesis in all cases is accepted, indicating

sufficient evidence to suggest that no significant difference in expectation and perception exists amongst these various demographics of gender, age, and distance.

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References

[1] Andreas, R. *Overview of Oil and Gas Industry in Malaysia*. 2016 [cited 2018 22 Oct 2018]; Available from: https://www.linkedin.com/pulse/overview-oil-gas-industry-malaysia-andreas-raynerdixon.
[2] Statista. *Number of Petroleum Stations in Malaysia in 2017, by brand*. 2018 [cited 2018 22 Apr 2018]; Available from: https://www.statista.com/statistics/811629/number-of-petroleum-stations-by-brand-malaysia/.
[3] Fatimah, Z., *Petrol Station Operator Hit By Weekly Swing in Fuel Prices*, in *The Star*. 2017, pressreader: Kuala Lumpur.
[4] MyPF. *Malaysian Petrol Price*. 2021 [cited 2020; Available from: https://mypf.my/lifestyle/petrol/.
[5] Harizah, K., *Petrol dealers' revenue down 60%*, in *The Malaysian Reserve*. 2021, TMR Media Sdn Bhd: Kuala Lumpur.
[6] Hollebeek, Linda D., Mark S. Glynn, and Roderick J. Brodie. "Consumer brand engagement in social media: Conceptualization, scale development and validation." *Journal of interactive marketing* 28, no. 2 (2014): 149-165.
[7] Anand, Neeraj, and Neha Grover. "Measuring retail supply chain performance: Theoretical model using key performance indicators (KPIs)." *Benchmarking: An international journal* (2015).
[8] Fang, Ruolian, Blaine Landis, Zhen Zhang, Marc H. Anderson, Jason D. Shaw, and Martin Kilduff. "Integrating personality and social networks: A meta-analysis of personality, network position, and work outcomes in organizations." *Organization science* 26, no. 4 (2015): 1243-1260.
[9] Yuen, Kum Fai, and Vinh Van Thai. "Service quality and customer satisfaction in liner shipping." *International Journal of Quality and Service Sciences* (2015).
[10] Miranda, Sandra, Patrícia Tavares, and Rita Queiró. "Perceived service quality and customer satisfaction: A fuzzy set QCA approach in the railway sector." *Journal of Business Research* 89 (2018): 371-377.
[11] Osman, Zahir, Liana Mohamad, and Ratna Mohamad. "An empirical study of direct relationship of service quality, customer satisfaction and bank image on customer loyalty in Malaysian commercial banking industry." *American journal of Economics* 5, no. 2 (2015): 168-176.
[12] Ismail, Azman, and Y. M. Yunan. "Service quality as a predictor of customer satisfaction and customer loyalty." *LogForum* 12, no. 4 (2016): 269-283.
[13] Zboja, James J., Mary Dana Laird, and Adrien Bouchet. "The moderating role of consumer entitlement on the relationship of value with customer satisfaction." *Journal of Consumer Behaviour* 15, no. 3 (2016): 216-224.
[14] Prithivirajh, Shaun. "Customer satisfaction levels at Caltex Oil SA." PhD diss., 2004.
[15] Petronas. *5-Year Financial Summary*. 2018 [cited 2018 22 APR 2018]; Available from: https://www.mymesra.com.my/5-Year_Financial_Summary-@-5-Year_Financial_Summary.aspx.
[16] Salkind, N.J. *Primary Data Source*. 2010 [cited 2018 29 May 2018]; Available from: http://methods.sagepub.com/reference/encyc-of-research-design/n333.xml.
[17] Mack, S. *What id the Difference Between the Target Population & the Experimentally Assessible Population?* 2018 [cited 2018 1 June 2018]; Available from: https://smallbusiness.chron.com/difference-between-target-population-experimentally-accessible-population-70637.html.
[18] Parasuraman, A., Valarie A. Zeithaml, and L. Berry. "SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality." *1988* 64, no. 1 (1988): 12-40.
[19] Swain, Jon, and Zachery Spire. "The role of informal conversations in generating data, and the ethical and methodological issues they raise." In *Forum: qualitative social research*, vol. 21, no. 1. FQS, 2020.
[20] Glen, S. *Correlation Coefficient: Simple Definition, Formulam Easy Steps*. 2018 [cited 2018 2 June 2018]; Available from: https://www.statisticshowto.datasciencecentral.com/probability-and-statistics/correlation-coefficient-formula/.
[21] D'Agostino, Ralph B. "Tests for the normal distribution." In *Goodness-of-fit techniques*, pp. 367-420. Routledge, 2017

[22] Thode, Henry C. *Testing for normality*. CRC press, 2002.
[23] Hun Myoung, P., *Univariate Analysis and Normality Test using SAS, Stata, and SPSS.* Technical Working Paper, 2008: p. 1-39.
[24] Field, Andy. *Discovering statistics using SPSS*. Sage publications, 2009.
[25] Gravetter, F. and L. Wallnau, *Essentials of Statistics for the Behavioral Sciences*. 8th ed. 2014, Belmont, CA: Wadsworth.
[26] Lani, J., et al. *Hypothesis Testing*. 2018 [cited 2018 20 Nov 2018]; Available from: https://www.statisticssolutions.com/hypothesis-testing/.
[27] Veazie, P.J., *Understanding Statistical Testing.* Sage Journals, 2015.
[28] Silver, C., et al. *T-Test*. 2018 [cited 2018 20 Nov 2018]; Available from: https://www.investopedia.com/terms/t/t-test.asp.
[29] Surbhi, S. *Difference Between T-Test and ANOVA*. 2016 [cited 2018 20 Nov 2018]; Available from: https://keydifferences.com/difference-between-t-test-and-anova.html.
[30] Stephanie. *ANOVA Test: Definition, Types, Examples*. 2018 [cited 2018 20 Nov 2018]; Available from: https://www.statisticshowto.datasciencecentral.com/probability-and-statistics/hypothesis-testing/anova/.
[31] Kumar, Mukesh, Fong Tat Kee, and Amat Taap Manshor. "Determining the relative importance of critical factors in delivering service quality of banks: an application of dominance analysis in SERVQUAL model." *Managing Service Quality: An International Journal* (2009).