CHAPTER – 4

RESEARCH METHODOLOGY
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CHAPTER – 4
RESEARCH METHODOLOGY

4.1 INTRODUCTION

The purpose of this chapter is to present the methods and approaches used in this research. It gives reference to readers about how the research was carried out and why certain applied methods were chosen. The topics of the research problem, objectives of the study, hypothesis, research design and approach, data sampling and collection and research tools and techniques are also included in this chapter.

4.2 OBJECTIVES OF THE STUDY

4.2.1 The Main Objective

The main objective of the study is to evaluate customers’ satisfaction /dissatisfaction with the services of life insurance companies in Surat district.

4.2.2 The Specific Objectives

1. To examine the relationship between selected demographic factors (viz. gender, marital status, LICs, age, education, income, occupation etc.) and overall service quality, overall customer satisfaction, recommendation and loyalty.
2. To know company wise customer satisfaction level.
3. To know the most important dimension from service quality.
4. To know the effect of demographic factors (viz. gender, marital status, age, education, income, occupation etc.) on service quality dimensions.
5. To know the relation between overall service quality and SERVQUAL dimensions, overall customer satisfaction and SERVQUAL dimensions, loyalty, overall service quality, overall customer satisfaction and recommendation.
6. To know the most effective source to attract the customers.
7. To provide useful suggestions for life insurance companies in light of the customers’ changing preferences.
4.3 HYPOTHESIS OF THE STUDY

4.3.1 Hypothesis for the Main Objective

To define the main objective of the study, hypothesis has been constructed as follows:

\[ H_0: \] Customers are not satisfied or neutral with the services of LICs in Surat district.

4.3.2 Hypothesis for the Specific Objectives

To get the result of specific objectives, objective wise following hypothesis has been framed.

1. \( H_{01}: \) There is no significance association between demographic factors (viz. gender, marital status, LICs, age, education, income, occupation etc.) and overall service quality, overall customer satisfaction, recommendation and loyalty.
2. \( H_{02}: \) Overall satisfaction of LICs in Surat district remains same.
3. \( H_{03}: \) Service quality dimensions are not important.
4. \( H_{04}: \) Demographic factors (viz. gender, marital status, age, education, income, occupation etc.) have no influence on service quality dimension mean score.
5. \( H_{05}: \) Independent variables (tangible, reliability, responsiveness, assurance and empathy) collectively do not affect on overall service quality.
6. \( H_{06}: \) Independent variables (tangible, reliability, responsiveness, assurance and empathy) collectively do not affect on overall customer satisfaction level.
7. \( H_{07}: \) Independent variables (overall customer satisfaction, overall service quality) collectively do not affect on customer loyalty.
8. \( H_{08}: \) Independent variables (overall customer satisfaction, overall service quality, customer loyalty) collectively do not affect on recommendation.

4.4 RESEARCH DESIGN

Research design can be classified into two parts. It may be exploratory or descriptive. The main purpose of the exploratory research is that of formulating a problem for more precise investigation or of developing the working hypothesis from an operational point of view. The study becomes exploratory when the information related to subject is insufficient. This type of study can serve as basis for further research.
Descriptive research studies are those studies which can provide information about the naturally occurring behavior, health status, attitudes or other characteristics of a particular individual or of a group. In this type of research, information is collected without changing the environment. To study frequencies, averages and other statistical calculation this type of research is used.

This research work is a descriptive type as the researcher wanted to describe a reality regarding customers’ satisfaction with services and to better understand those services dimensions that customers are satisfied or dissatisfied with. As well as this research work is exploratory too, as researcher also wanted to explore the relative importance of services in Surat district insurance market.

4.5 RESEARCH APPROACH

Basically, research approach can be classified into two parts. It may be either quantitative or qualitative.

The purpose of quantitative research is to form a database to interpret characteristics or relationships of population. This usually means survey research where a sample of population is studied to determine its characteristics. To identify the relationship between one thing (an independent variable) and another (a dependent variable) in a population quantitative research is carried out.

Qualitative research is concerned with subjective assessment of attitudes, opinions and behaviour. Research in such a situation is a function of researcher’s insights and impressions. Some researchers consider it simply to be researched whose goal is not to estimate statistical parameters but to generate hypotheses that can be tested quantitatively. It is a set of research techniques, used in marketing and the social sciences, in which data are obtained from a relatively small group of respondents and not analyzed with statistical techniques.

The main purpose of this research is to identify the influencing factor related to customers’ satisfaction and calculate the level of importance of each determinate on the final one which is customer satisfaction. Based on the described facts, this research work is quantitative by nature.
4.6 TIME HORIZON

Study may be cross-sectional or longitudinal. Cross-sectional study focuses on particular phenomena at a specific period of time whereas longitudinal study is done at a different period of time.

In this research study, cross-sectional study has been selected because data has been collected from the policyholders for once; not for the different time period.

4.7 DATA COLLECTION METHODS

The reliability of managerial decisions depends on the quality of data. The quality of data can be expressed in terms of its representative features of the reality which can be ensured by the usage of a fitting data collection method\(^\text{35}\). The data has been collected in the month of February 2014 to January 2015.

Primary data are those which are collected afresh and for the first time, and thus happened to be original in character. Primary data can be collected either through experiment or through survey. If the researcher conducts an experiment, he/she observes some quantitative measurements. But in the case of survey, data can be collected by one or more of the ways like by observation, through personal interview, questionnaire, through schedule, through telephonic interview etc.

Secondary data are collected from resources which have been already created for the purpose of first-time use and future uses. The secondary data collection involves less cost, time and effort. Sometime more accurate data can be obtained only from secondary data. The sources of secondary data are classified as internal sources and external sources. Internal sources of secondary data for making applications are sales records, marketing activity, cost information, distributor reports/feedback and customer feedback. Various external sources of secondary data are government publications, websites, foreign government publications, journals, publications of trade associations and books.

In this research, to capture customers’ satisfaction about life insurance companies and their services, primary data has been collected by framing a questionnaire. Secondary

data has been collected from the external sources like annual reports, articles and journals. A preliminary version of the questionnaire has been developed in English on the basis that non-Gujarati people of Surat district may not know Guajarati. A variety of measurement scales (nominal, interval and ratio) has been included in a structured format to examine the relationship between selected variables. Some questions have been open-ended because analysis and interpretation of such questions can be complex and subjective. Open-ended question has been used only to find suggestions from the policyholders that are included in the recommendation part.

As such, the questionnaires are divided into four sections:

**Section A:** Policyholders’ Personal Information

**Section B:** Information Related to Insurance Company.

**Section C:** Customers’ Perceptions (experience) Towards Services.

**Section D:** Importance of Dimensions of Service Quality.

**Section A** of the questionnaire has been used for statistical only. The first section consists of eight questions to find out the demographic features of the respondents such as gender, marital status, age, career, academic qualification, and annual household income. This section also helps to find out the relationship of respondents towards the expected service.

**Section B** focuses on the customers’ perception towards life insurance companies (LIC or Pvt.). It gives an idea for which reasons they selected the particular company.

**Section C** focuses on importance of dimensions of service quality. The SERVQUAL instrument has been selected to measure service quality.

**Section D** involves the questions related to customer satisfaction, customer loyalty and recommendation.

In this study, the questions of section C and D have been evaluated by using the rating of a five-point Likert and verbal scale. The five-point scale used for the SERVQUAL was 1-Strongly Disagree, 2-Disagree, 3-Neutral, 4-Agree and 5-Strongly Agree. Before the finalization a questionnaire, a pilot survey has been conducted and all the problems and queries which were found during the survey have been eliminated.
4.8 PILOT TESTING

In any research, the questionnaire should be pre-tested before the final operation. It is a device to measure the validity and reliability. Even, minimum of 30 members for pre-testing is adequate.

Lehana Thabane et al. (2010); Donald M Arnold et al. (2009); and Malhotra et al. (2007) agreed that in any research, as a matter of reliability and validity check the questionnaire should be pre-tested before final administration. A primary draft of a questionnaire was given to focus group of policyholders to test clarity and meaningfulness of the questions. 50 policyholders were selected by simple random method. Each of them was told that their response will be treated confidential and used only for academic purpose. All the problems and queries which were found during the survey have been eliminated. This procedure was done during the month of January/February 2014.

4.9 RESPONSE RATE

Any of the primary research, the respondents are free to decide whether they are participating or not in the conducting survey. Response rate is important because, the lower a response rate, the more questions are likely to be raised about the responsiveness of the achieved sample. During the survey, about 1500 questionnaire have been distributed and 1000 policyholders participated independently. In this research, company wise response rate has been calculated. Total 6 LICs of Surat district have been included in this research. The detail of response rate has been mentioned in Table No.4.1

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36 Response Rate = \( \frac{\text{No. of Returned Questionnaire}}{\text{No. of Distributed Questionnaire}} \times 100 \)
<table>
<thead>
<tr>
<th>LICs of Surat District</th>
<th>Questionnaire Distributed</th>
<th>Questionnaire Returned</th>
<th>Valid Questionnaire</th>
<th>Response Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIC</td>
<td>280</td>
<td>210</td>
<td>200</td>
<td>71.43</td>
</tr>
<tr>
<td>MAX</td>
<td>275</td>
<td>215</td>
<td>200</td>
<td>72.73</td>
</tr>
<tr>
<td>SBI</td>
<td>225</td>
<td>162</td>
<td>150</td>
<td>66.67</td>
</tr>
<tr>
<td>HDFC</td>
<td>235</td>
<td>153</td>
<td>150</td>
<td>63.83</td>
</tr>
<tr>
<td>ICICI</td>
<td>240</td>
<td>156</td>
<td>150</td>
<td>62.50</td>
</tr>
<tr>
<td>BAJAJ</td>
<td>245</td>
<td>164</td>
<td>150</td>
<td>61.22</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1500</td>
<td>1060</td>
<td>1000</td>
<td>66.67</td>
</tr>
</tbody>
</table>

4.10 DATA SAMPLING

The sampling process is as follows:

4.10.1 Defining Target Population

The first question related to sampling concerns identifying the target population, that is, the complete group of specific population elements relevant to the researcher’s project. To be completed, a population must be very explicitly defined in terms of elements, sampling units, extent and time.

The present study focuses on the customers’ satisfaction of life insurance companies in Surat district. Therefore, life insurance policyholder of selected companies and Talukas of Surat district is the target population.

4.10.2 Select Sample Frame

The physical materials from which the samples are chosen is called a frame. A map, a list of policyholders, a policy record, a list of insurance companies, census records are the examples of the frame. In this study, Census Record of 2011 as well as Market share of life insurance companies as on November 2013 has been chosen to formulate the sample size. The sampling units for the study are customers of LIC and top five

private insurance companies in Surat district. The private sector life insurers have been considered for the study on the basis of their market share in life insurance industry as on November 2013. The list of private life insurance companies were as under:

1. ICICI Prudential Life Insurance Co. Ltd.
2. Max Life Insurance Co. Ltd.
3. SBI Life insurance Co. Ltd.
4. HDFC Standard Life Insurance Co. Ltd.
5. BAJAJ Allianz Life Insurance Co. Ltd.

4.10.3 Sampling Method

The major alternative sampling plans may be either probable samples or non-probable samples.

Probable samples are those in which each member of the population has got an equal probability of being selected. The various types of probability samples are: Simple Random Sampling, Stratified Random Sampling, Systematic Random Sampling, Multi-Stage Random Sampling, Cluster/Group Sampling, Replicated Sampling, and Sequential Sampling.

The method in which the probability of unit selection is unknown at any stage of the selection process and the selection of the units is based on the judgment of the researcher rather than randomness is called non-probable samples. The various types of non-probability samples are: Purposive Sampling, Convenience Sampling, and Quota Sampling.

In this study non-probability samples are considered because the researcher has been taken the entire sample by her own judgment. Moreover the researcher took the sample as per respondents’ as well as her own convenience; the Convenience sampling method has been applied.
4.10.4 Determination of Sample Size

The decision about sample size is not an easy task. It depends on a number of considerations and there is no definitive answer. A larger sample cannot guarantee accuracy. An important component of any decision about sample size should be how much sampling error one is prepared to tolerate. The less sampling error one is prepared to tolerate, the larger a sample will need to be consideration of sampling size are likely to be profoundly affected by matters of time and cost. Here, the researcher tries to select those samples which are truly representative. In this study, Census Record of 2011 as well as Market share of life insurance companies as on November 2013 has been chosen to formulate the sample size.

4.11 TOOLS & TECHNIQUES OF DATA ANALYSIS

Data analysis comes after the data has been collected (Field, 2009): to make sense of the study and to reach at certain findings. This section presents the different techniques used for data analysis by the researcher. For the generalization of survey data, the collected data through canvassing the questionnaire has been entered in SPSS (Statistical Package for Social Science). After the data entry procedures the simple frequency tables has been derived. The researcher has applied Mann-Whitney U-test, Kruskal Wallis Test, Correlation, Factor Analysis and Chi-square test to analyze the data. The summary of these tests are as follows;

4.11.1 Mann-Whitney U Test

In this section, the effort is made to find out the association between the demographic variables (gender and marital status) and overall service quality, overall customer satisfaction, recommendation, and loyalty. Therefore, the attempt has been made to find out the demographic variables affecting the overall service quality, overall customer satisfaction, recommendation, and loyalty of the policyholders. For this purpose, statistical tools used such as Mann-Whitney U test. The steps of this technique are given as follows:
4.11.2 Kruskal Wallis Test

To find out the association between age, education, occupation, selected companies, income and overall service quality, overall customer satisfaction, recommendation, and loyalty, Kruskal Wallis Test has been applied. The steps of this technique are given as follows:

A. Distribution table
B. Hypothesis
   \( H_0 \): There is no significant difference in the Mean Rank between selected factors
   \( H_1 \): There is significant difference in the Mean Rank between selected factors
C. Ranks
D. Mann-Whitney U Test Statistics

4.11.3 Factor Analysis

One of the major uses of factor analysis is to summarize the data to be more manageable without losing any of the important information therefore making it easier to test theories. There are three main reasons for using factor analysis (Field, 2009): first to develop a scale to measure an underlying theme such as service quality; second to reduce the variables to a manageable size and third to have a better understanding of the variables.

According to Cooper and Schindler (2008), factor analysis is a technique used for specific computational techniques. These factors, also called latent variables, aim to measure things that are usually hard to measure directly, such as attitudes and feelings. This is a way to explain the relationships among variables by combining them into smaller factors. The scales usually start with many questions, and then by
using factor analysis are reduced to a smaller number. These reduced results are then used for other analysis such as multiple regression analysis (Pallant, 2007).

There are two methods of factor analysis observed by Kinnear and Gray (2010), the exploratory factor analysis and the confirmatory factor analysis. The purpose of the exploratory factor analysis is to find the number of factors that explain the correlations; while in the confirmatory factor analysis the researcher predicts the number of factors with specific loading. Another important point to consider when performing factor analysis is factor loadings. Factor loadings are the correlation of the variable with the factor. When the loading is clear then the interpretations of the factors become easier. Some variables have a loading or correlation with more than one factor. The mathematical technique for simplifying the results of the factor analysis results is called factor rotation (Zikmund et al., 2010).

The most common method of factor analysis is the principal component and the most common method of factor rotation is the varimax rotation (Kinnear & Gray, 2010; Zikmund et al., 2010). Principal component technique looks at the correlation of different variables to reveal the relationship between them, and then reduces the variables by empirically summarising them or combining them into a small number of factors under common themes (Tabachnick and Fidell, 2007). Factor rotation is used as a method to interpret the factors by showing the variables that group together (Pallant, 2007). Two tests are performed to ensure that the data is suitable for factor analysis, the Kaiser-Meyer-Olkin (KMO) measure for sampling adequacy and the Bartlett’s test of sphericity (Pallant, 2007). The KMO value is low if it is between 0.5 and 0.7 and excellent if it is above 0.90 (Field, 2009). Factors with an eigenvalue of 1 or greater are usually retained (Field, 2009).

In this research, exploratory factor analysis has been applied by using principal component analysis with varimax rotation to reduce and to analyze the data. The steps of this technique are as follow:
A. KMO & Bartlett’s test

The KMO value is low if it is between 0.5 and 0.7 and excellent if it is above 0.90 (Field, 2009).

B. Communalities

Factors with an eigenvalues of 1 or greater are usually retained (Field, 2009).

C. Total variance explain

D. Scree Plot

E. Rotated component matrix (a)

4.11.4 Reliability Test

Reliability is the degree to which measures are free from errors and therefore it yield consistent result. It refers to consistency of a measure of concept. It may be internal reliability or external reliability. Furthermore, reliability is more important when the questionnaire is a Likert type because there are many variables testing the concept. A questionnaire is considered reliable if it gives similar results when repeated (Hair, 2003).

In this study, internal reliability has been considered. Bryman et al. (2003) suggested that multiple-items measured in which each answers to each questions are aggregated to form an overall score, we need to be sure that all our indicators are related to each other. It can be test use Cronbach’s alpha method. The result of 0.7 and above implies an acceptable level of internal reliability.

4.11.5 Validity Test

Validity is concerned with whether the findings are really about what they appear to be. Validity defined as the extent to which data collection method or methods accurately measure what they were intended to measure (Saunders et al. 2003). Copper et al. (2003) believe that validity refers to the extent to which a test measures what the researchers actually wish to measure. Validity may be internal or external.

For the present study, the content validity of the instrument has been ensured as all the dimensions has been identified from the literature and were thoroughly reviewed by professionals and academicians. Numbers of different steps were taken to ensure the validity of the study as follows:
1. Data has been collected from the reliable sources.

2. Before finalize the questionnaire, a pilot survey has been conducted to ensure the validity of the result.

4.11.6 Normality Test

Here, the researcher wants to apply t-test, ANOVA test, correlation, regression etc. and before doing these tests, it is very necessary that the data should be normally distributed. By doing so, normality test has been run for twenty two statements of service quality. The results will be analyzed on the base of guideline of Kline (1998). As per Kline guideline, all variables in the analysis for univariate Skewness and Kurtosis are satisfactory within conventional criteria for normality. He suggests that the value of Skewness between -3 to 3 indicates that the data are normal. Moreover, he says that the value of Kurtosis between -10 to 10 also indicates the normality of data. Multivariate normality (the combination of two or more variables) means that the individual variable is normal in a univariate sense and that their combinations are also normal (Hair et al. 2003).

4.11.7 t-Test

4.11.7.1 One Sample t-test

One sample t-test has been used to evaluate the satisfaction level of customers’ of Surat district. It has been also used to identify the important service quality dimension and to identify the important statement of service quality dimensions. The procedure to run this test is as follows:

A. Hypothesis

\[ H_0: \mu < 3 \]

\[ H_1: \mu \geq 3 \]

B. Cut off value: 3

C. Statistical test and significance level:

One sample t-test, significant at 0.05
D. Calculated:  t-value

E. Critical Value: p-value

F. Decision rule:

   Null hypothesis should be rejected if p-value is less than 0.05 and alternate hypothesis should be accepted.

4.11.7.2 Independent t- test

Independent sample t-test has been applied to measure the significant difference between male and female towards life insurance service usage and also used to measure influence of gender and marital status on service quality dimensions mean score.

A. Hypothesis

   \( H_0: \) Gender has no influence on above attributes

   \( H_1: \) Gender has influence on above attributes

B. Calculated:  t-value

C. Critical Value: p-value

D. Decision rule:

   Null hypothesis should be rejected if p-value is less than 0.05 and alternate hypothesis should be accepted.

4.11.8 One-Way ANOVA

A One-Way ANOVA has been run. To check the equality of variance among the group, Levene statistics has been found. If its value remains above 0.05, it indicates that this test is fit for analysis. To find out the equality of means among the companies, ANOVA F value has been found. And if the significant value of F is greater than 0.05 indicates the acceptance of null hypothesis. To identify the structure of the difference, mean plot of mean differences for overall customer satisfaction has been carried out. To know this difference is significant, Scheffe post-hoc test has been run. And One-Way ANOVA is also used to measure influence of demographic factors (i.e. age, education etc.) on service quality dimensions.
A. Company Wise Mean

B. Test of Homogeneity of Variances

H\(_0\): Group variances are significantly equal

H\(_1\): Group Variances are significantly not equal

C. ANOVA for F-value

H\(_0\): Customer satisfaction level among life insurance service providers remain same

\((\mu_1=\mu_2=\mu_3=\mu_4 \ldots \ldots =\mu_n)\)

H\(_1\): Customer satisfaction level among life insurance service providers do not remain same

\((\mu_1\neq\mu_2\neq\mu_3\neq\mu_4 \ldots \ldots \neq\mu_n)\)

D. Mean Plot of Mean Difference

4.11.9 Correlation

Correlation is used to measure an association between variables. It is different from, regression analysis. It shows the strength between two continuous of the variables. It is carried out before regression analysis to rule out strong relationship between the independent variables.

A. The strength of correlation

The strength of correlation is shown in Table No.4.2

<table>
<thead>
<tr>
<th>Range</th>
<th>Strength of Association</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.81-1.00</td>
<td>Strong</td>
</tr>
<tr>
<td>0.61-0.80</td>
<td>Moderate</td>
</tr>
<tr>
<td>0.41-0.60</td>
<td>Weak</td>
</tr>
<tr>
<td>0.21-0.40</td>
<td>Very weak</td>
</tr>
<tr>
<td>0-00-0.20</td>
<td>None</td>
</tr>
</tbody>
</table>
### B. Structure of Correlation

The structure of correlation is shown in Table No.4.3

**Table No. 4.3**

**Structure of Correlation**

<table>
<thead>
<tr>
<th>Overall Service Quality</th>
<th>Overall Service Quality</th>
<th>Customer Satisfaction</th>
<th>Customer Loyalty</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Service Quality</td>
<td>Pearson Correlation</td>
<td>1</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.000**</td>
<td>.000**</td>
<td>.000**</td>
</tr>
<tr>
<td>Customer Satisfaction</td>
<td>Pearson Correlation</td>
<td>1</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.000**</td>
<td>.000**</td>
<td></td>
</tr>
<tr>
<td>Customer Loyalty</td>
<td>Pearson Correlation</td>
<td>1</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.000**</td>
<td></td>
<td>.000**</td>
</tr>
<tr>
<td>Recommendation</td>
<td>Pearson Correlation</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4.11.10 Regression

Regression analysis is used to find the relationship between one dependent variable and one or more independent variables and has become popular in many research areas. Regression is another way to determine the association between variables; this is similar to bivariate correlation as it assumes that there is a link between the dependent and independent variable (Zikmund, 2003). Regression analysis is called simple regression analysis when there is only one independent variable and is called multiple regressions when there is more than one independent variable (Robson, Pemberton & McGrane, 2008). Multiple regression analysis is more complex than correlation and is used to find the ability of a set of independent variables in predicting the dependent variable (Pallant, 2007).

In this study multiple regression analysis has been used because there is more than one independent variable. To know how good the estimated regression equation is, $R^2$ has been found, which simply the square of correlation coefficient. This measure is also called the coefficient of determination of a regression equation and its value lies between 0 and 1 (both values inclusive). It indicates the exploratory power of the regression model. The test for the significance of $R^2$ is carried out by using the F statistics as indicated by the p-value (0.00) from ANOVA table. Then t-value has been found with standardized coefficients beta. Following step / process has been done for multiple regression analysis.

A. Exploratory Power of Model Summary

$H_0$: $R^2=0$

$H_1$: $R^2>0$

B. ANOVA for F Value

$H_0$: Independent variables collectively do not affect dependent variable

$H_1$: Independent variables collectively affects dependent variable

If p-value is less than 0.05, null hypothesis is rejected and alternative hypothesis is accepted.
C. Estimated Beta Coefficients

\[ H_0: \beta_1 = 0, \beta_2 = 0 \ldots \ldots \beta_n = 0 \]

\[ H_1: \beta_1 \neq 0, \beta_2 \neq 0 \ldots \ldots \beta_n \neq 0 \]

Seven separate regression analysis have been performed which are mentioned as under.

**Regression Model - I**

To find out the relation between overall service quality as a dependent variable and tangible, reliability, responsiveness, assurance and empathy as independent variables

\[ y = \alpha + \beta_1 \times x_1 + \beta_2 \times x_2 + \beta_3 \times x_3 + \beta_4 \times x_4 + \beta_5 \times x_5 + e \]

Where, \( y \) the dependent variable overall service quality, \( \alpha \) is the y intercept which means the value of \( y \) when all the \( x \) values are zero, \( x_1 \) tangible, \( x_2 \) reliability, \( x_3 \) responsiveness, \( x_4 \) assurance, \( x_5 \) empathy, \( \beta \) the coefficient of the independent variable, \( e \) error

**Regression Model - II**

To find out the relation between customer satisfaction as a dependent variable and tangible, reliability, responsiveness, assurance and empathy as independent variables

\[ y = \alpha + \beta_1 \times x_1 + \beta_2 \times x_2 + \beta_3 \times x_3 + \beta_4 \times x_4 + \beta_5 \times x_5 + e \]

Where, \( y \) the dependent variable customer satisfaction \( \alpha \) is the y intercept which means the value of \( y \) when all the \( x \) values are zero \( x_1 \) tangible, \( x_2 \) reliability, \( x_3 \) responsiveness, \( x_4 \) assurance, \( x_5 \) empathy, \( \beta \) the coefficient of the independent variable, \( e \) error
Regression Model - III

To find out the relation between customer loyalty as a dependent variable and overall service quality, overall customer satisfaction as independent variables

\[ Y = \alpha + \beta_1 \times x_1 + \beta_2 \times x_2 + e \]

Where, \( y = \) the dependent variable, \( \alpha = \) the \( y \) intercept which means the value of \( y \) when all the \( x \) values are zero, \( x_1 = \) overall service quality, \( x_2 = \) overall customer satisfaction, \( \beta = \) the coefficient of the independent variable, \( e = \) error

Regression Model - IV

To find out the relation between recommendation as a dependent variable and overall service quality, overall customer satisfaction and customer loyalty as independent variables

\[ y = \alpha + \beta_1 \times x_1 + \beta_2 \times x_2 + \beta_3 \times x_3 + e \]

Where, \( y = \) the dependent variable, \( \alpha = \) the \( y \) intercept which means the value of \( y \) when all the \( x \) values are zero, \( x_1 = \) overall service quality, \( x_2 = \) overall customer satisfaction, \( x_3 = \) customer loyalty, \( \beta = \) the coefficient of the independent variable, \( e = \) error

4.12 LIMITATIONS

Limitations are matters and occurrences that arise in an experiment which are totally out of the researcher’s control. They limit the extensity that a study can go to, sometimes affecting the end result of the investigation. The limitations of this study are as follows:

1. The study has been conducted in the Surat district only. So the findings may not be generalized in a broader perspective.

2. The limitations of statistical methods applied for analysis would also be applied to this study.

3. Some of the respondents did not read the questionnaire carefully and as a result, they may mark some answer incorrectly.
4. During the study, the data and information furnished by respondents are based on their perception in this field and have to rely on it.
5. Inherent limitation of secondary data should be taken into consideration.