Chapter 3: Research Methodology

The introduction of wireless telephony improved the overall teledensity of the country. India is following China, which is number one with highest teledensity in the world. The increase in telecom penetration has been mainly due to the wireless connections and the state of wireline connections is showing a dismal state. The public sector service provider Bharat Sanchar Nigam Ltd. (BSNL) is the largest basic telecom service operator in India. It provides basic telephony (also written as landline or wireline), mobile (also written as wireless or cellular) communication services. BSNL has been reportedly facing problems in retaining its existing landline customer base. The company found its landline subscriber base shrinking at an alarming rate. BSNL sources revealed that during 2002, around 2.5 million landline connections were surrendered by customers.

Another problem being faced by BSNL is in adding new customers on account of delay in deploying new landline connections. The delay in providing new connections led to a 20% decline in the customer-base growth rate in 2002 as compared to the previous year as it could provide only one million lines as compared to 1.6 million lines provided in 2001.

Analysts point out that this situation is not new to BSNL. In 2001 also, many BSNL landline connections were surrendered, prompting the Department of Telecommunications (DoT) to order an enquiry into the cause of the problem. The enquiry revealed many factors were making subscribers surrender their landline connections.

One major issue was the 1x6 rule introduced by the Income Tax Department. In this scheme, a person was required by the law to file income tax returns, if he/she possessed a telephone. This led many subscribers, who did not otherwise fall under the purview of the 1x6 scheme, to surrender their phone connections. The trend was observed mainly in the rural areas. Income from agriculture was exempt from tax, but if they owned a telephone,
people in these areas had to file their tax returns. Surrendering the phone connection thus seemed to be a better option. Since rural markets were an important segment for BSNL, this trend was very disturbing.

In the Union Budget for 2002-03, the government of India removed landline connections from the 1x6 scheme. BSNL expected that this would help stem the evasion in its subscriber numbers. Yet the situation worsened. It had to face a new problem due to the growing popularity of cellular phone services in the country. Earlier people used to take more than one landline connection so that they could use one phone in case the other went out of order. Cellular phone services made the second landline connection useless.

These viewpoints of experts including Chairman and Managing Director (CMD) and industry scholars brings out the strength of BSNL as a national operator having pan-India network, low tariffs and consumer confidence. But at the same time worries of losing BSNL customers in the past due to Government policy of taxing landline owners and launch of mobile telephony by licensing to private players had become a challenge for future. It is pertinent to remember that BSNL was allowed as third operator for wireless services in the year 2002. The present study becomes relevant and seeks to evolve appropriate strategy for BSNL to reduce the ever growing churning of customers and further seeks to improve the Customer Relationship Management (CRM) for expansion and sustaining its customer base.

Bharat Sanchar Nigam Ltd. (BSNL) reported a loss of Rs.1,822.65 crore in 2009-10, first-ever in the company's history. It had reported a profit of Rs.575 crore in 2008-09. It also reported a 10.4 per cent decline in its revenue at Rs.32,045.41 crore in 2009-10 compared to previous fiscal's Rs.35,812 crore.

“The loss has occurred mainly due to reduction in revenue and increase in expenditure. Revenue has gone down due to drastic reduction in tariff, fierce competition as well as decline in fixed wireline connection due to preference of the subscribers for mobile,” BSNL Chairman and Managing Director Kuldeep Goyal told reporters here.
3.1 **Need for the Study**

The kind of turmoil that is happening in telecom market has never been witnessed before. The wave of liberalization fueled by the telecom policies of 1994 and 1999 resulted in privatization of telecom sector. A number of industrial groups such as TATA, Reliance, Bharti, and BPL etc were issued licenses of different telecom circles to provide telecom services. The organizations like TRAI, DoT and TDSAT combined together to ensure a level playing field for all these new entrants vis-à-vis the incumbent telecom operator i.e. BSNL. This caused a break in the monopoly of BSNL and started competition era in telecom industry. Since then, the major challenge has been the management of customers in every kind of service such as: -

- Fixed or wire line telephones
- Mobile telephones
- Internet and data services

The factors influencing the customer decision to hire a service could be many but some are apparently as follows: -

- Availability of desired service
- Quality of service
- Cost of service to be hired
- Customer relations
- Customer loyalty
- Delivery time
- Value addition and
- Popularity of incentive schemes

The customer decision influenced by these factors is affecting the market share of one operator or the other and hence the revenue earning. In face of this obvious situation and
trend, there is a need to examine the response of BSNL in deploying different marketing options to manage the customers.

For public sector operator, to survive the competition it is necessary to dig out the reasons and try to make up the deficiencies so that the trend adopted by the customers is arrested. By way of this remedial action the migration of the customers be reduced. BSNL has reacted to the newly thrown challenge of the competition in liberalized market characterized by increased ambiguity, uncertainty and volatility. It is equally applicable to the other telecom service providers whose market share is under threat from their rivals.

In the process of cutthroat competition, there has been a large-scale migration of customers from one company to other at the rate of 2-3% per year. For example, at the time of entry by basic service providers, migration took place from BSNL towards these telecom service providers. Later on, as BSNL introduced mobile services, the mobile users of other service providers left them in large number and joined BSNL due to latter’s customer friendly schemes and trust. There is a very strong justification of renewed approach towards customer management by BSNL. So in face of post-monopoly competitive era a study of customer management strategy adopted by BSNL is proposed.

3.2 Scope of the Study

Since last ten years there has been a paradigm shift in the market share of not only various companies but also in share of different services such as landline phone, mobile phone and Internet etc. With addition of 64.13 lakhs subscribers from April to July, the total number of telephones in the country had reached a figure of 8.29 crores by July 2004. The telephone density increased from seven percent in March 2004 to 7.67 percent in July 2004. Mobile and Wireless in Local Loop (WLL) segment touched 395 lakh figure in July 2004 out of which 354 lakh was the share of private operators.

In the Punjab state in the year 2000, about 20 lakh BSNL landline connections were
working out of which urban market share was 12 lakh and that of rural was 8 lakh. There were 3 lakh mobile subscribers in Punjab. Internet connections had been provided to 65 thousand customers.

During the above said period, BSNL had lost about 40,000 customers in about eight months in Punjab. At revenue per DEL of Rs 500/- this amounted to a loss of Rs 2 crores. The rate of churning in basic services was about 3%.

Keeping this in view, the scope of study was restricted to Punjab service area only. The period of study was selected from 1995 onwards being the time of utmost importance in the post-reform telecom era. This period has witnessed the liberalization effects on telecom industry in highly volatile and competitive environment. The services proposed to be included in the survey are mostly basic telephones, mobile phones and Internet connections.

This study on customer relations management will focus on the efforts made by BSNL to ensure a competitive edge over other telecom players in the following key areas:-

- Customer relations
- Quality of service
- State-of-the-art technology
- Service on demand
- Value addition in services
- Man power planning
- Marketing approach
- Restructuring and
- Reinventing

Customer database for sampling will be the directory of basic service customers of Punjab.
3.3 Objectives of the Study

The specific objectives of the study were as under:

i) To study the customer management status prior to telecom reforms during 1991-1999.

ii) To make an enquiry into the customer friendly measures as envisaged in NTP–94, NTP 99;

iii) To study the role of Telecom Regulatory Authority of India (TRAI) in improving the customer management

iv) To analyze the customer focused policies prior to formation of BSNL i.e. Oct. 2000.

v) To study the comparative change in customer-oriented approach after formation of BSNL and onset of competition.

vi) To study the customer perception about the change in marketing strategy of BSNL.

vii) To analyze the staff attitude towards the customer care and customer relations in the changed scenario.

The above mentioned objectives were initially coined at the time of synopsis. Most of these objectives were meant to study the period prior to the formation of BSNL in the year 2000. But the data available for the old period of 1990 and 1995 were not considered relevant and not significant for the purpose of the study. The subject of the study is CRM which is connected with marketing and this functional element had not become popular among the DoT as telecom services were its monopoly and marketing was not having a dominant role as it was a seller’s market prior to privatisation. But once the competition has set in, after the issue of licenses to private telecom companies, this CRM tool of marketing management has become important. The deliberations held in seminars and progress reports submitted from time to time were referred and the supervisory committee of learned Professors attending to the half yearly reports and seminars advised to examine and change the objectives suitably so that these may become more relevant to the competitive environment in telecom industry in the post reform era. Hence a review
was undertaken under the able guidance of the research supervisor and revised targets were reframed afresh and these are given as under;

a. To study the overview of the Indian telecom industry in relation to telecom policies, plans and regulation for success of telecom reforms.

b. To study the organizational structure of telecom industry at Centre, State and District level in Government and BSNL set up.

c. To survey customers in Punjab and analyse their perception about Customer care, telephone billing and staff attitude in BSNL.

d. To study the customer perception about the Quality of Service (QoS) offered by other telecom operators vis-à-vis BSNL.

e. To carry out sample survey of senior officers/managers in BSNL and to analyse their perception and opinions on staff skills for customer care and marketing and need for their upgradation in view of cut throat competition.

f. To study and identify the adequacy of publicity and service distribution efforts by BSNL.

g. To develop a framework for BSNL to invigorate the marketing efforts and to reinvent its organizational and HRD strategy for retention and growth of market share in the competitive environment.

3.4 Methodology

Before further discussion on research methodology, a review of statistical process is described here.

3.4.1 Types of Statistical Methods

Statistical methods broadly fall into following two categories (Mendenhall, et all 2009)

(i) Descriptive statistics, and

(ii) Inferential statistics
Descriptive statistics includes statistical method involving the collection, presentation, and characterization of a set of data in order to describe the various features of the set of data. In general, methods of descriptive statistics include graphic methods and numeric measures, bar charts, line graphs and pie charts comprise the graphic methods, where as numeric measures include measure of central tendency, dispersion, skewness, and kurtosis.

In the present research study, an extensive use of this approach is applied on the data collected during survey.

Inferential statistics includes statistical methods which facilitate estimating the characteristics of a population or making decisions concerning a population on the basis of sample results. (Sharma, 2010) The sample and population are two relative terms. The larger group of units about which interferences are to be made is called the population or universe and a sample about which inferences are to be made is called the population or universe and a sample is a fraction, subset or portion of that universe. (Sharma, 2007) Inferential statistical can be categorized as parametric or non-parametric. The use of parametric statistics is based on the assumption that the population from which the sample is drawn is normally distributed. Parametric statistics can be used only when data are collected on an interval or ratio scale. Non-parametric statistics make no explicit assumption regarding the normality of distribution in the population and is used when the data are collected on a nominal or ordinal scale. (David, 2010)

In the present study, sampling method was used with no explicit assumption that population is normally distributed. Mostly ordinal scale of measurement is applicable and hence used. This is a case of non-parametric and inferential statistics.

3.4.2 Methods of Measurements

Nominal scale: In nominal scaling the numerical values are either named or categorized in such as way that these values are mutually exclusive and collectively exhaustive.
For example, shirt number in football or cricket match is measure at a nominal level. A Player wearing a shirt number 24 is not different for anything than a player wearing a shirt number 12 and is certainly not twice the number 12. In other words, if we use numbers to identify categories, they are recognised as levels only and have no qualitative value. In the present case data collection and processing, this method is used as and where applicable.

Ordinal Scale: A scale of measurement for a variable that is used to rank (or order) observation in the data set. In ordinal scaling the numerical values are categorized to denote qualitative difference among the various categories as well as rank ordered the categories in some meaningful way according to some preference. (Turk Ercan, 2011)

The preference would be ranked from best to worst, first to last, numbered 1, 2, and so on.

Interval scale allows performing certain arithmetic on the data collected from the respondents. Whereas nominal scale allows only in qualitatively distinguishing the groups by categorizing them into the mutually exclusive and collectively exhaustive sets, the ordinal scale allows us to rank order the preferences, and the interval scale allows computing the mean, the standard deviation of the responses on the variables. In other words, the interval scale not only classifies individuals according to certain categories and determines order of the categories; it also measures the magnitude of the difference in the preferences among the individuals. (Sekaran, 2000)

In the ensuing research methodology the methods of measurement mainly used are nominal, ordinal scale and interval scale as per the suitability of data elements in the survey.

3.4.3 Sources of Data

Individuals, focus groups and/or panels of respondents specifically decided upon and set up by investigator for the collection are primary data sources. Any one or a combination of the following methods can be chosen to collect primary data. (Sharma, 2009)
(i) Direct personal observations
(ii) Direct or indirect oral interviews
(iii) Administrating questionnaires

In the survey conducted for the present research the collection of primary data has been done through administrating the questionnaires separately for telecom customers and officers.

Questionnaire is formalized with a set of questions for extracting information from the target respondents. It has been kept in the mind that the questions should correspond to the form of the required information. The three general forms of question are dichotomous (yes/no response type); multiple choice and open-ended. The questionnaire can be administered personally or mailed to the respondents. (Koneru, 2008) It is an efficient method of collecting primary data when the investigator knows what exactly is required and how to measure such variables of interest as:

- Behaviour –past, present, or intended.
- Demographic characteristics-age, sex, income, and occupation.
- Level of knowledge
- Attitudes and opinions

A Structured questionnaires set has formal list of questions to be posted to the respondents in a predetermined order. (Takona, 2002) The responses permitted are also completely predetermined. Such questions are often called closed end questions since the respondents are asked to make choices among a set of alternatives given by the investigator.

The questionnaire sent to sample population for collection of data in this study is of structured type and has dichotomous (yes/no response type) and multiple choice
questions. Open ended questions were avoided due to difficulty in carrying out analysis
and nature of information sought.

Secondary data refer to those data which have been collected earlier for some purpose
other than the analysis currently being undertaken. (Malhotra, 2009) Besides newspapers
and business magazines, other sources of such data are as follows:

3.4.4 External Secondary Sources of Data

Government publication, which includes the following Data Sources;

(i) The National accounts statistics, published by the Central Statistical
    Organization (CSO). It contains estimates of national income for several
    years, growth rate and rate on major economic activities such as
    agriculture, industry, trade, transport and so on;

(ii) Wholesale price Index, published by the office of the Economic Advisor,
    Ministry of Commerce and Industry;

(iii) Consumer Price Index;

(iv) Reserve Bank of India bulletins;

(v) Economic Survey.

(vi) Department of Telecom and National Telecom Policy

(vii) Telecom Regulatory Authority of India (TRAI)

Non-Government publications include publications of various industries and trade
association such as;

(i) The Indian Cotton Mills Association

(ii) The Various Chambers of Commerce

(iii) The Bombay stock Exchange, which publishes a directory containing
    financial account, key profitability and other relevant data.

Various syndicate service such as operations group (ORG). The Indian Market Research
Bureau (IMRB) and also collects and tabulates abundant marketing information to suit
the requirements of individual firms, making the same available at regular intervals.
Cellular Operators Association of India (COAI), Association of Unified Service Providers of India (AUSPI)

3.4.5 **Internal Secondary Sources of Data**

The data generated within an organization in the process of routine business activities, are referred to as internal secondary data. Financial accounts, production, quality control and sales records are examples of such data. *(Sharma, 2009)* However, data originating from one department of an organization may not be useful for another department in its original form. It is therefore, desirable to condense such data into a form needed by the other department.

For this research work the secondary sources (Internal and External) put to use are listed as under:

- TRAI reports on Operators’ performance
- DoT and BSNL annual performance reports
- Telecom Committee recommendations
- COAI and AUSPI industry reports
- Research Studies by IDC, AIMA, ACA research
- NASSCOM conference extracts and surveys
- Web sites of BSNL, DoT, TRAI and
- Articles downloaded from Net
- The list is not exhaustive as can be seen from the theses report.

3.5 **Sampling**

The process of selecting a sample from a population is called sampling. In sampling, a representative sample or portion of elements of a population or process is selected and then analysed. *(Zikmund, 2003)* Based on sample results, called sample statistics, statistical inferences are made about the population characteristic.
The need of sampling arises because in many situations data are sought for a large group of elements such as individuals, companies, voters, households, products, customers and so on to make inference about the population that the sample represents. Thus, due to time, cost, and other considerations data are collected from only a small portion of the population called sample. The concepts derived from probability theory help to ascertain the likelihood that the analysis of the characteristic based on a sample do reflect the characteristic of the population from which the sample is drawn. This helps the decision-maker to draw conclusions about the characteristics of the large population under study.

The survey of customers and senior officers was carried out separately and sampling method has been deployed due convenience of time and cost involved.

### 3.5.1 Sampling Methods

As mentioned above, sampling methods compared to census (when 100% of population is included in the survey) provides an attractive means of learning about a population or process in terms of reduced cost, time and greater accuracy. The representation basis and the element selection techniques from the given population, classify several sampling methods into two categories as shown in Table 3.1.

<table>
<thead>
<tr>
<th>Representation Basis</th>
<th>Probability (Random)</th>
<th>Non-probability (Non-random)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unrestricted</td>
<td>Simple random sampling</td>
<td>Convenience Sampling</td>
</tr>
<tr>
<td>Restricted</td>
<td>Complex random sampling, Stratified sampling, Cluster sampling, Systematic sampling, Multi-stage sampling</td>
<td>Purposive sampling, Quota sampling, Judgement sampling</td>
</tr>
</tbody>
</table>

(Sharma, 2010)
3.5.2 Non-Random Sampling Methods

Several non-random sampling methods for selecting sampling from a population or process are given as under:

In the convenience sampling procedure, the units to be included in the sample are selected at the convenience of the investigator rather than by any pre-specified or known probabilities of being selected.

Convenience samples are easy for collecting data on a particular issue. However, it is not possible to evaluate its representativeness of the population and hence precaution should be taken in interpreting the results of convenient samples that are used to make inferences about a population.

3.5.3 Purposive Sampling

Instead of obtaining information from those who are most conveniently available, another purposive sampling method is used. It sometimes becomes necessary to obtain information from specific target-respondents who will be able to provide the desired information either because they are the only one who can give the desired information or because they satisfy to some criteria set by researcher.

For the study in question, the respondents for survey of customer perception of BSNL services were chosen to be those who are visiting offices and Customer Service Centers (CSC). These respondents are able to provide desired information on behaviour, availability and attitude of the staff and officers posted there. So a convenient and purposive sampling was found more suitable and hence used.

Similarly, the respondents surveyed for officers’ survey who were mainly available at district headquarters were approached on the basis of convenient and purposive sampling. Even some of them were approached during training courses due to their easy availability
and specific expertise. The officers who could give response for specific information on customer services, staff, organization and marketing aspects were included in the sample for survey.

3.6 Data Collection and Data Analysis Methods

This study is based on both primary and secondary data sources. The primary data were collected from customers of BSNL on a specially structured pre-tested questionnaire. In addition to primary sources, reports of expert groups, Group of Ministers (GoM), standing committees, consultants and telecom magazines/journals were consulted to substantiate and corroborate the survey analysis. Non-Random sampling technique was applied for the selection of the sample for the study.

3.7 Selection of Customers for survey

The Punjab telecom circle consists of eleven telecom districts headed by General Manager Telecom. It has both types of areas i.e. Rural and Urban. To select a fair collection of customers for survey, the cluster areas of urban-rural mix were identified keeping in view the following features;

- Urban
- Rural
- Competition
- Availability of services
- Area in charge of BSNL

It was also kept in mind that all the major telecom companies are available in the selected cluster and also main telecom services of mobile, basic and internet are available and being used by the customers. The BSNL customers from Sangrur, Mohali, Sunam and Pathankot areas of Punjab were chosen. It was proposed to draw a sample of 300 customers through sampling technique. Sampling was done to give representation to customers of each of the services.
Directory of fixed line customers from whole of Punjab was taken as universe. Method of non-random sampling was chosen keeping in view the type of data required on customer perception of telecom services mostly rendered through customer care centres, cash counters and Sub Divisional Officers (SDO) offices.

It was presumed that some of the basic service customers are using mobile and internet services and have a fair knowledge about service and marketing activities carried out by BSNL and other operators. Detail of cluster-wise responses obtained is given in Table 3.2.

### Table 3.2 Customers surveyed from different towns for the study

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name of Town</th>
<th>Number of Questionnaires Distributed</th>
<th>Maximum Number of Responses Obtained</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sangrur</td>
<td>100</td>
<td>82</td>
</tr>
<tr>
<td>2</td>
<td>Mohali</td>
<td>75</td>
<td>49</td>
</tr>
<tr>
<td>3</td>
<td>Sunam</td>
<td>50</td>
<td>39</td>
</tr>
<tr>
<td>4</td>
<td>Pathankot</td>
<td>75</td>
<td>56</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>300</strong></td>
<td><strong>226 (75%)</strong></td>
</tr>
</tbody>
</table>

#### 3.8 Selection of Officers for survey

Apart from this, a convenient sample of 50 senior officers from Punjab telecom was taken and their expert opinion were sought on the issues relating to the customer relations, service quality, skill upgradation, market and competition, customer retention. The sample for officers included middle and senior level technical and managerial staff from Punjab.

#### 3.9 Statistical tools

For obtaining the information from customers and officers, separate questionnaires were designed. Various tools were deployed for collection, tabulation, representation, and
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analysis of data. Before going for application of different statistical techniques, some attributes were assigned weights suitably.

### 3.9.1 ANOVA-Analysis of Variances

Various methods of statistical tests were studied for their applicability to the survey data of customers and officers pertaining to the present study. It was found that the most suitable among these methods is ANOVA test.

In statistics, analysis of variance (ANOVA) is a collection of statistical models, and their associated procedures, in which the observed variance in a particular variable is partitioned into components attributable to different sources of variation. In its simplest form, ANOVA provides a statistical test of whether or not the means of several groups are all equal, and therefore generalizes t-test to more than two groups. Doing multiple two-sample t-tests would result in an increased chance of committing a type I error. For this reason, ANOVAs are useful in comparing two, three, or more means. ([www.wikipedia.org](http://www.wikipedia.org))

The ANOVA test is useful in identifying the level of significance among the clusters/areas for difference in perception of the surveyed population. In present case the study relates to the level of satisfaction among telecom customers for the services provided by BSNL and other operators. Also the ANOVA test is applied in on survey for officers in data analysis for service distribution channels.

a. **Customers’ Perceptions about Telecom services and customer care**

Attributes relating to various services, commercial activities, staff attitude & availability, new services & publicity and BSNL Comparison with other Telecom Players were identified.

Weights were assigned to the responses obtained from customers for ANOVA test for level of significance as below:
Analytical Study of Customer Management Strategy of BSNL in Punjab

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Good</td>
<td>3</td>
</tr>
<tr>
<td>Good</td>
<td>2</td>
</tr>
<tr>
<td>Poor</td>
<td>1</td>
</tr>
</tbody>
</table>

b. **Officers perceptions about working of BSNL and other operators**

Five point Likert scale analysis was also applied on data for BSNL Service Distribution Channels:

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High</td>
<td>2</td>
</tr>
<tr>
<td>High</td>
<td>1</td>
</tr>
<tr>
<td>Average</td>
<td>0</td>
</tr>
<tr>
<td>Poor</td>
<td>-1</td>
</tr>
<tr>
<td>Very Poor</td>
<td>-2</td>
</tr>
</tbody>
</table>

Then Analysis of Variance (ANOVA) was applied to find the level of significance of differences in the customer perception of quality of service among the selected towns/clusters. The analysis was processed electronically by using standard software package. Various terms used are indicated in table 3.3 and explained as under:

**Table 3.3 ANOVA TABLE**

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>d.f.</th>
<th>T.S.S.</th>
<th>M.S.S.</th>
<th>F-ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Towns (T)</td>
<td>T-1=a</td>
<td>S₁</td>
<td>S₁/a=x</td>
<td>x/y</td>
</tr>
<tr>
<td>Error</td>
<td>b-a=c</td>
<td>S₂</td>
<td>S₂/b=y</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>N-1=b</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Sharma, 2007)
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Where \( T \) = No. of towns to be compared i.e. 4

\( N = T \times Y \)

\( Y \) = No. of Respondents

\( T.S.S. = \text{Total Sum of Squares} \)

\( M.S.S. = \text{Mean Sum of Squares (TSS/d.f.)} \)

\( d.f. = \text{Degree of Freedom} \)

**Symbols used for Level of Significance**

***: Significance at 1% level (0.01)

**: Significant at 5% level (0.05)

*: Significant at 10% level (0.10)

There might have been constraints in the application of above methodology to the present research study because of the cost, time and statistical techniques envisaged for the purpose. Hence the validity of data, reliability and accuracy of the results and inferences drawn may vary if the size of the sample and type of sampling is reviewed and modified. Similarly the method of data analysis used for available data set has an important bearing on the outcome of the study. The limitations of this study and its applicability are discussed and included in the last chapter on conclusions and recommendations.

The further scope of study by deploying more fitting methodologies to such type of research work and enhancing its applicability is possible and needs further investigation.