Chapter 3

RESEARCH METHODOLOGY

RESEARCH DESIGN:

Research design constitutes the blueprint for the collection, measurement and analysis of data. Research design facilitates the researcher in the allocation of resource by posing crucial choice in methodology. Research design is the plan and structure of investigation so conceived so as to obtain answers to research problem. A research design expresses both the structure of the research problem and the plan of investigation used to obtain empirical evidence on relations of the problem. The research design provides the framework to be used as a guide in collecting and analyzing data. We can classify the research design into three kinds such as exploratory, descriptive and experimental research.

1. Experimental research. This is generally used to clarify thoughts and opinions about the research problem or the respondent population or to provide insights on how to do more conclusive (casual) research. Under this research one group is taken as experimental and other is the control group. Control referred as to the factors which is exception for the independent variables, must be held constant and must not be confounded with another variable that is not the part of the study. Professor R.A fishers name is associated with experimental designs. Professor Fisher found that by dividing agricultural fields or plots into different blocks and then by conducting experiments in each of these blocks, whatever information is collected and inferences drawn from them, happens to be more reliable.

2. Descriptive research. In this type of research discover answers to the questions who, what, where, when and sometimes how. It involves the collection of data and creation of distribution of the number of times the researcher observes a single event, act or characteristics. A descriptive study may be simple or complex; it may be done in many setting, whatever the form, a descriptive study can be just as demanding of research skills as the casual study, and we should insist on the same high standards for design and execution. It is also an estimation of frequency of appearance and the proportion of the population that has
these characteristics. Descriptive research also helps in discovering the association between the variables.

3. **Exploratory research**. Exploratory research is undertaken to explore an area where little is known or to investigate the possibilities of undertaking a particular research study (feasibility study / pilot study). Exploratory research is undertaken when few or no previous studies exist. The aim is to look for patterns, hypotheses or ideas for further research. Exploration is particularly useful when researchers lack a clear idea of the problems they will meet during the study. Through exploration researchers develop concepts more clearly, establishes priorities, develop operational definitions and improve the final research design.

There is inbuilt flexibility in research design is needed because the research problem, broadly defined initially, is transformed into one with more precise meaning in this type of research. One of the major applications of the exploratory research, therefore, is to generate hypothesis for further studies.

The research design for this study is **descriptive in nature** it helps in identifying the features of existing phenomenon. The present study intends to examine the productivity performance in post adoption period of ISO 9001 certification in comparison to pre adoption period for the selected companies. The impact of ISO 9001 adoption is assessed by comparing the productivity and profitability change(s) in the two time windows i.e. 5 pre and 5 post adoption periods. The present study intends to examine the productivity performance either increase or decrease in the post adoption period of ISO in comparison to pre adoption period. To measure the impact of ISO 9001 on productivity, the study took assumption that any change in productivity (increase or decrease) in the post period is due to the adoption of the ISO 9001. The perception of employees towards the impact of ISO 9001 on human resource practices among the selected sectors has been studied.

**OBJECTIVES OF STUDY:**

Objectives help for providing direction to the research. The main objective of the research is to know the impact of ISO 9001 on productivity of companies from selected sectors. In the light of the main objective following objectives are formulated:
1. To study the difference in productivity during pre and post adoption period in selected sectors.
2. To study the difference in net profit margin during pre and post adoption period in selected sectors.
3. To study the difference in return on assets during pre and post adoption period in selected sectors.
4. To study the difference in sales growth rate during pre and post adoption period in selected sectors.
5. To compare the total productivity, net profit margin, return on assets, sales growth among selected sectors during pre and post adoption period of ISO 9001 certification.
6. To study the perception of the employees of selected sectors towards the impact of ISO 9001 on human resource practices.
7. To compare the perception of senior level employees and line managers from selected sectors towards the impact of ISO 9001 on human resource practices.

**HYPOTHESES:**

Keeping in view the objectives of the study, the following hypotheses have been formulated:

H: There is no significant difference in productivity during pre and post adoption period in selected sectors.

H: There is no significant difference in net profit margin during pre and post adoption period in selected sectors.

H: There is no significant difference in return on assets during pre and post adoption period in selected sectors.

H: There is no significant difference in sales growth rate during pre and post adoption period in selected sectors.

H: There is no significant difference in productivity, net profit margin, return on assets and sales growth among selected sectors during pre and post adoption period of ISO 9001 certification.
H: There is no significant difference among the perception of the employees from selected sectors towards the impact of ISO 9001 on human resource practices.

H: There is no significant difference in the perception of senior level employees and line managers from selected sectors towards the impact of ISO 9001 on human resource practices.

**SAMPLING DESIGN AND SAMPLE DESIGN:**

Sampling design is a planning the research project is to identify the target population and then determine whether a sample or a census is desired. A sample examines a portion of the target population and the portion must be carefully selected to represent the population. Non probability sampling technique i.e. judgmental sampling has been used to collect the information from the respondents of the companies. Non probability sampling technique is that sampling procedure which does not afford any basis for estimating the probability that each item in the population has of being included in the sampling. **Judgmental Sampling** occurs when a researcher’s selects sample members to conform to some criterion. I have kept in mind the criteria to select the respondents.

The sector division of economy has been taken from the annual research report of CRISIL (Credit Rating Information Services of India Limited) on the union budget of 2012-2013. Out of all sectors I have selected three sectors which having a prospect of growth in the 12th five year plan. Accordingly, the companies from each sector has been selected which is enlisted in www.bse.com.

**METHOD OF DATA COLLECTION:**

The study relied on primary and secondary data. The primary data is collected to study the perception of employees towards the impact of ISO 9001 on human resource practices. The pilot testing was done on the sample of 50 employees through self structure questionnaire. Questionnaire was prepared on the basis of literature and after discuss with supervisor, academician and official staff of companies. It was found that the answers were not consistent. After that, the language of some statements was modified and some rephrasing was done. Again 30 questionnaires were filled from the respondents. The respondent provides comments on clarity of some items and confirmed face (expression) validity of items in the questionnaire. After considering comments made by the respondents, the questionnaire was finalized.
The reliability of the questionnaire was calculated from the results of pilot testing by using SPSS software. The coefficient of reliability of the questionnaire was found to be 0.953 that is Cronbach alpha.

\[ \alpha = \frac{kr}{1+(k-1)r} \]

(Note: \( \alpha \) denotes for Cronbach alpha, \( k \) denotes for number of items and \( r \) denotes for average correlation between the pairs of items)

Out of the 300 filled questionnaires by the respondents, 25 questionnaires were incomplete and were not considered for analysis. The result has been drawn on the basis of 275 questionnaires.

The secondary data pertains to eighteen companies listed on the BSE. Secondary data was used to understand the impact of ISO 9001 in financial terms to measure the productivity, net profit margin, return on assets and sales growth rate of the companies selected under the certain sectors such as power, textile and steel. The secondary data has been collected from prowess data base and money control.com to study the impact of ISO 9001 on productivity, net profit margin, return on assets and sales growth rate during the post adoption period of ISO 9001 certification.

**STATISTICAL TOOLS:**

Certain parametric and non parametric tests statistical tools were used. Wilcoxon Sign Rank test, Mann Whitney U test has to know the impact of ISO 9001 certification on productivity, net profit margin, return on assets and sales growth rate of companies from selected sectors during the post adoption period of ISO 9001 certification. ANOVA has been used for the comparison of the selected sectors and selected performance parameters during pre and post adoption period of ISO 9001 certification. For the analysis of primary data ANOVA and independent sample t-test have been used to study the perception of senior level employees and line managers across the selected sectors. The data collected from the survey analyze with the help of computer software SPSS package 17.0 version.

**LIMITATION OF THE STUDY:**

The study has certain limitations which are as follows:
1. The primary data having a possibility of personal bias of respondents. However, special care has been taken while the collection of data even the rationale and objectives of study were clearly explained to them.

2. Three sectors have been selected i.e. power, steel and textile for the study from all the sectors of the economy. The study has been confined to the limited numbers of companies from each sector. Other sectors can be consider for future research.

3. Time, cost and location factors caused difficulty to carry out the research study.

4. The respondents of the present study are the line managers and senior level employees. I faced lot of difficulties to get the appointment from the respondents due to their busy schedule and they are not willing to fill the questionnaires.