CHAPTER 3

Research Design

It deals with the content and meaning of the undertaking study in terms of objectives and process of analysing the objectives in the form of formulation of hypotheses. It also explains the methodology of the study in respect of sampling framework, source of data and mode of data collection, methods of data analysis, operational definition of key concepts and limitation of the study.

Objectives

The chief aim of the objectives of this study is the adoption and utilization of Information and Communication Technologies in Small Scale Industries in Tamilnadu with special reference to Tirunelveli District. The objectives of the present study are given as follows:

1. To examine the level of computer usage in Small Scale Enterprises.
2. To determine the level of various Software applications used in different routines of the Small Scale Enterprises.
3. To analyse the respondents' Information and Communication Technologies used pattern in various transactions in the business.
4. To identify the Relative advantage and Cost Effectiveness in using the Information and Communication Technologies.
5. To find out the nature of complexity and compatibility in using the Information and Communication Technologies in Small Scale Business.
6. To examine the Organisational feasibility in the adoption of Information and Communication Technologies in the Small Scale Industrial sectors.

7. To identify the competitive pressure and External Pressure in adopting the Information and Communication Technologies in the Small Scale firms.

8. To analyse the importance of adoption of Information System in the Small Scale Business.

9. To find out the impact of External Support and Vertical Linkage in the adoption of Information and Communication Technologies.

10. To suggest some reform measures to enhance the adoption and utilization of Information and Communication Technologies among the Small Scale Industrial Sectors.

11. To identify the success and the problems in the adoption and utilization of Information and Communication Technologies among the Small Scale Entrepreneurs.

**Hypotheses**

In order to study the above-mentioned objectives, the following hypotheses have been framed and these are tested by applying the appropriate statistical tools.

1. The enhancement in adoption and utilization of Information and Communication Technologies is not positively related with the area of operation of business.
2. The enhancement in adoption and utilization of Information and Communication Technologies is positively related with the nature of small business.

3. The respondents do vary with respect to the level of usage of computers in their Enterprises.

4. There is a significant variation with respect to the level of using various Software Applications in the business routines among the Small Scale Entrepreneurs.

5. The Small Scale Entrepreneurs do not vary in using their level of Information and Communication Technologies in various transactions in the Business in different areas.

6. The Small Scale Entrepreneurs do vary in using their level of Information and Communication Technologies in various transactions in the Business in different business types.

7. The Small Scale Enterprises do not vary in their level of realisation of Relative advantage and Cost Effectiveness in adopting the Information and Communication Technologies in their area of operation.

8. The Small Scale Enterprises do vary in their level of realisation of Relative advantage and Cost Effectiveness in adopting the Information and Communication Technologies in the Nature of business.

9. The difference in the area of location of operation will have no realization on complexity and Compatibility.
10. The difference in business nature will have significant influence on Small Scale Entrepreneurs' realization on Complexity and Compatibility.

11. The respondents do not vary with respect to their views on organizational feasibility in the area of operation in adoption of Information and Communication Technologies.

12. The respondents do vary with respect to their views on organizational feasibility in the nature of business in the adoption of Information and Communication Technologies.

13. The difference in area of operation will have no significant influence on Small Scale Business firms' realization on Competitive Pressure and External Pressure.

14. The difference in business nature will have significant influence on Small Scale Business firms' realization on Competitive Pressure and External Pressure.

15. The Small Scale Entrepreneurs do not vary in their level of realization of External Support and Vertical Linkage in the area of operation in adopting the Information and Communication Technologies.

16. The Small Scale Entrepreneurs do vary in their level of realization of External Support and Vertical Linkage in the business types in adopting the Information and Communication Technologies.
Methodology

The present study aims in the adoption and utilization of Information and Communication Technologies among the Small Scale Entrepreneurs doing business in Tirunelveli District of Tamilnadu. For that the impact of the three managerial antecedent factors Innovation, Organisation and the Environment, on the adoption of the Information and Communication Technologies in the Small Scale Business have been studied. Besides this the level of Computer usage, level of Software Applications used in various business routines, level of Information and Communication Technologies used in various business transactions have been studied. The general socio economic backgrounds of the Small Scale Industries in Tirunelveli District have been analysed.

Characteristics of Samples

The samples that have been selected for this study have the following characteristics.

Area of the Business

The Government of Tamilnaqu has identified the Taluks of Tamilnadu as Industrially Developed, Industrially Backward and Industrially Most Backward according to the degrees of facilities available to establish and run the Small Scale Industries successfully. Hence the samples have been collected from all the three areas Developed, Backward and Most Backward for this study.
Nature of Business / Industry

The samples have been collected from the various types of Enterprises like Manufacturing, Retail and Wholesale, Service industries, Finance/Insurance/Real estate and Other Enterprises.

Internet adoption

Since this study relates to the adoption and utilization of various Information and Communication Technologies like Face-Face, Postal! Courier, Telephone, Fax, Pager, Cellular Phone, E-Mail, Electronic Data Interchange, Online Data Access, Internet and Satellite Communication and most of these Technologies are based upon Internet connectivity, the samples have been collected from the Business people those who are having Internet facilities in their firms.

Data Collection

An interview schedule method was adopted in measuring the variables and other relevant information required for this study. The Entrepreneurs have been identified by interviewing personnel in Community agencies such as Chamber of Commerce, Small Scale Industries Entrepreneurs Association, Referrals from other Businesses, Telephone Directory, Regional marketing section of Videsh Sanchar Nigam Limited and Computers and other Information and Communication Technologies sale agencies.

Method of Data Collection

Since the population is large, sample random sampling techniques was applied. The selected samples contacted over Telephone / E-Mail. They were explained about this study and requested to extend their cooperation to
make this study a successful one. Then the interview schedules were distributed to them through post
/ in person.

As all the items in the schedule were self-explanatory, the samples were asked to furnish the
data and send them back to the author. After a week's time, reminders were sent to them through E-
MaiV Telephone requesting them to look into the schedule. The author also met the Entrepreneurs in
person and clarified their doubts and collected the filled in interview schedules. Nearly 400 samples
were contacted and the interview schedules distributed and out of them 326 samples responded and
cooperated.

Besides these interview schedules, the researcher has collected some data about the Small
Scale Industries, and information and Communication Technologies fTom the District Industries
Centre, Small Scale Industries Development Corporation, District Telecom office and several
websites through Internet.

Data Analysis

The collected data were entered in the coding sheets and a database was created in Visual
FoxPro. Further the data were analysed with the help of the software Excel and SPSS.

Cross tables were constructed. The values 5,4,3,2,1 have been assigned to the Likert type 5-
point scale opinions and appropriate scoring have been given to all other data. The findings were
tested with proper statistical tools.

The degree of level of computer usage in Small Scale Enterprises, level of software
application used in various business routines, and level of
Information and Communication Technologies used in various business transactions have been tested by Wilcoxon Signed Rank Test.

Further the Influence of Area of the business and Nature of business on the computer usage, usage of software applications, and the usage of Information and Communication Technologies in various business transactions have been analysed by the Multiple Linear Regression.

For the influence of Area and Nature of the business on the Computer usage

\[ \log Y_1 = a + b_1 \log x_1 + b_2 \log X_2 + \mu \]

For the influence of Area and Nature of the business on the usage of software applications

\[ \log Y_2 = a + b_1 \log x_1 + b_2 \log X_2 + \mu \]

For influence of Area and Nature of the business on the usage ICTs in various business transactions

\[ \log Y_3 = a + b_1 \log x_1 + b_2 \log X_2 + \mu \]

\( a = \) the intercept
\( b = \) Regression Coefficient
\( (\log X_1), (\log X_2) \)- Independent variables of socio economic factors.
\( \mu \) is random error

The Impact of the innovative, organizational, and the environmental characteristics on the adoption of Information and Communication Technologies and the utilization of Information and Communication
technologies in various transactions in small-scale enterprises have been tested by the two way classification model of ANOVA.

The utilization of computers in the business firms have been tested by the two way classification model of ANOVA.

The utilization of software applications in various business routines have been tested by the Chi-Square test as follows:

Chi-square test:

\[ x^2 = \sum \frac{(f_o - f_c)^2}{f_c} \]

\[ \lambda^2 \] = Chi-square value  
\[ f_o \] = Expected frequency  
\[ f_c \] = Observed frequency

Apart from that, the general data interpretations have been carried out with the help of Percentage analysis, Average and the Mean value. Diagrammatic and graphical representations have also been made according to the requirements of the study.

**Explanation of the Concept**

The following are the operational concepts defined for the purpose of the present study.

**1. Adoption**

If refers to the establishment of the Information and Communication Technologies in the Small Scale Industries.
2. Utilization

It deals with the usage of Information and Communication Technologies in the Small Scale Industries.

3. Information and Communication Technologies

It refers to the Information and Communication channels used for the Information Transfer and Communication Transfer in the Small Scale Enterprises.

4. Small Scale Industries

It refers to the Business! Enterprises! Industries! Firms run with less than 100 employees. The Government of India has identified 907 businesses under this category. It also includes various types of businesses like Manufacturing, Retail and Wholesale, Service, Finance! Insurance! Real estate, and other businesses.

5. Tirunelveli District

It refers to the geographical area of a revenue district in the continent of India situated in the southern part of the state Tamilnadu consists of 11 revenue taluks.

Limitations

The findings of this study are specifically applicable to the Small Scale Entrepreneurs of Tirunelveli District, and these are not applicable to the Large Scale and Medium Scale Entrepreneurs. Regarding the area of business, the developed, backward and most backward has been derived in only in the point of view of the industrially developed, industrially most
backward as identified by the Government of Tamilnadu for the purpose of developing the weak industrial areas and not in the economical/social point of view.