CHAPTER – 4
RESEARCH METHODOLOGY

4.1 Introduction

Research Methodology is simple the plan of action for a research that explains in detail how data is to be collected, analyzed and interpreted. The validity and reliability of any research depends upon the systematic collection of data and analyzing in a more scientific methods. ¹

4.2 Research Design

A research design is the specification methods and procedures for acquiring the information needed to structure or solve problems. It is the overall operational pattern or framework of the project that stipulates what information is to be collected, from which sources, and with what procedures. If it s a good design, it will ensure that the information obtained is relevant to the research problem and that it was collected through objective and economical procedures. A research design might be described as a series of advance decisions that, taken together, form a specific master plan or model for the conduct of the investigation (Shajahan, 2006). ²

According to Jahoda, Deutshe and Cook, “A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance
to the research purpose with economy in procedure.” A research design is a logical and systematic plan prepared for directing a research study. It specifies the objectives of the study, and the methodology and techniques to be adopted for achieving the objectives. It constitutes the blueprint for the collection, measurement and analysis of data. A research design is the program that guides the investigator in the process of collecting, analysis and interpreting observations.\textsuperscript{3}

Descriptive Research design has been used. In this study for example, the demographic profile of the respondents (HR executives and Non-HR executives), the significance of demographic variables in E-HRM practices etc. The objective of descriptive research design is to answer who, what, when and how of the subject under investigation.

Descriptive research design is the one that simply describes something such as demographic characteristics of respondents. The descriptive study is typically concerned with determining frequency with which something occurs or how two variables vary together.

4.2.1 Data Collection

The data required for the study were collected from appropriate sources. Both primary and secondary data are used to draw conclusions. The primary data is collected through a questionnaire, which was administered by personal interview. Primary data from the respondents with the structured, undisguised, and pre-tested questionnaire and
secondary data from the published literature, published research articles, books, journals, news, websites, and the like. Field survey technique was employed to collect first-hand information from the respondents. As questionnaire was the main tool used for data collection, much effort was taken and a lot of attention was paid to prepare the questionnaire in a systematic manner by designing adequate and relevant questions to ensure that the objectives of the study were fully taken care of. The questionnaire was prepared with the help of the research supervisor, who is an expert in research.

The study used two sets of structured questionnaires for the data collection. The first set of questionnaire for HR executives and the second set of questionnaire for Non-HR Executives from IT enabled organizations and software companies in and around Chennai.

4.2.2 Sampling Design

4.2.2a. Population

The researcher has chosen the area for this research study is Chennai city and its surrounding software based and information technology organizations and Information technology enables organisations [ITES] like BPO and Hardware related organisations.

4.2.2b. Sampling plan

The Sampling technique for this research is Simple Random Sampling. In a simple random sample each member of the population has a known and equal chance of being selected. Ten years old leading 52 companies were selected (see annexure) which
includes IT, software and IT enables services like BPO and hardware companies in Chennai. This has been calculated with the help of sample size Calculator.

4.2.2c. Sample size

The study comprises of 21,944 of employees from 52 companies. With the help of sample size calculator sample size is determined at 5% level is 378 (See annexure). The research has been carried out with the sample size of 406, which includes both HR executives and Non-HR executives of IT and IT enabled service organisations in Chennai.

4.2.2d The Pilot study

Pre-testing the questionnaire designed to assess the appropriateness of the questionnaire. A pre-test survey was carried out to see (a) whether the respondents have understood all the questions. (b) Whether any particular question is unanswered by the respondents. It is also noticed that some of the respondents were not able to understand some question because of technical words used. The results of the pilot survey were appropriately incorporated in the final questionnaire used for the study. The reliability test was carried out to test the effectiveness of the questionnaire. The reliability alpha value for section-1 was 0.901 and the reliability alpha value for section-2 was 0.883.
4.3 Hypothesis

The study considered two major hypotheses based on the objectives of the thesis and it includes:

- Opinions on E-HRM practices among the type of respondents are independent.
- Opinions on E-HRM practices among categories of organizations are independent.

4.4 Data Analysis

The purpose of analysis is to build up a sort of empirical model where relations are carefully brought out so that some meaningful inferences can be drawn. Data has to be analysed with reference to the purpose / objective of the thesis study and its possible bearing on scientific discovery. Analysis is done with reference to the research problem at hand or hypothesis. Until the advent of powerful personal computers, data were analysed either by hand or with the help of mainframe computers. The former was extremely time-consuming and error-prone, and the later expensive. Fortunately, the manual or calculator number-crunching and charting elements of quantitative analysis have been incorporated into relatively inexpensive personal-computer-based analytical software.
4.5 Statistical tools

The data gathered through the survey are to be analysed with appropriate tools and techniques and are represented with tables and graphs as and when necessary. The following statistical tools have been used for analyzing the data collected from the respondents.

4.5.1 Weighted average

As a part of descriptive analysis, weightages are assigned for the values of rating scales and ranking scales have been used. The values awarded are 5, 4, 3, 2 and 1 for the range from strong positive, positive, neutral, negative and strong negative responses on various factors. Higher scores indicate higher the agreement of the respondents on the factor under consideration and vice versa. The study uses the weighted average for ranking the factors which are considered for the opinion on E-HRM practices among HR Executives and Non-HR executives.

4.5.2 Factor analysis

Factor analysis is by far the most often used multivariate technique of research studies, specially pertaining to social and behavioural sciences. It is a technique applicable where there is a systematic interdependence among set of observed or manifest variables and the researcher is interested in finding out something more fundamental or latent which creates this commonality. For
instance, we might have data, say, about an individual’s income, education, occupation and dwelling area and want to infer from these some factor (such as social classes) which summarises the commonality of all the said four variables. The technique used for such purpose is generally described as factor analysis. Factor analysis, thus, seeks to resolve a large set of measured variables in terms of relatively few categories known as factors (C.R. Kothari, 2001).\(^4\)

The factor analysis is a very useful method of reducing data complexity by reducing the number of variables being studied. To test the suitability of the data for factor analysis, the following steps are taken

1. The correlation matrices are computed and examined. It reveals that there are enough correlations to go ahead with factor analysis.

2. Kaiser – Meyer Olkin Measure of sampling adequacy for individual variables is studied from the diagonal of partial correlation matrix. It is found to be sufficiently high for all the variables. The measure can be interpreted with the following guidelines: 0.90 or above, marvelous, 0.80 or above meritorious, 0.70 or above, middling, 0.60 or above, mediocre, 0.50 or above miserable, and below 0.50, unacceptable (Hair et al. 1995).
3. The overall significance of correlation matrices is tested with Bartlett Test of Sphericity to support the validity of the factor analysis of the data set. A p value < 0.05 indicates that it makes sense to continue with the factor analysis.

4. There are two stages in factor analysis. Stage I can be called the Factor Extraction process, where our objective is to identify how many factors will be extracted from the data. The most popular method for this is Principal Components Analysis. There is a rule-of-thumb based on the computation of an Eigen value, to determine how many factors to extract.

   The concept of Eigen value translates approximately to the ‘variance explained’ concept of regression analysis. The higher the Eigen value of a factor, the higher is the amount of variance explained by the factor. Before extraction, it is assumed that each of the original variables has an Eigen value = 1. Theoretically, there may be as many factors as they are original variables. But since the objective is to reduce the variables to a fewer number of factors, usually retain those with an Eigen value of 1 or more.

   Stage II is called Rotation of principle components. After the number of extracted factors is decided upon in stage I, the next task is to interpret and name the factors. The component matrix (factor matrix) is unrotated. It gives the initial
picture of the loadings of the variables onto the factors, but it can be made clearer by using varimax rotation. Rotation has shown that different variables load on to different factors and choose suitable names for factors.

Therefore the factor analysis has been used to identify the factors to influence the effectiveness of E-HRM.

4.5.3 Anova

Analysis of variance (abbreviated as ANOVA) is an extremely useful technique concerning researches in the fields of economics, biology, education, psychology, sociology, business / industry and in researches of several other disciplines. This technique is used when multiple sample cases are involved. (C.R.Kothari, 2001)\(^5\)

Anova stands for Analysis of Variance, the generic name given to a set of techniques for studying case-and-effect of one or more factors (independent variables) on a single dependent variable. The Analysis of Variance technique is used when the independent variables are of nominal scale (categorical) and the dependent variable is metric (continuous). (Rajendra Nargundar, 2007)\(^6\)

4.5.4 One way analysis of variance

It is used to know the significant difference among the groups (more than two) with regard to a particular factor. In one way (or single factor) one can consider only one
factor and then observe the reason for said factor to be important is the several possible types of samples can occur within that factor.

4.5.5 Friedman’s test

For the data collected in the rank form and to test the ranking given by the respondents across groups, Friedman test is used. As the groups and the number of respondents are becoming larger, the hypothesis testing of Friedman’s test can be used.

As a continuation of the Friedman test, Kendall coefficient of concordance (W) is done to understand the relationship among the groups where the number of groups are more than two. Perfect agreement among the respondents across group is indicated by the concordance value \( W=1 \) and lack of agreement by the value \( W=0 \).

4.5.6 Regression

Regression is a statistical tool used to find out the relationship between two or more variables. One variable is caused by the behaviour of the other. The former variable is defined as independent and the later variable is defined as the dependent. When there are two or more independent variables, the analysis that describes the relationship between the two is called multiple regression analysis. The main objective of using this technique is to predict the variability of the dependent variable based on its co-variants with all the independent variables. It is useful to predict the level of dependent phenomenon through multiple regression analysis.
4.5.7 One Sample T-test

One sample t-test is a statistical procedure that is used to know the mean difference between the sample and the known value of the population mean. We draw a random sample from the population and then compare the sample mean with the population mean and make a statistical decision as to whether or not the sample mean is different from the population. This one sample t-test is based on the assumptions such as (a). in one sample t-test, dependent variables should be normally distributed, (b). in one sample t-test, samples drawn from the population should be random, (c). in one sample t-test, cases of the samples should be independent, (d).in one sample t-test, one should know the population mean.

The study used one sample T-test tool to test the significant difference between test value and observed mean.
4.6 Limitations of the study

The study was conducted in South India’s metropolitan city Chennai where talent is abundant. Its growth in technological aspects is increasing gradually.

- The study was restricted in Chennai based software as well as Information technology enabled organizations only.
- The focus of the study was only on HR Executives and Non-HR Executives.
- The study is confined only to 52 leading organizations which are more than 10 years old.
REFERENCES