CHAPTER 4 – Research Methodology

4. Research Methodology

This chapter takes into account all main aspects of the research design and analysis of data. These aspects are discussed in various stages. First descriptive information about the research design and sampling approach is given. Second details with respect to questionnaire construction, questionnaire administration, measurement scales and reliability & validation of the measurement scales are illustrated. This is followed by the summary

4.1. Research

Research can be explained as search for knowledge in general. Methodical and organized search for applicable information on a specific topic can also be termed as research. In fact, research is an art of scientific investigation (C R Kothari, 1990). The Advanced Learner’s Dictionary of Current English (1952, page 1069), lays down the meaning of research as “a careful investigation or inquiry especially through search for new facts in any branch of knowledge.” Further Redman and Mory, (1923, page 10299), define research as a “systematized effort to gain new knowledge.” Some people consider research as a movement, a movement from the known to the unknown. It is actually a voyage of discovery.

Research is an intellectual activity and as such the term should be used in a scientific sense. According to Clifford Woody (1927 page 172300), “research comprises defining and redefining problems, formulating hypothesis or suggested solutions; collecting, organizing and evaluating data; making deductions and reaching conclusions; and at last carefully testing the conclusions to determine whether they fit the formulating hypothesis.”

Further, D. Slesinger and M. Stephenson in the Encyclopedia of Social Sciences, (1930 page 54301), define research as “the manipulation of things, concepts or symbols for the purpose of generalizing to extend, correct or verify knowledge, whether that knowledge aids in construction of theory or in the practice of an art.”
Thus, research is a novel contribution to the present collection of knowledge building up for its progress. It is the search of reality with the help of study, observation, comparative analysis and experiment. To sum up, the search for knowledge through objective and organized method of finding solution to a setback or capturing an opportunity is research. The systematic approach concerning simplification and the formulation of a theory is also research. Science is often contemplated as being a rational body of thought about a topic over which there is a broad agreement among its practitioners. As Alan Chalmers (1999\textsuperscript{302}) notes, that, when it is claimed that science is special because “it is based on the facts, the facts are presumed to be claims about the world that can be directly established by a careful, unprejudiced use of the senses. Science is to be based on what we see, hear and touch rather than on personal opinions or speculative imaginings. “If observation of the world is carried out in a careful, unprejudiced way then the facts established in this way will constitute a secure, objective basis for science”. (Chalmers 1999: page 3). Yet the actual practice of science shows that there are not only different views on a given observable fact, but also substitute methods of gathering information and of analyzing the resultant data. While these differences do affect the natural sciences, the study is concerned with the history and practice of the social sciences (M. Williams 2000\textsuperscript{303}). Further, Social Research is concerned with explaining various social phenomena, to concentrate on particular issues, and to challenge traditionally held beliefs about the societal and natural worlds. “Social research, however, does differ from natural sciences, in that researchers are able to ask questions to those they study. Unlike objects in nature, humans are self-aware beings who confer sense and purposes on what they do. We can’t even describe social life accurately unless, we first grasp the concepts that people apply in their behavior”. (Giddens’ 654 654 1997: page 12–13\textsuperscript{304}). The research under study is basically focused on this aspect of social research.
4.1.1 Research Philosophy

The organized method in which data for a particular research study is collected, analyzed and utilized is termed as research philosophy. The term epistemology (what is known to be true) as opposed to doxology (what is believed to be true) covers the various philosophies of research approach. The objective of science, then, is the method of transforming things believed into things known: doxa to episteme. Two major research philosophies have been acknowledged in the Western tradition of science, that is positivist (sometimes called scientific) and interpretivist (also known as antipositivist) (Galliers, 1991).

Positivists establish that reality is stable and can be observed and explained from an objective perspective (Levin, 1988), i.e. without interfering with the context or situation being studied. They state that the context should be secluded and that observations should be repeatable. This often requires management of reality with variations in only a single independent variable so as to identify similarities in, and to form associations between, some of the particular elements of the social world. Predictions can be made on the basis of the previously observed and explained realities and their inter-relationships.

Interpretivists contend that only through the subjective understanding and involvement reality can be fully understood. The study of occurrence in their natural surrounding is the main theme of the interpretivist philosophy, together with the acknowledgement that, scientists cannot avoid affecting the occurrence that they study. The interpretivist accept that there may be many interpretations of reality, but sustain that these interpretations are in themselves a part of the scientific knowledge they are pursuing. Predictions can be made on the basis of the formerly observed and explained realities and their inter-relationships. It can be stated on the basis of previous observations (e.g. Benbasat et al. 1987) that, no single research methodology is inherently better than any other methodology, many researchers practically utilize a combination of research methods in order to improve the quality of research. For this study, there was an intervening concern that, the research philosophy should be both relevant to the research question, and
A great number of research methodologies have been acknowledged, like Galliers (1991) listed fourteen, while Alavi and Carlson (1992), reported in Pervan (1994), listed hierarchical taxonomy with three levels and eighteen categories. In Table 4.1, there is a list of methodologies identified by Galliers (1991, page 149), indicating whether they typically conform to the positivist or interpretivist paradigms.

**Table 4.1 Various research methodologies**

<table>
<thead>
<tr>
<th>SCIENTIFIC/ POSITIVIST</th>
<th>INTERPREVITIST/ANTI POSITIVIST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory Experiments</td>
<td>Subjective/ Argumentative</td>
</tr>
<tr>
<td>Field Experiments</td>
<td>Reviews</td>
</tr>
<tr>
<td>Surveys</td>
<td>Action Research</td>
</tr>
<tr>
<td>Case Studies</td>
<td>Case Study</td>
</tr>
<tr>
<td>Theorem Proof</td>
<td>Descriptive / Interpretative</td>
</tr>
<tr>
<td>Forecasting</td>
<td>Future Research</td>
</tr>
<tr>
<td>Simulation</td>
<td>Role Play</td>
</tr>
</tbody>
</table>

Source: Galliers (1991)

As mentioned in the table, 4.1, survey is one of the important research methods of positivist philosophy. According to Isaac & Michael, survey research is defined as, “to answer questions that have been raised, to solve problems that have been posed or observed, to assess needs and set goals, to determine whether or not specific objectives have been met, to establish baselines against which future comparisons can be made, to analyze trends across time, and generally to describe what exists, in what amount and in what context.” (Isaac & Michael, 1997, page 136).

Kraemer (1991) identified three unique characteristics of survey research. First, survey research is used to qualitatively explain particular aspects of a sample population
under study. These aspects often involve investigating the relationships among variables. Second, the data required for survey research are gathered from individuals and are, therefore, subjective. Finally, survey research utilizes a selected portion of the population from which the findings can later be made universal back to the population. In survey research, independent and dependent variables are used to describe the scope of study; however these variables are not under the entire management of the analyst. Before conducting the survey, the researcher must forecast a model that identifies the expected relationships among these variables.

In research under study job role stressors that is role conflict and role ambiguity and service effectiveness factors are independent variables and frontline employee role performance towards customers is dependent variable. A model is proposed (Figure 3.8) on the basis of research objectives. The survey is then undertaken to examine this model against observations of the phenomena. A survey is a knowledge assortment tool for carrying out survey research. Pinsonneault and Kraemer (1993) defined a survey as a “means for gathering information about the characteristics, actions, or opinions of a large group of people” (p. 77). Surveys can also be used to investigate needs, evaluate demand, and examine impact (Salant & Dillman, 1994, p. 312).

The term survey instrument is often used to differentiate the survey tool from the survey research that it is designed to support. In this study, extensive use is made of questionnaire and informal interviews, for gathering information regarding gap between customer perception and customer expectation of service delivered by frontline employees, job role stressors i.e. role conflict & role ambiguity, service effectiveness and frontline employee role performance towards the customers.

A field study was undertaken to test the hypothesized relationships. A field study means non-experimental scientific enquiry carried out with the objective of hypothesis testing in real life social structures (Kerlinger and Lee 2000). The specific context for the thesis involves a cross-sectional survey within the retail industry with focus on frontline employees in departmental stores as herein majorly frontline employees are in direct contact and do have impact on purchase decisions of the customers.
The phenomenon of interest in this thesis (i.e. job role stressors i.e. role conflict & role ambiguity, frontline employee role performance towards customers and service effectiveness) suggest the suitability of a survey-based data compilation as part of a field study. Survey provides an effective means of conducting research on naturally occurring phenomenon and interrelationships among multiple variables. Further many of the constructs of interest in this thesis have no means of direct assessment beyond self-reports by means of questionnaire administration.

A field study offers many other benefits for the testing of hypotheses (Kerlinger and Lee 2000). First, field studies give realistic view and also enable to generalize research results. Second field study provides a greater range of variables due to their natural settings. Therefore the range of the phenomenon of interest that is investigated in the current study is extended in a field study. This allows for an improved theoretical understanding of relationship among service effectiveness, frontline employee role performance towards the customers and job role stressors i.e. role ambiguity and role conflict. This in turn leads to enhanced managerial understanding of the factors that contribute to beneficial employee performance towards the customers and service effectiveness. Finally, a field study allows for the determination of actual strength of relationships among the various constructs in a real setting. Several steps have to be taken to limit the weaknesses of survey-based field studies (e.g., limited causal deduction, control of irrelevant variance and time requirements) (Kerlinger and Lee 2000). First a single retail format i.e. departmental store for the study was chosen to limit time and cost constraints. For this study the initial contact with the departmental stores was through HR managers of the departmental stores located in central, harbor & western suburbs which are crowd puller locations.

The support of the HR managers permitted access to large and motivated sample resulting in high response rate. A single retail format allows for control of other extraneous sources of variance (Kerlinger and Lee 2000). Using a single retail format helps to eliminate potential extraneous variables that may differ across retail formats. This allows for a more applicable test of hypotheses. For example frontline employees
of a single retail format i.e. department store has to deal with customers who expect
more or less same kind of service from the store.

4.1.2 Introduction to Research Methodology

The task of social sciences is to separate, examine and comprehend the cause of human
behavior and to understand how social forces shape behavior. Here we need to study,
social group behavior rather than individual group behavior. In social science research,
evidence which is reliable and valid can be collected from observable phenomenon
which also can be tested. There are two types of research methods – quantitative and
qualitative research. In contrast to qualitative research, quantitative research
concentrates on measurement and the analysis of causal relationships between variables,
not processes (Denzin and Lincoln, 2003\textsuperscript{314}). Quantitative research has five main
methods, such as social surveys, experiment, official statistics, structured observations
and content analysis (Silverman, 2000\textsuperscript{315}).

Both quantitative and qualitative methods are analyzed from different perspectives:
quantitative research has been described as superior because it is considered objective
and judgment-free, whereas qualitative research is claimed to be influenced by the
researcher’s preferences and subjectivity (Silverman, 2000).
Figure 4.1. Research Methodology

- Review of Literature
- Identification of Research Questions and Objectives
- Formulation of Hypothesis
- Primary Data Collection
  - Formal/Informal discussions with Human Resource Managers and Employees
  - Responses from Frontline Employee's and Customers
- Secondary Data Collection
  - Journals, Books, Reports, Websites and Articles
  - Draft Questionnaire Design
  - Final Questionnaire Design
- Data Collection and Analysis
- Findings, Discussion and Conclusion
Quantitative research has also been considered reliable because it is more scientific in contrast to qualitative research which is thought of as unscientific. (Denzin and Lincoln, 1994). In most of the research investigations qualitative research is considered to be appropriate for preliminary studies and the precursor of a quantitative study. Qualitative data’s validity is also questioned by not being able to present counter examples in analysis. It also suffers from the accuse of ‘anecdotalism’ (Silverman 2000) that is it only has face value as it focuses on telling interesting stories, but not being able to convince the reader of their scientific trustworthiness. On the other hand even the assumed dependability of quantitative research was questioned deeply in the 1990’s. For instance, it has been accused of not revealing the differences between the natural and the social world, and that a purely quantitative method does not disclose the social and cultural edifice of variability (Silverman 2000).

So the research under study utilizes both qualitative & quantitative methods for reaching the conclusion. In case of quantitative research the method used is explanatory research. Explanatory studies look for examination of the nature of particular relationships. It utilizes hypothesis testing to provide an understanding of the relationships that exist between variables.

4.2. Research Design for the Present Study

This study started as an exploratory study that eventually led to the explanatory study portraying gap between customer expectation & customer perception of service effectiveness in Study 1, factors those are prominent to describe customer expectations /customer perception of service effectiveness in study 2, examination of dependency between service effectiveness factors & frontline employee role performance towards the customers in study 3, significance of job role stressors on frontline employee role performance towards the customers in study 4, and direction of relationship among job role stressors, service effectiveness and frontline employee role performance towards the customers in study 5.

The research design of this thesis initially was exploratory in nature. However, as Cooper & Schindler (1998) mention that “exploratory research is
(unfortunately) linked to old biases about qualitative research, namely subjectiveness, non representativeness and non- systematic design. A wiser view is that, it saves time and money and should not be slighted because exploration covers areas that may be new or so vague that a researcher needs to do an exploration, just to learn something about the dilemma facing the manager.” Cooper & Schindler (1998) further state, “Exploratory studies loose structure with the objective of discovering future tasks.”

Also, Daniel Mac and Gates (1999) mention that exploratory research is a small scale research carried out to define the exact nature of the problem and to gain a better understanding of the surrounding within which the problem occurred. The research methodology for the study under question started as an exploratory study and then developed an explanatory approach. Explanatory studies look for explanations of the nature of particular relationships. It utilizes hypothesis testing to provide an understanding of the relationships that exist between variables.

4.2.1 Research Design for Study 1 and Study 2

Study 1 – Gap between customer expectation & customer perception of service effectiveness

Study 2 - Factors that are prominent to describe customer expectations /customer perception of service effectiveness

For Study 1 & Study 2, the respondents were customers having shopping experience for at least 1 year or more in selected departmental stores. A total number of 1000 respondents answered the Structured Questionnaire. This Survey was quite voluminous and was carried out from July 2013 to December 2014. The sampling technique used was convenience sampling.

4.2.2 Research Design for Study 3, Study 4 and Study 5

Study 3 – Examination of dependency between service effectiveness factors and frontline employee role performance towards the customers

Study 4 - Significance of Job role stressors on frontline employee role performance towards the customers
Study 5- Direction of relationship among job role stressors, service effectiveness and frontline employee role performance towards customers

For Study 3, Study 4 and Study 5 the respondents were sales personnel (called as frontline employees for the purpose of study) of departmental stores located in central, harbor & western suburbs of Mumbai the financial capital of India having an experience of 1 year or more in the present department store. For this the Sampling Frame were the 5000 sales personnel working in the department stores located in Central, harbor & Western suburbs of Mumbai. From the 60 HR executives contacted, only 50 gave permission to administer the questionnaire to the sales people during their coffee breaks with the condition of confidentiality with respect to the identity of the names of department stores and frontline employees. The sampling technique used here was stratified random sampling. The stratum, being department stores operating in central, harbor & western suburbs of Mumbai. A total of 500 sales people were surveyed. In all the studies preliminary pilot survey was also conducted to test the validity & reliability of the measurement instrument.

4.3. Population

The study also would like to know in general terms and not be confined only to the people who are part of the study. Thus in the said study, we consider India’s population, in total with respect to customers and working class employed in the Indian department stores with respect to frontline employees. According to the latest Census Survey carried out on March, 2011, the total population of India was recorded to be 1,210,193,422 individuals thus making it the second largest populated country in the world. India follows China in this race of population, the former being at number one. In July 2007, this mark had increased by a considerable number and the last recorded data had the figure of 1,129,866,154, under the Indian Population head. Rising by a considerable percentage of about 21.34%, the population of India observed a sound rise in the sex ratio by coming up to 933 from 927 as at the 1991 Census that recorded a total
population of 1,027,015,247 persons comprising of 531,277,078 males and 495,738,169 females (www.indiaonlinepages.com).

But in most applied social research, the researcher aims in generalizing to particular groups. The group the study aims to generalize is often called the population in the study. This is the group one would like to sample from because this is the group the study is focused on while generalizing. With respect to customers the population is limited to customers having shopping experience for 1 year or more in selected departmental stores. A total number of 1000 respondents answered the structured questionnaire with a response rate of 60%, with an average of 20 customers per store. This Survey was quite voluminous and was carried out from July 2013 to December 2014. The sampling technique used was convenience sampling.

With respect to frontline employees in the present study, the population (also referred as Universe) is limited to the sales personnel having 1 year or more experience working in department stores located 5 geographical strata in central, harbor and western suburbs of Mumbai. After going through the employee records with due permission of the HR managers of the selected department stores it was found out that the sales people employed in central, harbor and western regions of Mumbai having experience of 1 year or more with the present employer are approximately 5000. Of this majority are undergraduates with few just being graduates. Thus the population for our survey consists of 5000 sales people in total. Of these for the present study the Sample Size which was surveyed was 500 sales people in selected 5 strata of Mumbai responded. The sampling technique used was stratified random sampling.

4.3.1. Sampling frame

In statistics, a sampling frame is the starting place or tool from which a sample is collected. It is a record of all those within a population who can be sampled, and may include individuals, households or institutions. (Carl-Erik Särndal; Bengt Swensson; Jan Wretman, 2003318). The importance of the sampling frame is stressed by Jessen (1978319), where he states that, “In many practical situations the frame is a matter of
choice to the survey planner, and sometimes a critical one. Some very worthwhile investigations are not undertaken at all because of the lack of an apparent frame; others, because of faulty frames, have ended in a disaster or in cloud of doubt”. The sampling frame must be representative of the population and this is a matter outside the scope of statistical theory demanding the opinion of experts in the particular subject matter being studied. As regards the present study, the Sampling Frame is a list of departmental stores located in central, western and harbor suburbs of Mumbai. From these 5 geographical strata’s are selected as department stores located in these strata’s are major crowd pullers. And then the respondents from these department stores - customer and frontline employees are sampled by means of methods like convenience sampling and stratified random sampling.

4.3.2. Sampling Design

The basic purpose of sampling is extrapolation from the part to the whole—from “the sample” to “the population.” (The population is also referred to as “the universe.”) There is an immediate corollary: the sample must be chosen to fairly represent the population. Methods for choosing samples are called “designs.” There are 5 studies involved in this research

**Study 1:** Gap between customer expectation & customer perception of service effectiveness

**Study 2:** Factors those are prominent to describe customer expectations /customer perception of service effectiveness

**Study 3:** Examination of dependency between service effectiveness & frontline employee role performance towards the customers

**Study 4:** Significance of Job role stressors on frontline employee role performance towards the customers

**Study 5:** Direction of relationship among job role stressors, service effectiveness and frontline employee role performance towards customers
4.3.2.1. Sampling design strategy for Study 1 and Study 2

A total of 1000 surveys were received from the respondents who visit targeted departmental stores with a response rate of 60%, with an average of 20 customers per store. The sampling method used is convenience sampling.

The following equation is used to calculate the sample size (S):

\[ S = \left[ \frac{z^2 \cdot p(1-p)}{e^2} \right] \]

\[ = \left[ \frac{(1.96)^2 \cdot 0.5 \cdot 0.5}{0.05^2} \right] \]

\[ = 385 \]

Now it can also be seen from the pilot survey conducted that the response rate of the sample selected is 60%, thus the final sample size will be calculated as follows:

Sample Size = 385 * 1.7

\[ = 655 \]

Thus for study 1 and study 2 the number of respondents should be at least 655. In this study the number of respondents is 1000.

4.3.2.2. Sampling design strategy for Study 3, Study 4 and Study 5

The sales personnel of Departmental stores located in 5 strata (Table 4.2) of Mumbai having experience of at least 1 year and more with the present store constitute the sample for the field study with respect to survey questionnaire comprising information regarding frontline employee role performance towards the customer, job role stressors i.e. role conflict and role ambiguity and service effectiveness factors. The sales personnel were chosen because they are majorly in direct contact with the customers and have an influence on their purchasing decisions. 5 Strata of Mumbai were chosen for sampling on basis of these areas being highly populated in Mumbai with respect to department stores density as well as population density.
Table 4.2. Selected Strata’s for Sampling design

<table>
<thead>
<tr>
<th>Sr.no.</th>
<th>Zone</th>
<th>Number of department stores</th>
<th>Number of sales personnel</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nariman point, Haji Ali, Worli, Lower Parel, Dadar, Mahim</td>
<td>80</td>
<td>1600</td>
</tr>
<tr>
<td>2</td>
<td>Bandra, Santacruz, Andheri, Goregoan, Malad, Borivali,</td>
<td>75</td>
<td>1400</td>
</tr>
<tr>
<td>3</td>
<td>Matunga, Chembur, Ghatkoar, Bhandup</td>
<td>53</td>
<td>800</td>
</tr>
<tr>
<td>4</td>
<td>Mulund, Thana, Kalwa, Kalyan</td>
<td>45</td>
<td>680</td>
</tr>
<tr>
<td>5</td>
<td>Airoli, Vashi, Nerul, Kharghar</td>
<td>35</td>
<td>520</td>
</tr>
</tbody>
</table>

The sampling method used for sales personnel is stratified random sampling. First of all department stores located in 5 strata’s of Mumbai are selected and sales personnel are randomly sampled from these strata.

The following equation is used to calculate the sample size (S):

Total population = 5000

Sample selected is 10% of the total population i.e. 500

So Sample weightage point is 500/5000 = 0.1

So from each stratum following number of employees will be selected on random basis:

Strata 1 = 160
Strata 2 = 140
Strata 3 = 80
Strata 4 = 68
Strata 5 = 52

Prior to questionnaire administration, several meetings were held with sales personnel and HR managers to (1) become more familiar with the specific language and job responsibilities of the respondents (2) review and discuss the data collection procedures
(3) identify relevant context-specific role performance and service productivity measures with special emphasis on frontline employee role performance towards customers and service effectiveness and (4) to assure the appropriateness of the various survey measures and instructions. These also helped to guide survey development, improvement and implementation. A large sample of frontline employees and customers is required to reduce the error variance of the sample and to increase the power of the statistical tests (Cohen 1992; Kerlinger and Lee 2000).

4.4. Questionnaire Administration

A pilot test of the sampling procedure was conducted with a sample size of 100 frontline employees (sales personnel) and 100 customers to examine the reliability and validity of the measures and to assess the appropriateness of the instructions and data collection procedures before being introduced to the remaining respondents and customers.

Cover letter, instructions for data collection and survey questionnaire was distributed personally, via email, with the help of students, personal contacts to the sales personnel and customers of the selected departmental stores.

4.5. Measurement Characteristics

The selection of construct measures and the design of the questionnaire represent critical design characteristics. The construct measures i.e. frontline employee role performance towards the customers, job role ambiguity, job role conflict, customer expectation and customer perception of the service delivered by the employees are self reports of frontline employees and customers.
Table 4.3. Measurement characteristics

<table>
<thead>
<tr>
<th>Construct</th>
<th>Source</th>
<th>Operationalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frontline employee role performance towards the customers</td>
<td>Bettencourt and Brown (1997)</td>
<td>A ten-item, seven-point scale that measures the extra role performance of employees towards the customers</td>
</tr>
<tr>
<td>Role ambiguity</td>
<td>Rizzo, J. R., House, R. J., &amp; Lirtzman, S. I. (1970)</td>
<td>A seven-item, seven-point scale that measures the level of job role ambiguity faced by frontline employees</td>
</tr>
<tr>
<td>Role conflict</td>
<td>Rizzo, J. R., House, R. J., &amp; Lirtzman, S. I. (1970)</td>
<td>A seven-item, seven-point scale that measures the level of job role conflict faced by frontline employees</td>
</tr>
<tr>
<td>Job role stressors, service effectiveness and frontline employee role performance towards the customers</td>
<td>Dubinsky (1984)</td>
<td>A two-item, seven-point scale that measures the relationship among job role stressors, service effectiveness and frontline employee role performance towards the customers</td>
</tr>
<tr>
<td>Service effectiveness</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4.5.1 Frontline employee role performance towards customers

Customer-directed prosocial behaviors, or the prosocial role performances that are directed towards and perceived by the customer are called as “Frontline employee role performance towards the customers”. Frontline employee role performance towards the customers is of particular interest in this study as they have direct implications for customer perceptions of service effectiveness. Two types of frontline employee role performance towards the customers can be viewed as being beneficial to the firm: role-prescribed performance and extra-role performance (Bettencourt and Brown 1997). Frontline employee role performance towards the customers was measured using a scale adapted from Bettencourt and Brown (1997). Scale items were reworded to accommodate the retail format selected i.e. departmental store. Employees were asked to self-evaluate their role performance towards the customers using ten frontline employee role performance items (Figure 3.8) measured by means of seven-point Likert scale from 1 (strongly disagree) to 7 (strongly agree).

4.5.2 Role ambiguity

Kahn et al. (1964), Walker et al. (1975) mentions that role ambiguity occurs when employee does not have sufficient information about the job to be performed. (Chenet, Tynan, & Money, 2000; Sutherland, & Cooper, 1991). Role ambiguity was measured using a scale adapted from Rizzo, J. R., House, R. J., & Lirtzman, S. I. (1970). Scale items were adapted to accommodate the retail format selected i.e. departmental store. Employees were asked to evaluate the level of role ambiguity faced by them using six-items depicting level of role ambiguity measured by means of seven-point Likert scale from 1 (strongly disagree) to 7 (strongly agree).

4.5.3 Role conflict

Role conflict is defined as “The simultaneous occurrence of two (or more) sets of pressures such that compliance with one would make more difficult compliance with the other” (Kahn et al. 1964, p. 19). In case of frontline employees the expectations from the management and demands and needs of customers may clash. For example, when a
superior expects that a frontline employee caters to as many customers as possible, a customer at the same time may demand personal attention. According to Pareek (1993) due to the boundary spanning role of frontline employees in the organization there is potential for conflict leading to job role stress. Such stress can lead to different unwanted end results for the organization like job related stress, demotivation, lower performance, etc. (Behrman and Perreault, 1984). In such instances, efforts to maintain a high level of work performance over a long time can be difficult or in some case impossible task for organizations as well as employees. Role conflict was measured using a scale adapted from Rizzo, J. R., House, R. J., & Lirtzman, S. I. (1970). Scale items were adapted to accommodate the retail format selected i.e. departmental store. Employees were asked to evaluate the level of role conflict faced by them by using seven - items depicting level of role conflict measured by means of seven –point Likert scale from 1 (strongly disagree) to 7 (strongly agree).

### 4.5.4 Service effectiveness

According to Harris et al. 2005; Saxe and Weitz, 1982 service effectiveness basically requires salespeople to concentrate on bridging gap between customer expectations and perception, keeping track and solving their purchase problems, and earning their loyalty. According to Anderson et al. (1994); Reichheld and Sasser (1990); Rust et al.( 1995) service effectiveness have gained strategic importance because of growing recognition of perceived service effectiveness as a significant indicator of business performance in terms of economic returns. But implementation of this strategy depends on frontline employee’s performance as they are responsible for incorporating strategy into operation in their service encounters with customers in retail outlets. Thus it is essential to have insight into the factors that enhance or impede the service encounter between frontline employees and customers (Mangold and Babakus, 1991). Service effectiveness measure was obtained by checking whether there is significant difference between customer expectation and customer perception of service quality.
4.5.4.1 Customer expectation

Customer expectations of service effectiveness are viewed as desires or wants of customers that what customer feel service provider should offer (Parasuraman et al. 1988). Customer expectation of service effectiveness was measured using a scale adapted from Parasuraman et.al. (1985, 1986, 1988), Kumar et.al. (2009) comprising of fifteen - items measured by means of seven –point likert scale from 1 (strongly disagree) to 7 (strongly agree). Scale items were adapted to accommodate the retail format selected i.e. departmental store.

4.5.4.2 Customer perception

Customer perception of service effectiveness is the customers view of what they actually receive (Parasuraman et al. 1985, Gronroos, 1982). Customer perception of service effectiveness was measured using a scale adapted from Parasuraman et.al. (1985, 1986, 1988), Kumar et.al. (2009), comprising of fifteen - items measured by means of seven –point likert scale from 1 (strongly disagree) to 7 (strongly agree). Scale items were adapted to accommodate the retail format selected i.e. departmental store.

4.6. The Development of Measurement for Study and Validation of data

Research is the systematic and empirical study of relationships among variables. Most of the research in the social sciences, study human behavior, based on observations. These observations vary from person to person and from group to group, from organization to organization or from social artifact to social artifact. Persons, groups, organizations or social artifacts are units of analysis. Units of analysis are those objects, persons or organizations which are examined in order to create summary descriptions of them, or to explain differences among them. The characteristics or behaviors that are studied on those units of analysis are called variables.

First, variables are defined by conceptual definitions that explain the concept the variable is focusing to capture.
Conceptual definition: A conceptual definition is a particular theoretical meaning of a term, but usually not one used for describing measurement. (It’s what one would find in a dictionary.)

Second, variables are defined by operational definitions; that is, definitions of how variables will be measured. Operational definition: An operational definition is the clear specification of a variable in such a way that its measurement is possible.

**4.6.1. Study 1 and Study 2 – Measurement, Validity and Reliability**

**4.6.1.1. The unit of Analysis for Study 1 and Study 2**

1. Department stores in central, harbor and western suburbs of Mumbai, India
2. Customers shopping in the selected department stores for 1 yr or more.

**4.6.1.2. Variables for the Study 1 & Study 2**

- Gender
- Qualification
- Age
- Marital status
- Employment status
- Annual Income
- Customer expectation
- Customer perception

**4.6.1.3. Validity and Reliability**

According to Netemeyer *et al.* (2003), reliability and validity are necessary entities of instrument development if researchers are to report with confidence the results obtained from the survey. Reliability refers to the consistency or repeatability of a test or measurement. Validity refers to the degree that an instrument actually measures what it is designed or intended to measure. (Netmeyer *et al.* 2003). The four common procedures for establishing the validity of an instrument are as given below.
Face validity: It is establishing an instrument's ease of use, clarity and readability. The face validity of survey as an instrument is clearly written statement of the purpose(s) and objective(s) for implementing the survey. These decisions will govern the survey methodology, administration, and analytical approach. The aim of the survey will also determine the survey’s “unit of analysis.” In Study 1 and Study 2 the unit of Analysis is the customers shopping in the selected departmental stores for at least 1 year or more.

Content validity: It is establishing an instrument's credibility, accuracy, significance, and span of knowledge regarding the field. Content validity builds on face validity by asking whether the survey fully captures and represents the concept under study. This type of validity is typically established by a review for relevance by individuals with expertise in the subject matter addressed in the survey. As regards Study 1 and Study 2, both the survey questionnaires were formed after the literature review, and were approved by the HR managers of the selected departmental stores and guide allocated by SCSVMV Kanchipuram University.

Criterion validity: It is establishing a tool’s choice over another or establishing the predictability of the measure for a future criterion. Construct and criterion validity are more sophisticated measures of validity, and require more time and resources to assess. Criterion validity measures how well the performance on a test reflects the performance on what the test is supposed to measure. There are two types of criterion validity: concurrent and predictive. Concurrent validity uses a correlation coefficient to compare the survey to a "gold standard" survey for measuring the same variable. Predictive validity measures the survey's ability to "predict" future outcomes, and uses a correlation coefficient for comparison. The instruments selected for study 1 and study 2 meet the objective of the study and thus are appropriate for criterion validity.

Construct validity: It is establishing an instrument's ability to evaluate the construct it was developed to measure. Construct validity assesses how well the test measures the underlying issue (e.g., role conflict, role ambiguity etc.) it is supposed to measure. There is support of literature review and pilot survey to establish construct validity of study 1 and study 2.
Most research is designed to permit the researcher to draw conclusions about the cause-effect relationships among variables. The ultimate aim is to develop a model which would explain the relationship found among variables. In order to authenticate the relationship, we need VALIDITY. Validity is a sign of accuracy in terms of the extent to which a research conclusion is related to reality. Thus validity means that, the researcher's conclusion corresponds with the actual state of the world. As stated earlier, Cook, Campbell and Peracchio (1990) list four types of validity that must be considered in designing and evaluating any piece of research. They are:

Internal Validity, Construct Validity, External Validity, Statistical Validity

Internal Validity

It states the logic of the relationship between the independent and the dependent variables. Thus if the independent variable causes the dependent variable to change then there is a definite cause-effect relationship present. In internal validity, one strives to rule out alternative variables as potential causes of the behavior of interest. Sequential precedence is the single most important instrument for determining the strength of a cause and effect relationship. One of the Hypotheses for Study 1 is discussed for its temporal precedence.

(H_0): There is no significant gap between customer expectation and customer perception of service delivered by frontline employee towards the customers.

Frontline employee role performance towards customers is expected to have a positive relationship with service effectiveness (Bettencourt and Brown, 1997). Initial, prior studies suggest that the service effectiveness delivered by frontline employees plays an important role in determining customer satisfaction with service encounters.

In a study conducted to determine what distinguishes satisfactory incidents from dissatisfactory incidents, Bitner and colleagues (Bitner et al. 1990) found that more than 40 percent of all satisfactory incidents were attributed to the unprompted and unsolicited behaviors of service employees. In these particular cases the core service was quite adequate (meal, airplane flight, hotel room) but the attitude or unusual discretionary behavior of the service employee transformed the encounter into a highly satisfactory
incident. Bitner et al. (1990) noted that the customers were delighted by exemplary attitudes and behaviors and this transformed what was an adequate service encounter into a truly memorable one. Thus frontline employee role performances do have an influence on customer perception of service effectiveness. Most of the previous studies related to employee performance towards the customers & service effectiveness are targeted towards the hotel industry but hardly any towards the organized retail. Hence to fill in the gap above hypotheses is formulated.

Construct Validity

In the field of measurement, the concept of validity and reliability is concomitantly linked. The validity is commonly defined as whether an instrument or tool can measure what it is actually intended to measure. Reliability basically exists when same results are obtained when the measurement is repeated with same instrument (Meister, 2004; Suter, 2006). Construct validity involves the examination of the hypothesized constructs which represent the concept that researchers try to measure, and a number of simulated studies will earn reliability of validating the hypothesized constructs.

Also, exploratory factor analysis is directed to uncover the underlying structure of a system. The researcher’s prior assumption is that any variable may be related with any factor. This is the most common type of factor analysis. There is no prior theory and one uses factor loadings to perceive the factor structure of the data. The end results of an investigative factor analysis may have heuristic and suggestive value and may generate hypotheses which are capable of more objective investigations by other multivariate methods. (Kaplunovsky, 2004).

In the applied sciences, studies have focused on human characteristics and their underlying intelligence. In the field of psychology, and sociology, and Human Resources, researchers design questions to measure the attitudes or opinions on issues of the concern. With the wide availability of computing technology in the late 20th century, factor analysis becomes a common efficient tool to ascertain the underlying construct of the studied characteristics. Based on the inquiry purpose, exploratory and confirmatory factor analysis is distinctively named to fulfill their tasks. The former approach focuses
on the acquisition of a factor structure accounting for the relationship with observed data, while the latter intends to test the hypothesized factor model. Overall, through the interpretation of eigenvalue, the plot of scree test, determination of the factor pattern, and the indices of goodness of model fit, these two factor analyses have proved a better solution for justifying the construct validity.

In terms of interpreting a factor, it is an important issue to determine the amount in the factor loadings. As being a known relationship, a factor loading means the Pearson correlation between the variable and the factor. Thus, any loading used for interpretation should be able to explain large enough variance of the factor. Then, what is the criterion for selecting such a loading, Stevens (1996) comments, “It would seem that one would want in general a variable to share at least 15% of its variance with the construct (factor) it is going to be used to help name. This means only using loadings which are about 0.40 or greater for interpretation purpose.” (Stevens, 1996, pp 372). So in study 2 factor analysis is used to determine construct validity.

3. External Validity
This concerns whether the results of the research can be generalized to another circumstances; different subjects, context, times and so forth. As regards the explanatory research approach of the study 1 and study 2 can be also applied to other service sectors like airlines, banks etc. to check if gap exist between customer expectation & customer perception of service effectiveness

4. Statistical Validity
There is inevitably a concern when using randomly selected variables for analysis, that the connected matrices that result may not be appropriate for factor analysis. Studies have shown, for instance, that chance variates may give rise to seemingly acceptable pattern and structure matrices (Dziuban and Shirkey 1974). The SPSS software package used in this study includes Bartlett’s test of sphericity (Bartlett 1950) and the Kaiser-Meyer-Olkin measure of sampling adequacy (Kaiser 1970) to assist in the assessment of the adequacy of their correlation matrices for factor analysis for study 1 and study 2.
For a large sample Bartlett’s test approximates a chi-square distribution. The Bartlett test therefore forms something of a bottom line test for large samples, but is less reliable for small samples. Very small values of significance (below 0.05) point out a high probability that there are significant relationships between the variables, whereas higher values (0.1 or above) point out that the data is inappropriate for factor analysis. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy provides an index (between 0 and 1) of the proportion of variance among the variables that might be common variance (i.e., that might be indicative of underlying or latent common factors). The SPSS software package point out that a KMO near 1.0 supports a factor analysis and that anything less than 0.5 is probably not amenable to use factor analysis.

4.6.2. Study 3, Study 4 and Study 5 – Measurement, Validity and Reliability

4.6.2.1 The unit of Analysis for Study 3, study 4 and study 5
1. Departmental stores in central, harbor and western suburbs of Mumbai
2. Sales personnel working in the departmental stores, having experience of at least 1 year or more with the present department store.

4.6.2.2 Variables for the Study 3, study 4 and study 5
1. Gender
2. Qualification
3. Age
4. Annual Salary
5. Work Experience Total
6. Work Experience with the present Organization
7. Role ambiguity
8. Role Conflict
9. Frontline employee role performance towards the customers
10. Service effectiveness

4.6.2.3. Validity and Reliability

Survey research is appealing, due to the flexibility of data collection and analysis. Furthermore, survey research offers benefits in terms of cost effectiveness, span of data collected, and access to larger samples for data analysis, and secrecy, which may help to reduce social desirability bias. Many of the potential limitations of the survey research like respondent misunderstanding the questionnaire can be reduced by preparing valid and reliable tools for accuracy in measurements and reduction in errors.

According to Netemeyer et al. (2003), reliability and validity are necessary entities of tool development if researchers are to testify with confidence the results obtained from the survey. Reliability refers to the consistency or repeatability of a test or measurement. Validity refers to the degree that a tool actually measures what it is designed or intended to measure. (Netmeyer et al. 2003). The four common procedures for establishing the validity of an instrument are as given below.

Face validity: It is establishing an instrument’s ease of use, clarity and readability. The face validity of survey as an instrument is clearly written statement of the aim of undertaking the survey. The decision regarding the same will enable to frame the survey methodology, administration, and analytical approach. The aim of the survey will also determine the survey’s “unit of analysis.” In Study 3, Study 4 & study 5 the unit of Analysis is sales personnel employed in departmental stores who have 1 year or more experience.

Content validity: It is establishing an instrument's credibility, accuracy, significance, and span of knowledge regarding the field. Content validity builds on face validity by asking whether the survey fully captures and represents the concept under study. This type of validity is typically established by a review for relevance by individuals with expertise in the subject matter addressed in the survey. As regards Study 3 study 4 and study 5, the survey questionnaires were formed after the literature review, and were approved by the HR managers and guide allocated by SCSVMV Kanchipuram University.
Criterion validity: It is establishing an instrument's selection over another or establishing the predictability of the measure for a future criterion. Construct and criterion validity are more sophisticated measures of validity, and require more time and resources to assess. Criterion validity measures how well the performance on a test reflects the performance on what the test is supposed to measure. There are two types of criterion validity: concurrent and predictive. Concurrent validity uses a correlation coefficient to compare the survey to a "gold standard" survey for measuring the same variable. Predictive validity measures the survey's ability to "predict" future outcomes, and uses a correlation coefficient for comparison. The instrument selected for study 3 to study 5 meet the objective of the study and thus is appropriate with respect to criterion validity.

Construct validity: It is establishing an instrument's ability to evaluate the construct it was developed to measure. Construct validity assesses how well the test measures the underlying issue (e.g., role conflict, role ambiguity etc.) it is supposed to measure. There is support of literature and pilot survey to establish construct validity of study 3 to study 5.

Further there are four validities for designing, evaluating any research work, as mentioned by Cook, Campbell and Peracchio (1990). They are as given below: Internal Validity, Construct Validity, External Validity, and Statistical Validity

1) Internal validity

It states the logic of the relationship between the independent and the dependent variables. Thus if the independent variable causes the dependent variable to change then there is a definite cause-effect relationship present. In internal validity, one strives to rule out alternative variables as potential causes of the behavior of interest. Sequential precedence is the single most important instrument for determining the strength of a cause and effect relationship. One of the Hypotheses for Study 4 is discussed for its temporal precedence.

(H0): There is no significant influence of role ambiguity on frontline employee role performance towards the customers.
Here the study, cites the literature review as follows:

According to Hochschild, 1983; Wharton 1999 job role stress is uni-dimensional construct exclusively concerned with the intensity and frequency of emotional displays which have impact on employee performance and others like Kruml and Geddes, 2000; Morris and Feldman, 1997; observed it as a multi-dimensional construct. Kahn et al. (1964) define role stress as a complex construct consisting of two role stressors which include role conflict and role ambiguity. There have been many studies conducted on relationship between role ambiguity, role conflict and many other correlates since the first introduction of theory of organizational dynamics (Kahn, Wolfe, Quin, Snoek, & Rosenthal, 1964). Most of the studies indicates that role stress is accompanied by anxiety and nervousness and affects job performance (Behrman & Perreault, 1984). According to Dubinsky and Mattson (1979) and Abramis (1994) there is a negative relationship between job role stress and job performance. According to Yousef (2000) who investigated 397 employees from several manufacturing and service organizations in the United Arab Emirates, found that low perceptions of both role conflict and role ambiguity would predict better job performance.

Behrman and Perreault (1984) found a negative relationship between role ambiguity and job performance and a positive relationship between role conflict and job performance (see also Michaels, Day, & Jaochimsthaler, 1987). Thus it can be seen that there is inconsistencies in impact of job role stress on employee performance (Schuler, 1975). Though, substantial numbers of empirical studies (Hochschild, 1983; Morris and Feldman, 1996) so far were able to demonstrate negative effects of job role stress but few other studies exhibited different results. Adelmann (1995) carried out a study on table servers and found no relationship between job role stress and job outcomes while Pugliesi (1999) found an independent effect of job conditions and job role stress on job strain, job satisfaction and psychological distress.

had negative impact on mental and physical health. Rutter and Fielding (1988) reported that job role stress is negatively associated with job satisfaction. Sandiford and Seymour (2002) conducted their research with staff members working for the pubs in the UK and found evidence that job role stress would negatively affect employee’s job performance. However, other studies did not uniformly find these negative effects, and some even found positive effects of job role stress. According to Putnam and Mumby (1993), job role stress reduces the caution exercised by the workforce in performing their jobs, whereas, stress free environment enable them to manage their emotions so as to enhance organizational effectiveness (Van Maanen and Kunda, 1989). Further, it was disclosed by Wharton (1999) that the consequences of job role stress may be highly contingent upon other characteristics of the job and the organization. Pugh (2001) found that the exhibit of positive emotions was connected to customer satisfaction and customers’ positive affect which may be indicators of successful service interactions. These processes may contribute to feelings of personal accomplishment. Wharton (1993) found a positive relation between job role stress levels and employee performance. Kruml and Geddes (2000) contended that job role stress can benefit an employee depending on the employee strategy utilized. But there is hardly any previous studies talking about the significance of job role stressors i.e. role conflict & role ambiguity on frontline employee role performance dimensions with respect to department store domain in India. Hence to fill in this gap the research under study is undertaken.

Construct Validity

This would explore the extent to which the results support the theory behind the research. One has to ask the question, would any other theory predict the same results? In construct validity, one must rule out other possible theoretical explanation of the result obtained. It refers to the extent to which operationalizations of a construct (e.g. practical tests developed from a theory) do actually measure what the theory says they do. For example, to what extent is a role ambiguity questionnaire actually measuring "role ambiguity"? There is support of literature and pilot survey to establish construct validity of study 3 to study 5.
External Validity

This concerns whether the results of the research can be generalized to another situation; different subjects, settings, times and so forth. As regards study 3 to study 5, the explanatory research design of the study, would establish a relationship between the organizational culture, selection criteria, job role stressors, performance and training needs of sales people not only in retail but other service sectors like BPO’s, banks etc.. Also by means of framing new hypothesis, there would be test conducted to test that hypothesis for e.g. establishing relationship between attrition in the retail firms in India and lack of long term career plans and ownership with the retail firm and so on.

Statistical Validity

To establish statistical validity, inferential statistic must be used properly, in keeping with their underlying assumptions. When a result is significant at the 0.05 level, there is a 0.05 probability, or a 1 in 20, that the result occurred when the null hypothesis was true – that is, when there was actually no effect. The level of significance is the same as alpha, or the probability of a Type I error. Another important parameter is the “effect size”. Effect Size is defined as the relationship between the independent and the dependent variable. A zero correlation coefficient, indicates there is no relationship between the two variables; A positive and a negative correlation 1.0 indicates a perfect relationship, whereas a correlation less than 0.2 are considered weak and between 0.2 to 0.4 moderately weak; 04 to 0.6 moderate and 06. to 0.8 moderately strong and 0.8 to 1.00 very strong. For study 3 and Study 4 non parametric chi square test is used for examining the association between service effectiveness factors and frontline employee role performance towards the customers and job role stressors that is role conflict and role ambiguity and frontline employee role performance towards the customers. Non parametric chi square test is used because the data under observation is measured on likert scale and does not follow normal distribution.

For study 5 Spearman rank correlation coefficient is used to determine the direction of relationship among job role stressors, service effectiveness and frontline employee role
performance towards the customers as the data is again measured on likert scale and does not follow normal distribution being an ordinal data.

As regards to the frontline employee role performance towards the customers, service effectiveness and job role stressors questionnaire for the department stores was concerned, after getting approval from the supervisory team of SCSVMV University, Kanchipuram a pilot survey was undertaken on 100 sales people of departmental stores in central, harbor and western suburbs of Mumbai and after testing the validity of the Questionnaire, formal primary data collection was embarked upon.

4.7. Data Collection Method

The primary data collection period ran from July 2013 to December 2014. Field research was carried out in Mumbai and a Structured Questionnaire which was approved by the supervisory team of SCSVMV University, Kanchipuram and validated through a pilot study was administered to 500 sales people who had at least 1 years work experience & 1000 customers from around 50 departmental stores in central, western and harbor suburbs of Mumbai. The research strategy was primarily quantitative, aimed at producing in-depth knowledge about the topics investigated. Quantitative data was generated from the survey as mentioned above.

A substantial primary database through survey, observation notes, and store records of the department stores, was generated through the following methods:

Administering a Structured Questionnaire to a sample of 500 sales personnel from selected departmental stores having at least 1 year of experience (See Appendix for the Questionnaire)

Administered a Structured Questionnaire to 1000 customers shopping in selected departmental stores for at least 1 year or more (See Appendix for the Questionnaire).

Collection of relevant documents, media clippings and internet files, to create a database on the human resource management practices in departmental stores operating in India.

Visits to different department stores and other public Libraries to get published data including Annual Reports of these departmental stores.
The researcher, along with more than 60 Masters of Management Studies course students of the University of Mumbai undertook this mammoth task. The researcher first met the Human resource Managers of 60 departmental stores and convinced them that the study which was undertaken was self financed and was solely academic in nature. Out of the 60 department stores contacted some Human resource managers gave, the researcher, the permission to carry out the survey however some others did not hence there are only 50 department stores which could be surveyed out of the 60 targeted. There is a fear among the Human resource managers that since there is lot of confidential data which can be disclosed by the sales personnel or which can be known while observing them on the floors at the department stores, some of them were reluctant for collection of data, and allowing the researcher and her team, to administer the questionnaire in their coffee breaks.

Also as the topic is more focused on stress some Human resource managers also had to be convinced that it will not generate any unrest among the sales personnel. Only when the researcher promised them that the analysis of the said data would assist them in increasing the productivity of the stores and would enable them to reduce the attrition rate of sales personnel by conducting such activities frequently in the form of stay interview they agreed but on one condition of keeping the confidentiality with respect to the identity of department stores, customers and frontline employees. The customers included friends, relatives, acquaintances; data was also obtained from the store records of some of the department stores.

As regards the MMS students, the team, who administered the questionnaire, they all were in the age group of 21 to 26 years and were in the first year of the Masters of Management Studies of University of Mumbai and they did this as a part of their assignment on the subject – Human resource management and Organizational Behavior. This was a learning experience for them, as well. The sampling technique used was stratified sampling for sales personnel and convenience sampling for customers.
4.8. Tools for Data Analysis

For both the studies, which focus on the Indian department stores located in central, harbor & western suburbs of Mumbai – survey method is used. In the first study and second study, a structured questionnaire was administered to the customers having shopping experience of 1 year or more in the selected departmental stores. For Study 1 tool used for data analysis was mean value determination and for study 2 factor analysis was used. For study 3, study 4 and study 5 a structured questionnaire was administered to sales personnel of departmental stores in Mumbai having at least 1 year or more working experience with the present department store. For study 3 and study 4 non-parametric chi-square test is used as tool of analysis. For study 5 Spearman rank correlation coefficient is used as a tool for analysis. For Study 1, 2, 3, 4 and 5, a simple percentage analysis method is also used.

4.9. Summary

Philippe Busquin (2001\textsuperscript{330}) states, that research and development are seen as a creator of information, development, service and societal cohesion. Greer (2000) as cited in Murton M (2005\textsuperscript{331}) state that, the amount of knowledge based on research and statistical analysis is developing in our society. Technical development and the increasing amount of information processed and made available by various electronic devices require the development of the desired skill sets to handle this information in many occupations. Because of the various data gathering and analysis methods, the complication of the information has also substantially increased.

Further, adequate use of the wealth of information requires that, the citizens of a information, communication and technology society develop more advanced and complex knowledge-handling skills (e.g. Bereiter & Scardamalia,1993\textsuperscript{332}, Murtonen & Lehtinen, 2005\textsuperscript{333}). The ability to recognize and utilize research-based information is becoming one of the key competencies of future expert practices. In conclusion, the chapter outlines the research methodologies, research philosophies and tools and techniques used for the thesis. Also the constructs for the research under study was defined and a procedure to test the hypothesis mentioned, were also defined. In the
following Chapter 5 the empirical results would be statistically and quantitatively analyzed to link the theoretical foundation and the research framework which was defined in this Chapter.