CHAPTER 3
Research Methodology

This chapter is devoted to describe and develop the research methodology for this research where research techniques and approaches utilized in the research are discussed with explanation behind the decisions of the research procedures. In this section the reader will gain exhaustive knowledge on how the researcher has directed the research. Information such as which research philosophy and approach have been utilized and also the design of the research, the population, sampling design and sampling procedure are clarified and the way the data of the research has been gathered and how it is analysed will all be visible in this chapter. Moreover, an explanation will be provided to the reader on why the authors have decided to go with a specific technique. A verification of the validity of the research is introduced for the reader.

3.1 Research Methodology

Before having a look into the subtle elements of research approach and methodology, it appears to be appropriate to put forth a brief concept of the research methodology. According to Kothari (2004) research methodology is an approach to scientifically find an answer to or deal with any research problem. It might be comprehended as an art of contemplating how research is done scientifically. It is a gathering of different steps carried out by a researcher with the aim to solve a particular problem and the justification behind them. Collis and Hussey (2009) characterized research methodology as the general approach utilized as a part of the whole procedure of research to explore particular issues. Similarly, Saunders et al. (2003) reveals that research methodology is a general approach that a researcher embraces with a specific end goal to answer the research problem. Though this
research study takes up Saunders et al. (2009) depiction of the diverse research terms as appeared in figure 3.1 which represents the research philosophy as an "onion", in which the research problem is put up at the middle. A few layers must be "peeled away" before going to the centre. These layers are the imperative phases of the methodology that must be taken after. Consequently, to organize this research problem, the research onion from Saunders et al (2009) can be utilized (See figure 3.1.).

Figure 3.1: Research Onion
3.2 Research Philosophy

Research philosophy is a firmly held belief or opinion and reasoning that an individual possess about the way knowledge is bring into existence (Saunders et al., 2009). Saunders et al. (2009) also argues that research philosophy contains imperative presumptions with respect to the way we perceive the world. These assumptions are means to establish the research strategy and the desired research methods as an aspect of that strategy (Saunders et al., 2009). Lancaster (2005) defines research philosophy as a tactic utilized as a part of a research procedure to shape an assortment of understanding. Mayers (1997) states that the essential aspect of paradigm incorporate epistemology which alludes to the presumption about well-grounded knowledge and the way it can be procured; Philosophical paradigm is likewise viewed as an epistemology which manifest the way towards research (Myers, 2009). Besides, research philosophy is a conviction about the course of action in which information about behavior ought to be assembled, analysed and utilized (Levin, 1988). Research philosophy is often influenced by the plan or method...
to be used for drawing explanation or justification for an action or event of developing knowledge and will influence the style of research itself lead by the researcher (Saunders et al., 2009).

There are four noteworthy philosophical paradigms with respect to research in information system (IS) as mentioned by Saunders et al. (2009) which are positivism, realism, interpretivism and pragmatism as shown in Figure 3.1. On the other hand, Orlikowski and Baroudi (1991) recommend three classes in light of the basic research epistemology: positivist, interpretive and critical; The decision about which research paradigm is better among the philosophies relies upon the research question(s) a researcher is trying to answer. Obviously, the viable truth is that a specific research questions infrequently falls flawlessly into just a single philosophical area as proposed in the "onion" (Figure 3.1).

3.2.1 Positivism

The positivism was at first emerged in the investigation of natural sciences while the interpretivism has been overwhelmingly utilized in social sciences to investigate and analyse individual cultural and behavioral fact or situation. Positivism is absolutely in light of realities assembled through direct observation and measured from quantitative information (Saunders et al., 2007). According to Orlikowski, and Baroudi, (1991) studies aimed from the perspective of positivism mainly make an effort to test theory, with an end goal to expand the prescient comprehension of phenomena. Positivist approach lies about formal propositions where variables are expressed or measured as a quantity, hypothesis testing and the drawing of inferences on the subject of phenomenon from the representative of whole populace (Orlikowski & Baroudi, 2002). Similarly, Schiffman and Kanuk (2009) suggests that the foremost of the positivist strategy comprises of observation, experiments and survey methods and commonly follows a complex statistical analysis so as to test theory and produce the results.

3.2.2 Interpretivism

While the positivism is acknowledged for its objectivity and generalizability, it can't compete firmly as a model to use in social science. The business condition in the
social world comprises of factors that are excessively perplexing, making it impossible to loan themselves to hypotheses of distinct laws of physical sciences (Saunders et al. 2007). According to Bryman and Bell (2007), from interpretivism philosophical paradigm perspective the subject matter presented for consideration in social science is in a general sense unique in relation to that of natural science. The investigation of the social world in this way requires an alternate rationale of research technique; As a matter of fact, an interpretative philosophy aims upon individual’s apprehension and elucidations of their social surroundings (May, 1998). Kaplan and Maxwell (1994) proposes that the interpretive paradigm does not built up any dependent or independent variable ahead of time, rather it concentrated on individual’s perception which are likely to change frequently as the condition rises. Similarly, Klein and Myers (1999) suggest that from the interpretative point of view, the researcher endeavour to comprehend phenomena through the implications that individuals designate to.

3.2.3 Research Paradigm Consideration

In information system research different research philosophies are employed to guide the researcher about how information will be collected and interpreted. The decision of one philosophical paradigm over the other basically relies upon essence of the research being proposed i.e. whether the research is deductive or inductive, quantitative or qualitative, objective or subjective and conceptual or empirical. Taking into account the present research problem, an interpretivism (interpretivist) research philosophy is considered for the research. The author adopts interpretivism philosophical paradigm for the reason that more explorations are desired to comprehend the research problem. Since the variables are not within the scope of knowledge on the whole, as in the context of this study, in this way an interpretivism research philosophy is chosen with the aim to inquire into the social reality for example: attitudes, beliefs, behaviours and apprehension of technology adoption in SMEs setting. Moreover, the investigation isn't guided by any hypothesis that should be tried quantitatively, rather the study aims to identify and understand the various issues confronting Indian SMEs with regard to their ICT adoption decision and further adduces some significant recommendations that will typically help them to cope with the key challenges and concerns. Also, the issue under scrutiny is more focused towards social phenomenon, in this manner can't be legitimately explored by
utilizing the positivistic approach. The interpretivism paradigm therefore would help the researcher to increase rich bits of knowledge about the social phenomena being under investigation. Additionally, it can be reasoned that the interpretivism philosophical view is appropriate for this research as it incorporates qualitative research approach using case study and survey. Consequently, the other philosophical paradigms must be forbidden for the proposed study as these were perceived to be inappropriate for this research because of their inability to change the scope of social phenomenon about the subject matter.

3.3 Research Approach

According to Saunders et al. (2009); Crowther and Lancaster (2008), there are mainly two important research approaches with respect to research methodology: inductive and deductive approaches. Crowther and Lancaster (2008) relate the deductive and inductive approaches with knowledge building and theory development respectively. According to Saunders et al. (2009) deductive research approach, a researcher is supposed to set up some hypothesis on the basis of theories and ideas that needs to be tested. On the other hand, inductive approach involves theory building from empirical data that is subsequently related to literature. To begin with, the inductive approach starts with the gathering of empirical data which is subjected to rigorous analysis so as to develop a theory. On the other hand, deductive approach begins with developing a hypothesis from theory and after that utilizes an appropriate methodology to test such hypothesis (Saunders et al., 2009).

3.3.1 Deductive Research

According to Saunders et al. (2009); Wilson (2010) deductive approach is concerned with developing a hypothesis or set of hypotheses established from present theory and afterward planning a research strategy in an attempt to test the hypothesis. Deductive approach can be explained with the help of hypotheses which can be developed from the propositions of the theory. As such, deductive approach is concerned with drawing a logical conclusion(s) from premises or propositions. Crowther and Lancaster (2008) define the deductive research approach as an
arrangement of methods embraced with the aim to test or evaluate the legitimacy of a theory or hypothesis. Deductive research creates hypothesis or theories and after that tests those by means of empirical data. De Vaus (2005) affirm that the deductive logic or theory testing approach involves the development of hypothesis from earlier theory which is empirically tested using observational data so as to verify the conformity of established theory.

### 3.3.2 Inductive Research

Inductive approach aims to methodically draft a theory from respondents’ observations explored from empirical data gathered (Saunders et al., 2009). Crowther and Lancaster (2008) state that inductive research basically invert the procedure found in deductive approach where the researcher develops a theory to elucidate the empirical findings obtained from real world. Jakobsson (2011) infer that inductive research is merely equivalent to “theory generating”, in which the researcher starts with collecting empirical data and theories are proposed as an outcome of the research process; De Vaus (2005) suggest that the inductive logic or theory building approach starts with collecting observational data rather than developing premises or hypothesis and proposes a new theory. This strategy is concerned with “theory-building”, whereby particular realities are utilized to make a theory that clarifies connections between the realities and permits the researcher to bring about new knowledge into existence.

![Figure 3.2: Deductive Research/Theory testing approach](source: De Vaus (2005))
3.3.3 Research Approach for Current Study

The research approach for the present study is inductive which was led by the research questions and objectives. Crowther and Lancaster (2008) ascertain that as a general rule, positivist studies generally adopt deductive approach, while interpretivist studies are usually allied with inductive research approach. Saunders et al. (2009) affirm that the absolute purpose or intention of a research is to build knowledge by either deductive or inductive rationale. It is acceptable to tie up these research approaches to distinctive research philosophies. Deductive approach suits to an increasing extent to positivism while the inductive approach to interpretivism (Saunders et al., 2009). For the reason that interpretivism philosophical paradigm has been selected as the best or most appropriate for this research, consequently the inductive approach best suits for this study. Moreover, this study has adopted qualitative research method and since inductive approach is for the most part used in qualitative research studies, therefore, the most suitable or relevant approach to this study is apparently an inductive procedure; Crowther and Lancaster (2008) infers that induction research approach is appropriate to examine social phenomenon or individual behavior in organizations. The authors further express that chief strength of the inductive research approach is certainly its flexibility in research design. Moreover, the authors contend that inductive approach allows the researcher to study the problem or issue under investigation in diverse ways so as to withdraw the distinct possible explanations of the phenomenon.

3.4 Research Strategy
An action plan which depicts the researcher’s decision and utilization of specific techniques and connects them to the coveted results is called research strategy (Crotty, 1998). According to Bickman and Rog (2008) research design is a constructive plan of a research study which interfaces all phases to guarantee that the research process is proceed with a vital indispensable austerity leading to absolute deductions and anticipated suggestions. On the other hand, Marshall and Rossman (1999) infer that research strategy is an interpretative measure of overall rationale for a research project for example, site selection, selection of population and samples, research methods, data collection techniques and data analysis techniques.

A number of alternatives research strategies are available at the disposal of the researcher to be employed in research (See Fig: 3.1). Discourse of all these research strategies is unreachable or out of context of this investigation. The author attempts to talk about survey and case study methods being applied as research strategies in this study.

### 3.4.1 Survey

Surveys makes it possible to analyse a substantial amount of data and allows a researcher to make specific conclusions (Kelly et al., 2003). A survey research is concerned with the study of sample population to ascertain its characteristics and it is then deduced or concluded from evidence and reasoning that the populace has the similar characteristics (Kothari, 2004). Saunders et al. (2009) likewise contends that surveys are widely accepted as they permit the researcher to gather considerable amount of information from fairly large sample populace in a very sparing manner by means of a questionnaire. The questionnaire however is not the only data accumulation procedure that has a place with survey strategy rather the researcher can use interviews, observation and so on. The survey strategy is regarded as able to be trusted as being accurate or true and simple to explain and to apprehend clearly (Saunders et al., 2009). Avison et al. (1993) also proclaim that surveys are valuable in acquiring predictable information from a substantial number of individuals and enable the researcher to search for patterns in the available data. Fowler (1995) express that a survey has a potential to facilitate researcher to collect valuable and preferable data with diverse possibilities by imposing questions to individuals. Moreover, a survey is particularly a reasonable approach when it is hard
to gather certain sort of information just by observing or conducting interviews; A survey strategy is generally accompanying with the deductive approach and is commonly employed to answer the questions like who, what, where, how much and how many (Saunders et al., 2009). However, Jansen (2010) label surveys as statistical and qualitative. While the statistical survey analyse population to determine frequencies of its characteristics, on the other hand qualitative survey aims to establish the differences in characteristics of any sample population being analysed.

3.4.2 Case Study

Case study is fundamentally a rigorous inquiry or study of a specific unit under thought with the aim to discover the fact or influence that contributes to behavioral patterns of a specified unit in its totality. The case study puts more accentuation on the full examination of a predetermined number of events or conditions and their interrelations (Kothari, 2004). According to Yin (2014) the case study approach is particularly appropriate to answer the questions like “How?” or “Why. Creswell (1998) state that case study is usually an in-depth exploration of a solitary case or few cases. Robson (2002) describe case study entail an empirical study of specific events at present time that can be seen and studied within its real-life circumstances that form the setting for an event or idea with the aid of many sources of evidence. Cassell and Symon (2004) deduce that case study can be very able for investigating new or developing actions or behaviours. Case study approach deals with comprehensive exploration of an event where data is frequently gathered over some stretch of time inside their unique context; Case study technique or in-depth approaches are such investigations that mainly allows the researcher to look extreme into the reasons for things or events to achieve the fundamental causal relations that intrigue us, using very small sample size and data gathering tools that allows the researcher to explore or examine the facts intensely (Kothari, 2004).

3.4.3 Rationale for Chosen Research Study

Taking into consideration the research problem, the author seeks to undertake survey and case study methods as a part of research strategy. Saunders et al., (2009) express that the available research strategies are not being fundamentally
unrelated. A researcher can use one research strategy say survey along with case study (Saunders et al. 2009). The research strategy therefore embraced to take up this investigation is the combination of survey method and case study approach and subsequently follows a triangulated data collection method. Accordingly, the data gathering for the investigation takes place at two distinct periods initially with a survey method followed by case study to attain extreme understanding of the outcomes of the survey. According to Sounders et al. (2009) it is very conceivable to utilize the survey method as a major aspect of case study. The survey is based on open-ended self-administered questionnaire (see Appendix B). On the other hand, survey responses were validated by means of in-depth case studies.

3.5 Research Methods

Kothari (2004); Sounders et al. (2009) among many other researchers’ highlight that there are two major research methods being employed as a part of research methodology: qualitative and quantitative research methods. Quantitative research is predicated on the quantification of quantity or amount. It is relevant or appropriate to phenomena that can be manifested with reference to numbers. Qualitative research, on the other hand, is related with qualitative phenomenon, i.e., phenomena that can be expressed by quality or kind (Kothari, 2004). Blaxter et al. (1996) states that if the data gathered about phenomena can be expressed in words, it can be classified as qualitative method, on the other hand, if it can be revealed in the form of numbers, it is regarded as quantitative method.

3.5.1 Qualitative Research

Qualitative research as a matter of fact was emerged in social and behavioral sciences to enable the researchers to carry out detailed investigation and analysis of a subject or situation related to social, behavioral and cultural phenomena (Almogbil, 2005). Qualitative research has the intention of ascertaining the underlying motives and desires for the reason by means of in-depth interviews (Kothari, 2004). Qualitative empirical investigations enquire into the diversity of specific behavior or perceptions within a given populace in light of aroundof some ten to fifty semi-structured interviews. Analysing the qualitative data generally take into practice of exploring similarities and dissimilarities between interview outcomes for each subject
matter inquired and then a summary of their differing qualities into various classes for example the relevant themes, individuals attitude and behavior etc. are presented (Jansen, 2010). Miles and Huberman (1994) suggests that qualitative research is based on words as opposite to numbers. Similarly, Leedy (1997) argue that qualitative research is to act in reaction to inquiries concerning the nature of the phenomena so as to depict and understand those phenomena from respondent’s particular attitude towards a phenomenon. Also, Yin (2009) reveals that from the research perspective, where a limited knowledge is available about a phenomenon under investigation, the qualitative research strategy is normally used to pick up comprehensive and thorough information about the phenomena being explored.

3.5.2 Quantitative Research

The quantitative research imparts a quantitative or numeric depiction of patterns, viewpoint or beliefs of a sample population whereby the researcher can conclude or generalize the findings for whole population (Creswell, 2014). Almogbil (2005) reveals that quantitative research technique is described as research that covers numeric calculation of traits, characteristics or attributes of an object. Cornford and Smithson (1996) mention that quantitative research involves the development of numerical metrics that can be used to give a detailed account of the subject or situation under investigation. Qualitative approach deals with the development and use of numerical methods to explore the research problem in the state of being examined and thusly to data analysis. The information accumulated can be in this manner analysed with the assistance of statistical analysis method. According to Amaratunga et al. (2002) quantitative approach is suitable in the circumstances where the researcher aims to quantify the behavior and the descriptive facets of underlying phenomenon which allows the researcher to compare and replicate the patterns.

3.5.3 Multiple Method Choice

According to Saunders et al. (2009), while deciding a research method, researchers have many options to choose from. In one hand, a researcher can either employ a mono method in which data collection and its respective analysis takes place by means of a single method to answer research questions. In the event that
researchers utilize a mono method, there is a possibility that a researcher will use either a single quantitative method, for example, surveys with quantitative data analysis technique or the researcher can use single qualitative method for example, in-depth interview with corresponding data analysis technique. On the other hand, a researcher can have a choice to employ multiple methods of data collection and consequently associated techniques of data analysis so as to fulfil the research objectives, known as multiple method (Saunders et al., 2009). Saunders et al. (2009) classify the multiple methods into two types: multi-method and mixed method. A multi-method approach uses more than one qualitative or quantitative data collection techniques and their respective qualitative or quantitative data analysis procedure. In a multi-method quantitative study, a researcher would possibly choose multiple quantitative data collection techniques for example, both questionnaires and structured observation and analyse the data gathered using quantitative statistical procedures. Contrary to this, a researcher can choose to combine more than one qualitative data collection techniques for example, diary accounts and in-depth interviews and the respective qualitative analysis procedures which shape a multi-method qualitative study draft (Saunders et al., 2009).

In a mixed-method approach a researcher is allowed to combine quantitative and qualitative techniques and procedures in a single research problem. Mixed-method is classified into mixed-method research and mixed-model research. The choice of mixed-method research is based on the concept of employing both quantitative and qualitative methods in blend at a time or following each other in quick succession. In contrast to mixed-method research, in mixed-model research quantitative and qualitative research approaches are mixed within or across the stages of the research process (Saunders et al., 2009).

**Figure 3.4: Research choices**
3.5.4 Choice of Research Methods

Keeping in mind the research problem, an exploratory qualitative research design was thought about applicable to deal with present research study. It emphasizes on the action of investigating prior unexplored topic or a concept wherever not so much knowledge is present about the issue under consideration (McGivern, 2006). At first, a qualitative research strategy using a questionnaire survey was employed to build up a preliminary understanding of related aspects of the issue, trailed by case studies to explore the more comprehension of the subject. Using a qualitative method with a data collection technique of interviews or survey would make it practicable to explore the things which are of incredible significance for this research. After delicately noticing the implications of the different philosophical paradigms, this research chooses to follow a qualitative research approach. Other than it is apparent that not very many researches about the subject to be researched have been accomplished in developing nations and particularly in India. Consequently, the author has considered qualitative research instead of quantitative since more investigations are intended to gain accurate and deep understanding of subject matter, as directed by the research problem (as recognized in Chapter one), epistemological paradigm under consideration and the level of existing knowledge encompassing the phenomenon under thought to study different convictions and realities perceived by SMEs in regards to the innovation appropriation. In this regard Leedy (1997); Almogbil (2005) state that in qualitative researches the main focus is
to understand and explore the attitudes, beliefs, values and experiences about the situation or subject among a group of people. Similarly, Flick (2014) express that the qualitative data gathered through semi structured interviews encourage respondents to express their attitude, opinion or belief without constraint. Another motive behind this decision is researcher’s epistemological stance. A research philosophy guides the way we outlook events occurring in the world around (Saunders et al., 2009) where quantitative paradigm is typically based on positivism epistemology (Sale et al., 2002) while the qualitative paradigm is based on interpretivism epistemology (Secker et al., 1995). Interpretive research approach is frequently related with qualitative research method, though the positivist approach is for the most part lined up with quantitative method (Williamson et al., 2002). Collis and Hussey (2003) specify that interpretivism philosophy makes it obligatory to use qualitative technique to answer ‘how’ and ‘what’ research questions. Conclusively, a qualitative research approach is embraced, prompting an interpretivistic point of view, which incorporates qualitative survey and case study. The strategy in this way was a multi-method qualitative study shaping the premise towards a framework for ICT adoption in SMEs in India.

### 3.6 Time Horizons

According to Saunders et al. (2009) a significant question throughout the course of research planning is that whether research ought to be a snapshot of phenomena under consideration at a specific time or it might be a sequence of snapshots describing the events, carried over a given time period. At the same time, Saunders et al. (2009) confer that time horizons pertaining to any research study are led by the research questions. A single viewpoint is what we call cross-sectional, on the contrary the successive viewpoints we call longitudinal (Saunders et al, 2009). Kothari, (2004) infers that form the perspective of time, a research might be either one-time i.e. restrained to a single time-period which is called longitudinal research. On the other hand, the cross-sectional research is carried on over a number of time-periods.

### 3.6.1 Cross-Sectional Studies
Cross-sectional research study emphasis on the detailed investigation and analysis of a certain phenomenon at a specific point in time (Saunders et al. 2009). When a research data is collected at a single point in time it is called cross-sectional study. The cross-sectional study aims to reflect the past behavior of respondents about a phenomenon rather that follow up a year later to predict the changes (Zikmund et al., 2009). According to Singh (2006) cross-sectional approach is concerned with the information of any aspect of the phenomena in the current circumstance. In cross-sectional studies, generally large number of respondents is included in the study, as opposed to longitudinal studies where much smaller number of respondents is examined over some undefined time frame. The cross-sectional method involves collection of data at exactly a specified time with little or no delay. It is inexpensive in regard of time since every one of the samples is accessible at once. This approach employs the survey, experimental and casual comparative or Ex-post facts strategy (Singh, 2006). However, Robson (2002) argue that cross-sectional studies frequently make use of the survey strategy. Saunders et al. (2009) also made same comments that cross-sectional studies attempt to depict the occurrence or frequency of a phenomenon. Notwithstanding, they may likewise utilize qualitative method for instance case studies where interviews are directed over a brief time-frame.

3.6.2 Longitudinal Studies

The representation of events through a series of snapshots over a given period of time is what is called longitudinal studies (Saunders et al., 2009). McGivern (2006) states that in a longitudinal study, data is gathered from identical sample population at multiple circumstances, with the primary aim being to contemplate changes in the components over time. According to Zikmund et al. (2009) in longitudinal study respondents are addressed at multiple times over a given period. The reason for longitudinal investigations is to look at coherence of response and to notice changes that happen after some time. Longitudinal studies are frequently termed as cohort studies in light of the fact that the respondents who firmly share certain experiences about facts or events during the same time period (cohorts) are likely to be incorporated in each sample (Zikmund et al., 2009). Singh (2006) deduces that longitudinal approach is time sense approach which concerned with gathering of complete information of the phenomena by reviewing the unchanged case at two or more different points in time. The longitudinal study would likely indicate how certain
circumstances or situations change over time, and the desired time intervals would probably reflect the predictable stages at which the changes should divulge themselves. This approach employs the historical, genetic and case study method (Singh, 2006). Similarly, Bouma and Atkinson (1995) state that the fundamental question in longitudinal study is ‘has there been any change over some stretch of time?’

3.6.3 Time Horizons for Current Research

Taking into consideration the research aim, which is to comprehend the phenomenon under consideration at a specific time and there is no scope for contemplating changes in individual behavior over a given period of time. Moreover, the study concentrates on the investigation of ICT appropriation behavior rather than the state or fact of being similar or dissimilar responses or whether individual behavior is developing or changing by time. Therefore, this study is carried out with a cross-sectional time horizon. There has been no time or set of circumstances that make it possible to collect longitudinal data. The act or process of replicating the same study to furnish longitudinal data could likewise be a concentration likely to happen in future. It could provide additional data supplementary to what is already available to study the adoption behavior over an extended period of time.

3.7 Study Population and Sampling

Saunders et al. (2009) defines the term population as the complete arrangement of elements or cases in a universal set from which a sample is selected to be enquired. In some cases, the population can be small size able to be controlled or dealt with without difficulty to deliver helpful outcomes. However, in most cases populations are unfeasible in practice to deal with. It will be inconceivable for the researcher to either gather or analyse all the data able to be used or obtained inferable from limitations of time, money and frequently accessibility (Saunders et al., 2009). Therefore, there emerges requirement for sampling. Sampling is the way toward choosing a set of subjects for research study in this fashion that the individuals are the representative of large group or populace wherefrom they were chosen. Sampling techniques make available a collection of techniques that empower researcher to decrease the
amount of data to gather by bearing in mind small samples instead of entire cases or population (Saunders et al., 2009).

Figure 3.5: Research Population and Sample

Source: Saunders et al. (2009)

Yount (2006) recommends that the initial phase in sampling is to recognize the sampling frame which is an entire set of cases in the populace that ought to constitute the sample. A suitable method of sampling must be considered for sample size determination in perspective of accuracy, cost, financial constraints and uniformity of population. Moreover, the cases chosen ought to be complete and appropriate to the research problem (Yount, 2006).
### Table: 3.1 Rule of thumb of arriving as sample size

<table>
<thead>
<tr>
<th>Population size</th>
<th>Sample size</th>
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<tbody>
<tr>
<td>&lt;= 100</td>
<td>100%</td>
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<tr>
<td>101-1000</td>
<td>10%</td>
</tr>
<tr>
<td>1001-5000</td>
<td>5%</td>
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<tr>
<td>5001-10000</td>
<td>3%</td>
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<tr>
<td>10000+</td>
<td>1%</td>
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</tbody>
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Source: Yount (2006)

### 3.7.1 Sampling Techniques

While carrying out any research study it is desirable to employ different sampling techniques at different stages which are assembled under the name of two important groups (Sounders et al., 2009).

1. Probability sampling (representative sampling)
2. Non-probability sampling (Judgemental sampling)

In probability sampling the probability of samples being selected is within the scope of researcher’s knowledge and is generally equivalent for all cases. For any probability sample, the sampling frame is entire set of all the cases in the population from which research sample will be obtained (Saunders et al., 2009). Dawson (2002) asserts that if case all samples from the research population has identifiable possibility of being selected, it is probability sampling. These sorts of sample are put to use if the researcher is desirable to describe, forecast or generalize the facts to the whole research population. Sounders et al. (2009) further infers that probability sampling (or representative sampling) is very often related to survey-based research and experimental research strategies.

When the probability of samples being chosen against the total population is not within the range of researcher’s knowledge, it is non-probability sampling (Saunders et al., 2009). Non-probability samples are utilized as a part of circumstances where the objective of the research is description instead of...
generalization (Dawson, 2002). According to Saunders et al., (2009) in many business and management research studies designed to answer specific questions, the choice of non-probability sampling is dictated by the research strategy, research question(s) and objectives. The underlying sample would come up with a great deal of information for the researcher to explore the research questions and reap exact and in-depth understanding (Sounders et al., 2009). Sounders et al. (2009) reveal that for all non-probability sampling techniques, with the exception of quota sampling, the issue of sample size is not clear or decided and does not follow explicit regulations or principles. The choice of sample size in non-probability sampling is guided by a logical relationship which exist between choices of sampling technique and research interest and motivation. Patton (2002) consequently uncover that matter of sample selection in non-probability sampling is usually determined by research question(s) and research objectives being established.

Figure 3.6 sketch the most commonly used probability and non-probability sampling techniques.

**Figure 3.6: Sampling Techniques**

![Sampling Techniques Diagram](source: sounders et al. (2009))

Note that the explanation of the various probability sampling techniques is not covered in this chapter.
3.7.2 Population and Sampling for Current Study

In order to make it sure that the sample utilized as a part of the study reflects the accurate and reasonable illustrative of the entire sample population of SMEs in the selected geographical domain, supreme care and exertion were practiced in the choice of the population and sample for this investigation. The sampling methods differ substantially amongst qualitative and quantitative studies (Kumar, 2011). Depending on the data collection methods employed in this study data was collected in two different phases, by means of survey and case study methods respectively. In the first phase of data collection simple random sampling (SRS) method from probability sampling technique was used to select the sample in order to give each SME in the objective population an unbiased and equivalent chance of being chosen; Simple random sampling SRS allows to choose the sample randomly without conscious choice from the sampling frame (Sounders et al., 2009); Simple random sampling may be the best acknowledged type, in which each unit has identical and known probability of being chosen (Zikmud et al., 2009). The use of simple random sampling strategy in determination of participant SMEs for this study was a certain approach to diminish the bias to minimum possible. A random sampling technique was employed on a population of around 4000 SMEs located in Kashmir India, selected on the basis of SME’s definition from European commission (2006). A total of two hundred (200) SMEs were initially preferred as samples i.e. 5% as suggested by Yount (2006). Wiping out those designated respondents who may for one reason or the other be unsuccessful to complete and return their questionnaires, out of 190 total responses received, 10 samples were discarded from this research because of partially completed responses. Consequently, 180 desirable samples were eventually selected and used for the study.

The sample selection for the second phase of data collection was picked up by non-probability convenience sampling technique. Taking into consideration the complexities associated with data collection from diverse SMEs distributed over a large area in the selected test bed, A total of ten SMEs was selected as cases in the light of the fact that case study generally involves an in-depth exploration of single case or few cases (Creswell, 1998). It is reasonable to note that all SMEs interviewed were placed in the vicinity of Kashmir. Subsequently, the sample size of
180 SMEs together with 10 cases were chosen and considered acceptable for the study, being representative of population identified.

3.8 Data Collection Techniques and Procedures

The activity of data collection is being initiated after a research problem has been defined and research design or plan is outlined. While choosing the data collection method to be taken into employment for the study, the researcher has to think of two types of data viz. primary and secondary (Kothari, 2004). As indicated by Kothari (2004) the primary data are those which are collected afresh and for the first-time and in this way, present itself to be original by nature. The secondary data on the other hand, are those which have previously been collected by other person and which have before now been gone through the analysis process. According to Churchill and Iacobucci (2005) secondary data is data that is entirely ready or prepared before now, that researchers have gathered from existing studies. Contrary to this, primary data are coined by the researchers with the determination to use it instantly in their research (Churchill & Iacobucci, 2005). Kothari (2004) affirm that the researcher needs to become conscious of which type of data he would be using for his study and as a result he will have to choose one or the other method of data collection (Kothari, 2004). Subsequently, in order to collect research data, various researchers have suggested different data collection methods. For example, Dawson (2002) proposes four research methods as a primary data collection tools which include interviews, questionnaires, focus groups (group interviews) and participant observation. Interviews are further grouped under unstructured interviews, semi-structured interviews and structured interviews. On the other hand, questionnaires could be closed-ended questionnaires, open-ended questionnaires or combination of both. Saunders et al. (2009) proposes observations, interviews and questionnaires as important primary data collection tools. According to Patel and Davidson (2011) researchers have the possibility to collect data with several different techniques, for instance existing documents, test and diagnostics, different kinds of self-reporting (diaries), observations, interviews and surveys. The secondary data in this study comprises of scholarly articles and books which has been gathered through the shri JJT university library and various databases and also internet. The primary data in this study has been assembled from SMEs. The research strategies utilized in this
investigation involved a blend of questionnaire survey and in-depth personal interview (multiple case study). The mix of the questionnaire and personal interviews altogether appreciably contributed in guaranteeing that the data collected by the researcher reflects the true picture of the research problem under enquiry. In the introductory period of data gathering, an open-ended questionnaire survey among SMEs was used as a means of primary data source. The questionnaire survey is vital tool incorporating a set of questions established and organized in advance that the respondent needs to reply. The objective of the initial exploratory stage utilizing qualitative survey is to pick up bits of knowledge about the issue under consideration and to search for pivotal themes and patterns in connection to ICT selection by SMEs. Secondly, being a most important data source, a case study approach via semi-structured interviews with SMEs’ key workforces was meant to collect the information revealing their insights and practice concerning ICT adoption and more importantly to ascertain other probable elements which were un-explored in first phase. Through each case, respondents were given chance to share their convictions and experiences in connection with research questions. The specific data collection techniques will be discussed in the next two sections.

### 3.8.1 Data Collection through Qualitative Survey

Jansen (2010) cited the definition of survey from Groves et al. (2004) which states that a survey method is an organized strategy aimed to collect research data from research units selected from a statistical population with the end goal of identifying descriptors that quantitatively describe the attributes of large populace from which the sample of entities are taken”. Arguably, Jansen (2010) point out that the definition of survey proposed by Groves et al. (2004) mainly focuses on such studies which employ numerical methods to analyse data for example, proportion of samples in a population having a particular attribute or belief. Jansen (2010) ascertain that survey can be also thought of as qualitative survey which is directed in a way to contemplates the difference or diversity of behavior in population. According to Jansen (2010) as the statistical survey aims to study the attributes in sample in terms of numeric distribution, qualitative study depicts the diversity of specific comprehensions or behavior, meanings and patterns among samples within a population about which the researcher desires to draw conclusion. However, Dawson (2002) argued that the qualitative data survey can be quantified through the
course of analysis. Culp and Pilat (1998) ascertain that while collecting information to ascertain the value or amount, in many instances, it is pivotal to ask open-ended questions to study the area of concern more completely. According to Saunders et al. (2009) this circumstance is probably going to happen in areas which are not entirely investigated or verified, where response categories related to the topic or specific activity cannot be anticipated and when the researcher necessitates to recognize a different method to increase the rate of responses; (Easterby-Smith et al., 2008) additionally discovered that the survey technique takes into account the accumulation of organized and structured information from a determined set of respondents who might be generally geologically scattered Saunders et al. (2009) likewise uncovers that questionnaire is a standout amongst the most regularly utilized data gathering methods in survey in light of the fact that every respondent is made a request to react to a similar arrangement of inquiries, it gives a viable method for gathering reactions from an expansive sample (Saunders et al., 2009). Besides, survey data permits the investigation of diversity and uniformity between the responses with a specific end goal to decide whether certain trends or patterns happening in a natural manner can be recognized, takes into account explicit comparisons of factors amongst respondents (DeVaus, 1991). Therefore, the qualitative survey using open-ended questionnaire is desirable as one of the research method in this study, to provide enough opportunities for respondents to provide a detailed account of some relevant issues relating to ICT adoption in their SMEs.

3.8.1.1 Pilot Testing of Survey Instrument

Before the execution of survey, a carefully crafted survey instrument incorporating a set of open-ended questions intended to bring about correct responses was piloted in order to find out any uncertainties or intrinsic problems along with identification of any questions that were not effortlessly comprehended or poorly designed and even those that were not relevant to the research problem and need to be dealt with and overcome. The concerned academicians and other scholars help out to determine the extent to which an instrument is viewed as covering the aspects it purports to measure. A gathering of four Ph.D. scholars and two academicians put into execution few tests with the instrument before administering it. Owner/managers from two SMEs also pilot tested the survey instrument. The respondents draw
special attention to certain questions that were not pertinent to subject topic. There was additionally worry about choice of terms utilized in crafting an initial blueprint of instrument. They were with opinion that the SMEs are not very sophisticated in technology and even lack technical staff and subsequently simple non-technical dialect must be utilized to draft questionnaire items wherever conceivable. The wholesome responses from the majority of the participants were encouraging, worthwhile and way to design a survey instrument simple and convenient. Taking into considerations the various suggestions, comments and interests of respondents witnessed from pilot testing, the entire questionnaire was refined and improved upon so as to be precise or subtle. Besides the piloting was encouraged to deal with the observed inadequacies, enhance the legitimacy and make the questions to answer with less efforts and more response-friendly. Subsequently, a comprehensive and precise questionnaire was crafted incorporating all or nearly all elements or aspects of the research problem with a specific end goal to decrease weariness and complexity so that the respondents don't deplete their energy and time and could answer the questions with minimum efforts. The researcher trusted that this approach will undoubtedly draw out the best responses from the respondents and will help them to be open-minded, direct, clear or even straight-up while responding the questionnaire.

3.8.1.2 Questionnaire Development

The objectives of the research were considered primary units to develop a research questionnaire to assist the researcher to gather empirical data from the respondents and at the same time to create opportunity for SMEs to draw special attention to various issues and factors impeding their decisions of not using and/or extending ICT in their organizations. The outcomes of the study were certain to be incorporate in the proposed framework. In the light of various objectives to be covered in this study and the information required about the respondents enables the researcher to make right conclusions about the elements to be incorporated in the instrument. At the same time the piloting of the questionnaire turns out to be very helpful in the designing of a comprehensive and self-explanatory questionnaire as a data collection tool. The survey instrument was divided into three sections (see Appendix B) as mentioned below:

Section A was designed in a way to collect basic respondents' information
Section B with a focus on information about demographics of SMEs. Section C dealt with information regarding subject matter.

The questionnaire was aimed at SMEs owner/manager or key personnel having an obligation to deal with ICT adoption decision and practices within their corresponding enterprises since they generally have an opportunity to manage ICT at their working position. The questions incorporated in section A of questionnaire were designed to capture detailed profile of the respondents and their demographics. Section B was endeavouring to gather information about the profile of participant SMEs. Section C was designed to elicit the responses from respondents with regard to subject matter. The questions were intended to identify the major problems and issues facing SMEs in connection with ICT adoption, various motivators, drivers and benefits of ICT as well as the respondent’s recommendations and expectations about what should be done to alleviate the challenges confronting the SMEs.

3.8.1.3 Survey Execution

The survey was put into execution by using a self-administered questionnaire. A questionnaire enfolding a return envelope and covering letter were directed on the randomly selected 200 size sample through personal delivery, addressed to the owner, manager or I.T officer/supervisor of the organizations. An envelope bearing researcher’s address (self-addressed) was attached along with questionnaire to make it convenient for respondents to send back replies. Similarly, a covering letter was likewise encased with questionnaire clarifying the reasons for the investigation, guaranteeing secrecy of the respondents and their organizations and giving directions on how and who should finish the survey. Considering diverse industries, data was collected from all three sectors as raw materials industry called primary sector. The primary sector extracts raw materials which include agriculture, forestry, farming, mining etc. Manufacturing industry called secondary sector concerned with producing finished goods which includes manufacturing, processing, construction, engineering etc. Sales and service industry called tertiary sector is concerned with offering goods and services to general population and to businesses which includes retail and wholesale sales, insurance, health and medical, banking and finance, education and training, travel and tourism, restaurants, hotels, boarding and lodging houses, transport and logistics, IT related service and advertising etc. Organizations of varying size, type, industry sector were designated so as create opportunities to
build rich sources of qualitative data desirable at this exploratory stage. Moreover, it was contemplated that investigating organizations from diverse sectors would bring about an ample data set than organizations allied to alike industries. To make as large as possible the return rate and to get with the respondents, subsequent reminders were disposed to the respondents through phone calls, personal visits and e-mails to guarantee that they reply back the questionnaires in the near future. The researcher also had to go to get the completed questionnaires for those respondents who make a choice for personal delivery. It should be noted that a total of 200 sample SMEs was initially focused for this study and the responses returned in accordance with what is required or appropriate were 180 which records to 90% of response rate.

3.8.2 Data Collection through Case Study

The responses to the survey questionnaires were accompanied by ten case studies. The case studies were put into practice using semi-structured interviews to make sure that the major concerns of ICT will be uncovered in each case. The open-ended questionnaire was designated to elicit extreme responses and comments from respondents based on facts and clear reasoning. The objective of this phase of the data collection was to concentrate on how case studies regardless the survey would shed light on the information discovered as the result of an inquiry or investigation. The questionnaires and personal interview all in all empowered the researcher to place a high value on some of the survey responses as well as some comments and remarks extracted from cases. Moreover, each face to face interview provided an ample opportunity to the researcher to reveal some other outlooks and consequences of the issues confronting SMEs which the questionnaires did not apprehend but is immeasurably imperative while considering technology adoption among SMEs. The responses acquired from cases also facilitate the researcher in validating outcomes of the survey. As was the case with the questionnaires, the interviews were basically intended to focus on the reasons, factors and issues facing SMEs in connection with technology adoption. Besides the inhibiting factors, the study was aimed to explore the understanding of various benefits and drivers of technology including their expectations and obligations in their natural settings. In addition, case studies can likewise satisfy the qualitative aspect of the research; at this stage multiple cases enable the respondents to reveal their views and
perspectives more amenably than might be the situation with more structured interviews (Flick, 2014). Moreover, case studies are reasonable for exploratory investigation in light of the fact that the researcher could modify the questions as needed, elucidate uncertainty or confusions and guarantee that the responses are appropriately comprehended (Sekaran, 2000). The case study method is exceptionally well-known type of qualitative analysis which involves watchful and complete investigation of an individual or a group or community. It is a method of exhaustive study as opposed to expansiveness. The case study puts more accentuation on the full examination of a predetermined number of events or factors and their relationship (Kothari, 2004). The prime advantage of the case study is that a whole organization or elements can be researched in depth with careful consideration of events or facts. This profoundly engaged consideration empowers the researcher to vigorously contemplate the sequence of events as they happen or to focus on recognizing the relationship among activities, individuals or entities (Zikmud et al., 2009).

Case study strategy is extremely thorough and careful technique of research having a great strength to interpret or view pattern of change or growth of a phenomenon within a particular environment (Eisenhardt, 1989). The case study strategy is of great interest if a researcher expresses a strong desire to arrive at an in-depth comprehension of the research problem being established (Morris & Wood, 1991). A multiple case study is a relevant approach acknowledged for collecting data in regards to any events during present time in their existing state (Yin, 1993). Thus, case study approach was concluded to be a supplementary tool for exploratory investigation into their insight regarding the subject matter under study. The personal interviews turn out to be exceptional means for close communication and understanding between the researcher and the respondents and besides assisted the researcher to evoke more relevant information by asking them appropriate questions and noticing to their own perspectives and views regarding the matter, which the questionnaire did not seize or deliver; In a situation, where the survey strategy experiences an impediment that it will most likely be unable to uncover factors affecting a particular behavior, In-depth case study strategy can be utilized to answer the how and why questions (Eisenhardt & Graebner, 2007).

The personal interviews as well facilitated the researcher the flexibility to allow literal replications (aimed at producing the same results) (Yin, 1994). According to Braun and Clarke (2006), the semi structured interview is acknowledged as a method of
extricating a more profound and wealthier comprehension of the issues that are being investigated; Case studies are rich elucidation of particular occurrences of a fact or situation verifiable by observation or experience rather than theory or pure logic that are usually based on diverse data sources (Eisenhardt & Graebner, 2007; Yin, 2003).

3.8.2.1 Case Selection and Execution

The in-depth case studies were conducted to explore the participant’s perceptions regarding the subject matter directed towards the objectives of the research. At the underlying phase of research strategy, twenty SMEs were selected using non-probability sampling technique and personally informing them regarding case study participation as well as the objectives of the research. From twenty enterprises that were contacted for case study participation, ten enterprises agreed to play a part and were being selected as cases for the study. Therefore, ten SMEs were selected as cases for the study that already been participated in the survey (first phase). An enterprise was chosen mostly on the premise that it contributed best to respond to the survey questionnaire and proved to be a pre- eminent representative. The SMEs’ owners/ managers/ IT supervisors, guided towards exploratory study to determine key issues pertaining to the study in their respective enterprises through open-ended interviews. Accordingly, to keep focus of the dialog around the research objectives, a concise documentation a set of interview questions (interview guide) were drafted ahead of time and accompanied with the researcher throughout the course of the interviews (see appendix D). Prior to the execution of case studies, a follow up call was given to participants to affirm their acknowledgment and set up plans to for interview schedule and time. On the time of the interview the participants were provided “the interviewees consent form” (see Appendix C) to be signed personally to affirm their willingness to be a part of the case study. The respondents were given plentiful time and scope to talk openly and honestly with no hindrance or stimulation. Each interview on an average kept going around 60 minutes with some participants exploited much time than expected because of the respondent’s self- interest and eager to impart detailed account of the issues. The demographics of the respondents and profile of participant SMEs was first talked about to draw out some background information about the cases being selected. This was trailed by specific question with a rigorous focus on the factors determining technology adoption in SMEs and other
information pertinent to the research problem under thought. Respondents provided profound account of the factors and issues acting as barriers to initiate or extend the level of their ICT usage within their organizations. They also share their views about benefits and drivers of ICT which encourage them to take a step ahead towards technology adoption irrespective of diverse impeding factors. Besides they discussed the necessary obligations as well as their opinions which could empower them to adopt or move forward from their current ICT usage levels. Through the course of case studies, respondents provided profound descriptions of issues discussed and thereby create an ample opportunity for the researcher to collect a rich set of exploratory and descriptive primary data as first-hand information. Each of the interviews was recorded by note-taking in shorthand style with the help of fellow assistant. It is advisable to write up all notes into a longer report as quickly as time permits after the interview though it’s still fresh in researcher’s mind (Dawson, 2002). In this manner, transcribing of the data was prepared on the same day as the interview. This provided an instant chance for recall and consolidation of the information collected.

3.9 Data Analysis Methods

Keeping in view the multiple data collection techniques used in this study, data analysis and interpretation takes place at different stages for survey responses and case study outcomes. However, it is important to note that the first step towards the analysis of qualitative survey data was quantification of sample results that provides a quantitative or numeric description of trends, attitudes or opinions of the selected samples. The questionnaire responses were carefully sight checked and quantified during the analysis stage prior to actual analysis (Dawson, 2002). Saunders et al. (2009) infers that a quantitative data can be possibly qualitised i.e. a researcher has the opportunity to change quantitative data into a description of a series of events to be analysed by qualitative means. Conversely, a researcher has a prospect to quantitise the qualitative data, i.e. it can be converted into numeric codes to be analysed by statistical means (Saunders et al., 2009). As mentioned by Culp and Pilat (1998) for each open-ended question a word or phrase used to describe any response (descriptor) needed to be categorized into groups and then into similar categories (Culp & Pilat, 1998). The researcher was governed by the prior literature
and primary data in order to identify the sub-categories for this study; There is a need to repeat the same procedure for entire questions even though new categories no longer emerge. The categories for each open-ended question were alphabetically coded for data entry (Culp & Pilat, 1998). The categories that have arisen were analysed using descriptive statistics. Descriptive statistical analysis makes use of tabulations, charts, graphics to summarize and present quantitative data in a way that is brief but comprehensive; Descriptive statistics are statistical methods that quantitatively summarize and represent aspect of an information collected (Mann, 1995). Saunders et al. (2003) express that descriptive statistics are apprehensive with the description or summary of data collected for a group of entity that is being analysed in a study (Saunders et al., 2003). Descriptive statistics comprises of procedures for organizing, describing and displaying the data with the aid of tables, graphs and summary measures that describe data numerically (Mann, 2010).

Prior to the analysis phases directed for case studies, the researcher had individually transcribed all ten recorded interviews. During the analysis phase, thematic analysis was put into action to analyse case reports to categorise the reposes into specific themes emerged out of the interviewee’s responses to questions posed. According to Dawson (2002) when data is analysed by theme, it is called thematic analysis. This sort of analysis is decidedly inductive, that is, the themes rise up out of the data and are not forced upon it by the researcher (Dawson, 2002). Braun and Clarke (2006) proposes that thematic analysis can be an essentialist or realist method, which describes experiences, meanings and the reality of participations, or it can be a constructionist method, which studies the ways in which experiences, meanings, realities, events and so on are consequence of an action of an array of discourses going on within the society (Braun & Clarke, 2006).