BA IN MANAGEMENT

COURSE MATERIAL FOR

BUSINESS RESEARCH METHODS (MGMT 3181)

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CHAPTER ONE
INTRODUCTION TO RESEARCH METHODOLOGY

Learning Objectives

- *Describe what research is and how is it defined;*
- *Distinguish between applied and basic research;*
- *Explain why managers should know about research;*
- *Discuss what managers should and should not do in order to interact most effectively with researchers;*
- *Discuss what research means to you and describe how you, as manager, might apply the knowledge gained about research; and*
- *Discuss advantages and disadvantages of internal and external researchers.*

1.1 INTRODUCTION

Just close your eyes for a minute and utter the word research to yourself. What kinds of images does this word conjure up for you? Do you visualize a lab with scientists at work Bunsen burners and test tubes, or an Einstein-like character writing dissertations on some complex subject, or someone collecting data to study the impact of a newly introduced day-care system on the morale of employees? Most certainly, all these image do represent different aspects of research. Research is simply the process of finding solutions to a problem after a thorough study and analysis of the situational factors. Managers in organizations constantly engage themselves in studying and analyzing issues and hence are involved in some form of research activity as they make decisions at the workplace. As is well known, sometimes managers make good decisions and the problem gets solved, sometimes they make poor decisions and the problem persists, and on occasions they make such colossal blunders that the organization gets stuck in the mire. The difference between making good decision and committing blunders lies in how managers go about the decision-making process. In other words, good decision making fetches a "yes" answer to the following questions: Do managers identify where exactly the problem lies, do they correctly recognize the relevant factors in the situation needing investigation, do they know what types of information are to be gathered and how, do they know how to make use of the information so collected and draw appropriate conclusions to make the right decisions, and finally, do they know how to implement the results of this process to solve the problem? This is the essence of research and to be a successful manager it is important for you to know how to go about making the

right decisions by being knowledgeable about the various steps involved in finding solutions to problematic issues. This is what this book is all about.

1.2 MEANING & DEFINITION OF RESEARCH

Research in common parlance refers to search for knowledge. Actually the word Research is derived from French word 'Researcher' meaning 'to search back'. In simple term research is an in-depth study of the status, to find out the inner truth, inner story of any subject of interest, and also to solve problems.

One can also define research as a scientific and systematic search for pertinent information on a specific topic. In fact research is an art of scientific investigation. In short, research is all about;

- A careful investigation /inquiry especially through search for new facts in any branch of knowledge.
- A systematized effort to gain new knowledge.
- Search for knowledge through objective and systematic methods of finding solution to a problem.

Definitions of Research

- Research is essentially an investigation, a recording and analysis of evidences for the purpose of gaining knowledge. (Robert Ross).
- Research is an organized enquiry Designed and carried out to provide information for solving a problem, (Fred kerlinger).
- Research is a careful inquiry or Examination to discover new information or relationship and to expand to and to verify the existing knowledge. (Francis Rummel).
- According to Clifford woody Research comprise defining ands redefining problems, formulating hypotheses, collecting, organizing and evaluating data, making deduction and reaching conclusions and lastly carefully testing the conclusions to determine whether they fit for formulating hypotheses. Research is thus
    - An original contribution to the existing stock of knowledge making for its Advancement.
    - The search for knowledge through objective and systematic method of finding solutions to a problem.

These Definitions Emphasis the following characteristics of research

1. Research must follow a systematic / scientific procedure and well-drawn research plan.

2. It is a controlled, empirical and critical investigation.
3. It involves investigation of some hypothetical propositions.
4. Its purpose is to provide information for decision making and solving problems. Further to establish relationship between the variables.
5. It is an organized and careful investigation /inquiry, recording, analyzing the available evidence to gain knowledge.

Objective of Research

The purpose of research is to discover answer to questions through the application of scientific procedures. The main aim of research is to find out the truth which is hidden and which has not been discovered as yet. Though each research study has its own specific purpose, we may think of research objectives as falling into a number of following broad groupings.

1. To gain familiarity with a phenomenon or to achieve new insight into it. studies with this object in view are known as Exploratory Research
2. To portray accurately the characteristics of a particular individual, situation or a group – studies with this object in view are known as Descriptive Research.
3. To Determine the frequency with which something occurs / or with which it is associated with something else – studies with this object in view are known as Diagnostic Research studies.
4. To test the hypotheses of a causal relationship between variables – such studies are known as Hypothesis Testing Research.

Generally the objective of any research study is either to explore a phenomenon or to describe the characteristics of a particular event /object/ individual or groups or to diagnose or to test the relationship between variables.

Research Method Vs Research Methodology

Research Method: research method is all about all those methods / techniques / procedures for conduction of research. Research method, thus, refers to the methods the researchers use in performing research operations. In other words, all those methods which are used by the researcher during the course of studying his research are termed as research methods.

In short, research methods can be put into the following three groups:

a. Those methods which are concerned with the collection of Date (i.e. methods of data collection)

b. Those methods / statistical techniques which are used for establishing relationship between the data and the unknowns (i.e., methods of analysis)
c. Those methods which are used to evaluate the accuracy of the result obtained.

Research Methodology: Research methodology is a way to systematically solve the research problem. It may be understood as a science of studying how research is done scientifically. In it we study the various steps that are generally adopted by the researcher in studying his research problem along with the logic behind them. It is necessary to the researcher to know not only the research methods / techniques but also the methodology. Researcher not only need to know how to develop certain questionnaires, indices or tests, how to calculate, how to apply particular research techniques, but they also need to know which of these method or technique are relevant and which are not and what would they mean and indicate and why. Researchers also need to understand the assumption underlying various methods and they need to know the criteria by which they can decide that certain methods / procedures will be applicable to certain problems and others will not.

From what has been stated above, we can say that research methodology has many dimensions and research methods do constitute a part of research methodology. The scope of research methodology is wider than that of research method.

"Research Methodology is generally refers to different approaches to systematically inquiry developed within a particular paradigm with associated epistemological assumptions. (e.g. Experimental / Non-experimental, Action / grounded / …)

Thus, when we talk about research methodology we are not only talk of research methods but also consider the LOGIC behind the methods we use in the context of our research study and explain why we are using a particular method and why we are not using others so that research result are capable of being evaluated.

- Why research study has been undertaken?
- How the research problem has been defined?
- Why the hypotheses has been formulated and in what way?
- What data have been collected and what particular method has been adopted? And why not others?
- Why particular method of analysis has been used?, and

A host of other similar questions are usually answered when we talk of research methodology concerning a research study.

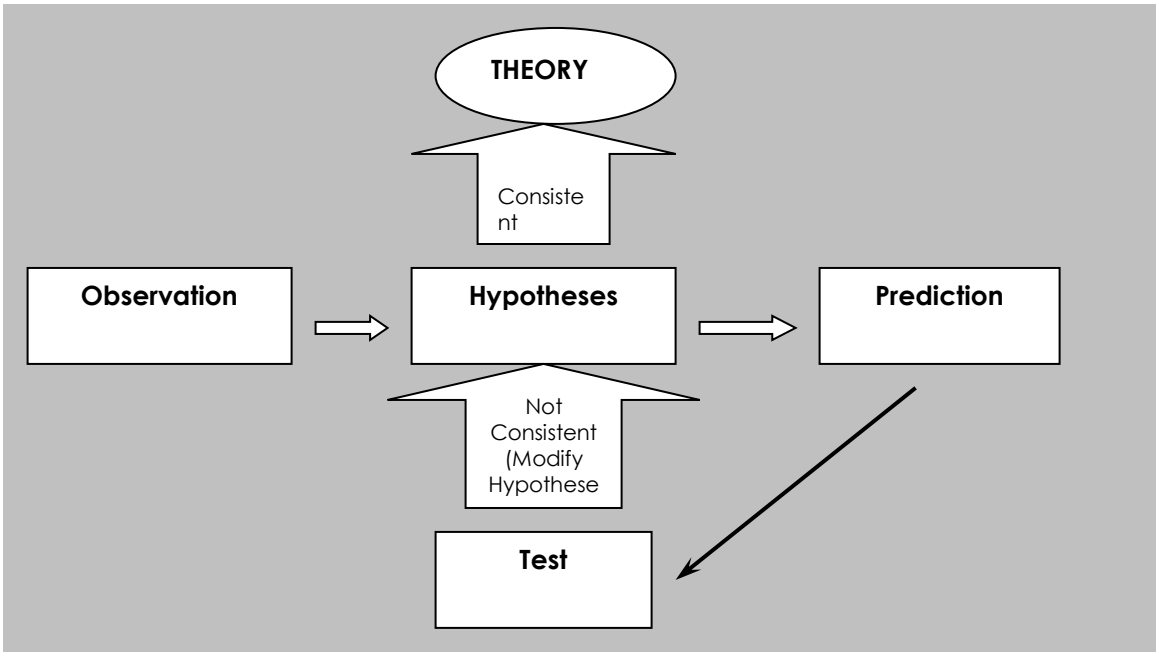
Research and Scientific Method

For clear perception of the term research, one should know the meaning of scientific method. The two terms, research and scientific method are closely related. Research as already stated, can be termed as "an enquiry in to the nature of, the reason for and the consequence of any particular set of circumstances, whether these circumstances are experimentally controlled or recorded just as they occur".

On the other hand scientific method is the pursuit of truth as determined by logical considerations. The ideas of science are to achieve a systematic interrelation of facts. Scientific method attempts to achieve these ideal by observation – experimentation – logical argument from accepted postulates and the combination of these three in varying propositions (i.e., declarative tentative statements). In scientific method logic aids in formulating propositions explicitly and accurately so that their possible alternative become clear with the consequence of such alternatives.

Thus, the scientific method is the best way yet discovered for winnowing the truth from lies and delusion. It is based on certain basic postulates. The simple version looks something like this:

1. Observe some aspects of the universe
2. Invent a tentative description, called Hypotheses, which is consistent with what you have observed.
3. Use the hypotheses to make predictions.
4. Test those predictions by experiments or further observations and modify the hypotheses in the light of your results.
5. Repeat step 3 and 4 until there are no discrepancies between theory and experiment and / or observation.



When consistency is obtained the hypotheses becomes a theory and provides a coherent set of propositions, which explain a class of phenomenon. A theory is then a framework with in which observations are explained and predictions are made. The great advantage of scientific method is that:

- It is unprejudiced: one does not have to believe a given researcher: one can redo the experiment and determine whether his / her results are true or false. The conclusions will hold irrespective of the state of mind.
- A theory is accepted not based on the prestige or convincing power of the proponent, but on the results obtained through observation and / or experiments, which any one can reproduce: the result obtained through scientific method are repeatable.

A frequent criticism made of the scientific method is that it cannot accommodate any thing that has not been proved. The argument then points out that many things thought to be impossible in the past are now every day realities. This criticism is based on a misinterpretation of the scientific method. When the hypotheses pass the test it is adopted as a theory it correctly explains arrange of phenomenon it can, at any time, be falsified by new experimental evidences. When exploring a new sort of phenomena scientists do using existing theories but, since this is a new area of investigation, it is always kept in mind that the old theories might fail to explain the new experiment and observations. In this case new hypotheses are devised and tested until a new theory emerges.

The other limitations of scientific method are relating with the: Difficulty in use of experiments: for instance the laboratory of social scientists is the world of every day living. It is difficult to control

external factors; Complexity of subject matters; Measurement problem; Difficulties in replication / generalization; Differences in observation – bias / preconception of phenomenon; and Objectivity.

Motivation in Research

What makes people to undertake research?

- Desire to get a research degree along with its consequential benefits
- Desire to face the challenge in solving the unsolved problem
- Desire to get intellectual joy of doing creative work
- Desire to be provide service to society
- Desire to get respectability
- Government directives, employment conditions

Significance of Research

"All progress is born of inquiry. Doubt is often better than over confidence, for it leads to inquiry, and inquiry, and inquiry leads to invention" is a famous Hudson maxim in the context of which the significance of research can well be understood, and the following are the basic:

- Research provides the basis for nearly all government policies in our economic system.
- Research has its special significance involving various operational and planning problems of business and industry.
- Research is equally important for social scientists in studying social relationships and it's seeking answers to various social problems.
- To philosophers and thinkers research may mean the out let for new ideas and insights.
- To professional in research, it may mean a source of insights.
- To analysis and intellectuals, it may mean the development of new theories.
- To literary men & women, it may mean development of new styles & creative work.
- To managers it helps to get information as basis for making certain decisions.

1.3 CLASSIFICATION OF RESEARCH

Research can be classified based on different ways in to the following

1. **Based On Outcome Of The Research:** whether the research tries to solve a particular problem or makes a general contribution to the knowledge, research can be classified on the following traits.

A. Basic/Pure/Fundamental Research Fundamental research is also called academic or basic or pure research. Such research is aimed at investigating or search for new principles and laws. It is mainly concerned with generalization and formulation of a theory. Fundamental research is organized only for the attainment of knowledge and truth. With change of time and space, it is necessary to make in the fundamental principles in every branch of science; thus, this type of research also verifies the old established theories, principles and laws. In general, fundamental research is concerned with the theoretical aspect of science.

Ex. - The relationship between crime and economic status

- Darwin theory of Evolution

B. Applied Research: A research aimed finding a solution for an immediate problem facing a society, a group or industry (business organization). The results of such research would be used by either individuals or groups of decision-makers or even by policy makers.

Ex. The improvement of safety in the working place.

Types of Applied Research

- Social impact analysis: the major purpose of social assessment is to estimate the likely consequences of a planned change. Such an assessment can be used for planning and making choices among alternative policies.
- Evaluation Research: is widely used type of applied research that addresses the question, "did it works?" Evaluation is a process of establishing value judgment based on evidence.

Applied research being impact analysis or evaluation research uses two tools namely; need assessment and cost benefit analysis.

- *Need Assessment: a* research collects data, to determine major needs and their severity. It is often a preliminary step before deciding on a strategy to help people.
- *Cost benefit analysis:* this is commonly used in social impact analysis. Economics developed cost benefit analysis, in which the researcher estimates the future costs and the expected benefits of one or several proposed actions and gives them monetary values.

2. Based On Purpose: The reason why are we conducting the research:

A. Exploratory Research (Pilot Survey): It is also called preliminary research. As it s name implied, such research is aimed at discovering, identifying and formulating a research problem and hypothesis. When there are few or no studies that can be referred such research is needed. *Sales decline in a company may be due to: Inefficient service, Improper price, Inefficient sales force, Ineffective promotion, Improper quality*

The research executives must examine such questions to identify the most useful avenues for further research. Preliminary investigation of this type is called exploratory research. Expert surveys, focus groups, case studies and observation methods are used to conduct the exploratory survey. **E.g. "**Our sales are declining and we don't know why"

B. **Descriptive Research:** it describe characteristics of population or phenomenon and it tries to answer questions like, who how, what, when where questions. The main purpose of descriptive research is to describe the state of view as it exists at present. Simply stated, it is a fact finding investigation. In descriptive research, definite conclusions can be arrived at, but it does not establish a cause and effect relationship. This type of research tries to describe the characteristics of the respondent in relation to a particular product.

Descriptive research deals with demographic characteristics of the consumer. For *example*, trends in the consumption of soft drink with respect to socio-economic characteristics such as age, family, income, education level etc. Another example can be the degree of viewing TV channels, its variation with age, income level, and profession of respondent as well as time of viewing.

C. **Explanatory (causal) research:** Causal research is conducted to determine the cause and effect relationship between the two variables. ***Example:*** Effect of advertisement on sales. **E.g.** Which of two advertising strategies is more effective?

3. On The Basis Of The Process Of Research

That is, on the basis of **data** used in the research process research an be

A. **Qualitative research**: Such research is applicable for phenomena that cannot be expressed in terms of quantity. Things related to quality and kind. Research designed to find how people feel or what they think about a particular subject or institution is an example of such research.

B. **Quantitative research**: Quantitative research on the other hand, is concerned with quantitative phenomena. It is based on the measurement of quantity or amount. It is applicable for phenomena that can be expressed in term of quantity.

4. On The Basis Of The Environment: in which the research is carried out can be:

A**. Field Research -** It is a research carried out in the field. Such research is common in social science, agricultural science, history and archeology.

B**. Laboratory Research -** It is a research carried out in the laboratory. These are commonly experimental research. Such researches are common in medical science, agriculture and in general in natural sciences.

C. Simulation Research - Such research uses model to represent the real world. Simulation is common in physical science, economics and mathematics.

5. **On The Basis Of The Time Required To Complete The Research,** research can be**:**

A. **One –time research**: it is a research limited to a single time period

B. **Longitudinal research**: Such research is also called on-going research. It is a research carried out over several time periods.

6. Based on logic: is the research from specific to general or vice versa.

A. Deductive Research: is a study in which conceptual and the critical structures is developed and then tested by empirical observation. It is moving from the general to particular

B. Inductive Research: is a study in which theory is developed from the observation of empirical reality

1.4 STAGES IN THE RESEARCH PROCESS

Achieving objective of research study requires the knowledge of the overall research process. Research process consist a series of steps / actions necessary to effectively carryout research and the desired sequencing of these steps.

As shown in the chart below the research process consist of a number of closely related activities. But such activities overlap continuously rather than following a strictly prescribed sequence. At times, the first step determines the nature of the last step to be undertaken. If subsequent procedures have not been taken in to account in the early stages, serious difficulties may arise which may even prevent the completion of the study. One should remember that the various steps involved in a research process are not mutually exclusive nor they are separate and distinct. The do not necessarily follow each other in any specific order and the research has to be constantly anticipating at each step in the research process the requirement of the subsequent steps.

Step 1: Formulating research problem: There are two types of problem (research problem), that are (i) those relates to state of nature and (ii) those of which relates to relationship between variables. At the very outset the researcher must single out the problem s/he want to study. Essentially two steps are involved in formulating the research problem. One – understanding the problem thoroughly and two – Rephrasing the same in to meaningful terms from analytical point of view. Research problem may be formulated from practices, theory, and research and so on.

Step 2: Extensive Literature Survey: At this juncture the researcher should undertake extensive literature survey connected with the problem. For this purpose, the abstracting and indexing journals

and published or unpublished bibliographies are the first place to go. The earlier studies, if any, which are similar to the study in hand, should be carefully studied.

Step 3: Developing Objectives and working Hypotheses: Defining the objective of a research is one of the most important steps going along with formulation of research problems in the research process. Clearly stated objective / goal keep a research project focused. The processes of objective definition begin by writing down broad and general goals of the study. As the process continues, the goals become more clearly define and the research issues are narrowed. Statement of objective is of basic importance because it determine the data which are to be collected, the characteristics of the data which are relevant, relation which are to be explored, the choice of methods / techniques to be used in these explorations. Research hypotheses are a tentative assumption made in order to draw out and test its logical or empirical consequences. Hypotheses should be very specific and limited to the piece of research in hand because it has to be tested.

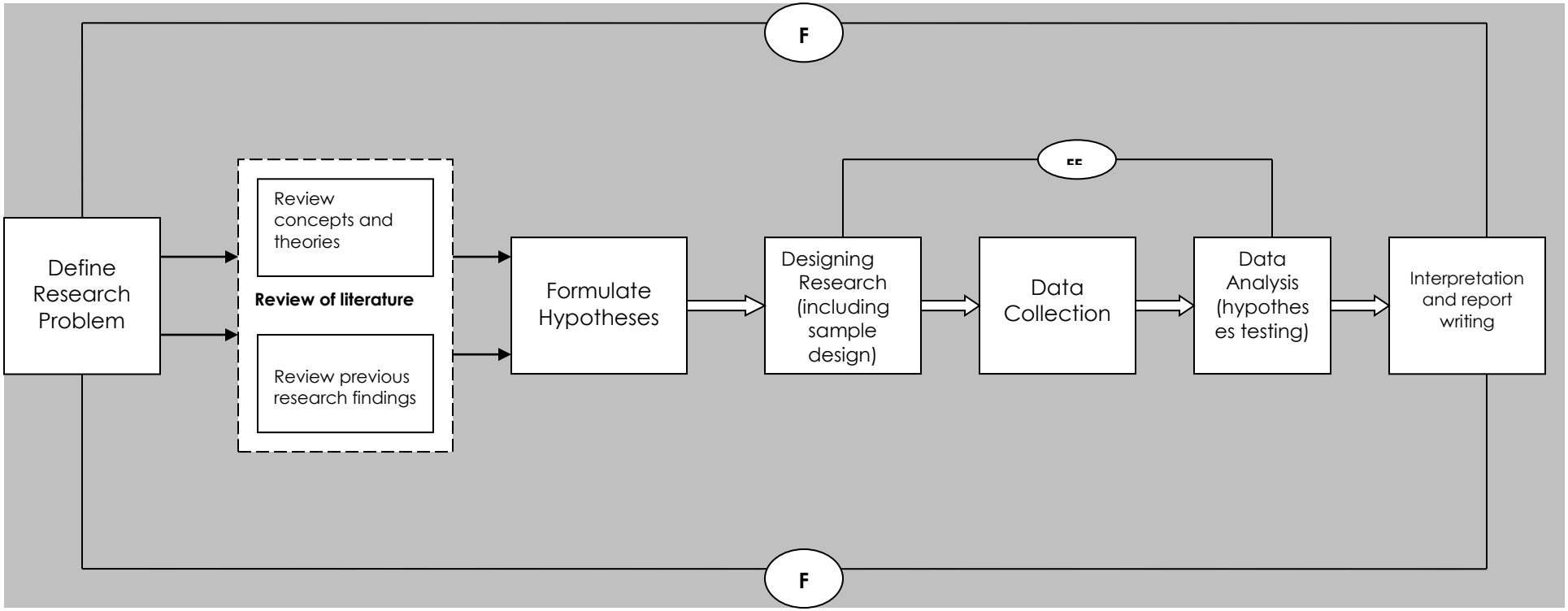


Figure 1.1 Research process in flow chart

Step 4: Preparing a research Design (creating research Design): Defining research problem provides a format for further investigation. A well defined problem points to a method of investigation. There is no one best method of research for all situations. Rather, there are a wider variety of methods for the researcher to choose from. Often the selection of a method involves a serious of trade-offs and depend up on the purpose of the research which may be grouped in to four categories, viz., (i) Exploration, (ii) Description, (iii) Diagnosis and (iv) Experimentation. The preparation of research design, appropriate for a particular research problem, involves usually the consideration of the following:

- The means of obtaining the information
- The availability and skill of the researcher
- Explanation of the way in which selected means of obtaining information will be organized and the reasoning leading to the selection, and
- The time available for the research and the cost factor relating to the research.

Step 5: Determining Sample Design: All the times under consideration in any field of inquiry constitute a 'universe' or 'population'. It is incumbent on the researcher to clearly define the target population. There are no strict rules to follow, and the researcher must rely on logic and judgment. The population is defined in keeping with the objective of the study.

Sometimes, the entire population will be sufficiently small, and the researcher can include the entire population in the study. This type of research is called census study, because data is gathered on every member of the population.

Usually the population is too large for the researcher to attempt all of its members. A small, but carefully chosen sample can be used to represent the population. The researcher must decide on the size and the way of selecting a sample or what is popularly known as the sample design. In other words, a sample design is a definite plan determined before any data are actually collected for obtaining a sample from a given population. Sampling methods are classified as either probability or Non-probability.

- ✓ *In probability sampling*, each members of the population have a known probability of being selected and it includes random, systematic, stratified and cluster / multistage sampling.
- ✓ *In Non-probability sampling* members are selected from a population in some nonrandom manner, which includes convenient, purposive, quota, snowball sampling.

Step 6: Collecting the Data: In dealing with any real life problem it is often found that the data at hand are inadequate, and hence, it becomes necessary to collect data that are appropriate. Each research project use a data collection method / techniques appropriate to a particular research methodology. The two primary goals for both quantitative and qualitative studies are to maximize response and accuracy. There are different methods of data collection in both approaches. Like collecting data through experiment, survey, observation, interview, group discussion, schedule and so forth. At this stage the researcher should select one of these methods of collecting the data taking in to consideration the nature, objective and scope of investigation, financial resource, availability of time and the desire degree of accuracy.

Step 7: Analysis of Data: After the data have been collected the researcher turn to the task of analyzing them. The analysis of data require a number of closely related operation such as establishment of categories, the application of these categories to raw data through coding and tabulation and then drawing statistical inference. There are different methods of data analysis in both approaches, like descriptive, bivariate, multivariate, content, comparative, and thematic and so forth. The researcher should select the method of analysis based upon the purpose and the availability of skill.

Step 8: Interpretation and reporting the results: After analyzing data the next step in the research process as interpretation and reporting of the final results. Interpretation is nothing but the explanation of findings on the basis of some theory.With regard to report writing, the most important consideration in preparing any research report is the nature of the audience. The purpose is to communicate information, and therefore, the report should be prepared specifically for the readers of the report.

1.5 BUSINESS RESEARCH

The scope of business research is limited by one's definition of "business". Certainly research in the production, finance, marketing, or management areas of a for-profit corporation is within the scope of business research. A broader definition of business, however, includes not-for-profit organizations, such as the American Heart Association, the Sac Diego Zoo, and the Boston Pops Orchestra, Each of these organizations exists to satisfy social needs, and they require business skills to produce and distribute the services that people want. Business research may be conducted by organizations that are not business organizations. The reserve bank of India, for

example, performs many functions that are similar, if not identical, to those of business organizations. Reserve bank economists may use research techniques for evaluative purposes much the same way as managers at Reliance or Ford. The term business research is utilized because all its techniques are applicable to business settings.

Business research covers a wide range of phenomena. For managers the purpose of research is to fulfill their need for knowledge of the organization, the market, the economy, or another area of uncertainty. A financial manager may ask, "Will the environment for long-term financing be better two years from now?" A personnel manager may ask, "What kind of training is necessary for production employees?" or "What is the reason for the company's high turnover?" A marketing manager may ask, "How can I monitor my sales in retail trade activities?"

Business Research Defined

The task of business research is to generate accurate information for use in decision making as we say above, the emphasis of business research is on shifting decision makers from intuitive information gathering to systematic and objective investigation. Business research is defined as the systematic and objective process of gathering, recording, and analyzing data for aid in making business decisions.

This definition suggests, first, that research information is neither intuitive nor haphazardly gathered. Literally, research (re-search) means to "search again". It connotes patient study and scientific investigation wherein the researcher takes another, more careful look at data to discover all that can be known about the subject of study.

Second, if the information generated or data collected and analyzed are to be accurate, the business researcher must be objective. The need for objectivity was cleverly stated by the nineteenth-century American humorist Artemus Ward, who said, "It ain't the things we don't know that gets us in trouble. It's the things we know that ain't so". Thus the role of the researcher is to be detached and impersonal, rather than biased in an attempt to prove preconceived ideas. If bias enters the research process, the value of the data is considerably reduced.

A developer who owned a large area of land on which he wished to build a high-prestige shopping center wanted a research report to demonstrate to prospective retailers that there was a large market potential for such a center. Because he conducted his survey exclusively in an elite neighbourhood, not surprisingly his findings showed that a large percentage of respondents

wanted a “high-prestige” shopping center. Results of this kind are misleading, of course, and should be disregarded. If the user of such findings discovers how they were obtained, the developer loses credibility. If the user is ignorant of the bias in the design and unaware that the researchers were not impartial, his decision may have consequences more adverse than if he had made it strictly on intuition. The importance of objectivity cannot be overemphasized. Without objectivity, research is valueless.

Third, the above definition of business research points out that its objective is to facilitate the managerial decision process for all aspects of business: finance, marketing, personnel, The definition is not problem-solving and decision-making activities, business research generates and provides the necessary information upon which to base decisions. By reducing the uncertainty of decisions, it reduces the risk of making wrong decisions. However, research should be an aid to managerial judgement, not a substitute for it. There is more to management than research. Applying research remains a managerial art.

1.6 MANAGERIAL VALUE OF BUSINESS RESEARCH

We have argued that research facilitates effective management. At the Ford Motor Company a marketing manager stated, “Research is fundamental to everything we do, so much so that we hardly make any significant decision without the benefit of some kind of market research. The risks are too big.” Managers in other functional areas have similar beliefs about research in their specialties.

The prime managerial value of business research is that it reduces uncertainty by providing information that improves the decision-making process. The decision making process associated with the development and implementation of a strategy involves three interrelated stages.

- Identifying problems or opportunities
- Selecting and implementing a course of action
- Evaluating the course of action

Business research, by supplying managers with pertinent information, may play an important role by reducing managerial uncertainty in each of these stages.

Identifying Problems or Opportunities

Before any strategy can be developed, an organization must determine where it wants to go and how it will get there. Business research can help managers plan strategies by determining the nature of situations by identifying the existence of problems or opportunities present in the organization.

Business research may be used as a diagnostic activity to provide information about what is occurring within an organization or in its environment. The mere description of some social or economic activity may familiarize managers with organizational and environmental occurrences and help them understand a situation. For example, the description of the dividend history of stocks in an industry may point to an attractive investment opportunity.

Information supplied by business research may also indicate problems. For example, employee interviews undertaken to delineate the dimensions of an airline reservation clerk's job may reveal that reservation clerks emphasize competence in issuing tickets over courtesy and friendliness in customer contact. Once business research indicates a problem, managers may feel that the alternatives are clear enough to make a decision based on experience or intuition, or they may decide that more business research is needed to generate additional information for a better understanding of the situation.

Whether an organization recognizes a problem or gains insight into a potential opportunity, an important aspect of business research is its provision of information that identifies or clarifies alternative courses of action.

Selecting and implementing a course of action

After the alternative courses of action have been identified, business research is often conducted to obtain specific information that will aid in evaluating the alternatives and in selecting the best course of action. For example, suppose a facsimile (fax) machine manufacturer must decide to build a factory either in Japan or in Sough Korea. In such a case, business research can be designed to supply the exact information necessary to determine which course of action is best of the organization.

Opportunities may be evaluated through the use of various performance criteria. For example, estimates of market potential allow managers to evaluate the revenue that will be generated by each of the possible opportunities. A good forecast supplied by business researchers is among the

most useful pieces of planning information a manager can have. Of course, complete accuracy in forecasting the future is not possible because change is constantly occurring in the business environment. Nevertheless, objective information generated by business research to forecast environmental occurrences may be the foundation for selecting a particular course of action.

Clearly, the best plan is likely to result in failure if it is not properly implemented. Business research may be conducted with the people who will be affected by a pending decision to indicate the specific tactics required to implement that course of action.

Evaluating course of action

After a course of action has been implemented, business research may serve as a tool to inform managers whether planned activities were properly executed and whether they accomplished what they were expected to accomplish. In other words, business research may be conducted to provide feedback for evaluation and control of strategies and tactics.

Evaluation research is the formal, objective measurement and appraisal of the extent to which a given action, activity, or program has achieved its objectives. In addition to measuring the extent to which completed programs achieved their objectives or to which continuing programs are presently performing as projected, evaluation research may provide information about the major factor influencing the observed performance levels.

In addition to business organization, nonprofit organization, such as agencies of the federal government, frequently conduct evaluation research. It is estimated that every year more than, 1,000 federal evaluation studies are undertaken to systematically assess the effects of public programs. For example, the General Accounting Office has been responsible for measuring outcomes of the Employment Opportunity Act, the Head Start program, and the Job Corps program.

Performance-monitoring research is a term used to describe a specific type of evaluation research that regularly, perhaps, routinely, provides feedback for the evaluation and control of recurring business activity. For example, most firms continuously monitor wholesale and retail activity to ensure early detection of sales declines and other anomalies. In the grocery and retail drug industries, sales research may use the universal product code (UPC) for packages, together with computerized cash registers and electronic scanners at checkout counters, to provide valuable market share information to store and brand managers interested in the retail sales volume of specific product.

United Airlines' Omnibus in-flight surveys provide a good example of performance monitoring research. United routinely selects sample flights and administers questionnaire about in-flight service, food and other aspects of air travel. The Omnibus survey is conducted quarterly to determine who is flying and for what reasons. It enables United to track demographic changes and to monitor customer ratings of its services on a continuing basis, allowing the airline to gather vast amounts of information at low cost. The information relating to customer reaction to services can be compared over time. For example, suppose United decided to change its menu for in-flight meals. The results of the Omnibus survey might indicate that shortly after the menu changed, the customers' rating of the airline's food declined. Such information would be extremely valuable, as it would allow management to quickly spot similar trends among passengers in other aspects of air travel, such as airport lounges, gate-line waits, or cabin cleanliness, Thus managerial action to remedy problems could be rapidly taken.

When analysis of performance indicated that all is not going as planned, business research may be required to explain why something "went wrong." Detailed information about specific mistakes or failures is frequently sought. If a general problem area is identified, breaking down industry sales volume and a firm's sales volume into different geographic areas may provide an explanation of specific problems, and exploring these problems in greater depth may indicate which managerial judgments were erroneous.

1.7 WHEN IS BUSINESS RESEARCH NEEDED?

A manager faced with two or more possible courses of action faces the initial decision of whether or not research should be conducted. The determination of the need for research centers on (1) time constraints, (2) the availability of data, (3) the nature of the decision that must be made, and (4) the value of the business research information in relation to its costs.

Time constraints

Systematically conducting research takes time. In many instances management concludes that because a decision must be made immediately, there will be no time for research. As a consequence, decisions are sometimes made without adequate information or thorough understanding of the situation. Although not ideal, sometimes the urgency of a situation precludes the use of research.

Availability of data

Frequently managers already possess enough information to make a sound decision without business research. When there is an absence of adequate information, however, research must be considered. Managers must ask themselves, "Will the research provide the information needed to answer the basic questions about this decision?" If the data cannot be made available, research cannot be conducted. For example, prior to 1980 the people's republic of China had never conducted a population census. Organizations engaged in international business often find that data about business activity or population characteristics, found in abundance when investigating the United States, are nonexistent or sparse when the geographic area of interest is an underdeveloped country. Further, if a potential source of data exists, managers will want to know how much it costs to obtain those data.

Nature of the decision

The value of business research will depend on the nature of the managerial decision to be made. A routine tactical decision that does not require a substantial investment may not seem to warrant a substantial expenditure for business research. For example, a computer software company must update its operator's instruction manual when minor product modifications are made. The cost of determining the proper wording for the updated manual is likely to be too high for such a minor decision. The nature of such a decision is not totally independent from the next issue to be considered: the benefits versus the costs of the research. However, in general the more strategically or tactically important the decision, the more likely that research will be conducted.

Benefits versus costs

Some of the managerial benefits of business research have already been discussed. Of course, conducting research activities to obtain these benefits requires an expenditure; thus there are both costs and benefits in conducting business research. In any decision-making situation, managers must identify alternative courses of action, then weigh the value of each alternative against its cost. It is useful to think of business research as an investment alternative. When deciding whether to make a decision without research or to postpone the decision in order to conduct research, managers should ask: (1) Will the payoff or rate of return be worth the investment? (2) Will the information gained by business research improve the quality of the decision to an extent

sufficient to warrant the expenditure? And (3) Is the proposed research expenditure the best use of the available funds?

For example, TV Cable Week was not test-marketed before its launch. While the magazine had articles and stories about television personalities and events, its main feature was a channel-by-channel program listing showing the exact programs that a particular subscriber could receive. To produce a "custom" magazine for each individual cable television system in the country required developing a costly computer system. Because development required a substantial expenditure, one that could not be scaled down for research, the conducting of research was judged to be an improper investment. The value of the research information was not positive, because the cost of the information exceeded its benefits. Unfortunately, pricing and distribution problems became so compelling after the magazine was launched that it was a business failure. Nevertheless, the publication's managers, without the luxury of hindsight, made a reasonable decision not to conduct research. They analyzed the cost of the information (i.e. the cost of business research) relative to the potential benefits.

1.8 MAJOR TOPICS FOR RESEARCH IN BUSINESS

Research is expected to improve the quality of business decisions, but what business-decision topics benefit from research efforts? Exhibit 1.1 lists several major topics for research in business.

EXHIBIT 1.1: MAJOR TOPICS FOR RESEARCH IN BUSINESS

- General Business, Economic, and corporate Research
- Short-range forecasting (up to one year)
- Long-range forecasting (over one year)
- Studies of business and industry trends
- Inflation and pricing studies
- Plant and warehouse location studies
- Acquisition studies
- Export and international studies
- Financial and Accounting Research
- Forecasts of financial interest-rate trends

- Stock, bond, and commodity value predictions
- Capital formation alternatives
- Research related to mergers and acquisitions
- Risk-return trade off studies
- Impact of taxes
- Portfolio analysis
- Research on financial institutions
- Expected-rate-of-return studies
- Capital asset pricing models
- Credit risk management in corporates
- Cost analysis
- Management and Organizational Behavior Research
- Total quality management
- Morale and job satisfaction
- Leadership styles and their effectiveness
- Employee productivity
- Organizational effectiveness
- Structural studies
- Absenteeism and turnover
- Organizational communication
- Time and motion studies
- Physical environment studies
- Labor union trends
- Sales and Marketing Research
- Measurement of market potentials
- Market-share analysis
- Market segmentation studies
- Determination of market characteristics
- Sales analysis
- Establishment of sales quotas, territories

- Distribution-channel studies
- New-product concept tests
- Test-market studies
- Advertising research Buyer-behavior/consumer satisfaction studies
- Corporate Responsibility Research
- Ecological impact studies
- Legal constraints on advertising and promotion studies
- Sex, age, and racial discrimination worker-equity studies
- Social values and ethics studies.

1.9 BUSINESS RESEARCH IN A GLOBAL ACTIVITY

Business today operates globally. Business research, like all business activity, has become increasingly global. Some companies have extensive international business research operations. Upjohn conducts business research in 160 different countries.

Companies that conduct business in foreign lands must understand the particular nature of those markets and determine whether they require customized business strategies. For example, although the 14 nations of the European Community not share a single market, business research shows that they do not share identical tastes for many consumer products. Business researchers have learned that there is no such thing as a typical European consumer or worker; the nations of the European Community are divided by language, religion, climate, and centuries of tradition. For example, Scantel Research, a British firm that advises companies on color preferences, found inexplicable differences in the way Europeans take their medicine. The French prefer to pop purple pills, while the English and Dutch wish for white ones. Consumers in all three countries dislike bright red capsules, which are big sellers in the United States. This example illustrates that companies that do business in Europe must learn whether they need to adapt to local customs and habits.

A.C. Nielsen, the company that does television ratings, is the world's largest business research company. More than 60 percent of its business comes from outside the United States. Although the nature of business research can change around the globe, the need for business research is universal. Throughout this book we will discuss the practical problems involved in conducting business research in Europe, Asia, Latin America, the Middle East, and elsewhere.

1.10 ETHICS AND BUSINESS RESEARCH

Ethics in business research refers to a code of conduct or expected societal norm of behavior while conducting research. Ethical conduct applies to the organization and the members that sponsor the research, the researchers who undertake the research, and the respondents who provide them with the necessary data The observance of ethics begins with the person instituting the research, who should do so in good faith, pay attention to what the results indicate, and surrendering the ego, pursue organizational rather than self-interests. Ethical conduct should also be reflected in the behavior of the researchers who conduct the investigation, the participants who provide the data, the analysts who provide the results, and the entire research team that presents the interpretation of the results and suggests alternative solutions.

Thus, ethical behavior pervades each step of the research process-data collection, data analysis, reporting, and dissemination of information of the Internet, if such an activity is undertaken. How the subjects are treated and how confidential information is safeguarded are all guided by business ethics.

There are business journals such as the journal of business Ethics and the Business Ethics Quarterly that are mainly devoted to the issue of ethics in business. The American Psychological Association has established certain guideline for conducting research, to ensure that organizational research is conducted in an ethical manner and the interests of all concerned are safeguarded.

1.12 SUMMARY

Business research is a management tool that companies use to reduce uncertainty. Business research, the manager's source of information about organizational and environmental conditions, covers topics ranging from long-range planning to the most ephemeral tactical decisions.

Business research is the systematic and objective process of gathering, recording, and analyzing data for decision making. The research must be systematic, not haphazard. It must be objective to avoid the distorting effects of personal bias. The objective of applied business research is to facilitate managerial decision making. Basic or pure research is used to increase the knowledge of theories and concepts.

Managers can use business research in all stages of the decision-making process: to define problems; to identify opportunities; and to clarify alternatives. Research is also used to evaluate

current programs and courses of action, to explain what went wrong with managerial efforts in the past, and to forecast future conditions.

A manager determines whether business research should be conducted based on (1) time constraints, (2) the availability of data (3) the nature of the decision to be made, and (4) the benefits of the research information in relation to its costs.

There is a broad variety of applied research topics, such as general business, economic, and corporate research; financial and accounting research; management and organizational behavior research; sales and marketing research; and corporate responsibility research.

SELF ASSESSMENT QUESTIONS

1. Give some examples of business research in your particular field of interest?
2. In your own words, define business research and list its tasks.
3. How might a not-for-profit organization use business research?
4. What is the difference between applied and basic research?
5. Discuss how business research can be used in each stage of the decision-making process.
6. In your own words, describe the scientific method and state why it is an essential aspect of business research.
7. Describe a situation where business research is not needed and a situation where business research is needed. What factors differentiate the two situations?
8. Why should a manager know about research when the job entails managing people products, events, environments, and the like?
9. For what specific purposes is basic research important?
10. When is applied research, as distinct from basic research, useful?
11. Why is it important to be adept in handling the manager-researcher relationship?
12. Explain, giving reasons, which is more important, applied or basic research.

CHAPTER TWO

FORMULATION OF RESEARCH PROBLEMS AND HYPOTHESES

Learning objectives

- *discuss the nature of decision makers' objectives and the role they play in defining the research problem;*
- *understand that proper problem definition is essential for effective business research;*
- *Develop the art of mentally designing research problem for any research topic*
- *Produce research hypothesis for any research problem except exploratory ones*
- *understand the nature of hypothesis and hypothesis statement*
- *discuss the influence of the statement of the business problem on the specific research objectives;*

2.1 INTRODUCTION

In research process, the first and foremost step happens to be that of selecting and properly defining a research problem. A researcher must find the problem and formulate it so that it becomes susceptible to research. Like a medical doctor, a researcher must examine all the symptoms (presented to him or observed by him) concerning a problem before he can diagnose correctly. To define a problem correctly, a researcher must know: what a problem is?

Research forms a cycle; it starts with a problem and ends with a solution to the problem and a possible implication for future research. Perhaps the most important step in the research process is selecting and developing the problem for research. A problem well stated is a problem half solved. Many students, far along in their research, find that their research problems are too long, indefinite, trivial or not really researchable. These and many other hazards are likely to stem from poorly selected and stated problems.

The first step in the research process is the choice of suitable problem for investigation. Problem is any question or matter involving doubt, uncertainty or difficulty. Problem also denotes here a question proposed for solution or discussion. On the other hand research problem refers to a problem that someone would like to investigate; a situation that needs to be changed or addressed. These problems usually consist of area of concern, condition to be improved,

difficulties to be eliminated, and questions seeking answer. A research problem also defined as an issue or concern that an investigator presents and justifies in research study.

The identification of research problem is difficult, but it is an important phase of the entire research process. It requires a great deal of patience and logical thinking on the part of the researcher. Beginners find the tasks of identifying a research problem a difficult one. Most of the time researchers select a problem because of his own unique needs and purposes. There are, however, some important sources which are helpful to a researcher for selecting problem to be investigated.

2.1. WHAT IS RESEARCH PROBLEM?

A research problem is any significant, perplexing and challenging situation, real or artificial, the solution of which requires reflective thinking. It is the difficulty experienced by the researcher in a theoretical or practical situation. A research problem is the situation that causes the researcher to feel apprehensive, confused and ill at ease. It is the determination of a problem area within a certain context involving the, who, what, where, when and the why of the problem situation.

Elements of a research problem: the elements of research problems are

1. Aim or purpose of the problem for investigation. This answers the question ‘why’ why is there an investigation, inquiry to study.
2. The subject matter or topic to be investigated. This answers the question what.
3. The place/local where the research is to be conducted. This answers the question where? Where the study to be conducted?
4. The period or time of the study during which the data are to be gathered. This answers the question when.
5. Population/universe from whom the data are to be collected. Answers the question who or from whom.

Necessary Conditions for Formulation of Research Problems

We can list some of the conditions that experience has proved to be conducive to the formulation of significant research problems.

I. Systematic Immersion in the subject Matter through First-hand Observation.

The researcher must immerse himself thoroughly in the subject-matter area within which he wishes to pose a specific problem. For example, if the researcher was interested in the general area of juvenile delinquency, it would serve him well if he visited remand homes, juvenile centers, juvenile courts, the families of the delinquents and the locality where the incidence is high. This process is known by various names, e.g. Pilot survey, preliminary survey, or exploratory study.

II. Study of Relevant Literature on the subject

The researcher must be well equipped to experience some difficulty or challenge to be able to pose a problem. This in turn would depend upon the researcher being well-conversant with the relevant theories in the field, reports and records etc. This is also an aspect of exploration.

III. Discussions with persons having rich practical experience in the field of study.

This is often known as an experience survey, which again is an exercise at exploration. Administrators', social workers, community leaders, etc. are persons who have a rich practical experience in different fields of social life.

Steps in Formulating a Research Problem/Topic

There are several steps to follow in formulating a Research problem

1. *Identify broad fields of study*. In which area are you most interested? E.g. Management, Logistics, Accounting, Economics or Marketing
2. *Dissect the broad area into sub-areas,* E.g. HRM, Motivation, and Leadership
3. *Select the sub-areas* which you are most interested within the subject by considering your knowledge, time, budget…etc
4. *Raise research questions* in questionnaire or interview guides.
5. *Formulate research objectives***:** Research objectives are drive from research questions. Research objectives and research questions are the same except the way they are written.
    - Research questions are written in the form questions.

- Research objectives are written in the form of affirmative statement by using action-oriented words, such as “to examine, “to ascertain”, “to measure”, “to investigate” etc.

6. *Assess objectives*- evaluating the objectives in the light of the time, budget, technical and professional expertise about the subject and other related resources.
7. *Double check*- go back and make sure that you have sufficient interest, time, resource and expertise, if you are happy, then you jumps to next step.

Sources Of A Research Problem

Research problem / Idea originate from many sources. We discuss four of these sources for the time being: Everyday life, practical issue, past research (literature), and Inference from theory.

1. **Everyday life**: is one common source of research problem / idea, Based on Questioning and inquisitive approach, you can draw from your experiences, and come up with many research problems. For example think about what type of management practices in cooperatives you believe work well or do not work well. Would you be interested in doing a research study on one or more of those practices?
2. **Practical Issue**: this is one of most important source of research problem especially when you are practitioner. What are some current problem facing cooperatives developments? What research topic do you think can address some of these problems? By such types of inquisitive approach with regard to the practical issue you can come up with research problem.
3. **Past research (literature):** Among the sources of research problems one has to be very familiar with the literature in the field of one’s interest. Past research is probably the most important source of research idea / problem. That is because, importantly research usually generate more questions that it answers. This also the best way to come with a specific idea that will fit in to and extend the research literature.
4. **Theory (Explanations of phenomenon):** inference from theory can be a source of research problem. The application of general principles involved in various theories to specific situation makes an excellent starting point for research. The following question gives illustration how theory can be a source of research problem.
    - Can you summarized and integrate a set of post studies in to a theory?

- Are there any theoretical predictions needing empirical testing?
- Do you have any theories that you believe have merit? Test them.
- If there is little or no theory in the area of interest to you, then think about collecting data to help you to generate a theory.

Selecting and Defining a research problem

Selecting a research problem

The research problem undertaken for the study must be carefully selected. The task is difficult one, although it may not appear to be so. The research problem as identified and defined for the purpose of inquiry should be an amenable to scientific research. As such every research problem selected for research must satisfy the following criteria.

1. The problem selected for the purpose of research should be original. It should be problem that is being inquired for the first time. It should not be a problem of repeated nature and should not have been already probed with some valid reasons. For this purpose the researcher must attempt a thorough review of the existing literature. It is useful for identification of specific problems, eliminating the duplication of works, improving the research techniques over those used earlier in similar research, avoiding the hounding points of earlier researchers, identification of gaps, and gathering knowledge of new concepts and technical aspects.
2. The problem taken for the research should not be too general or too specific. It should be a problem of less general nature and most of specific treatment. In other word research problem should be moderate and compromising between the spaces sets out above. A problem of general nature may lead to vague treatment and too specific problem may end in narrow focus without any consequence.
3. The research problem must be operational and should not be too subjective and non-measurable. It should be solvable or researchable. Sometimes the problem may be significant but may not be a single enquiry. A solvable problem improves the conditions immediately. A problem remains insolvable for two reasons. They are:
    (a) That it may concern supernatural or amorphous phenomena. For example a research problem to know who is responsible to the creation of the world is beyond one's research exercise.

(b) That it cannot be operationally defined. The problem may not be possible for measurement. For instance measurement of anxiety, creativity etc, are too difficult to measure.

4. The research problem undertaken should be feasible for implementation. The feasibility of completing the research project should be checked by taking into consideration the study design, access to organizations and respondents, sample and universe to be studied must be with in the reach; time and cost required and so on.
5. The selection of a problem must be proceeding by preliminary study. This may not be necessary when the problem requires the conduct of research closely similar to one that has already been done. But when the field of enquiry is relatively new and does not have available set of well developed techniques, a brief feasibility study must always be undertaken.

If the problem for research selected properly by observing the above mentioned points and fulfill the features of good research problem indicated in the box here under, the research will not be difficult to implement.

Features of suitable Research problem

1 It should be of great interest to you: You will have to spend many months investigating the problem. A lively interest in the subject will be an invaluable incentive to persevere.
2 The problem should be significant: It is not worth time and effort investigating a trivial problem or repeating work which has already been done elsewhere.
3 It should be delineated Consider the time you have to complete the work, and the depth to which the problem will be addressed. You can cover a wide field only superficially, and the more you restrict the field, the more detailed the study can be. You should also consider the cost of necessary travel and other expenses.
4 You should be able to obtain the information required You cannot carry out research if you fail to collect the relevant information needed to tackle your problem, either because you lack access to documents or other sources, and/or because you have not obtained the co-operation of individuals or organizations essential to your research.
5 You should be able to draw conclusions related to the problem: The point of asking a question is to find an answer. The problem should be one to which the research can offer some solution, or at least the elimination of some false ‘solutions’.
6 You should be able to state the problem clearly and concisely A precise, well thought out and fully articulated sentence, understandable by anyone, should normally clearly be able to explain just what the problem is.

Criteria of a Good Research Problem

A number of criteria in the form of conditions might be listed for guidance in the selection of a topic.

Novelty-or-Originality: - It should be sufficiently original so that it does not involve objectionable duplication. Originality is the basic credit point of any research. Ignorance of prior studies may lead a student to spend time on a problem already investigated by some other worker. Moreover the study should employ the most recent data.

Interesting: - The problem should be interesting for the investigator himself. If s/he is not interested in it, s/he will not be able to face and overcome the obstacles which come at every step in research. S/he should have a strong inherent motivation for it. His/her interest should be purely intellectual and should not be there only for a reward, material benefit, and advancement in position, increased authority and so.

Importance: - It should be significant enough and involve an important principle or practice. If it is not worthwhile, it neither adds to knowledge nor leads to any improvements in the current practices.

Feasibility or Amenability: - The next question to be asked is whether research into the problem would be feasible. S/he should possess the required competence, knowledge and understanding. S/He should be skilful enough to develop, administer and interpret the necessary data- gathering devise and procedures.

Availability of Data: - The research work should ensure the availability of valid and reliable data gathering devices and procedures.

Availability of cooperation: - The study may require cooperation from various institutions, authorize and individuals. In may need administration of tests to pupil's, interviewing employees, observation of students at play, meeting the citizens, writing for data, going through records, conducting necessary experiments and going into prolonged study of exceptional cases.

Availability of other facilities: - Will have the necessary financial resources to carry out the study? The investigators should be able to meet the expenditure involved in data gathering equipment printing, test machines, travel, computerization, clerical help, postage, preparation of the reports etc. Will I have enough time to complete the project? Selecting a problem, library

study, preparing the data-gathering devices, collecting and analyzing the data writing the research report, etc are all time- consuming processes.

Immediate Application:- Will my research help in solving an urgent problem?

Aim of Research:- The aim of research also influences the selection of the problem.

Experience and creativity: - Good research problems stem from a clear understanding of the theoretical, empirical and practical aspects of the subject derived from personal experience and from a thorough review of the literature. Conversely, lack of familiarity, with the subject is almost sure to result in a poor choice.

Courage and confidence:- Will I have the courage and confidence to purse the study inspire of the difficulties and social hazards that may be involved? Will I be able to work aggressively when data are difficult to gather and when others are reluctant to cooperate?

Formulating and stating the problem

After the problem has been selected, it must be definitely formulated and stated. If it is to serve as a guide in planning the study and interpreting its result, it is essential that the problem is stated in precise terms. The type of statement to be employed depends on the preference of the worker and the nature of the problem. Preferably it should be set as a question or in such form that the question to be answered is clearly indicated. There are two different ways of stating a problem:-

1. Posing question /questions.
2. Making declaration statement /statements

One may choose any of these ways remembering that the question form has an advantage in sharpening and focusing the issue, but the declarative form is perhaps more common, and both of the ways may be combined easily in an initial statement.

Definition of the problem: - It implies the separation of the problem from the complex of difficulties and needs. It means to put a fence around it, to separate it by careful distinctions from like question found in related situations of need. The definition helps to establish the frame of reference with which the researcher approaches the problem.

Delimitation of the problem:- Here the investigation states the restrictions and limitations which he imposes on his study. It is statement of the limits or scope of the investigation. This statement

will provide information concerning who, what, where and how many. It will determine the boundaries of the project in hand.

Justification of the problem: - This step would prevent wastage of research efforts on un-important or insignificant problems. Problems should be broad-based enough to provide an investigation of real significance. The research worker would assess to what extent the solution of the problem would contribute for the furtherance of human knowledge. The list of the objectives of the study magnifies further its utility and importance.

Necessity of Defining the Problem

Quite often we all hear that a problem clearly stated is a problem half solved. This statement signifies the need for defining a research problem. The problem to be investigated must be defined unambiguously for that will help to discriminate relevant data from the irrelevant ones. A proper definition of research problem will enable the researcher to be on the track whereas an ill-defined problem may create hurdles. Questions like: What data are to be collected? What characteristics of data are relevant and need to be studied? What relations are to be explored?

What techniques are to be used for the purpose? And similar other questions crop up in the mind of the researcher who can well plan his strategy and find answers to all such questions only when the research problem has been well defined. Thus, defining a research problem properly is a prerequisite for any study and is a step of the highest importance. In fact, formulation of a problem is often more essential than its solution. It is only on careful detailing the research problem that we can work out the research design and can smoothly carry on all he consequential steps involved while doing research.

Technique Involved In Defining a Problem

Let us start with the questions: What does one mean when he / she want to define a research problem? The answer may be that one wants to state the problem along with the bounds within which it is to be studied. In other words, defining a problem involves the task of laying down boundaries within which a researcher shall study the problem with a pre-determined objective in view.

How to define a research problem is undoubtedly a phenomenal task. However, it is a task that must be tackled intelligently to avoid the perplexity encountered in a research operation. The usual approach is that the researcher should himself pose a question (or in case someone else wants the researcher to carry on research, the concerned individual, organization or an authority should pose the question to the researcher) and set-up techniques and procedures for throwing light on the question concerned for formulating or defining the research problem. But such an approach generally does not produce definitive results because the question phrased in such a fashion is usually in broad general terms and as such may not be in a form suitable for testing.

Defining a research problem properly and clearly is a crucial part of a research study and must in no case be accomplished hurriedly. However, in practice this frequently overlooked which causes a lot of problems later on. Hence, the research problem should be defined in a systematic manner, giving due weight age to all relating points. The technique for the purpose involves the undertaking of the following steps generally one after the other: (i) statement of the problem in a general way; (ii) understanding the nature of the problem; (iii) surveying the available literature (iv) developing the ideas through discussions; and (v) rephrasing the research problem into a working proposition.

A brief description of all these points will be helpful.

(i) *Statement of the problem in a general way*: First of all the problem should be stated in a broad general way, keeping in view either some practical concern or some scientific or intellectual interest. For this purpose, the researcher must immerse himself thoroughly in the subject matter concerning which he wishes to pose a problem. In case of social research, it is considered advisable to do some field observation and as such the researcher may undertake some sort of preliminary survey or what is often called pilot survey. Then the researcher can himself state the problem or he can seek the guidance of the guide or the subject expert in accomplishing this task. Often, the guide puts forth the problem in general terms, and it is then up to the researcher to narrow it down and phrase the problem in operational terms. In case there is some directive from an organizational authority, the problem then can be stated accordingly. The problem stated in a broad general way may contain various ambiguities which must be resolved by cool thinking and rethinking over the problem. At the same time the feasibility of a

particular solution has to be considered and the same should be kept in view while stating the problem.

(ii) *Understanding the nature of the problem:* The next step in defining the problem is to understand its origin and nature clearly. The best way of understanding the problem is to discuss it with those who first raised it in order to find out how the problem originally came about and with what objectives in view. If the researcher has stated the problem himself, he should consider once again all those points that induced him to make a general statement concerning the problem. For a better understanding of the nature of the problem involved, he can enter into discussion with those who have a good knowledge of the problem concerned or similar other problems. The researcher should also keep in view the environment within which the problem is to be studied and understood.

(iii) *Surveying the available literature:* All available literature concerning the problem at hand must necessarily be surveyed and examined before a definition of the research problem is given. This means that the researcher must be well-conversant with relevant theories in the field, reports and records as also all other relevant literature. He must devote sufficient time in reviewing of research already undertaken on related problems. This is done to find out what data and other materials, if any, are available for operational purpose. "Knowing what data are available often serves to narrow the problem itself as well as the technique that might be used." This would also help a researcher to know if there are certain gaps in the theories, or whether the existing theories applicable to the problem under study are inconsistent with each other, or whether the findings of the different studies do not follow a pattern consistent with the theoretical expectations and so on. All this will enable a researcher to take new strides in the field for furtherance of knowledge i.e., he can move up starting from the existing premise. Studies on related problems are useful for indicating the type of difficulties that may be encountered in the present study as also the possible analytical shortcomings. At times such studies may also suggest useful and even new lines of approach to the present problem.

(*iv) Developing the ideas through discussions:* Discussion concerning a problem often produces useful information. Various new ideas can be developed through such an exercise. Hence, a researcher must discuss his problem with his colleagues and others who have enough experience in the same area or in working on similar problems. This is quite often known as an experience survey. People with rich experience are in a position to enlighten the researcher on different

aspects of his proposed study and their advice and comments are usually invaluable to the researcher. They help him sharpen his focus of attention on specific aspects within the field. Discussions with such persons should not only be confined to the formulation of the specific problem at hand, but should also be concerned with the general approach to the given problem, techniques that might be used, possible solutions, etc.

(v) *Rephrasing the research problem:* Finally, the researcher must sit to rephrase the research problem into a working proposition. Once the nature of the problem has been clearly understood, the environment (within which the problem has got to be studied) has been defined, discussions over the problem have taken place and the available literature has been surveyed and examined, rephrasing the problem into analytical or operational terms is not a difficult task. Through rephrasing, the researcher puts the research problem in as specific terms as possible to that it may become operationally viable and may help in the development of working hypotheses.

In addition to what has been stated above, the following points must also be observed while defining a research problem.

- Technical terms and words or phrases, with special meanings used in the statement of the problem, should be clearly defined.
- Basic assumptions or postulates (if any) relating to the research problem should be clearly stated.
- A straight forward statement of the value of the investigation (i.e., the criteria for the selection of the problem) should be provided.
- The suitability of the time-period and the sources of data available must also be considered by the researcher in defining the problem.
- The scope of the investigation or the limits within which the problem is to be studied must be mentioned explicitly in defining a research problem

2.2 RESEARCH HYPOTHESIS AND HYPOTHESIS TESTING

The entire investigation is carried out by the research team according to the hypothesis formulated for the study. It is the basis for the statement of the objectives of the study. It helps in the decision making with regard to the research design. Hypothesis formulation is not an end itself. The researchers must test the hypothesis in appropriate manner viz, by statistical techniques or by an in depth field enquires. In lay man’s parlance, hypothesis is a kind of

assumption that motivates or guides the researcher to proceed with the research design and its implementation.

Hypothesis is the statistical statement about the characteristics of population made on the basis of sample evidence. A statistical hypothesis is some assumption or statement, which may or may not be true, about a population or equivalently about the probability distribution characterizing the given population which we want to test on the basis of the evidence from a random sample. Hypothesis can be formulated in either of the following two ways:

(i) **Null Hypothesis (H_o):** It states that there is no much (significant) difference between the parameter and statistic. In other words, H◦ states that the difference between sample statistic and the claimed population parameter is due to chance variation in sampling. Null hypothesis is normally preferred in testing process. It enables the researcher to test it. The random selection of the samples from the given population makes the tests of significance valid for us. For applying any test of significance we first set up a hypothesis - a define statement about the population parameter(s). Such a statistical hypothesis, which is under test, is usually a hypothesis of no difference between statistical and parameter. Hence it is called Null hypothesis. In the words of R.A. Fisher null hypothesis is the hypothesis which is tested for possible rejection under the assumption that it is true.

(ii) **Alternative Hypothesis (H_1):** It is true when H◦ is false. It is the statement about the population that must be true if null hypothesis is false. Any hypothesis which is complementary to the null hypothesis is called an alternative hypothesis. It is important to explicitly state the alternative hypothesis in respect of any null hypothesis, because the acceptance or rejection of H◦ is meaningful only it is being tested against a rival hypothesis

Source of Hypothesis

The inspection for hypothesis comes from a number of sources w/h includes the following:

1. *Professional Experience*: The daily life experience or the day to day observation of the relationship (correlation) between different phenomena leads the researcher to hypothesize a relationship and to conduct a study if his/ her assumptions are confirmed.
2. *Past Research or Common beliefs*: Hypothesis can also be inspired by tracing past research or by commonly held beliefs.

3. *Through direct analysis of data or deduction from existing theory*: Hypothesis may also be generated through direct analysis of data in the field or may be deducted from a formal theory. Through attentive reading, the researcher may able to get acquaintance with relevant theories, principles and facts that may alert him or her to identify valid for his/her study
4. *Technological and social changes*: Directly or indirectly exerts an influence in the function of an organization. All such changes bring about new problems for research.

Characteristics of a usable Hypothesis

A "good" usable hypothesis is the one which satisfies any of the following criteria.

- ***A hypothesis should be empirically testable***. The concepts embodied in the hypothesis must have empirical correspondence. For example, *"Bad parents gets bad children is hardly a statement that can qualify as a usable hypothesis.*
- ***A good hypothesis is in agreement with the observed fact***s. A single unexplained conflict between fact and hypothesis is disastrous to the latter. A hypothesis is entirely plausible and conceivable. It is based directly on existing date.
- ***A good hypothesis does not conflict with any law of nature***, which is known to be true. The idea involved in this principle is not very different from that expressed in the preceding principle. We know that there are a number of conflicting theories of learning and teaching.
- ***A good hypothesis is expert.*** It is stated in a scientific and research like language and is not an ordinary statement.
- It should be so designed that ***its test will provide an answer to the original*** problem,
- It must be ***stated in final form early in the experiment*** before any attempt at verification is made.
- The ***hypothesis must be conceptually clear***.
- ***The hypothesis must be specific.***
- Advisedly, ***the hypothesis should be related to a body*** of theory or some theoretical orientation.
- ***Hypotheses should be related to available techniques.*** This is, of course, a sensible requirement applicable to any problem when one is judging its research ability. The

researcher who does not know that techniques are available to test his hypothesis is in a poor way to formulate usable questions.

Forms of Hypothesis

Statement of research hypothesis can take a declarative (positive) form, negative form, the null form, or the question form.

- ✓ **Positive: "***Students who learn in small class size will perform significantly better in mathematics test than those who learn in large class size."*
- ✓ **Negative: "***Students who learn in small class size will not perform significantly better in math's test than those in large class size."*
- ✓ **Null Form: "***There is no significances difference between students who learn in small class size and those who learn in large class size in their mathematics performance."*
- ✓ **Question Form: "***Is there significant difference between students who learn in small class size and those in large class size in their math's performance?"*

In general,

- When a researcher makes a positive statement about the outcome of the study, the hypothesis takes declarative forms.
- When the researcher negates about outcome of the study, the hypothesis takes the negative form.
- When the researcher makes a statement that no relationship exists, the hypothesis takes the null form.
- In the question form hypothesis, a question is asked as to what the outcome will be instead of stating what outcome is expected.

It should also be noted that a working proposition stated either in declarative, negative, null, question form is a matter of preference by the researcher.

Procedure for Hypothesis Testing

The first and foremost problem in any testing procedure is the setting up of the null hypothesis. As the name suggests, it is always taken as a hypothesis of no difference. The decision maker or researcher should always adopt the neutral or null attitude on the part of the researcher before drawing the sample is the basis of the null hypothesis. The following points may be borne in mind in setting the hypothesis.

1. If we want to test significance of the difference between a statistic and the parameter or between two sample statistics then we set up the null hypothesis, that the difference is not significant. This means that the difference is just due to fluctuations of sampling.
2. Setting the level of significance: The hypothesis is examined on a predetermined level of significance. In other words the level of significance can be either 5% or 1% depending upon the purpose, nature of enquiry and size of the sample.

In hypothesis testing, two kinds of errors are possible viz., Type I error and Type II error. Type I error means rejection the null hypothesis when it happens to be true. Type II error means accepting null hypothesis when it is false.The following tables being explain the type of error

Position of Hypothesis	Null Hypothesis-Accept	Null hypothesis-Reject
H_0 TRUE	Correct Decision	Type: I Error
H_0 FALSE	Type II Error	Correct Decision

For instance the level of significance is 5%. It means that five cases of out of 100 are rejecting the H_0 which is true. It is possible to reduce type I error by lowering down the level of significance. Both the type of errors cannot be reduced simultaneously. We have to balance between them.

3. The next step in the testing of hypothesis is calculation of Standard Error (SE). The standard deviation of the sampling distribution of a statistic is known as Standard Error. The concept of standard error (SE) is extremely useful in the testing of statistical hypothesis. Note that the SE is calculated differently for different statistical value.
4. Calculation of Significance ratio: Significance ratio is symbolically described as‘t’. It is calculated by dividing the difference between parameter and statistic by the standard error
5. Deriving the inference: Compare the calculated value with critical value (table value). If the observed value is less it is insignificant and vice-versa.

SELF ASSESSMENT QUESTIONS

1. In its broadest context, what is the task of problem definition?
2. State a problem in your field of interest and list some variables that might be investigated to solve this problem.
3. Go to the library, find business journals, and record and evaluate some hypotheses that have been investigated in recent years. Identify the key independent and dependent variables.
4. Evaluate the statement of the business problem in each of the following situations:
    a) A farm implement manufacturer: Our objective is to learn the most effective form of capitalization so that we can maximize profits.
    b) An employees' credit union: Our problem is to determine the reasons why employees join the credit union, to determine members' awareness of credit union service, and to measure attitudes and beliefs about how effectively the credit union is operated.
    c) The producer of a television show: We have a problem: The program's ratings are low. We need to learn how to improve our ratings.
    d) A soft-drink manufacturer: the problem is that we do not know if our bottlers are more satisfied with us than our competitors' bottlers are with them.
    e) A women's magazine: Our problem is: to document the demographic charges that have occurred in recent decades in the lives of women and to put these changes in historic perspective; to examine several generations of American women through most of this century, tracking their roles as student, worker, wife, and mother and noting the changes in timing, sequence, and duration of these roles; to examine at what age and for how long a women enters each of the various stages of her life: school, work, marriage.
5. What is the necessity of defining a research problem? Explain.

CHAPTER THREE

RESEARCH DESIGN (PLANNING RESEARCH PROJECT)

Learning Objectives

- *Create analogy between a researcher and an architect in the process of designing*
- *Know and differentiate the different types of research designs*
- *Develop art of visualizing the research process before the actual research starts*
- *Produce research question for any exploratory research problem*
- *Design the data and method in order to test a hypothesis*

3.1 Meaning of Research Design

The formidable problem that follows the task of defining the research problem is the preparation of the design of the research project, popularly known as the "research design". Decisions regarding what, where, when, how much, by what means concerning an inquiry or a research study constitute a research design. "*A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure."*

Research design is the plan and structure of investigation so conceived as to obtain answers to research questions. The plan is an overall scheme or program of the research process. It includes an outline of what the researcher will do starting from statement of the problem and hypotheses formulation to the final analysis of data.

A research design is a logical and systematic plan prepared for directing a research study. A research design may be defined as a *master plan* specifying, the methodology and techniques to be adopted for achieving the objectives. It constitutes the ***blueprint*** for the collection, measurement and analysis of data.

A research design is the program that guides the investigator in the process of collecting, analyzing and interpreting observations. It *"provides a systematic plan of procedure for the researcher to follow."* As such the design includes an outline of what the researcher will do from writing the hypothesis and its operational implications to the final analysis of data. More explicitly, the designing decisions happen to be in respect of:

- What is the study and why is the study is being made?

- Where will be the study being carried out and what types of data are required?
- Where can the required data be found and what techniques of data collection will be used?
- What time will the study be conducted and what will be the sample design?
- How will be the data analyzed?
- In what style will the report be prepared?

In brief, research design must, at least, contain—

- A clear statement of the research problem;
- Procedures and techniques to be used for gathering information;
- The population to be studied; and
- Methods to be used in processing and analyzing data.

Characteristics of A Good Research Design

A good design is often characterized by adjectives like flexible, appropriate, efficient, and economical and so on. Generally, a good research design is characterized, in respect of many research problems, by;

- A design which minimizes bias about data
- A design which maximizes the reliability of the data collected and analyzed
- A design which gives the smallest experimental error
- A design which yields maximal information
- a design which provides an opportunity for considering many different aspects of a problem.

3.2 Types of Research Designs

Types of research designs are analogous to types of "blue prints". An architect can choose among different types of possible building designs depending on factors such as purpose of the building, method of construction, time of construction and the like. Similarly, researchers choose among different types of possible research designs depending on such dimensions as purpose of the research, method of data collection, control of variables, the time dimension, the research environment, depth of the research, and the like.

Purpose of Research *is the first dimension of research design*. As explained, research has purpose of exploration, description or explanation or a combination of them. Therefore, based on the "purpose of research" dimension, there are at least three classes of research

designs: ***exploratory, descriptive and explanatory***. Change of purpose, say from exploration to explanation, changes all components of the research process.

Method of Data Collection *is the second dimension* resulting in new classes of research designs. Based on the level of involvement of the data collector we may orderly classify data collection methods into participant observation, unstructured interview, focus group discussion, non-participant observation, and mail questionnaire. The level of data collector involvement decreases as you go on from participant observation to mail questionnaire or survey. Hence, method of data collection generally ranges between ***observation and survey***. It is important to note that a combination of purposes of research and method of data collection could result in new breeds of research designs.

Control of Variables *is a third dimension* that could result in additional classes of research designs. Variables are operationalization of concepts in your research. For example, Satisfaction is a variable that operationalizes the concept of employee performance. You may want to do research on "the relationship between satisfaction and employee performance" in order to come up with a generalized statement or proposition regarding satisfaction and performance of employees. But you know that satisfaction is not the only factor that determines performance. Can you put a boundary on the part of performance that is totally determined by satisfaction? If you can then you have control over your variable. *Therefore, you may conduct an experiment. Particularly in social sciences, it is very difficult to put clear boundary on a variable hence it is difficult to conduct experiments. The only option you have is to observe past data about satisfaction of employees and relate it with their past data about performance.* Research design that plans to use past data, instead of experimental data, is known as ex post design. In short, based on control over variables we differentiate research designs between ***experimental and ex post designs***.

The **Time Dimension** *of the research is the fourth dimension of research design*. You may plan to collect data across geographical space, that is, from respondents located in different geographical locations or you may plan to collect data across time. Data that involve respondents from different geographical locations as of a single point of time are known as

cross-sectional data. For example, a research on "measuring relative efficiency of Ethiopian banks" is cross-sectional study because it does not require observation or survey across time periods. Data that involve a respondent in one geographical location across different time periods are known as longitudinal data. For example, a research on "On the dynamics of share holders' wealth in Awash International Bank" is longitudinal study because it requires observation or survey across time. In short, we classify research design based on time dimension as ***cross-sectional and longitudinal designs***.

Research Environment *is fifth dimension of research design*. There are at least two possible ways of getting data for your study. You may collect actual or real data from the field, say, by interviewing respondents or you may also generate artificial data using simulation. Simulation is a statistical method of generating artificial data based up on statistical parameters such as mean and standard deviation and the type of distribution. Based on the research environment dimension, we classify research designs into **field and simulation**.

Last but not least, **Depth of Research** *is the sixth dimension of research design*. The depth and breadth of research are on a constant trade off. If a research has to increase its depth it usually gives up some part of its breadth. Research projects that emphasize on depth of analysis are usually aimed at particularization. Whereas, research projects that emphasize on breadth of analysis are usually aimed at generalization. ***Qualitative*** research designs are usually meant for researches that require depth instead of breadth and ***Quantitative*** research designs are commonly used in research projects aiming at generalization.

Table 1: Dimensions of research designs

Dimensions of the Research	Purpose of the Research			Method of Data Collection		Control of Variables		Time Dimension		Research Environ		Depth of Research	
	Exy	Des	Exp	Obs	Sur	Exl	Pos	Cro	Lon	Fie	Sim	Qnt	Qul
Exploratory (Exy)													
Descriptive (Des)													
Explanatory (Exp)													
Observation (Obs)													
Survey (Sur)													
Experimental (Exl)													
Ex post (Pos)													
Cross-sectional (Cro)													
Longitudinal (Lon)													
Field (Fie)													
Simulation (Sim)													
Quantitative (Qnt)													
Qualitative (Qul)													

Table 1 presents different types of research designs. New research designs can be formed by combining the 13 different types of research designs in Table 1. For instance, exploratory research design could be formed as a combination of observation method of data collection, ex post design, cross-sectional time dimension, field research design and qualitative analysis.

3.3 Forms of Research Design

Research design is unique to a methodology. Two broad methodology groups can be used to answer any research problem. These are experimental and non-experimental. The main difference between these two methodologies lies in the control of extraneous variables and manipulation of at least one independent variable by the intervention of the investigator in experimental research.

Research Design for Non- Experimental Research

I. **Design for Exploratory:** is a research aimed at identifying and formulating a research problem or developing working hypothesis. The main purpose of such study is only formulating a problem for further, precise investigation of developing the only hypothesis from an operational point of view. An exploratory study is often used as introductory phase of a larger study. The design for such study is characterized by a great deal of flexibility. Since no clear hypothesis has been developed about the problem, the following forms of research design can be used.

A. *The survey of concentrating literature***:** this is the most simple and fruitful method of formulating precisely the research problem or developing hypothesis. Hypothesis stated by earlier works may be review and their usefulness be evaluated as a basis for further research.

B. *Experience Survey:* this implies the survey of people who have practical experience with the problem to be studied. The objective of such survey is to obtain insight in to the relationship between variables and new ideas relating to the problem.

C. *Analysis of Insight (examining analogous situation):* is also important method for suggesting hypothesis for research. It is particularly suitable in areas where there is a little experience to serve as a guide. This method consists of intensive study of selected instances of the phenomenon in which one is interested.

II. Research Design for Descriptive Study: - Descriptive researches are those studies, which are concerned with describing the characteristics or function of a particular individual, or of a group or a phenomenon. Descriptive research in contrast to exploratory research is marked by the prior formulation of specific research problem (question) Investigator already knows a substantial amount about the research, may be as a result of exploratory study, before the project initiated. Thus, the researcher should be able to define clearly, what he wants to measure and setup appropriate and specific means for measuring it. Most of the social research comes under this category.

The design in such studies must be rigid and not flexible and must focus attention on the following:

- ✓ *Formulating the objective of the study (what the study is about and why is it being made?*
- ✓ *Designing the methods of data collection (what techniques of gathering data will be adopted?*
- ✓ *Selecting the sample (how much material will be needed?*
- ✓ *Collecting the data (where can the required data be found and with what time period should the data be related?*
- ✓ *Processing and analyzing the data.*
- ✓ *Reporting the findings.*

Research Design for Experimental Research

Hypothesis-testing research studies (generally known as experimental studies) are those where the researcher tests the hypotheses of causal relationships between variables. Such studies require procedures that will not only reduce bias and increase reliability, but will permit drawing inferences about causality. Usually experiments meet this requirement. Hence, when we talk of research design in such studies, we often mean the design of experiments.

Experimental studies are those in which the researcher can control and manipulate at least one of the independent variable and test the hypothesis of causal relationship between variable.

Basic Principles of Experimental Research

1. The Principle of Replication

The experiment should be repeated more than once. That is, each treatment is applied in many experimental units instead of one. By doing so the statistical accuracy of the research of the experiment is increased. Replication is introduced in order to increase the precision of the study.

Suppose the researcher wants to examine the effect of new teaching method on student's performance. The researcher can divide students' population in to two groups, and one treatment (old teaching method) will be given to one group and the new teaching method to another group. After treatment the result is compared in both groups. Applying this principle implies the students population is divided in to more than one group and each treatment is given more than once.

2. The Principle of Randomization

This principle of experiment is applied in order to reduce the effect of extraneous factor by randomizing the application of treatments. In other words, this principle indicates that we should design or plan the experiment in such a way that the variation caused by extraneous factor all be combined under the general heading of "chance". We can apply the principle of randomization to the above example:

To reduce the effect of extraneous variable, which is intelligence, a researcher can randomly assign students in different groups or we can apply different treatments randomly.

3. The Principle of Local Control

This is also another important principle of experimental design. This is used to measure and eliminate the variability caused by extraneous variable. The extraneous factor, the known sources of variability, is made to vary deliberately over a wide a range as necessary and this need to be done in such a way that the variability it causes can be measured and hence eliminated from the experimental error.

Here the researcher will try to fix the extraneous variable. The students are divided on the basis of their IQ. Students in each IQ level are divided in to two groups and each group is given different treatment and results are compared. By doing so the effect of extraneous variable (intelligence) is controlled.

3.4 Important Concepts Relevant to Research Design

Dependent Variable: If one variable depends upon or a consequence of the other variable that variable is called a dependent variable. It is variable that is to predicted or explained

Independent variable: is a variable that is expected to influence the dependent variable

Extraneous variable: Independent variables that are not related to the purpose of a study, but may affect the dependent variable are termed as extraneous variable. A study must always be so designed that the effect upon the dependent variable is attributed entirely to the independent variable(s), and not to some extraneous variable or variables.

Control: a good research design has to minimize the influences of extraneous variable. To do so the researcher uses control as a remedy to minimize the effects of extraneous variable. In experimental research control refers to restrain to experimental condition.

Confounded relationship: when dependent variable is not free from the influence of extraneous variable, then the relationship between dependent and independent variables is said to be confounded extraneous variable.

Experimental and control groups: In experimental research when a group it is exposed to usual condition is called control group, but when a group is exposed to special condition is called experimental group.

Treatments: the different conditions under which experimental and control groups are put referred to as treatment.

Experiment: the process of examining the truth of a statistical hypothesis, relating to some problem, is known as an experiment. Examining the usefulness of a newly developed drug is good example of an experiment. Experiment can be comparative or absolute. If we want to determine the impact of newly developed drug is a good against the existing drug it is an example of comparative experiment.

Experimental Unit: the pre-determined plots (or blocks or group) where different treatments are used are known experimental units.

SELF ASSESSMENT QUESTIONS

1. Explain the meaning and significance of a Research design.
2. Explain the meaning of the following in context of Research design.
    a. Extraneous variables;
    b. Confounded relationship;
    c. Research hypothesis;
    d. Experimental and Control groups;
    e. Treatments.

3. Describe some of the important research designs used in experimental hypothesis-testing research study.
4. "Research design in exploratory studies must be flexible but in descriptive studies, it must minimize bias and maximize reliability." Discuss.
5. Give your understanding of a good research design. Is single research design suitable in all research studies? If not, why?
6. Write a short note on 'Experience Survey' explaining fully its utility in exploratory research studies.
7. What is research design? Discuss the basis of stratification to be employed in sampling public opinion on inflation.

CHAPTER FOUR
RESEARCH PROPOSAL

Learning Objectives

- *Know the different parts of a research proposal*
- *Develop theoretical and conceptual frameworks and hypotheses thereof*
- *Review related theoretical and empirical literatureusing APA Style of referencing*
- *Know different websites of funding sources*
- *Prepare a full scale research proposal for funding purposes*
- *Evaluate and criticize research proposals*

4.1 INTRODUCTION

Research proposal is a written document of research plan meant to convince specific readers whereas research design deals with choosing a specific holistic research design from among all possible research designs to address the research topic. Hence, it can be claimed that a research proposal presumes availability of the research design. A research proposal is usually required when the research project is to be commissioned and the researcher is expected to compete with other researchers to get research fund or else when the research project is a requirement for partial fulfillment of an academic degree such as BSc, MSc or PhD. For example, a senior essay research proposal is intended to convince your supervisor that your senior essay is a worthwhile research project and that you have the competence and the work plan to complete it.

4.2 WHAT IS A RESEARCH PROPOSAL?

Research proposal is a specific kind of document written for a specific purpose. Research involves a series of actions and therefore it presents all actions in a systematic and scientific way. In this way, Research proposal is a blueprint of the study which simply outlines the steps that researcher will undertake during the conduct of his/her study. Proposal is a tentative plan so the researcher has every right to modify his proposal on the basis of his reading, discussion and experiences gathered in the process of research. Even with this relaxation available to the researcher, writing of research proposal is a must for the researcher.

A research proposal is a written statement of the research design that includes a statement explaining the purpose of the study and a detailed and systematic outline of a particular research methodology.

Research proposal is a blueprint of a study which outlines all the steps a researcher should follow to undertake a given research project. The objective in writing a proposal is to describe: What you will do, why it should be done, how you will do it and what result will you expect?

Being clear about these things from the beginning will help you complete your research in a timely fashion. A vague, weak or fuzzy proposal can lead to a long, painful, and often unsuccessful research writing exercise. A clean, well thought-out, proposal forms the backbone for the research itself. A good research proposal hinges on a good idea. Getting a good idea hinge on familiarity with the topic and this assumes a longer preparatory period of reading, observation, discussion, and incubation. Read everything that you can in your area of interest.

Purpose of a Research Proposal:

- To present the problem to be researched and its importance
- To discuss the research efforts of others who have worked on related problems. (If Any)
- To set forth the data necessary for solving the problem
- To suggest how the data will be gathered, treated and interpreted

The preparation of a research proposal involves a careful consideration of the following questions and making appropriate decisions on them.

- What the study is about?
- Why is the study made?
- What is its scope?
- What are the objectives of the study
- What are the prepositions to be tested?
- What are the major concepts to be defined operationally?
- On the basis of what criteria or measurements, the operational definitions to be made?
- When or in what place the study will be conducted?
- What is the reference period of the study?
- What is the typology of the design?
- What kinds of data are needed?
- What are the sources of data?

- What is the universe form which the sample has to be drawn?
- What is the sample size?
- What sampling techniques can be used?
- What methods are to be adapted for collecting data?
- How the data are to be processed?
- What techniques of analysis are to be adapted?
- What is the significance of the study?
- To what target audience the reporting of the findings is meant?
- What is the type of report to be prepared?
- What is the time period required for each stage of research work?
- What is the limit within which the whole work should be completed?
- What is the involved?

These questions should be considered with reference to the researcher's interest, competence, time and other resources, and the requirements of sponsoring agency, if any. "Thus, the considerations which enter in to making decisions regarding what, where, how much, by what means constitutes a plan of study or a study design".

Importance of Research Proposal

Importance to the sponsor

- It allows the sponsor to assess the sincerity of your purpose, the clarity of your design, the extent of your background material, and your fitness for undertaking the project.
- It demonstrates your discipline, organization and logic. A poorly planned, poorly written, or poorly organized proposal damages your reputation more than the decision to submit one.
- It provides a basis for the sponsor to evaluate the results of a research project
- It serves as a catalyst for discussion between the researcher and the managers.

Importance to the researcher

- A proposal is more beneficial for the beginning researcher to have a tentative work plan that charts the logical steps to accomplish the stated objectives.
- It allows the researcher to plan and review the project's steps. Literature review enables the researcher to assess the various approaches to the problem and revise the plan accordingly.

- It enables the researcher to critically think through each stage of the research process.
- After acceptance the research proposal serves as a guide for the researcher throughout the investigation. Progress can be monitored and milestones noted.
- It forces time and budget estimates.

4.3 TYPES OF RESEARCH PROPOSAL

Research proposals can be generally classified into student, internal and external. Student research proposals range between term paper and senior essay that are least complex to MSc thesis and PhD dissertation that are most complex. The form and content of student research proposal differs according to complexity of the student research. For instance, term papers are meant for teaching students as to how to do research where as senior essay, thesis or dissertation are supposed to develop students' knowledge on a specialized field. Research proposals are internal if they target an entity or organization and are prepared by individual or a team of researchers who are part of the entity or organization. For instance, academic and administrative staff research proposals of Mekelle University addressing efficiency and effectiveness of the university are internal proposals. The organization or entity usually provide budget for large scale internal research projects even though it is also not uncommon for the researcher to self-sponsor small scale internal research projects.

Research proposals that are not either in the student or internal proposal categories are external research proposals. External research proposals are either solicited or unsolicited. Solicited research proposals are when the customer asks for a proposal. For instance, students that look for masters scholarships abroad are expected to sell themselves by writing best research proposal according to the specific guidelines in the call for scholarship. In fact research proposal is usually a mandatory requirement to get PhD scholarship. Likewise, large scale research projects such as the NORAD of Norway, the IUC of Belgium, and the NUFU of the Netherlands call for research proposals for funding. Hence research proposals that are addressed to NORAD, IUC, NUFU etc funds are all solicited external proposals.

4.4 SECTIONS OF RESEARCH PROPOSAL PROTOCOL

A. The preliminaries

i. Title or cover page

ii. Table of contents

iii. Abstract

B. The body

1. The problem and its Approach
    - 1.1 Introduction
    - 1.2 Statement of the problem
    - 1.3 Objectives of the study
    - 1.4 Signification of the study
    - 1.5 Delimitation of the study
    - 1.6 Definition of used terms
    - 1.7 Researches Methodology
    - 1.8 Organization of the study
2. Review of the related Literature

C. The supplemental

1. Budget Breakdown
2. Time Schedule
3. Bibliography (Reference)

A. The Preliminary Parts of a Proposal

I. Title: The title is the most widely read part of your proposal. The title will be read by many people who may not necessarily read the proposal itself or even its abstract. It should be long enough to be explicit but not too long so that it is not too tedious usually between 5 and 25 words. It should contain the key words the important words that indicate the subject. Titles may sometimes be too short to be clear. For instance the title credit and poverty may suffice as a text book title but it needs to be explicit and say more if it is to serve usefully as a research title.

Generally there are three kinds of Title

1. **Indicative Title: -** This type of title states the subjects of the research (proposal) rather than the expected out come. Example the role of Agricultural credit on alleviating poverty in low potential Areas of Ethiopia.

2. **Hanging Title:** The hanging tile has two parts: a general first part followed by a more specific second part. It is useful in rewording an otherwise long clumsy and complicated indicative title. E.g. Alleviation of poverty in low potential Areas of Ethiopia: The impact of Agricultural credit.
3. **Question Title:** Question title is used less than indicative hanging title. It is, however acceptable where it is possible to use few words say less than 15 words. E.g. does Agricultural credit alleviate poverty in a low potential area of Ethiopia?

II. Table of contents: The table of contents usually headed simply CONTENTS (in full capital). List all the parts except the title page which precedes it. No page numbers appear on the title page.

III. **Abstract:** It is summary, which reflects the whole content of the proposal (most of the time less than 300 words). Abstract should be concise, informative, and should provide brief information about the whole problem to investigate.

Abstract of a proposal should contain the following points:

- ✓ Title or topic of the research
- ✓ Statement of the problem and objective
- ✓ Methodology of Investigation
- ✓ Expected result (tentative only if a researcher starts with a formulated hypothesis)

B. The body

1. The problem and its Approach

1.1. Introduction: The introduction should start with a clearly articulated statement to make the reviewer or sponsor interested in supporting the problem. The study should show how it fits in to a large field or wider problem. The impact of the research will not be seen unless a clearly visible problem exists and is clearly articulated. The main purpose of the introduction is to provide the necessary background or context for your research problem informed reviewers will already be familiar with much of the background information. So it is advisable to go straight to aspects that will be new and that add value to the problem statement it is also important to state who the target beneficiaries are and how they will benefit from the proposed projects. It should highlight how the study will contribute to solving a particular problem or minimizing its effect.

1.2. Statement of the problem: The problem statement contains the need for the research project the problem is usually represented by a management question or originating question. It

is followed by a more detailed set of objectives in this part of your work you have to explain what the problem is all about if you know the problem. State it clearly. Each word of the problem should be expressive sharp indispensable and definitive. Always state the problem in a complete grammatical sentence. Your problems should be stated so well that anyone could read it, understand it, and react to it without benefit of your presence. If for any reason your problem is not stated with such clarity, then you are merely deceiving yourself if that you yourself know what the problem is such deception will merely cause you trouble later on.

There should not be room for ambiguity in statement of the problem. Clarity in statement of the problem is important for the following three basic reasons:

- It is the foundation for the development of research problems
- It enables the researcher to describe the problem practically to think about its importance, priority and to point out all the necessary points.
- It provides the researcher with the basis for the discussion with people in the community, the relevant government agency and/or the potential funding agency.

1.3. Objective of the study: The objective section of a proposal is typically very brief usually half a paper at most. This is because the rationale for each objective has already been established in the previous section, while the way of achieving the objectives should be explained in the methodology section it should consist of both the general and specific objectives. The general objective provides a short statement on the other hand, are operation in nature. They may indicate specific types of knowledge to be produced, certain audiences to be reached, etc. These are therefore the objectives against which the success of the research will be judged. It must flow logically and clearly from the purpose, problem statement and justification already stated.

1.4. Significance of the study: In this section, the researcher indicates the importance of the research and there by convinces the reader. The researcher is thus it required to indicate what his/ her research will contribute whether the research is to provide solution or to shed light on the nature of the problem or both some researches extend the frontiers of knowledge. This section therefore enable the researcher answer questions like “what is the usefulness of this study?” and “What does this study contribute?”

1.5. Delimitation of the study (scope of the study): In this section, the researcher indicates the boundary of the study. The problem should be reduced to a manageable size delimitation is done to solve to problem using the available financial, labor and time resources. This does not

however mean that should delimit the research topic to particular issue and/or organization or place because it is less costly and take less time. Delimiting is done not to necessarily reduce the scope of the study for the stake of minimizing the effort to be exerted. This means that we should not sniff the life of the topic in the name of making it manageable. Thus, there should be balance between manageability and representativeness of the universe being studies.

1.6. Definition of used Terms: Many research works include some technical words. Thus, terms must be defined so that it is possible to know what precisely the terms used in the body of the research mean. Without knowing explicitly what the terms mean we can't evaluate the research or determine whether the researcher has carried out what in the problem was announced as the principal thrust of the research. Thus terms should be defined from the outset. There are Nominal and Operational definition of terms.

- **Normal definition:** are statements assigned to a term such as its dictionary meaning.
- **Operational Definition:** are specifications of dictionary definition of the term in to observable and hence measurable characteristics.

Terms must be defined operationally; i.e. the definition must interpret the term as it is employed in relation to the researcher' project. Sometimes students rely on dictionary definitions" dictionary definitions are seldom neither adequate nor helpful. In defining a term to researcher makes that term mean whatever he/she wishes it to mean within the particular context of the problem or its sub-problems we must know how the researcher defines the term we need not necessarily subscribe to such a definition, but so long as we know precisely what the researcher means when employing a particular term, we are able to understand the research and appraise it more objectively.

1.7. Research Methodology: Assuming that the research questions to be addressed have been clearly identified, the purpose of the methodology is to show how these questions will be answered in the most rigorous way possible. The researcher has to choose which methods to use and justify them. The nature of the problem determines the methodology to be used. Thus in this section the researcher should indicate:

- The method chosen and the reason
- The sources of data (both primary and secondary) and the reason
- The data gathering tool chosen and the reason
- The sampling techniques chosen and the reason

- The sample size chosen and the reason
- The statistical tool chosen to analyze data and the reason

A. Research design: The coverage of the design must be adapted to the purpose. For example in experimental research the materials, tests, equipment, control conditions, and other devices should be indicated

B. Source of data: at this stage the researchers try to induct the possible source of data (primary or secondary)

C. Sampling Design: The researcher explicitly defines the target population being studied and the sampling methods used example: probability or non probability? If probability;

- ✓ What is the technique of sampling?
- ✓ How will the elements be selected?
- ✓ How will the sample size be determined

Explanations of the sampling methods uniqueness of the chosen parameters or other points that need explanation should be covered with brevity. Calculations should be placed in the appendix.

D. Data collection: This part describes the specifics of gathering the data. Its contents depend on the selected design. Typically you would include a discussion on the relevance of secondary data that guided these decisions again detailed materials such as questionnaires or interview guide should be include in the appendix.

E. **Data Analysis: -** This section summarizes the methods will be used to analyze the data. The rationale for the choice of analysis approaches should be clear. This section describes data handling, preliminary analysis, statistics tests, Computer programs and other technical information.

1.8. Organization of the study: This section explains what each chapter of the research report consists of **Example: -** The study will be organized in to four chapters. The first chapter deals with the problem and its approach. The second chapter will be concerned with presenting the review of the related literature. The third chapter will treat the analysis of the data collected. The fourth chapter will bring to an end this study with summary conclusion and recommendation.

2. Review of the related literature

This section examines recent or (historically significant) research studies company data, or industry reports that act as a basis for the reposed study begin your discussion of the related literature and relevant secondary data from a comprehensive perspective moving to more specific

studies that are associated with your problem. If the problem has a historical background begins with the earliest references.

The review of related literature should give readers the context for the present study. The review should not merely summarize a series of books and articles rather it should call attention to the most important previous work identify the place of your study in relation to other research and delineate areas of agreement and disagreement in the field. The review should evaluate and interpret existing research rather than simple report repeats it.

D. The supplemental parts of research proposal

1. Budget breakdown: The budget should be presented in the form the sponsor request. It should be no more than one to two pages. But it should contain all costs needed.

2. Time Schedule: Your schedule should also include the major phases of the project their timetables and millstone that signify completion of a phase. For example major phases may be (1) exploratory interviews. (2) Final research proposal, (3) questionnaire revision, (4) field interviews, (5) editing and coding, (6) data analysis, and (7) report generation. Each of this should have an estimated time schedule.

3. Bibliography (Reference): - The concluding section of a research paper thesis or dissertation is usually an alphabetical listing of source materials. This list is generally entitled "**Bibliography**". This list allows the reader to observe the scope of the research behind the paper or to see if a particular work has been used. The bibliography may also provide the reader with a foundation for further research.

Sample of research Proposal

Title: *A Senior Paper (Proposal) on "_____" Submitted to the Department of Management for the Partial Fulfillment for the Award of Bachelor of Arts (BA) Degree in Management*

Advisor:

Submitted BY: _____

_____ University

College of Business and Economics

Department of Management

Date,xxxxxx

The preliminaries (Title or cover page, Table of contents, Abstract)

Chapter One

1. Introduction:

1.1 Background of the study

1.2 Statement of the problem

1.3 Objectives of the study (General and specific)

1.4 Signification of the study

1.5 Delimitation of the study

1.6 Definition of used terms (if any)

1.7 Researches Methodology

1.8 Organization of the study (optional)

2. **Review of the related Literature**

Time schedule and budget Breakdown

I. Time Schedule

No	**Activity**	**months**															
		Month 1				**Month2**				**Month**				**Month 4**			
	Weeks	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
1	Identification of problem																
2	Definition of the problem																
3	Literature review																
4	Redefining the problem																
5	Developing the hypothesis																
6	Preparation of the plan																
7	Preparing questionnaire																

8	Data collection																
9	Discussion and analysis																
10	Conclusion & Recommendations																
11	Editing & Finalizing the Paper																

II. Budget Breakdown

S/N	Description/Activity	Unit	Unit price	Total cost
1	Stationary materials			
2	Typing the manuscript, printing and photocopying	Ls		
Total				

3. **Bibliography**

Your bibliography might include Books, Journal Articles, Magazines and Newspapers, and sometimes other media such as Television and Radio depending on the nature of data your research demands. Bear in mind that Books and Text-Books are different. Usually, Text-Books are not preferred sources of literature for your research because they are "tertiary" sources of data. In other words, Text-Books are neither primary nor secondary sources of data collection.

APA Style of referencing Books

A book is referenced by writing name of the authors, year of publication in bracket, title of the book (in italics), edition, publisher, and place of publication respectively.

For example: Gitman, L. (2003). *Managerial Finance*, Dryden Press, Hinsdale Illinois. If the book has no author then you need information regarding title of the book, city where the book was published, and publisher. Oxford Dictionary, (2nd ed.), (1991). Oxford University Press, USA. Similarly, citation of an online book, journal, or any other online material for that matter has to include the date it was viewed. For instance: Trochim, W.M. (2004). The research methods knowledge base, 2nded. Retrieved November 14, 2009, from http://www.socialresearchmethods.met/kb/index.htm.

APA Style of referencing Journal Articles

A journal article can be referenced by writing nameof the authors, year of publication, 'title of article' (in single quotation marks), title of the journal (in italics), volume number, issue number, and page numbers.

For example: Gebregziabher (2009b). 'Financing preferences of micro and small enterprise owners in Tigray: does POH hold?' Journal of Small Business and Enterprise Development, 16 (2), 322-334. If a journal article has no author then it can be cited as follows: 'Building human resources instead of landfills' 2000. Biocycle, 41 (12), 28–9.

APA Style of referencing Magazines and Newspapers

Magazine and newspaper articles can be used to support an empirical fact. Magazine articles are cited similar to that of journal articles except that the date of publication should be written.

For example: Kluger, J. (2008, January 28). Why we love. Time, 171 (4), 54-60. Newspaper article can be cited as: Tesfaye, K. (2010, September 10). Unchanged Trade Flows May Nullify Impact of Devaluation. Addis Fortune, 11 (541). Retrieved from http://www.addisfortune.com/economic_commentary.htm. Similarly, articles from web 2.0 services such as wikipedia can also be cited as: Research Funding. (2010, August 27). In Wikipedia, the free encyclopedia. Retrieved, September 16, 2010, from http://en.wikipedia.org/wiki/Research_funding.

APA Style of referencing Audio-Visual Media

Sometimes, audio-visual media can also be referenced. Audio-visual references shall include the following: name and function of the primary contributors (e.g., producer, director), date, title, the medium in brackets, location or place of production, and name of the distributor.

For example: Anderson, R., & Morgan, C. (producers). (2008, June20). 60 Minutes[Television broadcast]. Washington, DC: CBS News.

Research Proposal preparation Guideline

Make sure that the following important points are kept in mind as a prerequisite before conducting any research:

- ✓ Researcher's interest to the topic
- ✓ Researcher's field of study/background
- ✓ Are enough sources available on the topic? (sources should be recent and inline to the objectives of the study)
- ✓ Do the researchers get an approval from the case study so that adequate and pertinent information will be obtained?
- ✓ Make sure that your research work has certain expected outcomes.
- ✓ Topic, objective, methodology, conclusion and recommendation should feed one another and it should be consistent enough.
- ✓ Objectives should be SMART (Specific, Measurable, Attainable, Relevant, and Time bounded).
- ✓ Originality and ethics should be kept in conducting a research.

Basic Contents of a Research Proposal are:

1. **Title:** should be:
   - ✓ Brief, precise, clear not too lengthy, avoid jargon words
   - ✓ Contemporary: reflect the essence of the study
   - ✓ In line with the researcher's interest
2. **Background:** this part mainly deals with the overall basic concept behind the research topic to be conducted. It has to address the following important points:
   - ✓ What do we mean by the concept of the research topic to be undertaken in general?
   - ✓ What is the importance of dealing with such issue in general?
   - ✓ What other studies have there been in this area? Journal, publications, articles, authors…..etc.
3. **Statement of the Problem:** the Statement of the Problem must clearly flow from the background. The Statement of the Problem should be seen as the nucleus around which the entire study revolves. It must therefore be clearly substantiated and elaborated on the proposal. It must be evident from the Statement of the Problem that the problem is real and important and it requires urgent attention.

The following important points should be mentioned in this part:

- ✓ The reason why this issue or topic is going to be conducted in that particular case study.
- ✓ Different citations should be incorporated in this part that states and justifies the existence of the issue that is going to be investigated.
- ✓ After identifying the gap that already exists, the researcher has to state why and how this gap/s/ could be filled.

4. **Objective of the Study:** two important information should be clearly and precisely stated here:
   - ✓ The general objective of the study and
   - ✓ The specific objective of the study (in line with the theoretical chapters).

The processes of objective definition begin by writing down broad and general objective of the study. As the process continues, the objective become more clearly defined and the research issues are narrowed. Statement of objective is of basic importance because it determine the data which are to be collected, the characteristics of the data which are relevant, relation which are to be explored, the choice of methods / techniques to be used in these explorations.

Note: It is not advisable to list out objectives in bulletins form rather it should be presented in numerical form and specific objectives would not be feasible if it exceeds more than 5 on average.

5. **Research Questions/Hypothesis**

Outlining research questions or hypothesis is important in conducting any research. The researcher has to prepare research questions that have to be addressed at the end of the study. Research questions are mostly used in descriptive studies to describe the situation. On the other hand, for hypothesis is determined to test and finally arrive at conclusion that either the null or alternative hypothesis is going to be rejected or accepted based on the finding.

6. **Significance of the study**

Contribution of the study (importance of the research), for example

- ✓ Who (people, groups, communities, NGOs, Government...etc) will be benefited from the study?

7. **Scope or Delimitation of the study**

This deals with the boundary of the research work which mainly includes the area or place and target group to be considered in the research.

8. Research Method and Methodology

This part clearly explains how the objectives will be achieved, what research population will form part of the study, and what research methods you intend using. The following should form part of this section.

8.1. Description of the Study Area

This is giving a brief overview of the area or place in which the study is going to be conducted. In addition, specific areas or issues related to the research topic should be well described in this part.

8.2. Research Design

Describe the type of research to be conducted. This should be stated based on the purpose of the study. Example, pilot survey or exploratory, descriptive research, analytical research (case and tracer study) and predictive research.

8.3. Target Groups/Study Population

This deals with identifying the population to be studied in the study. Besides, the reason why the identified target group is appropriate for this study should be justified.

8.4. Sample Size Determination

Sometimes, the entire population will be sufficiently small, and the researcher can include the entire population in the study. This type of research is called **census study**, because data is gathered on every member of the population.

But if the population is too large, depending on the cost and time available and nature of the population, participants from the target group should be considered via different computational formulas.

8.5. Sampling Methods/Techniques

Sampling methods are classified as either probability or Non-probability. In probability sampling, each members of the population has a known probability of being selected and it includes random, systematic, stratified and cluster / multistage sampling. In Non-probability sampling members are selected from a population in some nonrandom manner, which includes convenient, purposive, quota, snowball sampling.

8.6. Sources of Data

Primary and/or secondary sources of data can be employed to gather pertinent information.

8.7. Data Collection Methods/Instruments

There are different methods of data collection in both qualitative and quantitative studies. Like collecting data through experiment, survey, questionnaire (open-ended and closed-ended questions), observation, interview (structured and semi-structured), group discussion, schedule and so forth.

8.8. Data Analysis Tool

The analysis of data require a number of closely related operation such as establishment of categories, the application of these categories to raw data through coding and tabulation and then drawing statistical inference. There are two data analysis tools known as descriptive and inferential statistical tools.

Descriptive analyses tools can be done through mode, mean, median…….etc. Inferential analysis tools like ANOVA, Regression, Correlation, T-test, Z-test, comparative, and so forth. The method of analysis is considered based upon the purpose and the availability of skill.

9. Limitation of the Study

This deals with any obstacle that is encountered during conducting a research and it is often presented at the end of conducting the whole research work. The factors that should be considered as a limitation must have a negative impact on the study. For instance, if time is a limitation, what you miss because of lack of time? Otherwise time by itself can not be a limitation.

Note:

Definition of key terms/operational definition

This is defining terms that contains significant meaning of the study depending on the nature of the research topic. Example, customer satisfaction, training and development, education etc.

Table of Contents

Content **Page**

SELF ASSESSMENT QUESTION

1. On the basis of the given guideline for preparation of research proposal select any relevant business management topic and prepare a research proposal.

CHAPTER FIVE

SAMPLE DESIGN AND PROCEDURE

Learning Objectives

- *Understand the meaning and characteristics of a sample design.*
- *Explain reasons for taking a sample rather than a complete census*
- *Describe the process of identifying a target population and selecting a sampling frame*
- *Compare random sampling and systematic (non sampling) errors*
- *Identify the types of nonprobability sampling, including their advantages and disadvantages*
- *Summarize the advantages and disadvantages of the various types of probability samples*
- *Discuss how to choose an appropriate sample design, as well as challenges for Internet sampling*

5.1 INTRODUCTION

A sample design is a definite plan for obtaining a sample from a given population. It refers to the technique or the procedure the researcher would adopt in selecting items for the sample. Sample design may as well lay down the number of items to be included in the sample i.e., the size of the sample. Sample design is determined before data are collected.

Sampling is a familiar part of daily life. A customer in a bookstore picks up a book, looks at the cover, and skims a few pages to get a sense of the writing style and content before deciding whether to buy. A high school student visits a college classroom to listen to a professor's lecture.

Selecting a university on the basis of one classroom visit may not be scientific sampling, but in a personal situation, it may be a practical sampling experience. When measuring every item in a population is impossible, inconvenient, or too expensive, we intuitively take a sample.

Although sampling is commonplace in daily activities, these familiar samples are seldom scientific. For researchers, the process of sampling can be quite complex. Sampling is a central aspect of business research, requiring in-depth examination. This chapter explains the nature of sampling and ways to determine the appropriate sample design.

5.2 Basic sampling and statistical terminology

The most common concepts and terminologies in sampling are the following:

- *Census*: is study of the whole population & it involves complete enumeration of the whole population.
- *Population:* the totality of the element to be studied.
- *Element*: unit about which information is collected & which provides the basis of analysis.
- *Sample:* a small proportion of a population selected for observation and analysis from a population in accordance with specified procedures.
- *Sampling frame*: the actual list of sampling units from which the sample is selected.
- *Sample size*: the number of sampling units selected for observation and analysis.
- *Statistics*: The summary description of a given variable in the population.
- *Variable*: a set of mutually exclusive characteristics such as sex, age, income, etc.
- *Sampling error*: Although the sample is the part of the population it cannot be expected generally to supply full information about the population. So there may be in most cases difference between statistics and parameters. The discrepancy between a parameter and its estimate (statistics) due to sampling process is known as sampling error (i.e., the difference between the value of a sample statistics (such as the sample mean) and the true value of the population parameter (such as the population mean).
- *Non- sampling error*: In all research /survey some errors may occur during collection of actual information. These errors are called non- sampling error.

Reasons for selecting sample: Why sample?

Sampling is inevitable in the following situations:

- Complete enumeration are practically impossible when the population is infinite,
- When the results are required in short time - it would be too time consuming to study the whole units in the population.
- When the area of survey is wide - it would to expensive and time consuming as will to study the whole units in the population
- When resource (Money, time and trained persons) are limited.

- When the items or units are destroyed under investigation for example a company to demonstrate that their car can survive certain crash tests. Obviously, the company cannot expected to crash every car, to see if it survives, the company crash only the sample of cars.

Principles of sampling

Samples have to provide good estimate. The following principle tells us that the sample methods provide such good estimate.

1. *Principle of statistical regularity*: A moderately large number of units chosen at random form large groups are almost sure on the average to possess the characteristics of the large group.
2. *Principle of Inertia of large number*: Other things being equal, as the sample size increase the result tend to be more accurate and reliable.
3. *Principle of validity*: This states that the sampling methods provide valid estimate a bout the population units (parameters).
4. *Principle of Optimization*: The principle takes in to account the desirability of obtaining a sampling design which gives optimum result. This minimizes the risk/ loss of the sampling design.

5.3 Census Survey Versus Sample Survey

The data which is need for a research could be obtained from primary and secondary sources. There are two methods of study in using primary data for research : Census and Survey

Census Survey: is collecting all the necessary data from the whole population under study.

Advantages of Census Method

- Completeness: data are obtained from each and every unit of population in the study area.
- Originality: all the target groups are participated in the study.
- Precision (accuracy) & reliability: the results obtained are likely to be mote representative, accurate, & consistent.
- Less sampling error: - there is no subjective judgment in selection of some study units from the entire population.
- Wide applicability: - the data collected has a wide application in the country as a whole.

Disadvantage of Census Method

- Huge resources (HR, financial, time resources) requirements
- Time constraints: requires long period of time
- Impossibility of checking biasness,
- Not appropriate for short term study.

Sample Survey: is a research design in which information is gathered from a sample of respondents.

Assumptions or rationales for survey:

a. ***Homogeneity****:* - survey is based on the assumption that groups have certain essential common traits. There is no basic difference in the nature of the units of the universe.
b. ***Representativeness***: - Because of the law of statistical regularity the groups chosen through sampling from the whole population have the likely of the characteristics of the population.
c. ***Relativity****:* The results of sampling method may not be 100% accurate but they are sufficiently accurate
d. ***Adequacy*****:** the size of the sample should be adequate enough, other wise it may not represent the characteristics of the universe.

Survey may be cross sectional and longitudinal designs

A. *In cross sectional survey*, data are collected at one point in time from a sample selected to describe some larger population at that time.
B. *Longitudinal studies* are survey of respondents at different points in time. In this method respondents are asked in different moments of times.

Errors in Survey Research

1. *Random sampling error*: the difference between the result of a sample and the result of a census conducted using identical procedures.
2. *Systematic error*: error resulting from imperfect aspect of the research design that causes response error or from a mistake on the execution of the research. Systematic error may be: respondent & Administrative error.

I. Respondent Error: are of two types

*A. Non Response Error***:** The statistical difference between a survey that includes only those who responded and a survey that also includes those who failed to respond. Non response error occurs because of: *Not- at- home, Refusal, Self selection bias*

*B. Response Bias***:** error that occurs when respondents tend to answer in a certain direction: consciously or unconsciously misrepresent the truth. Response bias may:

- ✓ *Consent Bias*: When individuals have tendency to agree with all questions or to indicate a positive connotation
- ✓ *Extremity bias*: results from response style varying from person to person.
- ✓ *Interviewer bias*: Bias in the responses of subjects due to the influence of the interviewer.
- ✓ *Auspices/Sponsorship Bias*: Bias in the responses of subject caused by respondent being influenced by the organization sponsored the study.

II. Administrative error: is an error caused by improper administration of the research task. Data processing error, Sample section error, Interviewer error, Interviewer cheating

Advantages of Sample Survey Study Design

- Viability: the results that the researches find out from the study can be obtained in a short period of time.
- Thoroughly: the area of the study is small.
- Administrative convenience
- Practicability
- Possibility of checking biasness

Disadvantages of Sample Survey Study Design

- Possibility of bias and prejudices
- Difficulty in selecting representative
- Need for specific and specialized knowledge

Characteristics of A Good Sample Design

From what has been stated above, we can list down the characteristics of a good sample design as under:

- Sample design must result in a truly representative sample.
- Sample design must be such which results in a small sampling error.
- Sample design must be viable in the context of funds available for the research study.

- Sample design must be such so that systematic bias can be controlled in a better way.
- Sample should be such that the results of the sample study can be applied, in general, for the universe with a reasonable level of confidence.

5.4 Types Sampling Design and Procedures

There are different types of sample design based on two factors viz. the representation basis and the Element Selection Technique. On the representation basis the sample may be probability sampling or it may be non- probability sampling. Probability sampling is based on the concept of random selection. Whereas non-probability is non-probability is non-rand sampling.

On the element selection basis the sample may be restricted or unrestricted. When each sample element is drawn individually from the population at large, then the sample so drawn is known as unrestricted sample, whereas all other forms of sampling are covered under the term restricted sampling. However, Sample design is basically of two types: probability and non- probability sampling.

Table 5.1 Types of sampling design

Element selection Technique	Representation Basis	
	Probability	Non-probability
Unrestricted	Random Sampling (simple)	Haphazard/ Convenience sampling
Restrict	Cluster sampling Systematic sampling Stratified sampling	Purposive sampling (Quota, judgment sampling)

5.4.1 Probability Sampling

A probability sampling is on where the selection of the units from the population is made according to known probability. The sample is based on probability theory. Every unit of the population of interest must have a know non-zero chance of being selected in to the sample.

- Assigns equal probability/ chance to each units of the population (Every element has equal (non zero) chance of being selected.

- Error of estimation/significance of results obtained can be measured.
- Best technique for representative sample (i.e., produce representative sample).
- Ensure the law of statistical regularity (i.e., on an average, sample chosen will have the same composition and structure as the universe/ population.)
- Even each combination (possible) of sample will have equal probability of being picked.
- All choices are independent of one another.

Types of Probability Sampling

1. Simple Random Sampling

The simplest of the methods of probability sampling is known as the method of simple random sampling, often known as the method of random sampling. In this method an equal probability of selection is assigned to each available unit of the population at the first and each subsequent draw. Thus, if the number of units in the population is N, the probability of selecting any unit of the first draw is 1/N and the probability of selecting any unit from among the available (N–1) units at the second draw is 1/(N–1) and so on. Simple random sampling may also be defined as a method of selecting n units out of N units in the population such that each possible sample among the total possible ${}^{N}c_{n}$ samples has an equal chance of its being selected.

In case of simple random sampling the probability of a specified unit of the population being selected at any given draw is equal to the probability of its being selected at the first draw. The successive draws may be made with or without replacing the units selected in the preceding draw. The fanner is called the procedure of sampling with replacement, the latter is called sampling without replacement. The basic assumption for simple random sampling is that the population can be subdivided into a finite number of distinct and identifiable units and sampling frame is available.

Procedure of Selecting a Random Sample

Commonly used procedures for selecting a random sample are: (i) Lottery Method, and (ii) Random Number Tables Method.

Lottery Method: Each unit in the population of N units may be associated with a chit or ticket such that each sampling unit has its identification mark from 1 to N. All the chits or tickets are placed in a container, in which a thorough mixing is possible before each draw. Chits or tickets may be drawn one by one and may be continued until a sample of the desired size is obtained.

The main demerit of this method is that when the size of population is large, it may be too difficult to achieve a thorough reshuffling of units before each draw.

Table of Random Numbers: As the lottery method cannot be used, when the population is infinite, the alternative method is that of using the table of random numbers. A random number table is so constructed that all digits 0 to 9 appear independent of each other with equal frequency. If we have to select sample from population of size N= 100, then the numbers from 001 to 100.

Procedures: Units of the population from which a sample is required are assigned with equal number of digits. When the size of the population is less than thousand, three digit numbers 000, 001, 002, --- 999 are assigned. We may start at any place and may go on in any direction such as a column wise or row-wise in a random number table. But consecutive numbers are to be used. If any random number is greater than the population size N the N can be subtracted from the random number drawn. This can be repeatedly until the number is less than N or equal to N.

Example: In an area there are 500 families. Using the following extract from a table of random number select a simple of 15 families to find out the standard of living of the families in that area.

4652	3819	8431	2150	2352	2472	0043	3488
9031	7617	1220	4129	7148	1943	4890	1749
2030	2327	7353	6007	9410	9179	2722	8445
0641	1489	0328	0385	8488	0422	7209	4950

In the above random number table we can start from any row/column and read three digit numbers continuously row-wise or column-wise.

Now we start from the third row, the numbers are:

203	023	277	353	600	794	109
179	272	284	450	641	148	908
280.						

Since some numbers are greater than 500 we subtract 500 from those numbers and we rewrite the selected numbers as follow.

N203	023	277	353	100	294	109
179	272	284	450	641	141	408
280.						

Advantages of Simple Random Sampling

- Free from subjectivity
- Simplicity
- More representative
- Easily assess accuracy

Disadvantage Of Simple Random Sampling

- It requires complete lists of the universe
- It is not suitable for respondents (dispersed) over a large geographic area.
- For a given degree of accuracy, this method requires larger sample as compared to stratified
- Lack of control of the investigator.

2. Systematic Random sampling

If the sampling units are arranged in a systematic manner, then sample is drawn not at random but by taking sampling units systematically at equally spaced intervals along same order. The sample obtained in this manner is called a systematic sample and the technique is called the systematic sampling. A systematic random sample is obtained by selecting one unit on a random basis and then choosing additional elementary units at equi-spaced intervals until the desired number of units is obtained.

Each unit in the population is identified and each unit has an equal chance of being in the sample. It is also called Quasi- random sampling. Selection procedures: systematic sampling involves three steps:

1st: Determine the sampling interval, which is symbolized by "**K"** (i.e., it is the population size divided by the desired sample size).

2nd: Randomly select a number between **1** and **k** and include that person/unit in your sample.

3rd: Include all **kth** elements in your sample. For example if **K** is**10** and your random selected number between 1 and 10, for instance 5, then you will select persons **5,15,25----** etc**.** When you get to the end of your sampling frame you will have all the people to be included in your sample.

For example, suppose there are 100 students in your class and you want select a sample of 20 students. Further suppose that the names are listed on a piece of paper in an alphabetical order. If you choose to use systematic random sampling, divide 100 by 20, you will get 5 as the sampling interval. Randomly select any number between 1 and 5. Suppose the number you have picked is 4, that will be your starting number. So student number 4 has been selected at random and then you will select every 5^{th} name until you reach the last one. You will end up with 20 selected students.

Advantages of Systematic Sampling

- It is very easy to operate & checking can also be & done quickly.
- It results in representative sample because of its randomness and probability features.

Disadvantages of Systematic Sampling

- it works well only it the completed & up-to date frame is available & if the units are randomly arranged
- Any hidden periodicity in the list will adversely affect the representative of the sample.

3. Stratified Sampling

Simple random sampling is the most appropriate when the entire population from which the sample is taken is homogeneous. Stratified sampling techniques are generally followed when the population is heterogeneous and where it is .possible to divide it into certain homogeneous sub-populations, which are called strata. The strata differ from one another but each is homogeneous within itself. The units are selected at random from each of these strata. The number of units selected from different strata may vary according to their relative importance in the population. The sample, which is the aggregate of the sampled units of each of the stratum, is called a stratified sample and the technique of drawing this sample is known as stratified sampling.

Allocation of Sample in Different Strata

For management purposes the most effective utilization of resources is achieved if the variance of the estimator is minimized for a fixed budget or the cost of sampling is minimized for a fixed variance of the estimator. Keeping in view the stratum size, the variability within stratum and the cost per observation the techniques of proportional allocation and optimum allocation are commonly used.

a. Proportional Allocation: In this procedure the number of sampling units n_i allocated to the i-th stratum is proportional to the number of units in the population.

Thus $n_i = \frac{N_i}{N} \times n$; i = 1, 2, …, k

Proportional allocation is an efficient and suitable design when the cost of selecting a unit is equal for each stratum and there is no difference in within stratum variance.

b. Optimum Allocation: Let C_i be the cost of sampling one unit from the i-th stratum having variance σ_i^2. Assuming σ_i^2 to be known, n_i is given by

$$n_i = n \frac{N_i \sigma_i / \sqrt{C_i}}{\sum N_i \sigma_i / \sqrt{C_i}}; \qquad i = 1, 2, \ldots, k$$

Thus, the sample size would larger if

- the stratum size is larger
- stratum variance is larger
- The sampling cost in the stratum is lower

Illustration 5.1: Using proportional allocation, allocate the sample of size 30 to be drawn from a population of 800 units divided into 3 strata of sizes $N_1 = 400$, $N_2 = 240$ and $N_3 = 160$.

Solution: N = 800, n = 30, $N_1 = 400$, $N_2 = 240$ and $N_3 = 160$

$$n_1 = n \times \frac{N_1}{N} = 30 \times \frac{400}{800} = 15$$

$$n_2 = n \times \frac{N_2}{N} = 30 \times \frac{240}{800} = 9$$

$$n_3 = n \times \frac{N_3}{N} = 30 \times \frac{160}{800} = 6$$

Illustration 5.2: A population of 1000 units is divided into three strata so that $N_1 = 500$, $N_2 = 200$ and $N_3 = 300$ having standard deviation of 15, 18 and 5 respectively. Assuming cost per unit sampling same for each stratum, allocate a sample of size 84 using optimum allocation.

Solution: N = 1000, n = 84

Stratum size (N_i)	**Stratum standard deviation (σ_i)**	**$N_i\sigma_i$**
500	15	7500
200	18	3600
300	5	1500
		126000

Since, $n_i = n \times \frac{N_i\sigma_i / \sqrt{C_i}}{\sum N_i\sigma_i / \sqrt{C_i}} \sqrt{C_i}$; $i = 1, 2, \ldots, k$

Therefore,

$$n_1 = n \times \frac{N_1\sigma_1}{\sum N_i\sigma_i} = 84 \times \frac{500 \times 15}{12600} = 50$$

$$n_2 = n \times \frac{N_2\sigma_2}{\sum N_i\sigma_i} = 84 \times \frac{200 \times 18}{12600} = 24$$

$$n_3 = n \times \frac{N_3\sigma_3}{\sum N_i\sigma_i} = 84 \times \frac{300 \times 5}{12600} = 10$$

Advantages of Stratified Sampling Method

- If a correct stratification has been made, even a small number of units will form a representative sample
- It is more accurate and avoids bias to great extent
- It enables to achieve different degree of accuracy for d/t segment of the population
- Replacement of case is easy if the original case is not accessible to study.
- It enables d/t research methods & procedures to be used in d/t strata.
- Greater control of t investigator.

Disadvantages of Stratified Sampling

- It is very difficult to divide the universe in to homogeneous strata
- It the strata are over-lapping or disproportionate, the selection of samples may not be representative.

4. Cluster Sampling

In some situations the elementary units are in. the form of groups, composed of smaller units. A group of elementary units is called a cluster. Sampling is done by selecting a sample of clusters and then carrying out the complete enumeration of clusters. This is called cluster sampling. For example in taking a sample of households we select a few villages and then enumerate them completely. The systematic sampling may also be taken as the cluster sampling in which a sample of one cluster is taken and then it is completely investigated. Cluster sampling is typically used when the researchers cannot get a complete list of the members of a population they wish to study but can get a complete list of groups or 'clusters' of the population. It is also used when a random sample would produce a list of individuals so widely scattered that surveying them would prove to be much expensive.

This sampling technique may be more practical and/or economical than simple random sampling or stratified sampling. For example, a cluster may be something like a village or a school in a state. So you decide all the schools in Hisar are 'clusters. You want 20 schools selected. You can use simple or systematic random sampling to select the schools, then every school selected becomes a cluster. If your interest is to interview teachers on their opinion of some new program, which has been introduced, then all the teachers in a cluster must be interviewed. Though very economical cluster sampling is very susceptible to sampling bias. Like for the above case, you are likely to get similar responses from teachers in one school due to the fact that they interact with one another.

5.4.2 Non Probability Sampling

Non probability sampling is the process of sample selection based on personal judgment and knowledge. Under this method a desired number of sample units are selected deliberately or purposely depending up on the object of the inquiry so that only the important items representing the true characteristics of the population are including in the sample.

Advantages of Non- Probability Sampling

- requires lower cost
- requires less time
- Acceptable if level of accuracy of the research results is not utmost importance.

Disadvantages of Non—probability sampling

- The research results can't be projected generalized to the total population.
- The researcher doesn't know the degree to which the sample is representative of the population from which is drawn.
- Sampling error can't be estimated.

Types of Non-Probability Sampling

1. Convenience Sampling

As the name suggests, convenience sampling refers to sampling by obtaining people or units that are conveniently available. A research team may determine that the most convenient and economical method is to set up an interviewing booth from which to intercept consumers at a shopping center. Just before elections, television stations often present person-on-the-street interviews that are presumed to reflect public opinion. (Of course, the television station generally warns that the survey was "unscientific and random") The college professor who uses his or her students has a captive sample—convenient, but perhaps not so representative.

Researchers generally use convenience samples to obtain a large number of completed questionnaires quickly and economically, or when obtaining a sample through other means is impractical. For example, many Internet surveys are conducted with volunteer respondents who, either intentionally or by happenstance, visit an organization's Web site. Although this method produces a large number of responses quickly and at a low cost, selecting all visitors to a Web site is clearly convenience sampling. Respondents may not be representative because of the haphazard manner by which many of them arrived at the Web site or because of self-selection bias.

Similarly, research looking for cross-cultural differences in organizational or consumer behaviour typically uses convenience samples. Rather than selecting cultures with characteristics relevant to the hypothesis being tested, the researchers conducting these studies often choose cultures to which they have access (for example, because they speak the language or have contacts in that culture's organizations). Further adding to the convenience, cross-cultural research often defines "culture" in terms of nations, which are easier to identify and obtain statistics for, even though many nations include several cultures and some people in a given

nation may be more involved with the international business or academic community than with a particular ethnic culture.

Here again, the use of convenience sampling limits how well the research represents the intended population. The user of research based on a convenience sample should remember that projecting the results beyond the specific sample is inappropriate. Convenience samples are best used for exploratory research when additional research will subsequently be conducted with a probability sample.

2. Judgment Sampling

Judgment (purposive) sampling is a nonprobability sampling technique in which an experienced individual selects the sample based on his or her judgment about some appropriate characteristics required of the sample member. Researchers select samples that satisfy their specific purposes, even if they are not fully representative. The consumer price index (CPI) is based on a judgment sample of market-basket items, housing costs, and other selected goods and services expected to reflect a representative sample of items consumed by most Americans. Test-market cities often are selected because they are viewed as typical cities whose demographic profiles closely match the national profile. A fashion manufacturer regularly selects a sample of key accounts that it believes are capable of providing information needed to predict what may sell in the fall. Thus, the sample is selected to achieve this specific objective.

Judgment sampling often is used in attempts to forecast election results. People frequently wonder how a television network can predict the results of an election with only 2 percent of the votes reported. Political and sampling experts judge which small voting districts approximate overall state returns from previous election years; then these bellwether precincts are selected as the sampling units. Of course, the assumption is that the past voting records of these districts are still representative of the political behaviour of the state's population.

3. Quota Sampling

Suppose a firm wishes to investigate consumers who currently subscribe to an HDTV (high definition television) service. The researchers may wish to ensure that each brand of HDTV televisions is included proportionately in the sample. Strict probability sampling procedures

would likely underrepresent certain brands and over represent other brands. If the selection process were left strictly to chance, some variation would be expected.

The purpose of quota sampling is to ensure that the various subgroups in a population are represented on pertinent sample characteristics to the exact extent that the investigators desire. The interviewer is responsible for finding enough people to meet the quota. Aggregating the various interview quotas yields a sample that represents the desired proportion of each subgroup.

The major advantages of quota sampling over probability sampling are speed of data collection, lower costs, and convenience. Although quota sampling has many problems, carefully supervised data collection may provide a representative sample of the various subgroups within a population.

Quota sampling may be appropriate when the researcher knows that a certain demographic group is more likely to refuse to cooperate with a survey. For instance, if older men are more likely to refuse, a higher quota can be set for this group so that the proportion of each demographic category will be similar to the proportions in the population. A number of laboratory experiments also rely on quota sampling because it is difficult to find a sample of the general population willing to visit a laboratory to participate in an experiment.

4. Snowball Sampling

A variety of procedures known as snowball sampling involve using probability methods for an initial selection of respondents and then obtaining additional respondents through information provided by the initial respondents. This technique is used to locate members of rare populations by referrals. Suppose a manufacturer of sports equipment is considering marketing a mahogany croquet set for serious adult players. This market is certainly small. An extremely large sample would be necessary to find 100 serious adult croquet players. It would be much more economical to survey, say, 300 people, find 15 croquet players, and ask them for the names of other players.

Reduced sample sizes and costs are clear-cut advantages of snowball sampling. However, bias is likely to enter into the study because a person suggested by someone also in the sample has a higher probability of being similar to the first person. If there are major differences between those who are widely known by others and those who are not, this technique may present some

serious problems. However, snowball sampling may be used to locate and recruit heavy users, such as consumers who buy more than 50 compact discs per year, for focus groups. As the focus group is not expected to be a generalized sample, snowball sampling may be appropriate.

What Is the Appropriate Sample Design?

A researcher who must decide on the most appropriate sample design for a specific project will identify a number of sampling criteria and evaluate the relative importance of each criterion before selecting a sampling design. This section outlines and briefly discusses the most common criteria.

A. Degree of Accuracy

Selecting a representative sample is important to all researchers. However, the degree of accuracy required or the researcher's tolerance for sampling and non-sampling error may vary from project to project, especially when cost savings or another benefit may be a trade-off for a reduction in accuracy.

For example, when the sample is being selected for an exploratory research project, a high priority may not be placed on accuracy because a highly representative sample may not be necessary. For other, more conclusive projects, the sample result must precisely represent a population's characteristics, and the researcher must be willing to spend the time and money needed to achieve accuracy.

B. Resources

The cost associated with the different sampling techniques varies tremendously. If the researcher's financial and human resources are restricted, certain options will have to be eliminated. For a graduate student working on a master's thesis, conducting a national survey is almost always out of the question because of limited resources. Managers concerned with the cost of the research versus the value of the information often will opt to save money by using a nonprobability sampling design rather than make the decision to conduct no research at all.

C. Time

A researcher who needs to meet a deadline or complete a project quickly will be more likely to select a simple, less time-consuming sample design.

D. Advance Knowledge of the Population

Advance knowledge of population characteristics, such as the availability of lists of population members, is an important criterion. In many cases, however, no list of population elements will be available to the researcher. This is especially true when the population element is defined by ownership of a particular product or brand, by experience in performing a specific job task, or on a qualitative dimension. A lack of adequate lists may automatically rule out systematic sampling, stratified sampling, or other sampling designs, or it may dictate that a preliminary study be conducted to generate information to build a sampling frame for the primary study.

E. National versus Local Project

Geographic proximity of population elements will influence sample design. When population elements are unequally distributed geographically, a cluster sample may become much more attractive.

5.5 Sample Size Determination

There is no set percentage that is accurate for every population. What matters is the actual number or size of the sample, not the percentage of the population. If you surveyed 20% of a group of 300 program participants to produce a sample of 60 people, you would *under represent* the population, since there is a fairly large chance in a small group that the respondents you choose will vary from the whole population.

Steps in Selecting a Sample-Size

An appropriate sample size is based on a number of accuracy factors that you must consider. Together they comprise a five step process:

Step One: Determine Goals

- First, know the size of the population with which you're dealing. If your population is small (200 people or less), it may be preferable to do a **census** of everyone in the population, rather than a **sample**. However, if the population from which you want to gather information is larger, it makes sense to do a sample.
- Second, decide the methods and design of the sample you're going to draw and the specific **attributes or concepts** you're trying to measure.
- Third, know what kind of resources you have available, as they could be a limitation on other steps below such as your level of precision.

Step Two: Determine the Desired Precision of Results

The *level of precision* is the closeness with which the sample predicts where the true values in the population lie. The difference between the sample and the real population is called the *sampling error*. If the sampling error is ±3%, this means we add or subtract 3 percentage points from the value in the survey to find out the actual value in the population. For example, if the value in a survey says that 65% of farmers use a particular pesticide, and the sampling error is ±3%, we know that in the real-world population, between 62% and 68% are likely to use this pesticide. This range is also commonly referred to as the **margin of error**.

Step Three: Determine the Confidence Level

The confidence level involves the **risk** you're willing to accept that your sample is within the average or "bell curve" of the population. A confidence level of 90% means that, were the population sampled 100 times in the same manner, 90 of these samples would have the true population value within the **range of precision** specified earlier, and 10 would be unrepresentative samples. Higher confidence levels require larger sample sizes. *A 95% confidence level* is standard for most social-science applications, though higher levels can be used.

Step Four: Estimate the Degree of Variability

Variability is the degree to which the attributes or concepts being measured in the questions are distributed throughout the population. A heterogeneous population divided more or less 50% 50% on an attribute or a concept, will be harder to measure precisely than a homogeneous population, divided say 80%-20%. Therefore, the higher the degree of variability you expect the distribution of a concept to be in your target audience, the larger the sample size must be to obtain the same level of precision.

To come up with an estimate of variability, simply take a reasonable guess of the size of the smaller attribute or concept you're trying to measure, rounding up if necessary. If you estimate that 25% of the population in your county farms organically and 75% does not, then your variability would be 0.25 (which rounds up to 30%) *If variability is too difficult to estimate, it is best to use the conservative figure of 50%.*

Step Five: Estimate the Response Rate

The base sample size is the number of responses you must get back when you conduct your survey. However, since not everyone will respond, you will need to increase your sample size,

and perhaps the number of contacts you attempt to account for these non-responses. To estimate response rate that you are likely to get, you should take into consideration the method of your survey and the population involved. Direct contact and multiple contacts increase response, as does a population which is interested in the issues, involved, or connected to the institution doing the surveying, or, limited or specialized in character. You can also look at the rates of response that may have occurred in similar, previous surveys.

Characteristics of Good sample size

- The large the size of the universes, the bigger should the samples size
- If the resources available are vast a lager sample size could be taken.
- The greater the degree of accuracy desired the larger should be the samples size.
- If universe consists of homogeneous units a small sample may serve the purpose & Vic verse.
- For intensive & continuous study a small sample may be suitable.

SELF ASSESSMENT QUESTIONS

1. What do you mean by sample design? What points should be taken into consideration by a researcher in developing a sample design for his research project.
2. What are probabilities and non-probability sampling designs? Why probability sampling is generally preferred in comparison to non-probability sampling?
3. How would you differentiate between simple random sampling and stratified random sampling designs? Explain clearly giving examples.
4. What is simple random sampling? Explain the concept of sampling with and without replacement.
5. Explain the procedures of selecting a simple random sample.
6. A certain population is divided into five strata with sizes 2000, 2000, 1800, 1700, and 2500 respectively. Respective standard deviations are 1.6, 2.0, 4.4, 4.8, and 6.0 and further the expected sampling cost in the first two strata is Rs. 4 per interview and in the remaining three strata the sampling cost is Rs. 6 per interview. How should a sample of size n = 226 be allocated to five strata if we adopt proportionate sampling design; if we adopt disproportionate sampling design considering (i) only the differences in stratum variability (ii) differences in stratum variability as well as the differences in stratum sampling costs.
7. Describe the difference between a probability sample and a nonprobability sample.
8. In what types of situations is conducting a census more appropriate than sampling? When is sampling more appropriate than taking a census?
9. Comment on the following sampling designs:
    a. A citizen's group interested in generating public and financial support for a new university basketball arena prints a questionnaire in area newspapers. Readers return the questionnaires by mail.
    b. A department store that wishes to examine whether it is losing or gaining customers draws a sample from its list of credit card holders by selecting every tenth name.\
    c. A motorcycle manufacturer decides to research consumer characteristics by sending one hundred questionnaires to each of its dealers. The dealers will then use their sales records to track down buyers of this brand of motorcycle and distribute the questionnaires.

d. An advertising executive suggests that advertising effectiveness be tested in the real world. A one-page ad is placed in a magazine. One-half of the space is used for the ad itself. On the other half, a short questionnaire requests that readers comment on the ad. An incentive will be given for the first thousand responses.
e. A research company obtains a sample for a focus group through organized groups such as church groups, clubs, and schools. The organizations are paid for securing respondents; no individual is directly compensated.
f. A researcher suggests replacing a consumer diary panel with a sample of customers who regularly shop at a supermarket that uses optical scanning equipment. The burden of recording purchases by humans will be replaced by computerized longitudinal data.

CHAPTER SIX

DATA SOURCE AND DATA COLLECTION METHODS

Learning Objectives

- *Identify unit of analysis and unit of observation of any research topic*
- *Develop skill of identification and collection primary data*
- *Develop the skill of identification and collection of secondary data*
- *Identify the full variety of secondary data that are available;*
- *Use a range of techniques to search for secondary data;*
- *Evaluate the suitability of secondary data for answering your research question(s) and meeting your objectives.*
- *be aware of approaches to data collection for each type of observation;*

6.1 INTRODUCTION

If your research is not theoretical then you need to plan for empirical data collection. Identification of sources of data and sampling design are pre-requisites of an actual data collection. Data sources can be generally classified into: primary and secondary sources. Ideally data are collected from all members of a given population (or people, objects, work units, departments, organizations). Nevertheless, because of time and cost constraints you may need to take representative sample such that conclusions based upon the sample data could be generalized onto the defined population if certain statistical conditions are met.

Unit of Analysis versus Unit of Observation

Unit of analysis is the subject of a research about which conclusion is to be drawn. In survey research the random sample are the units of analysis because the generalized conclusion in effect explores, describes, or explains the population from which the sample is drawn.

Unit of observation is the person, event, or object from which the data, regarding the units of analysis, is collected. The unit of analysis and unit of observation can be identical. That is, data about the sample can be collected from the sample itself. On the other hand, the unit of observation of a research can be different from the unit of analysis.

For example, the sample of your research could be a set of small and micro enterprises in Ethiopia but your unit of observation could be owners of the small and micro enterprises in question.

6.1 DATA SOURCE

6.1.1 SOURCES OF PRIMARY DATA

Primary data are original or un-interpreted accounts pertaining to people, objects, or events that are collected for the task at hand. For example, you might be interested to study "the impact of board composition on company performance". Information regarding each members of board of directors of a company can be collected either by 1) directly asking a set of questions to the board members themselves, 2) tracking audio and video speech recordings of the board members, 3) examining minutes of board meetings, 4) letters, memos or emails exchanged, 5) newspaper articles at the time of event, 6) asking a set of questions to respondents with first-hand information about the board members and etcetera.

Primary data can also be generated on a controlled environment that is simulation. For instance, to study "the impact of board composition on company performance" you may assign board member roles to selected students thereby establishing control and experimental groups. Structured questionnaire or similar data collection apparatus could be prepared to collect the experimental data. Likewise, primary data can also be generated using simulation software if the statistical properties of the variables are known. Specifically, simulation requires information regarding statistical distribution, a measure of central tendency or mean, a measure of dispersion or standard deviation, a measure of peakedness or kurtosis, and a measure of tail length or skewness.

Overview of primary data collection techniques

There are a number of data collection techniques some of which are: observation, content analysis, questionnaire, interview, key informants, focus group discussion, nominal group technique, and Delphi method.

1. Observation

Observation is a technique that involves systematically selecting, watching and recording behaviour and non-behaviour characteristics of living beings, objects or phenomena. Observation of human behavior is a much-used data collection technique. For instance, if you want to study on the topic "Impact of energy efficiency on energy expenditure at Mekelle University" one method of data collection could be observation of student and staff behavior with regard to energy efficiency.

Observation method of data collection can be designed as either participant or nonparticipant. In participant observation, the researcher actually participates in the event or phenomenon being observed. Good example of participant observation is the Ethiopian Television drama titled "Gemena" televised since August 2009. In participant observation the observer may be known by all of the observed, known only by some of the observed, or may be totally concealed from the observed. On the other hand, in nonparticipant observation the observer is outside the social setting of the observed.

Observation could be directly observed an observer that is physically present and personally monitors what takes place. As an alternative, observation could also be indirectly observed with the help of mechanical recordings, cameras, or other electronic equipment.

Observational studies can be classified based upon the degree structure and researcher involvement in the natural environment. Based on degree of structure, an observational study can be either structured or unstructured. Structured observation can be conducted either within natural environment or within a laboratory. Similarly, unstructured observation can be made either within natural environment or within a laboratory. An unstructured study within natural environment requires you to be part of the social setting.

For example, you may want to undertake an exploratory study on "the degree of corrupt behavior in the Audit Bureau of Tigray regional state". One way of doing this type of research is to be an employee of the bureau in order to observe the natural behavior employees and managers in the bureau. On the other hand, in a structured study within a laboratory environment, questionnaire-like checklists are used to collect the actual data. The observation may be at a factual level such as age, gender, height, etc or it may involve inference such as the degree of motivation of the observed, attitude of the observed towards a stimulus and the like.

2. Questionnaire

A written questionnaire, also referred to as self-administered questionnaire, is a data collection tool in which written questions are presented and given to respondents. Structured questionnaire is common data collection tool in survey researches. It can be

administered to respondents in different ways such as 1) Sending questionnaires by mail with clear instructions on how to answer the questions and asking for mailed responses, 2) Gathering all or part of the respondents in one place at one time, giving oral or written instructions, and letting the respondents fill out the questionnaires, or 3) Hand-delivering questionnaires to respondents and collecting them later.

3. Interview

Interview is a data-collection technique that involves oral questioning of respondents, either individually or as a group. Answers to the questions posed during an interview can be recorded by writing them down (either during the interview itself or immediately after the interview) or by tape-recording the responses, or by a combination of both. Interviews can be either unstructured or structured. Unstructured interview is very important to study sensitive issues such as assessment on the prevalence of corruption in an organization. If you are using unstructured interview for your research then you may use a list of topics rather than fixed questions. Sequence of the topics has to be determined by the flow of the discussion. That is, unstructured interview is more flexible. On the other hand, structured interview presumes that you are aware of the subject matter that is why interview questionnaire is used in structured interviews. In general, unstructured interview method of data collection is particularly useful in exploratory researches whereas structured interview is good for descriptive and explanatory researches.

4. Key informants

The use of key informants is another important technique to gain access to potentially available information. Key informants could be knowledgeable community leaders or administrative staff at various levels and one or two informative members of the target group of your research. For instance, if you want to study "time series analysis of energy cost efficiency in Mekelle University" you may collect primary data using the method of key informants. Method of key informants is good when the types of data you need are relatively objective - like energy expense of Mekelle University.

5. Focus group discussions (FGD)

The focus group is a special type of group in terms of purpose, size, composition, and procedures. A focus group is typically composed of seven to twelve participants who are unfamiliar with each other and conducted by a trained interviewer. You may be interested to study "the determinants of tax evasion in Tigray regional state". You may create a permissive environment in the focus group that nurtures different perceptions and points of view, without pressuring participants to vote, plan, or reach consensus about tax evasion in the region. In FGD the facilitator sets the agenda and lets the participants brainstorm on the agenda thereby specifying the points of discussion. The group discussion is conducted several times with similar types of participants to identify trends and patterns in perceptions. FGD can be conducted in a meeting hall or using FM radio or television as a medium. Moreover, online services such as Facebook and Twitter can also be used to run a focus group discussion.

6. Nominal group technique (NGT)

The nominal group technique is a method to identify issues of concern to special interest groups or the public at large. The NGT is used to obtain insight into group issues, behaviors and future research needs. In NGT discussants are given the chance to list down and prioritize their own idea about the topic in question. Then each NGT member presents the prioritized points and accordingly group discussion starts. As a result of the group discussion, a consolidated list of issues is developed. Finally, NGT members prioritize the consolidated list of issues by voting on it. The NGT could be helpful in developing structured questionnaire.

7. Delphi method

The Delphi method was developed to structure discussions and summarizes options from a selected group so as to avoid meetings, collect information/expertise from individuals spread out over a large geographic area, and save time through the elimination of direct contact. The technique requires a series of questionnaires and feedback reports to a group of individuals. Each series is analyzed and the instrument/statements are revised to reflect the responses of the group. A new questionnaire is prepared that includes the new material, and the process is repeated until a consensus is reached. Although the data may prove to be valuable, the collection process is very time consuming. When time is available and respondents are willing to be

queried over a period of time, the technique can be very powerful in identifying trends and predicting future events.

Delphi method of data collection can be exercised using FM radio or television as a medium. Moreover, online services such as personal web blogs, Facebook and Twitter can also be used to apply the Delphi method.

6.1.2 SOURCES OF SECONDARY DATA

Secondary sources are the analyzed, evaluated, interpreted or criticized form of primary data. Secondary data are originally collected for a task other than the task at hand. For example, if you refer to an article that presents a scientific experiment along with inferred conclusion, as most scientific papers do, then your data source is secondary. To this end, most scientific papers are secondary data sources. Researchers keep database of their primary data for future use. If you get access to these databases then you are using secondary data source because the data were not collected for your research's purpose.

Collection of primary data is not only very costly but also difficult. Recognizing this fact, governments have an agent organization in charge of primary data collection. For example, the Central Statistical Agency (CSA) of Ethiopia is in charge of collecting primary data from all over Ethiopia and making it available for researchers. The CSA covers population, agriculture, industry, commerce, and other economic data. To get more information about CSA, you can browse http://www.csa.gov.et. Similarly, the UnitedNations has huge database of primary data collected from all over the world. The UN data covers such diverse issues as finance, industry, energy, ICT, labor, population, food and agriculture, gender, health, and the like. For more information you can browse http://data.un.org.Published data are often preferred due to convenience, relatively low cost, and higher reliability if it is collected by reputable organization.

Overview of secondary data collection techniques

Secondary data collection techniques are mainly related to data collection from available database, data collection from documents, content analysis, and meta-analysis.

1. Data collection from available database

Usually there is a large amount of data that has already been collected by others, although it may not necessarily have been analyzed or published. Locating these sources and retrieving the information is a good starting point in any data collection effort. For example, the author

of this research had collected primary data for the paper on "Financing preferences of micro and small enterprise owners in Addis Abeba: does POH hold?" You can use this data if your topic is similar to the paper in question. Another example is data collected by governmental and non-governmental organizations for their own purposes.

2. Data collection from documents

Data collection from documents or otherwise called data mining is commonly used in accounting and finance researches. For example, you may be interested to conduct research on "efficiency of land lease contracts in Ethiopia". In this research, the best candidate for data collection method is data collection from documents; that is, land lease contracts in Ethiopia. Similarly, most researches in auditing intensively use data collection from documents related to financial statements of an entity.

Data collection from documents is particularly helpful method of secondary data collection to identify research questions. It is also helpful to validate your research findings. In other words, after you finish your research, you may compare your conclusions with the documentary facts in the organization in question.

3. Data collection using Meta-Analysis

Meta-analysis combines the results of studies being reviewed. For instance, you may want to conduct extensive literature review on "climate change financing". The natural starting point is to collect theoretical and empirical research papers in the area of climate change financing. You may utilize statistical techniques to estimate the strength of a given set of findings across many different studies. This allows the creation of a context from which future research can emerge and determine the reliability of a finding by examining results from many different studies. Meta-analysis findings form a basis for establishing new theories, models and concepts.

6.2 METHODS OF DATA COLLECTION

The task of data collection begins after a research problem has been defined and research design plan chalked out. While deciding about the method of data collection to be used for the study the researcher should keep in mind two types of data, primary and secondary. The primary data are those which are collected a fresh and for the first time and thus happen to be original character. The secondary data, on the other hand, are those which have already been collected by passed though the statistical process. The researcher would have to decide which sort of data he would

be using for the study and accordingly he will have to select one or other methods of data collection. There are several methods of data collection, researches. The most important one are: (1) Questionnaires (2) Interview and schedules (3) Observations (4) Focus groups and other methods like test and existing files/data sets for the secondary data. The methods are briefly explained in the following parts.

1. Questionnaires

A questionnaire is a self- report data collection instrument/ method that are filled out by research participants. This method of data collection is quite popular, particularly incase of big enquires. In this method a questionnaire is sent to the person concerned with a request to the answer the questions and return the questionnaire. Questionnaires are usually paper are pencil instruments, but they can also be placed on the web for participants to go to are "fill out", which contains a series of questions a providing space for the replies to be filled by the respondent him/herself.

Questionnaires are sometimes called survey instruments, which are fine, but the actual questionnaire should not be called "the survey". The word survey refers to the process of using questionnaire or interview protocol to collect data.

In short, Questionnaire is a data collection method, which contain a series of questions, which will be filled by the respondent/ participant themselves without any direct oral explanation/interpretation from the investigator.

Types of Questionnaires

There are two important dimensions along which questionnaires generally vary. That is the degree of structure is the number of response possibilities.

1. Based up on the degree of Structure: from the point of view of degree of structure questionnaires may be of two types:

   A. ***Structured Questionnaire:*** are those Questionnaires, in which there are defined, concrete and pre-determined Questions. The questions are presented with exactly in the same wording and in the same order to all respondents. In other word structured questionnaire presents questions with exactly the same wording and order to all respondents, and consist definite, concrete and predetermine items. Generally structured questionnaire is characterized by the following points:

- Resort is taking to this sort of standardization to ensure that all respondents replay to the same set of questions.
- The form of the question may be either closed or open, but should be stated in advance and NOT constructed during questioning.
- It may also have fixed alternative questions in which response of the informants /participants are limited to the stated alternative.
- Comments in the respondents own words are held to the minimum.
- Help to maximize standardization.
- Simple to administer are relatively in expensive to analysis.

B. Unstructured Questionnaires: are those which specify only the broad areas of a subject and not the form and sequence of questions. The interviewer is provided with the general guide on the type of information to be obtained. Formulation of questions is left to the wisdom of the interviewer themselves who are free to question respondents in their own way and the replies are to be taken down in the respondent's own words to the possible extent; in the same situation tape recorders may be used to achieve this goal. Unstructured questionnaire suffer from two important limitations: one the replies gathered though unstructured questionnaires can not be compared with each other and this makes it difficult to judge the reliability of information. Two unstructured questionnaires can be used by only trained interviewers who can frame questions at the time of interview itself based on the response of the participants.

2. Based on the number of response Possibilities: Questionnaires also vary in respect of the number of response possibilities provided to the subject/respondents.
    - If the question provides the subject with only two response possibilities it is known as a *dichotomous* questionnaire
    - If it provide with more than two possibilities it is called *multiple-choice* questions/questionnaire.
    - If it provide with complete freedom to select his most appropriate answer it is known as an *open ended* questionnaire.

Designing a Questionnaire

Much labor and care are needed in designing a good questionnaire, which must possess two qualities: Brevity and Accuracy.

- By Brevity is meant that the number of questions should not more than necessary. The rule is gathering the data you need but not more than what is needed.
- By Accuracy is meant that the question should be able to evoke accurate response. Accurate response is obtained if the replies form the respondents contain the information sought.

In order to design a good questionnaire there are 15 principles of questionnaire construction that we should follow:

(1) *The questionnaire must intimately relate to the final objective of investigation:* One should make sure that the questionnaire items match with the research objectives.

(2) *Understand your research participant:* Your participant (Not you) will be filling out the questionnaire. We should consider the demographic and cultural characteristics of our potential participants, so we can make it understandable to them. Respondent knowledge of the subject, ability and willingness should be property weighted.

(3) *Use Natural and familiar language:* "Familiar language is comforting; Jargon is not". If a questionnaire is to be translated for use in to several districts/local dialects, the translated version of a questionnaire should be retranslated in to the original language to check its fidelity.

(4) *Write items that are clear, precise and relatively short:* If your respondent/participant didn't understand the items, your data will be invalid (i.e. your research study will have the garbage in, garbage out, syndrome), the items should be short; short items are more easily understood and less stressful than long items.

(5) *Do not use "Leading "or" Loading" questions:* Leading questions always lead the participant to where you want him or her to be. Loading questions include loaded words (i.e., words that create an emotional reaction or response by the participant). Always remember that you don't want the participant's response to be the result of how you worded the questions. Always use natural wording.

(6) *Avoid double- barreled questions:* a double –barreled question combines two or more issues in a single question and answer to double barreled questions are ambiguous because two or more idea are confounded.

(7) *Avoid double negatives:* Does the answer provided by the participants required combining two negatives? (Ex: I disagree that promoters should not be required to supervise the cooperatives during audit time if yes, rewrite it)

(8) Determine whether an open- ended or a closed ended question is needed :

- Open ended question provides qualitative data in the participants' own words. Here is an open ended question: How can your representatives improve the moral/ your participation at your cooperatives?
- Closed ended question provides quantitative data based on the researcher's response categories. Here is an example of closed ended question:

  How difficult do you find learning about research method to be?

  1. very difficult
  2. some what difficult
  3. Not very difficult
  4. Not at all difficult
  5. Don't know

Generally, in closed ended response categories should be inclusive and mutually exclusive. Open ended questions are common in exploratory research and closed ended question is common in confirmatory research.

(9) Use mutually exclusive and exhaustive/inclusive response categories for closed ended questions.

-Mutually exclusive categories: are those categories do not over lap (e.g. age 0 10,10-20,20-30 are NOT mutually exclusive and should be write as; less than 10,10-19,20-29, 30-39,…).

- Exhaustive /Inclusive categories : means that the categories should include all possible responses (e.g. If you are doing a national survey of adult citizens (i.e. 18 or older) then this categories (18-19,20-29, 30-39,40-49.50-59, 60-69) are NOT exhaustive because there is no where to put some one who is 70 years old or older.

(10) *Consider the different types of response Categories available for closed ended questionnaires items (i.e. Rating scale, Ranking, semantic deferential, checklist).*

Rating scale: are the most commonly used, including:

(a) Numerical rating scale: where the end points are anchored/labeled, sometimes the center point also labeled.

1 2 3 4 5 6 7

Very low very high

(b) Full anchored rating scale: Where all the points on the scale are labeled/anchored.

1	2	3	4	5
Strongly Agree	Agree	Neutral	Disagree	Strongly disagree

1	2	3	4
Strongly Agree	Agree	Disagree	strongly disagree

- Omitting the center point on rating scale doesn't applicably affect the response pattern.
- You should use some where form4-11 point in your rating scale. 1-10 is not recommended, because many respondents mistakenly view the 5 as a center point.

(b) *Ranking:* where participant put their responses in to rank order, such as most important, second most important and third most important.

(c) *Semantic differential*: Where one item stem and multiple scales, there are anchored/ labeled with polar opposite or antonyms, are included and are rated by the participants.

(d) *Checklists:* Where participants "check all the responses in a list that apply to them.

(11) *Use multiple items to measure Abstract constructs:* This is required if you want your measure to have high reliability and validity. One approach is to use a summated rating scale. Another name for a summated rating scale is a Likert scale because the summated rating scale was pretty much invented by the famous social psychologist named Rensis Likert.

(12) *Consider using multiple methods when measuring abstract constructs*: The idea here is that if you only use one method of measurement, then your measurement may be an artifact of the method of measurement. On the other hand, if you use two or more methods of measurement you will be able to see whether depend on the method.

(13) *Use caution if you reverse the wording in some of items to prevent response sets:* (A response set is tendency of a participant to respond in a specific direction to items regardless of the item content). Reversing the words of some items can help ensure that participant don't just "speed through" the instrument, checking "yes" or "strongly agree" for all the items. On the other hand, you may want to avoid reverse wording if it create a double negative. Also recent research suggests that the use of reverse wording reduce the reliability and validity of scales. Therefore, you should generally use reverse wording sparingly, if at all.

(14) *Develop a questionnaire that is easy for a participant to use:* The participant must not get confused or lost anywhere in the questionnaire. Make sure that the direction(s) are clear and that any filter questions used is easy to follow.

(15) *Always Pilot tests your questionnaire:* in pilot testing your questionnaire, you will always get/find some problems that you have overlooked. The best pilot test is with people similar to the ones to be included in your research study. After pilot testing your questionnaire revise it and pilot test it again, until it works correctly.

- to decide the proper form and structure
- to understood questions the will be misunderstood or which a rouse defensiveness.
- To improve the questionnaire design in terms of format, quality of instruction, need for filter or screening question, and amount of spacing required.
- It gives firm estimates of the amount of time, money, personal and equipment required.

Strength and Weakness of Questionnaires

Strength: Good for measuring attitudes and eliciting other content from research participants, in expensive, can provide information about the participants internal meaning and ways of thinking, can be administered to probability samples, quick turn round, can be administered to groups,

Moderately high measurement validity for well constructed and validated questionnaire, provide exact information needed by researcher (especially the closed ended questions)**,** ease of data analysis (for closed ended) , useful for exploration as well as confirmation, free from bias of the interviewer**,** give adequate time to give well thought out answers, and large sample can be made use of and thus the results can be made more dependable and reliable.

Weaknesses: usually must be kept short, reactive effect may occur (e.g. interviewees may try to show only what is socially desirable), non response to selective items, low response rate, open ended items may reflect differences in verbal ability, obscuring the issue of interest, measures need validation, used only when the respondents are educated and cooperating, and slowest of all.

2. Interview and schedules

Interview

The interview method of collecting data involves presentation of oral verbal stimuli and replay in terms of oral verbal response. This method can be used through personal (face-to-face) interviews and if possible through telephone interviews.

Interview may be in the form of direct personal investigation or it may be indirect oral investigation. *Personal investigation*: In this case the interviewer has to collect the information personally form the sources concerned. He has to be on the spot and has to meet people from whom data have to be collected. *Indirect oral Investigation:* In this case the interviewer has to cross- examined other persons who are supposed to have knowledge about the problem under investigation and the information obtained is recorded.

Interview can be also two type based up on the degree of structure that is

(1) Structured interview

- Such interview involves the use of a set of predetermined questions and of highly standardized techniques of recording.
- The interviewer usually follows a rigid procedure laid down, asking questions in a form and order prescribed.

(2) Unstructured interview

- Characterized by a flexibility of approach to questioning.
- Don't follow a system of pre-determined questions and standardize techniques of recording information.

- The interviewer is allowed much greater freedom to ask, in case of need, supplementary questions or at times he may omit certain questions if the situation so requires.(?) However, this may result in lack of comparability of one interview with another and analysis of unstructured response becomes much more difficult and time consuming.
- Demand deep knowledge and grater skill on the part of the interviewer.
- It is a central technique of collecting information in the case of exploratory research studies. Generally, in this method of data collection trust and rapport are important and probing is available and is used to reach clarity or gain additional information. (Examples of probing, anything else? Any other reason? What do you mean?)

Strength and Weakness of interview

Strength: Good for measuring attitudes and most other content of interest, Allow probing and posing of follow up questions by the interviewer, Can provide information's about participant's internal meaning and ways of thinking, Closed-ended/ structured interview provide exact information needed by researcher, Can use with probability samples, Relatively high response rate are often attainable (sample can be controlled more effectively), Useful for exploration as well as for confirmation, There is a greater flexibility, Ease to obtain personal information, and Useful to collect supplementary information and language the interview can be adapted to the ability/education level of the person interviewed.

Weaknesses: In person interview usually are expensive and time consuming, Reactive effect (e.g. interviews may try to show only what is socially desirable), Investigators effect may occur (e.g. untrained personal biases and poor interviewing skills), Interviewees may not recall important information's and may lack self-awareness, Data analysis is time consuming, and Measure needs validation.

Schedules

This method of data collection is very is much like the collection of data through questionnaire with little difference which lies in the fact that schedules are being filled in by the enumerators who are specially appointed for this purpose. Schedule is noting but like a Performa containing a set of questions. This enumerator along with the schedule goes to respondents, put to them the

question from the Performa in the order the questions are listed and record the replies in the space meant for the same in the Performa.

- In certain situation, schedule may be handed over to respondents and enumerator may help them in recording their answer to various questions in the side schedules.
- This method requires selection of intelligent enumerators, which possess the capacity of cross- examination in order to find out the truth.
- Schedules are useful in extensive enquires (e.g. population census) and can lead to fairly reliable results.
- It is, however, very expensive.

The Difference between schedule and Questionnaire

Questionnaires	Schedules
1. filled by the respondent themselves with out any assistant.	1. 1filled by the enumerators or by themselves with assistant from research worker.
2. Cheap an economical	2. Expensive
3. High rate of Non-response	3. Low rate of Non-response
4. Very slow since many respondents do not return the questionnaire in time (lack of control over the samples).	4. The information is collected well in times as they are filled by the enumerators.
5. Used only when respondents are literate & cooperative	5. Can be used even happen to be illiterate
6. Wider and more representative distribution of sample is possible	6. Difficult to spend a relatively over wider area in this respect.
7. The success lies on the quality of the questionnaire itself.	7. The success much depends up on the Honesty & competence of the enumerator.
8. No room for using other methods of data collection complementary.	8. Observation method can also be used as a complementary data collection method.

3. Focus Groups

The Focus Groups Discussions had its origin in the evolution of audience responses to radio programs in 1941 by Robert Metron, prominent social scientists. Metron applied these techniques to the analysis of army training and moral films during World War II.

Definitions

- Focus Groups Discussion defined as "a group of individuals selected and assembled by researchers to discuss and comment on, from personal experience, on the topic that is the subject of the research.
- It is careful planned discussion designed to obtain perceptions in a defined area of interest in a permissive, non- threatening environments.
- It is a form of group interviewing but it is important to distinguish between the two. Group interviewing: involve interviewing a number of people at the same time, the emphasis being on question and response between the researcher and participants (i.e., limited to those situations where the assembled group is small enough to permit genuine discussion among all its members and researchers). Focus Groups: A method relay on interaction with in the group based on topics that are supplied by the researchers, to obtain perceptions, attitudes, feelings of respondents in a defined area of interests.

The Purpose /Roles of Focus Groups

- Help to draw up on respondent's attitudes, feelings, beliefs, experiences and reaction in a way in which would not be feasible using other methods.
- Enable the researcher to gain large amount of information in a short period of time, since it is organized events, not depend on a natural event to be happen like observation.
- Elicit a multiplicity of view and emotional processes within a group context.
- Help to explore the degree of consensus on a given topic.
- Useful at the preliminary/ exploratory stage of a study and after a program has been completed;
    - To explore/generate hypothesis and develop question concepts for questionnaire and interview guide at preliminary stage.
    - To asses its impact or to generate further a venues of research after program has been completed, and
    - To evaluate or develop a particular program of activities during the time of a study.

Participant Selection and Size of the Group

Participant Selection

- Selection participant is carefully important. Generally, participants are chosen on the basis of their experience related to the research topic. Participant selections depend up on the purposes of the study.
- When developing a recruitment/ selection strategies, it can be helpful to contact /consult with local people who are active in/connect to the study population. They may be able to after ideas about how to gain access to the population, how best to approach peoples, and possible obstacles to recruitment.

Size of the Group

- Most of the Focus Groups consist of between 6-12 people. The size of the group should manifestly be governed by two considerations; One – is should not be as large as to be unwieldy or to preclude adequate participation by most members. Two- nor should it be so small that it fails to provide substantially greater coverage than that of an interview with one individual. Number of groups - if there are different distinct sub groups the need arise to run separate groups. One group is never enough to observe dynamism.

How Long Should the Focus Group Last? (Duration)

- Focus groups sessions generally last between one and two hours and recorded using audio and/ or video tapes. And it is a good idea to record the start and end times of each focus group.

The Moderator / facilitator

The techniques of moderating a focus group is a skill it self where the moderator may have to wear many hats and assume deferent roles throughout the course of the discussion. Moderator is responsible for leading the focus group discussion, posing all questions specified in the focus group question guide, keeping the discussion on track, and encouraging all participant to contribute. The role of the moderator/facilitator includes.

- Recruiting/selecting participants
- Reminding recruits of the focus group time and place
- Answering any Advance questions
- Being reliable – demonstrate commitment to the discussion
- Encouraging exploration of an idea
- Moving on to a different topic
- Keeping on track

- Inviting agreement
- Clarifying
- Curbing a talkative person
- Encouraging a very quite person

Strengths and Weaknesses of FGDs

Strength: Useful for exploring ideas and concepts, Provides window in to participants internal thinking, Help to obtain in- depth information, Can examine how participants react to each other, Allows probing, Most content can be tapped, and Allows quick turnaround.

Weaknesses: Sometimes expensive, May be difficult to find a focus group moderator with good facilitative and rapport building skills, Reactive and investigator effects may occur if participants feel they are being watched or studied, Difficult to generalize results if small, unrepresentative samples of participants are used, May included large amount of extra or unnecessary information, Measurement validity may be low, Usually should not be the only data collection methods used in a study, and Data analysis can be time consuming because of the open-ended nature of the data.

4. Observation

Observation is a very important technique of data collection in use in experimental and non-experimental, social and anthropological research. In the strict sense it implies the use of the eyes rather than the ears and the voice in scrutinizing collective behaviors. In this method, the researcher observes participants in natural and/or structured environment. The investigators obtain the data by watching and noting the phenomena as they occur with regard to their cause and effect or mutual relations.

Definition

1. A systematic description of events, behaviors and artifacts in the social setting chosen for study. (Marsall a Rossman)
2. The process of learning through exposure to or involve in the day to day or routine activities of participants in the research setting.
3. Is the process of enabling the researcher to learn about the activities of the people under study in the natural setting through observing and participating in those activities.

Observation can be carried out in two types of environment in laboratory observation (which is done in a lab set up by the researcher) and Naturalistic observation (which is done in real world setting).

Types of Observation

(1) **Simple/ uncontrolled**

Simple/ uncontrolled observation is those which do not make use of any standardized observational techniques such as carefully draw out schedules, questionnaire, test etc. With the result there are no checks on the observer's biases, his selection perception, his prejudices and desire become concisely woven with the fabric of his conclusions. Also there is no check on the reliability of information. The data collected by any two observers can not be compared. To the intent that each observers record of experience is uniquely his own, the data gathered by him cannot be compared with those gathered by any other observer. The gives rise to the problem of standardization. However, despite its weaknesses, the use of this method is common in exploratory social investigations. Uncontrolled/ simple observation may be of three types:

(a) Participant Observation

This method followed in the investigation where there is need to penetrate deep in to the inner chamber of the group which is studied. In participant observation the researcher becomes a part of the community, while observing their behaviors and activities. The observer generally lives in the group which he is studying without revealing his identity. In this approach the researcher is interactively involved with the observed group as a member. Ex: to study the secret rituals of a tribe. The success of this method depends up on two factors: First: The investigator must have the skill to gain the confidence of the persons being studied so that his presence does not disrupt or in any way interfere with the natural course of events and they provide him with honest answer to his questions and not hide important activities from his view. Second: The investigator should have the ability to prevent his own preconceptions from distorting his interpretations. He should collect a wide range of facts as is possible and should not begin shifting and interpretations them until he has gained enough familiarity about the general life pattern of the people begin studied.

(b) Non-participant observation

In some/many research situation it is almost impossible for the observer to himself participate in all ways. For example a researcher cannot become a criminal in order to study a criminal or a female social scientist cannot become prostitute in order to study prostitutes. In all such cases the researcher may collect data as a non participant observer. In this approach, type of uncontrolled observation the researcher is isolated from the observed group. The observer either asks questions and records the answer or observes the group from a distance.

Advantage: Beneficial to observe a group from an external point of view where personal involvement plays no obstructive roles.

Disadvantage: - lack reliability/consistency

- time consuming
- Restricted by the amount of people that can be observed at one time.

(C) <u>Quasi-Participant Observation</u>

Purely participant and non participant observation is difficult. In the absence of any standard set of relationships or role patterns for the outsider who is always present but never participating, both the group and the outsider are likely to feel uncomfortable. Therefore, in much social survey quasi-participant observation is preferred.

In this method the observer assumes several roles. Some times he is in the role of a participant taking part in the activities of the group. At other time in the role of an interviewer, a stranger or a listener. Nevertheless, he makes it clear to the group that purpose is to gather-facts.

Generally if the observation taken place in the natural setting it may be termed as uncontrolled/simple observations. In such type of observation no attempt is made to use precision instruments. The major aim of this type of observation to get spontaneous picture of life and person. It has a tendency to supply naturalness and completeness of behavior, allowing sufficient time for observing it.

(2) Systematic/Controlled Observation

The observer bias is the crucial weakness of simple/uncontrolled observation. Systematic or controlled observation tries to overcome this weakness by using various control techniques ranging from sample testing and scoring device elaborate laboratory set ups. In the case of

controlled observation the observation takes place according to definite pre-arranged plans, involving procedures. It requires use of precision/mechanical instruments as aid to accuracy and standardization. Such observation has a tendency to supply formalized data upon which generalization can be built with some degree of assurance.

Very often, an exhaustive list of mutually exclusive categories of behavior with a description of each category is prepared and the job of observer is to assign observed behaviors to different labeled categories.

In should be noted, however, the use of controlled observation does not completely eliminate observer's bias. Many times if the categories are vague and the specification is inadequate, different observer can easily put different interpretations on the same behavior. On the other hand to specific categories, while they cut down ambiguity and uncertainty, may tend to be too rigid and inflexible. But such lists definitely enable the observer to tell how he made his observation, under what conditions, when and so on.

(3) Mass observation

This method is used to record mass/ collective behavior of people in public place on the basis of observation and interview. Its objective is to record the collective behavior of people in public places.

Sampling methods in observation (sample of behavior)

There are three sampling methods involved with data capturing in observation.

(1) **Event sampling**: Here an event is observed every time it occurs. The observer selects for his observation integral behavioral occurrence of events.

(2) **Time sampling**: In time sampling the observer selects for his observation at different point in time, say, and three one hour observation (at specified/random time) on each day. In short in time sampling the data is captured over certain period of time.

(3) **Point sampling**: in point sampling. The data is captured in away, say, each individual's current category of behavior is captured before moving on to observe an other person.

When to use observation?

- Observation is most effective when one is conducting social research, and is interested in researching people's behavior.

Strength and weakness of observation

Strength: Flexible techniques: it doesn't necessary have to be structured around a hypothesis, it can be used before obtaining a researcher questions, It can examine simultaneous issue at once, Enable the researcher to examine the people's behavior directly rather than relaying on self-reports in questionnaire/interview, Provide firsthand experience, especially if the observer participates in activities, Can provide relatively objective measurement of behavior, Observer can determine what does not occur, and Good for description and provide moderate degree of realism.

Weakness: In observation the researcher might faced with values and beliefs that lack any behavioral reference, In line with the above, paid fall, reasons for observed behavior may be unclear, Observation sometimes result multiplication of explanations to given problem/ behavior, Inhabited by situational constraints, Reactive effects may occur when respondents know they are being observed, Investigators effect (ex: personal biases and selective perceptions of observers), Observer may 'go Native' (over identifying with the groups being studied), Expensive than other methods, and Time consuming- especially during the data Analysis.

SELF ASSESSMENT QUESTIOS

1. Discuss the strength and weakness of primary and secondary source data
2. Discuss the strengths and weaknesses of using surveys, case studies, and observation to gather primary information.
3. Design a data collection form to allow observation of employees in a restaurant
4. Compile a list of the format of secondary data that physically exist at your nearest library. Comment on the usefulness of each format in terms of your own area of research.
5. Design a short questionnaire to determine the factors that influence the frequency of people shopping at a particular supermarket, allowing analysis by gender, age and socio-economic grouping.
6. Give three examples of different situations where you might use secondary data as part of your research.
7. Suggest possible secondary data that would help you answer the following research questions. How would you locate these secondary data?

a. To what extent do organizations' employee relocation policies meet the needs of employees?

b. How consumer spending patterns in your home country changed in the last 10 years?

c. How governments' attitudes to the public sector altered in the twenty-first century?

8. You are a bank branch manager. You feel your staffs are too reluctant to generate interest from customers in relation to new accounts that the bank offers. You would like to understand the reasons for their reluctance.

a. As the participant observer, how would you go about this?

b. How would you record your observations?

9. What type of interview would you use in each of the following situations?

a. a market research project?

b. a research project seeking to understand whether attitudes to working from home have changed?

c. following the analysis of a questionnaire?

CHAPTER SEVEN
DATA PROCESSING AND ANALYSIS

Learning objectives

- *identify the main issues that you need to consider when preparing data for analysis*
- *recognize different types of data analysis and understand the implications for subsequent analyses;*
- *Describe and apply various techniques of data analysis;*
- *select the most appropriate tables and graphs to explore and illustrate different aspects of your data;*
- *select the most appropriate statistics to describe variables*
- *interpret the tables, graphs and statistics that you use correctly.*

7.1 INTRDUCTION

After collecting data from the field, the researcher has to process and analyze then in order to arrive at certain conclusions which may or may not support the hypothesis which he had formulated to wards the beginning of his research work. Planning for data processing must be done well in advance of field work as an integral part of the research design. Following are the stages through which the raw data must be processed in order ultimately to deliver the final products.

1. **Editing:** Editing means to look for and remove any errors, incompleteness or in consistency in the data, if the raw data are erroneous in compete, or inconsistent, these deficiencies will be carried through all subsequent stages of processing and will greatly distort the results of any inquiry. Therefore, at this stage, certain questions are specified for 100 percent editing because they are known to be especially troublesome or particularly critical to study objectives. The editor is responsible for seeing that the data are: As accurate as possible; Consistent with other facts secured; uniformly entered; as complete as possible; Acceptable for tabulation; and Arranged to facilitate coding and tabulation. With regard to points or stages at which editing should be done one can talk of field editing and control editing.

a. Field Editing: It consists in the review of the reporting forms by the investigator for completing (translating or rewriting) what the later written in abbreviated and/or in illegible from at the time of recording the respondent's responses. This type of editing is necessary in view of the fact that individual writing styles often can be difficult for other to decipher. This sort of editing should be done as soon as possible after the interview, preferable on the very day or on next day. While doing field auditing, the investigator must restrain himself and must not correct errors of omissions by simply guessing what the informant would have said if the question had been asked.

b. Central Editing: This should take place when all forms or schedules have been completed and returned to the office. This type of editing implies that all forms should get although editing by a single editing by a single editing a small study and by a team of editors in case of a large enquiry. Editors must keep in view several points while performing their work.

(i) They should be familiar with instructions given to the interviewers and coders as well as with the editing instructions supplied to them for the purpose.

(ii) While crossing out an original entry for one reason or another, they should draw a single line on it so that same may remain legible.

(iii) They most make entries (if any) on the form in some distinctive color and that too in a standard form

(iv) They should initial all answers which they change or supply

(v) Editor's initials and date of the editing should be pace on each completed form or schedule.

2. **Coding:** Coding refers to the process of assigning numerals or other symbols to answers so that responses can be put in to a limited number of categories or classes. Coding is necessary for classes which contain the critical information required for analysis. Coding decisions should usually be taken at the designing stage of the questionnaire. Following are important guidelines for coding:
    1. Coding should be mutually excusive

2. Set of categories should be collectively exhaustive so that all responses should be classified in one or the other category.
3. Separate categories should be created for recording 'non-response' and no knowledge response.
4. Inter coder and intera-coder agreement tests should be conducted through out the entire coding process to check its reliability.
5. To help ensure that responses are being coded systematically.

3. **Classification:** Most research studies result in a large volume of raw data which must reduced in to homogenous groups for getting meaningful relationships. In this step data having common characteristic are placed in one class and in this way the entire data get divided in to a number of groups or classes. Classification can be of like following two types, depending upon the nature of the phenomenon involved:

   (i) Classification according to Attributes: Data are classified on the basis of common characteristics which can either be descriptive or numerical. Descriptive characteristics refer to qualitative phenomenon, which can not be measured quantitatively; only their presence or absence in an individual item can be noticed. Data obtained this way on the basis of certain attributes are known as statistics of attributes and their classification is said to be classification according to attributes. Such classifications can be simple or manifold classification: In *simple classifications* we consider only one attribute and divided the universe in to two classes- one consisting of items possessing attributes and the other class consisting of items which do not possess the given attribute. *Manifold classification* we consider two or more attributes simultaneously, and divided the data in to number of classes.

   (ii) Classification according to class-intervals: Unlike descriptive characteristics, the numerical characteristics refer to quantitative phenomena which can be measured through some statistical units. Data relating to income production, age, weight etc. Come under this Category. Such data are known as statistics of variables and are classified on the basis of class intervals.

4. **Tabulation:** When a mass data has been assembled, it becomes necessary for the researcher to arrange the same in some kind of concise and logical order. This process of summarizing raw data and displaying the same in compact form for the further analysis. In the broader sense, tabulation is the process of summarizing data and displaying the same in compact from for the further analysis. In the broader sense, tabulation is an orderly arrangement of data in columns and rows. Tabulation is essential because of the following reasons: It conserves space and reduces explanatory and descriptive statement to a minimum; It facilitates the process of comparison; It facilitates the summation of items and the detection of errors and omissions; and It provides a basis for various statistical computations.

   Tabulation can be done by hand or by mechanical or electronic devices. The choice depends on the size and type of study, study, cost conditions time pressures and the availability of tabulating machines or computers. Generally accepted principles of tabulation are:

   (i) Every table should have clear concise and adequate title so as to make the table intelligible with out reference to the text.
   (ii) Every table should be given distinct number to facilitate easy reference
   (iii) The column heading s and roe headings of the table should be clear and brief
   (iv) Units of measurement under each heading or sub heading must always be indicated
   (v) Explanatory foot notes, if any, concerning the table should be placed directly beneath the table.
   (vi) Source of data must be indicated below the table.
   (vii) It is generally consider better to approximate figures before tabulation as the same would reduce unnecessary details in the table it self.
   (viii) In order to emphasize the relative significance of certain categories, different kinds of type, spacing and indentations may be used.
   (ix) Abbreviations should be avoided to the extent possible and ditto marks should not be used in the table.
   (x) Miscellaneous and exceptional items, if any should be usually placed in the last row of the table.

(xi) Table should be made as logical clear, accurate and simple as possible, very large data should not be crowded in a single table.

(xii) The arrangement of the categories in the table may be chronological, geographical, and alphabetical or according to must suit the need and requirements of an investigation.

7.2 Elements/Types of Analysis

The manner in which data can be analyzed depends to a great extent up on the measurement and sampling procedure followed in their collection. Depending up on these two components the analysis is always more precise and objective. It also enables the readers of the study to evaluate the quality of the research. This is not possible in the case of non statistical analysis which is always qualitative and therefore less accurate. Analysis may therefore be categorized as descriptive analysis and inferential analysis.

1. Descriptive Analysis

Perhaps the most basic statistical analysis is descriptive analysis. Descriptive statistics can summarize responses from large numbers of respondents in a few simple statistics. When a sample is obtained, the sample descriptive statistics are used to make inferences about characteristics of the entire population of interest. It is largely the study of distributions of one variable. This study provides us with profile of companies work group, persons and other subjects on any of a multitude of characteristics such as size composition, efficiency, preferences etc.

Statistical Measures for single variate Analysis: Where the data consists of measurement of only one variable, they are often presented either in the form of a frequency table or a time series. In a frequency table one column gives observed values of a random variable X and the other gives the frequency of each value. In a time series one column gives certain units of time and the other gives observed values of a variable as it varies from one time period to anther. *Frequency table is* commonly analyzed in commonly analyzed in terms of its four important characteristics viz Central tendency, dispersion, skew ness and kurtosis. *Time series is* analyzed in terms of four important components Viz, Trend, seasonal variations, cyclical variations and irregular variations.

A. **Measures of central Tenancy or Averages:** These measures are so called because they show a tendency of the distribution to concentrate at certain values, some where in the center of the distribution. These include mean, mode, G.M, H.M, Quadratic mean index number.

B. **Measures of Dispersion:** How the items in a series are distributed and how they scatter. Measures of Dispersion are:
    a. Range as a measure of dispersion represents a difference between the values of entrée items i.e., largest and like smallest items of the data under review.
    b. Semi-inter quartile range is the difference between the upper and lower quarrel divided by 2.
    c. Mean Deviation is the average distance of the items in a series from their average
    d. Standard Devaluation

C. **Measures of Skew ness:** The data in a frequency distribution may fall in to symmetrical and asymmetrical patterns. The measures of the direction and degree of asymmetry are called measures of skew ness. In a symmetrical distribution the mean medium and mode between any two of these values indicates the extent of skew ness. Thus the measures of skew ness are: Mean- Mode; Mean-Median; and Median- Mode.

D. **Measure of Kurtosis:** These measure show the extent to which the distribution (when method and graph) is more peaked or less peaked than the normal curve. If the terms are more closely bunched around the mode than normal, making the curve unusually peaked, we say that curve is lep to kurtic. If on the other hand, the curve is more flat-topped than normal, we say it is platy Kurtic. The condition of peaked ness or of flat topped ness itself is known as kutosis or excess.

2. Inferential Analysis

Empirical testing typically involves inferential statistics. This means that an inference will be drawn about some population based on observations of a sample representing that population.

Most researcher wishes to go beyond the simple tabulation of frequency distribution and calculation averages and/or dispersion. They frequently conduct and seek to determine the relationship between variables and test statistical significance. When the population is consisting of more than one variable it is possible to measure the relationship between them. Statistical analysis can be divided into several groups:

- Uni-variate statistical analysis: tests hypotheses involving only one variable.
- Bivariate statistical analysis: tests hypotheses involving two variables.
- Multivariate statistical analysis: tests hypotheses and models involving multiple (three or more) variables or sets of variables.

I. Statistical measures for Bivariate Analysis: If we have the data on two variables i.e. for every measurement of a variable x, we have corresponding value of a second variable Y, the resulting pairs of values are called a bivariate population.

- Correction techniques - karl person's coefficient of correlation (simple linear correlation), Partial correlation , Charles superman's coefficient of correlation
- Association of Attributes
- Simply Regression

II. Statistical Measures for Multivariate Analysis: Much behavioral research is multivariate nature and cannot be done with a bivariate approach. The determinants of phenomena like achievement, learning aggression, intelligence, certainly, risk taking organizational productivity, group cohesiveness etc. is complex. Many variables influence such phenomena, and multi-variables on one or more dependents variables.

7.3 Various statistical models for research

1. Hypothesis Testing

Inferences on population characteristics (or parameters) are often made on the basis of sample observations, especially when the population is large and it may not be possible to enumerate all the sampling units belonging to the population. In doing so, one has to take the help of certain assumptions (or hypothetical values) about the characteristics of the population if some such information is available. Such hypothesis about the population is termed as statistical hypothesis and the hypothesis is tested on the basis of sample values. The procedure enables one to decide on a certain hypothesis and test its significance. "A claim or hypothesis about the population parameters is known as Null Hypothesis and is written as, H_0."

This hypothesis is then tested with available evidence and a decision is made whether to accept this hypothesis or reject it. If this hypothesis is rejected, then we accept the alternate hypothesis. This hypothesis is written as H_1.

For testing hypothesis or test of significance we use both parametric tests and nonparametric or distribution free tests. Parametric tests assume within properties of the population, from which we draw samples. Such assumptions may be about population parameters, sample size, etc. In case of non-parametric tests, we do not make such assumptions. Here we assume only nominal or ordinal data. Important parametric tests used for testing of hypothesis are: z-test, and t-test,

As has been stated earlier all parametric tests used for testing of hypothesis are based on the assumption of normally, i.e., population is considered to be normally distributed.

Procedure for testing of hypothesis

1. State the null hypothesis as well as the alternate hypothesis

For example, let us assume the population mean = 50 and set up the hypothesis $\mu = 50$. this is called the null hypothesis and is denoted as;

Null hypothesis,	H_0: $\mu = 50$
Alternative hypothesis	H_1: μ □ 50
	Or $\mu > 50$
	$\mu < 50$

2. Establish a level of significance (prior to sampling)

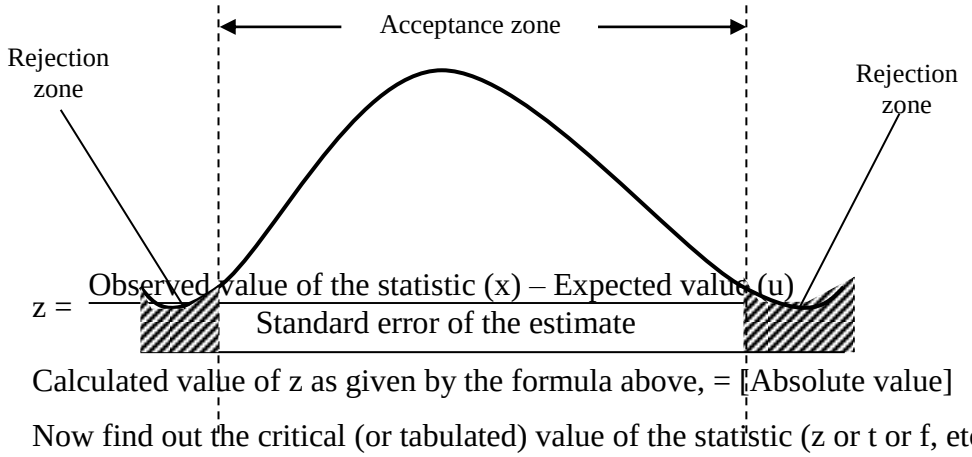
The level of significance signifies the probability of committing Type 1 error □ and is generally taken as equal to 0.05. Sometimes, the value □ is established as 0.01, but it is at the discretion of the investigator to select its value, depending upon the sensitivity of the study. To illustrate per cent level of significance indicates that a researcher is willing to take 5 per cent risk of rejecting the Null Hypothesis when it happens to be true.

3. Choosing a suitable test statistic

Now the researcher would choose amongst the various tests (i.e. z, t, □2 and f-tests). Actually, for the purpose of rejecting or accepting the null hypothesis, a suitable statistics called 'test statistics' is chosen. This means that H_0 is assumed to be really true. Obviously due to sampling fluctuations, the observed value of the statistic based on random sample will differ from the expected value. If the difference is large enough, one suspects the validity of the assumption and rejects the null hypothesis (H_0). On the other hand, if the difference may be assumed due to sampling (random) fluctuation, the null hypothesis (H_0) is accepted.

4. Defining the critical rejection regions and making calculations for test statistics

If we select the value of □ = Level of significance = 0.05, and use the standard normal distribution (z-test) as our test statistic for testing the population parameter u, then the value of the difference between the assumption of null hypothesis (assumed value of the population parameter) and the value obtained by the analysis of the sample results is not expected to be more than 1.96 □ at □ = 0.05. This relationship can be shown by the diagram given below;



$$z = \frac{\text{Observed value of the statistic (x)} - \text{Expected value (u)}}{\text{Standard error of the estimate}}$$

Calculated value of z as given by the formula above, = [Absolute value]

Now find out the critical (or tabulated) value of the statistic (z or t or f, etc.).

Usage Of *'Z'* And *'T'* Tests

The z-Test is used to measure the difference between any variable value (x) and the mean of all variable values or 'x' values, which is indicated by '□', divided by the standard deviation(s). It is based on the normal probability distribution. In following cases, we find the usage of z-test:

- To judge the significance of statistical measures, particularly the mean. This is done by comparing the observed value (test statistic) with the probable value (table value) at a specified level of significance.
- It is used to compare the mean of a sample with some hypothesized mean of the population.
- It is also used to judge the significance of difference between means of two independent samples.
- It can also be used for judging the significance of difference between sample and population proportion or proportions of two independent samples.
- Finally this test can also be used for measuring the significance of medium, mode, coefficient of correlation and other measures.

2. Chi-Square Test

A chi-square (χ^2) test can be used when the data satisfies four conditions.

- There must be two observed sets of data or one observed set of data and one expected set of data (generally, there are n-rows and c-columns of data)
- The two sets of data must be based on the same sample size.
- Each cell in the data contains the observed or expected count of five or large?
- The different cells in a row of column must have categorical variables (male, female or younger than 25 years of age, 25 year of age, older than 40 years of age etc.)

Application areas of chi-square test

The χ^2 distribution typically looks like a normal distribution, which is skewed to the right with a long tail to the right. It is a continuous distribution with only positive values. It has following applications:

- To test whether the sample differences among various sample proportions are significant or can they be attributed to chance.
- To test the independence of two variables in a contingency table.
- To use it as a test of goodness of fit.

χ^2test has the following steps:

1. State the null hypothesis and calculate the numbers in each category.
2. Determine the level of significance (i.e., how much risk of type I error) the researcher is prepared to take.
3. Calculate □^{2}, as follows:

$$\chi^2 = \sum \frac{(O_i - E_j)^2}{E_j}$$

where, O_i = Observed frequency.

E_j = Expected frequency in the category.

4. Find the critical value of χ^2 against the number of degrees of freedom for the specified level of significance.

5. Compare the calculated value of χ^2 with the tabulated (critical) value and determine the region of rejection.

3. Measures of Association

Research questions in business frequently revolve around the study of relationship between two or more variables. Various objectives may be served by such an analysis. The strength, direction, shape and other features of the relationship may be discovered. Or tactical and strategic questions may be answered by predicting the values of one variable from those of another.

With correlation, one estimates the degree and nature of the relationship between variables calculated. With regression, an equation is developed to predict the values of the dependent variable. Both are affected by the assumptions of measurement level and the distributions that underline the data.

Bivariate correlation analysis

Bivariate correlation analysis differs from non-parametric measures of association and regression analysis in two important ways. First, parametric correlation requires two continuous variables measured on an interval or ratio scale. Second, the coefficient does not distinguish between independent and dependent variables. It treats the variables symmetrically since the coefficient r_{xz} has the same interpretation as r_{yx}.

Linear regression equation

The pattern of the scatter diagram, in most cases, is linearly related. The line which runs through most of the points, (if not all), is known as the 'line of regression'. This line should be the most representative of the data, i.e., most suitable and is thus popularly known as the 'line of best fit'.

The best line would be the one which passes through all the points. But this is not possible in most situations. The next step is to find the line which is closest to all the points, i.e., the distance between the line and points is minimum. As some points shall be above the line and some below the line, therefore, we take the square of deviations and hence the line of best fit would be one which gives the minimum differences:

$Y = a + bx$

Where Y = Dependent variables

X = Independent variables

a and b are constants which determine the completed line.

Where $b = \frac{n(\text{å}xy) - (\text{å}x)(\text{å}y)}{n(\text{å}x^2) - (\text{å}x)^2}$

$a = \bar{Y} - b\bar{X}$

The coefficient of determination (r^2)

The square of the coefficient of correlation is called the coefficient of determination (r^2). It is a more precise measure of the straight relationship between the two variables and lends itself to more precise interpretation because it can be represented as a proportion or as a percentage. The coefficient of determination can be defined as a proportion of the variation in the dependent variable y, that is explained by the variation in independent variable x, in the regression model.

$$r^2 = \frac{\text{Explained variation}}{\text{Total variation}}$$

$$= \frac{\dfrac{a\mathring{a}y + b\mathring{a}xy - (\mathring{a}y)^2}{n}}{\dfrac{\mathring{a}(y)^2 - (\mathring{a}y)^2}{n}}$$

SELF ASSESSMENT QUESTIONS

1. What do you mean by data analysis?
2. Briefly explain the two types of data classification with examples
3. Explain the important stages in data analysis. Give examples.
4. Explain the importance of graphs, diagrams, averages, standard deviation, correlation coefficient and tests of hypothesis in data analysis. Give examples.
5. Define hypothesis and describe the steps in testing a hypothesis.
6. Define chi-square and describe the steps in chi-square testing

CHAPTER EIGHT
REPORT WRITING

Learning Objectives

- *Understand the meaning, purpose, types and contents of a research project report;*
- *Plan and organize an academic report;*
- *Evaluate an academic report.*

8.1 INTRODUCTION

Research reporting is the oral or written presentation of evidence and the findings in such a way that it is readily understood and assessed by the reader and enables him to verify the validity of the conclusions. Research report writing is the culmination of the research investigation. It is at the stage of reporting that the researcher assembles the findings of the study, draws conclusions and evaluates his own findings. Report writing is the end product of research activity. It is highly skilled work; it is an interesting, fascinating, challenging, gruelling and sometimes even exasperating experience.

Writing a research report is a technical activity that demands all the skills and patience of the researcher. It requires considerable thought, effort, patience and penetration and an overall approach to the problem, data and analysis. Also needed is firm control over language and great objectivity. A vast amount of planning and preparation is necessary for organising and writing the report. Perfection in a research report is achieved by continuous and persistent thought and creative and intelligent writing. Only hard and patient work on the facts, careful and critical assessment and intelligent planning in organising the report can facilitate communication. There are no standard criteria for the organisation of a report, popular or technical. They depend on each investigation, problem, the novelty or familiarity of the methods, nature and volume of facts, techniques of analysis and so on.

No research project is complete without a report. The nature of the report is determined by the project itself and to whom it is addressed. Academic research is expected to produce lengthy reports, or theses, covering all aspects of the research and reporting on them in a precise and rather formal manner. But no matter what the size or formality of the report, it is reasonable to expect it to convey information on a fairly standard set of topics. First, it must say why the work

was done, what events led up to it and what other work was found to be relevant. This is usually contained in the introduction, which should also include the precise statement of the objective and aims of the project.

Generally, there should be a section describing what work was done. This should cover the methods used, their selection and any problems experienced in their application. From this it is easy to move on to what was found out, or the results. In turn, these lead on to the conclusions, which are a statement of what the researcher deduced from the results, and then on to the recommendations, which set out what the researcher feels should be the action taken as a result of the conclusions.

8.2 TYPES OF REPORTS

Research reports may differ in length and form. Generally, business firms prefer reports in the form of letters. Banks, insurance companies and financial institutions require short balance-sheet type of tabulation in their annual reports to customers and shareholders. The results of a research investigation can be presented in a number of ways: as a technical report, a popular report, an article, a monograph or at times even in the form of an oral presentation. A technical report is used whenever a full written report of the study is required whether for record-keeping or for public dissemination. A popular report is used if the research results have policy implications.

A. Technical report

A technical report is written for fellow researchers and therefore should be organised on a different footing altogether. In such a report, the researcher is expected to give a full account of the technical aspects, both in the sampling methods and the subject matter. Fellow professionals are more concerned about the methods employed. In fact, the value of the findings depends on the techniques adopted. The conceptual and analytical framework sample design should be adequately explained. A technical report consists of the following aspects.

1. Major findings and contents: A technical report will contain the main findings just in two or three pages.

2. Nature of the research work: This describes the general objectives of the study, formulation of the problem in operational items, the working hypothesis, the type of analysis, data required, etc.

3. Research methodology: This explains the various methods used in the study and their limitations. For instance, sample size, sample selection, etc.

4. **Data analysis:** The report analyses the data and their sources, characteristics and limitations. If secondary data are used, their suitability to the problem at hand is fully assessed. In case of a survey, the manner in which data were collected should be fully described.

5. **Presentation of findings:** The researcher presents his main findings of the study with supporting data in the form of tables and charts. This part is the main body of the report, usually extending over several chapters.

6. **Main conclusion:** Here, the main findings of the research are presented and the main body of the report, usually extending over several chapters.

7. **Bibliography:** This contains the main sources of secondary data.

8. **Technical appendices:** These contain all technical matters relating to questionnaires, mathematical derivations, elaboration on particular techniques of analysis and the like.

The above format provides a general idea of the nature of a technical report; the order of presentation may not necessarily be the same in all technical reports. Therefore, the presentation may differ; the different sections outlined above will not always be the same, nor will all these sections appear in any particular report.

B. Popular report

This stresses on simplicity and attractiveness. Its writing is clear, with minimum statistical details and the liberal use of charts and diagrams. It has an attractive layout, large print size, many sub-headings, and may be even some cartoons. Besides, it emphasises on the practical aspects and policy implications. The following is the general outline of a popular report:

1. Major findings and conclusions: The report will have findings of practical interest and their implications.

2. Follow-up action: It will suggest follow-up action on the basis of the findings of the study in this section.

3. **Objectives of the study:** Here the problem is presented, along with the specific objectives of the study.

4. **Methodology:** Here, a description of the methods and techniques used, including a short review of the data on which the study is based, is provided.

5. **Results:** This is the main body of the report, presented in clear and non-technical terms with the liberal use of all sorts of illustrations such as charts, diagrams and the like.

6. **Appendices:** This consists of detailed information on the methods used, forms, etc. Appendices are generally not included if the report is meant for the general public. A popular report emphasises on simplicity and policy implications from the operational point of view, avoiding technical details.

8.3 Report Format

Research Report is a product in the sense that it must satisfy the parties concerned viz., sponsor (user), researcher himself to get recognition and for fetching further assignments, and the general public or academicians interested in the acquisition of knowledge. A standard format cannot be conceived as the user needs may be different and also difficult to guess. However, an attempt is made to understand the basic minimum requirements of a research report. The mechanical format of a research report consists of three parts viz., the preliminaries (including introduction, methodology, and design), the text (the relevant data, interpretations, inferences etc.) and the reference materials. The following sequence is generally accepted.

The Preliminaries:

- Title Page (inside the hard cover)
- Preface including acknowledgements (if desired or necessary)
- Table of contents
- List of Tables
- List of Abbreviations uses in the report
- List of Figures or illustrations,
- Abstract

The Text:

- Introduction
- Methodology
- Main body of the report (presented in appropriate modules or chapter form)
- Conclusions

Reference Material:

- Bibliography
- Appendix or appendices
- Index (if necessary)

A brief explanation of each item is given below:

Title Page: It should be as brief as possible but self-explanatory. It should contain basically the name (title) of the subject investigated, date of submission (some times moth is sufficient and they year), name of the author(s), and the name of the agency to whom it is submitted. The font of the above should be appropriately set to attract the reader.

Preface: The preface (often used synonymously with foreword) may include the purpose in conducting the study, a brief resume of the background, scope, purpose, general nature of the research upon which the report is being based and acknowledgement.

'Acknowledgements' recognize the persons to whom the writer is indebted for guidance and assistance during the study and the funding institutions for providing finances to implements the study. If the list of acknowledgements is short, the heading 'acknowledgements; is omitted and a brief statement containing the acknowledgments is placed slightly above the centre of the page. The word, preface and Acknowledgements should be printed in capital letters. This entire preface is not necessary if the project is sponsored and where letter of transmittal is considered as necessary.

Table of Contents: The purpose of a table of contents is to provide an analytical overview of the material included in the study or report. Any report of more than six to ten pages should have contents page. It must indicate the pate numbers (from and to or only from page) for each of the items like acknowledgement (Arabic numerals), list of tables, list of figures, list of abbreviations, and list of illustrations.

The Text: Among all the three parts of research report, the Text is the most important part of the report. In this section the researcher presents the facts observed or the basic aspects of argument.

Introduction: It should be prepared with considerable care with two major aims introducing the problem in a suitable context and arousing and stimulating the reader's interest. If the

introduction is dull, aimless, confused and lacking precision, direct and specificity, there is a litter interest for the reader to continue perusal. The reader should gauge the material inside with a cursory reading of the first few pages. An introductory chapter should contain the following:

a) A lucid, complete and concise statement of the problem being investigated.
b) A description of the scope of the study
c) An explanation of the need for the study and its importance
d) A preview of the organization of the thesis
e) A resume of the historical background and present importance of the problem
f) Preliminary results of the exploration
g) A brief statement regarding the sources of data, the techniques used for analyzing the data, the assumptions used in the analysis and the technical terminology used.
h) An analytical review of literature should also be an important part of introduction.

Methodology: In both technical and management reports and explanation of methodology is necessary. Of course, some of the researchers opine that in management a mention about methodology is not important. It is the core aspect of the report to evaluate the scientific nature of the study. The reliability and validity of research process depends upon the strength of methodology. A scientific methodology is composed of an explanation about sampling design, data collection design, experimental design, tools of data analysis, limitations, time frame, techno format etc.

Main Body of the Report: The chapters constituting the main body of the report will vary in number and length according to the nature of the evidence to be presented. The arguments and findings should be presented in a logical or orderly way. Every bit of evidence should be supported by logical reasoning and empirical facts. Materials should be organized systematically and presented under appropriate headings. The following order may be adopted:

a) Statement of specific question or hypothesis under study
b) Presentation of relevant data
c) Interpretation of data
d) Conclusions and interpretations for each specific question.

In the body of the report, according to the necessary charts, graphs, tables and diagrams can be employed. They must be appropriately numbered. At the end of each chapter, a summary of the arguments, findings and relevant data may be given in clear and concise terms.

Conclusions; serve the important function of the research report, i.e., informing the user of the report the results and the possible interpretations of the information and data. The researcher incorporates the findings of his investigation along with the conclusions what he thinks fit. The researcher may also list out unanswered questions, which require further research. If the recommendations for future action grow out of the conclusion, they should be clearly stated in the report. The conclusions, recommendations, and possible problems that could be further researched must be presented in a classified manner. Each conclusion must be supported by empirical data and evidence.

Appendix: It includes such matters as original data, tables that present supporting evidence, tests that have been constructed by the research student, parts of document or any supportive evidence that would detract from the major line of argument and would make the body of the thesis unduly large and any extract from official document. Usually the copy of the questionnaire and the interview schedule used for collecting the primary data are included in the appendix.

Bibliography: is a source of the major information concerning the dissertation. Thus it is the main body of the text and is separate but integral part of a thesis. It must focus on subject books, and central theme of the research process. In comprehensive listing, bibliography should follow a logical arrangement in alphabetical (dictionary) style of presentation) order. Again it should be noted that reference notes are different from bibliography. The essential information for each book or journal article should be shown as under:

(a) In case of books; this order is to be followed: name of the author(s) year of publication; Title of the book; edition number preferably in brackets; place of publication; and name of the publisher.

Example: Guildford, J. P., (1995) Fundamental Statistics in Psychology and Education (4^{th} ed.), New York: McGraw Hill.

(b) In case of a journal the place of publication and the publisher's name are not included. But the volume number and the inclusive pages which contain the article are given.

Example: Turner, L.C.F. (1998). The Russian Mobilization in 1914. Journal of Contemporary History, 3, 65-68

(c) In case of Reports the name of the authority for whom the report is prepared followed by the title of the Report, place and year of publication.

Example: Ministry of Information and Publications, Government of Ethiopia, Statistical Abstract of Ethiopia, Addis Ababa, 1995

8.5 Referencing In the Text

The Harvard system, which we have adopted in this book, uses the author's name and data of publication to identify cited documents within the text. For example:

- It has been shown that… (Saunders, 1993).
- When referring generally to work by different authors on the subject, place the authors in alphabetical order: (Baker, 1991; Lewis, 1991; Thornhill, 1993).
- When referring to dual authors: (Saunders and Cooper, 1993).
- When there are more than two authors: (Bryce et al., 1991).
- For corporate authors, for instance a company report: (Hanson Trust Plc, 1990).
- For publications with no obvious author; for example an employment gazette: (Employment Gazette, 1993).
- When referring to different publications by the same author, the works should be arranged according to date in ascending order: (Lewis, 1989, 1991).
- To differetiate between publications by the same author in the same year use a, b, c etc., (Forster, 1991a). Make sure that this is consistent throughout the research project and corresponds with the bibliography.
- To reference an author referred to by another author where the original publication has not been read: (Granovetter, 1974, cited by Saunders, 1993). In this case the author who cites and the original document's author should both appear in the bibliography.

8.6 Referencing In the Bibliography

In the bibliography, the referenced publications are listed alphabetically by author's name. All the author's surnames and initials are listed in full. If there is more than one work by the same author, these are listed chronologically.

- An example of a reference to a book would be: Saunders, M.N.K. and Cooper, S.A., (1993) *Understanding Business Statistics,* London, DP Publciations.
- A reference to a book other than the first edition would be: Morris, C., (1993) *Quantitative Approaches to Business Studies* (3rd ed.,) London, Pitman Publishing.
- A reference to a book with no obvious author would be: Department of Trade and Industry (1992). *The Single Market: Europe open for Professions, UK Implementation,* London, HMSO.
- A reference to a particular chapter in a book would be: Robsoon, C., (1993) *Real World Research,* Oxford, Blackwell, Chapter 3.
- A reference to a particular chapter in an edited book would be: Graig, P.B. (1991) '*Designing and Using Mail Questionnaires',* in Smith, N.C. and Dainty, P. (eds) *The Management Research Handbook, London,* Routledge, pp. 181-89.
- An example of a reference to an article in a journal (in this example volume 20, part 6 would be): Brewster, C. and Bournois, F., (1992) '*uman Resource Management: A European Perspective', Personnel Review,* 20: 6, 4-13.

Footnotes

Researchers must insert footnotes in the appropriate places. These fulfil two purposes:

- The proper identification of materials used in quotations in the report.
- The footnotes provide supplementary value to the main body of the text. Based on the footnotes' description, one can easily refer the cross references, citation of authorities and sources, acknowledgement and elucidation or explanation of a point of view. The recent trend is to avoid footnotes. Some people feel that they enhance display of the scholarship of the researchers. But it is neither an end nor a means of displaying scholarship.

8.7 Precautions In Preparing Report

1. A report is an important way of communicating research findings to others. A good research report is one that does this task efficiently and effectively. Hence, the following precautions must be taken while preparing it:

2. While determining the length of the report, one should keep in mind the fact that it should be long enough to cover the subject but short enough to maintain interest. In fact, report writing should not be a means to learning more and more about less and less.
3. Abstract terminology and technical jargon should be avoided. The report should be able to convey the matter as simply as possible. In other words, this means that reports should be written in an objective style in simple language, avoiding expressions such as 'it seems', 'there may be' and the like.
4. Readers are often interested in acquiring quick knowledge of the main findings and as such the report must make the findings readily accessible. For this purpose, charts, graphs and statistical tables may be used for the various results in the main report in addition to summaries of important findings.
5. The layout of the research should be well thought out. It must be appropriate and in accordance with the objective of the research problem.
6. The report should be free from grammatical mistakes and must be prepared strictly according to the rules of composition of research reports such as the use of quotation marks, footnotes, documentation, punctuation and use of abbreviations in footnotes and the like.
7. The report must present a logical analysis of the subject matter. It must reflect a structure wherein the different pieces of analysis relating to the research problem fit well.
8. A research report should show originality and should necessarily be an attempt to solve some intellectual problem. It must contribute to the solution of a problem and must add to the store of knowledge.
9. Towards the end, the report must also state the policy implications of the problem under consideration. It is usually considered desirable for a report to make a forecast of the probable future of the subject concerned and indicate the kind of research that still needs to be done in that particular field.
10. Appendices should be enlisted for all the technical data in the report.
11. Bibliography of sources consulted is a must for a good report.
12. An index is also considered an essential part of a good report and as such must be prepared and appended at the end.
13. The report must have an attractive appearance. It should be neat and clean, whether typed or printed.
14. Calculated confidence limits must be mentioned and the various constraints experienced in conducting the research study stated.

15. The objective of the study, the nature of the problem, the methods employed and the technique of analysis adopted must all be stated at the beginning of the report in the form of an introduction.

8.8 Oral Presentation

Often the researchers are asked make oral presentation of his research process and findings which is also called as 'Briefing'. This presentation exercise is unique for the following factors:

1. A small group is to be addressed
2. Statistical Tables constitute major aspect of the topic
3. The audience is a core group interested in learning, knowing, analyzing and evaluating.
4. The speaking time may vary from 10 to 20 minutes or 20n minutes to 1 hour 30 minutes depending upon the purpose and the audience
5. Presentation is normally followed by questions and answers.

Preparation: The presenter has to carefully jot down the outline of critical aspects of the research study. While preparing for the presentation the presenter has to bear in mind: (a) the purpose of the presentation (for instance, is it to inform about the problem? Or is it to solve the problem? Or is it to give conclusions and recommendations) ands (b) what is the time given for presentation? The oral presentation should cover the following major points:

1. Opening remarks to explain the nature of the project, problem, found, and how it is processed to solve
2. Findings and conclusions should be the basis of presentation. They must be brief and comprehensive. And
3. Presentation of recommendation. They must have relevance to the conclusions and findings stated earlier.

There are mainly three types of presentations. They are (a) Memorized speech. As a matte of fact, it is not preferable method of presentation. It is highly self centered or speaker centered (b) Reading manuscript. This is also not advisable because over the time it becomes dull, lifeless and fails to evoke interest in the audience (c) Extemporaneous Presentation. It is an oral presentation based on minimal notes or an outline of the subject matter. This speech appears natural, conversational and flexible. It is the best choice in organizational setting. The outlines or important deliverable points can be noted on Cards of 5 x 8 inches or 3 x 5 inches size.

An inexperience speaker or novice resorts, compulsorily, make a rehearsal quiet in advance of the presentation. The rehearsal makes the presentation an artistic and dramatic exercise. The presenter can achieve mastery over ht presentable information. He can find out the weak areas and they can be rectified, revised and reformed during rehearsal period. If necessary a video tape recorder can be used as a diagnostic tool. The delivery should be couched in sophisticated phrases and terms so that it increases receptiveness. The delivery of the research exercise should be in a good demeanor, postures, in terms of dress, total appearance befitting for the occasion. There is no chance of using anecdotes and other rapport developing techniques.

If the audience requires, and / or the occasion demands, audio visuals can also be used. It gives good results. Visual aids decision depends upon several factors because there are a number of lecture-aids such as chalk boards, white boards, handouts, flip charts, overhead transparencies, slides of 35 mm and computer drawn visuals.

SELF ASSESSMENT QUESTIONS

1. Define a research report and explain its purpose.
2. What are the characteristics of a research report? What functions does it perform?
3. What are the format requirements of a research article to be published in a professional journal?
4. Describe the considerations and steps involved in planning report writing work.
5. What are the various kinds of target audience for research reports? What may be their requirements?
6. Describe the layout or format of a research report.
7. Why is a ‘review of literature’ included in a research report? What is its purpose?
8. Describe briefly the various elements included in a research report.
9. Compare and contrast the findings and the conclusions of a research study.
10. What precautions should a researcher take while interpreting his findings?
11. What is a bibliography? What is its purpose?
12. What are the principles for the organisation of a research report?
13. What style characteristics are desirable while writing a research report?

SAMPLE RESEARCH PROPOSAL

MEKELLE UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

DEPARTMENT OF MANAGEMENT

FACTORS AFFECTING THE PERFORMANCE OF SMALL MEDIUM ENTERPRISES IN THE CASE OF MEKELLE CITY (QUIHA SUB CITY)

A RESEARCH PROPOSAL SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR B.A DEGREE IN MANAGEMENT

January, 2019

Mekelle, Ethiopia

TABLE OF CONTENT

CHAPTER ONE

1. Introduction

1.1 Background of the study

Small and medium enterprise (SMEs) have an important role as the backbone of the economy in almost all countries. the success of the government and a country, in regard to business development, is related to small and medium business sustainability (Carrasco-Davila, 2005). The small and medium business sectors are recognized as an integral component of economic development and a crucial element in the effort to lift countries out of purveys. The dynamic role of small and medium enterprises (SMEs) in developing countries as engines through which the growth objectives of developing countries can be achieved has long been recognized. Small medium businesses play an important role in the development of a country and serve as a means to sustain and grow economies (Ibrahim, Angelidis, & Parsa, 2008). Due to the ease in starting and simplicity in operation, small and medium businesses are initiated for various reasons depending upon entrepreneur motives and traits (Kozan et al., 2006). Small and medium businesses contribute to lowering unemployment as well as generate new sources of employment.

Recent empirical studies show that SMEs contribute to over 60% of GDP and over 70% of total employment in low-income countries, while they contribute over 95% of total employment and about 70% of GDP in middle-income countries. Therefore, an important policy priority in developing countries is to reform the policies that divide the informal and formal sectors, so as to enable the poor to participate in markets and to engage in higher value added business activities (Ayyagari, Beck and Demirgüc-Kunt, 2003).

While contributions of SMEs were recognize, many programs and policies were developed to support them, their journey in many instances is short-lived with high rate of failure mostly in Africa due to several factors (Michael and Jeffrey, 2009; Lussier, 1996; Honjo, 2000; ILO,2007; Wiboonchutikula, 2001; Zewde and Associates, 2002). There are many obstacles hindering their growth like competitions, lack of access to credit, cheap imports, insecurity, debt collection, marketing problems, lack of enough working space, identical products in the same market, change in demand and absence of market linkages, lack of raw material accessibilities (Wiboonchutikula,2001).

Even though the government formulated some policies and established many institutions to promote the smooth functioning of SMEs, the sector is not performing up to the expectations of many stakeholders as it has been suffering from several problems. Therefore, The research will be expect to identify and understanding of the factors that affect the performance of small and medium enterprises in quiha town.

1.2 Statement of the problem

Small and medium businesses enterprises play a vital role in poverty reduction, employment generation as well as economic development of both developed and developing countries like Ethiopia. The key role of small and medium business enterprises to the building of indigenous based and growth national economies and advancing technological innovations has created the situation that small businesses collectively have a greater stake in promoting corporate citizenship in general (Taylor, 2004).Increase of transportation costs and increase cost of make operation of small and medium businesses difficult (Opara, 2011). Bad infrastructure network has been a problem for the small business owners. In addition to the Bad infrastructure network is Consumers find it difficult to reach certain places and will prefer to buy their goods that are available along the road rather than an area reserved for small business owners, but with inaccessible roads. According to Arinaitwe (2006), small medium business enterprises are countenance with the problems of lack of expertise, lack of managerial skills, inadequate legislature to protect small medium business enterprise against the competitions from multinational and imported goods and limited of finance. as a result, most of these enterprises have been force to obtain funds from family members and from small medium credit markets, which interest rates are very high and often injurious. According to Carter & Jones-Evans (2006) also clearly put the followings as the strategic problems of small and medium business enterprises- un availability financial resources, marketing problems and customer concentration, poor management skills, lack controls, and technology skills. They further explained that most small business are under capitalized and are improperly capitalize in terms of both a high debt-equity ratio. Small business managers fit into place in little marketing activity and have no awareness of marketing, prefer to apply their time to activities that products that are more familiar. According Parsa, H. (2007). However, it appears that considering the enormous potentials of the small medium enterprises sector, and despite the acknowledgment of its immense contribution to sustainable economic development, its performance still falls below

expectation in many developing countries (Arinaitwe 2006). This is because the sector in these developing countries has been bedeviled by several factors militating against its performance, and leading to an increase in the rate of small and medium enterprises failure. Even though different researches are conducted in various places concerning the small medium enterprises, no study has been conducted in the study area where this research is going to study that is Mekelle city Quiha sub-city. Hence this research will be conducted to fill the place gap.

The purpose of this study is to identify and understanding the factors that affect the performance of small and medium business enterprises in quiha town.

- ✓ If there are the factors,try to identify their sources,
- ✓ where they come from and how they can exist.
- ✓ Understanding the level of effects that comes from these factors and try to indicate the risk taker or responsible one for those factors.

1.3 Research Objectives

The general objective of the study is to identify the major factors affecting the performance of Small and medium enterprises in case of Mekelle city,Quiha sub city.

1.4 Specific objectives

The specific objectives of the research are:

1. To investigate factors that affects the performance of small medium enterprises in the study area.
2. To describe the economic characteristics of small medium enterprise operators in the study area.
3. To assess the overall level of performance of small medium enterprises in the study area . .

1.5 The scope of the study

Among the different types of business classification based on different characteristics, this research will be focus on small medium enterprises working at Mekelle,Quiha sub city.

The main reasons for selecting Small medium enterprises at Mekelle,Quiha sub city are the observed increase of economic activity.

1.6 Significance of the Study

The study will be conducted in this thesis concern on the following significant expectations. That is the suggestion including the discussion; result and recommendation that forward in the study

will use to control or limit the effect of the factors that affect the performance of small medium enterprises in Mekelle,Quiha sub city. It indicates how the performance of small medium enterprise can be improved by minimizing the effects of the factors.

The significance of this study is to distinguish problems related with performance of small medium enterprises in mekelle,quiha city and proposing the following contribution:

For sub city administration: The finding of this study will help the mekelle,quiha sub city administration to create conducive environment for improving the performance of the enterprises by controlling or limiting the effects of the factors related with the administration.

For small enterprises: The findings of this study will help small medium enterprises in mekelle,quiha sub-city and others, within an insight into the benefits of using different factors studied in this research to predict the factors that affect the performance of small enterprises.

Academics/Researchers: The finding of this study will contribute a basis for further study on factors affecting performance of small medium enterprises. In general the significance of this study is to provide a clear overview of the factors affecting performance of small medium enterprises. And, provide a way of controlling the negative effect of these factors on the small medium enterprises.

1.7 Organization of the Paper

The paper will organize under five chapters. The first chapter include introduction, statement of the problem, objective of the study, scope of the study,possible challenge, and organization of the paper. The second chapter includes review related literature. The third chapter includes research methodology, research design, data source, data collection, population of the study and method of data analysis and the fourth chapter includes data analysis and interpretation and the last chapter contains conclusion and recommendation.

CHAPTER TWO

2. Literature Review

The economic growth and development of SME sector in continues to be affected by various challenging factors. Study by the Global Entrepreneurship Monitor (GEM) Reports (20012010), SME survival is one of the lowest in the world (Herrington, Kew & Kew, 2010a). Growth rates of small businesses in Ethiopia are low, A lot of factors increase their influence and causing a huge effect on the success of SMEs (Cacciotti & Hayton, 2015).

Definition of SME:

small and medium-sized enterprises (SMEs) are the engine of the all country economy. They are an essential source of jobs, create entrepreneurial spirit and innovation in the country and are thus crucial for fostering competitiveness and employment.(Günter Verheugen, Member of European Commission 2005, 3) The new SME definition, User guide and model declaration) "The category of small and medium-sized enterprises (SMEs) is made up of enterprises which employ fewer than 200 persons and which have an annual turnover not exceeding 50 million euro, and/or an annual balance sheet total not exceeding 43 million euro." (Extract of Article 2 of the Annex of Recommendation 2003/361/EC) Defining SMEs is challenging, because there is no single agreed definition of an SME. And numerous are applied among OECD (Organization for Economic Co-operation and Development) countries, and employee numbers are not the sole defining criterion. SME are usually independent non subsidiary firms which employ certain number of employees. In the European union the most frequent upper limit designation an SME is 200 employees, but some countries can set the limit to 100, while over the sea The United States consider SMEs to include firms with fewer than 500 employees. (OECD 2005, 17) EU commission changed the definition of SMEs in 2005 from the previous one that was adapted in 1996. The changes were mostly done because of general economic developments since 1996, and a growing awareness to the specific barriers confronting 14 TURKU UNIVERSITY OF APPLIED SCIENCES BACHELOR'S THESIS | Eveliina Soini & Labinot Veseli SMEs. The new SME definition is done for all business categories and also takes better account of different types of relationships between enterprises. The new definition also ensures that different support measures are awarded only to the ones that need them. Changes are also done because the

businesses are now days more innovative and technology plays a crucial role as well. (EU Commission,

well below the average of 70% for sub-Saharan Africa. SMEs stretch across all sectors of the economy (FinMark, 2010).

Table 1.

Definitions of SMMEs given in the National Small Business Act			
Enterprise	No of employee	Annual turnover	Gross assets
Medium	Fewer than 100 to 200, depending on industry	Less than R4 million to R50 million, depending upon industry	Less than R2 million to R18 million, depending on industry
small	Fewer than 50	Less than R2 million to R25 million, depending on industry	Less than R2 million to R4,5 million, depending on industry
Very small	Fewer than 10 to 20, depending on industry	Less than R200 000 to R500 000, depending on industry	Less than R150 000 to R500 000, depending on industry
micro	Fewer than 5	Less than R150 000	Less than R100 000

2.1 Factors affecting SMEs.

The business environment is defined as factors both inside and outside the organization, influencing the continued and successful existence of the organization. The business environment is considered to play a crucial role in the growth of SMEs (Delmar & Wiklund, 2008). Factors inside the business are known as internal environment and factors outside the business are the external environment. According to Beck and Demirguc-Kurt (2006), the growth of both internal and external environment is important for SME growth. Growth of SMEs will be

negatively or positively influenced by changes in the business environment (World Bank, 2006; Zhang, van Doorn & Leeflang, 2014).

2.1.1 Internal environment factors.

The internal environment includes factors in the business environment that are largely controllable by the business (Fatoki & Garwe, 2010; Kolstad & Wiig, 2015). Challenges in the internal environment of a business, includes management competency and skills, limited financial knowledge and a lack of business management training, technological capabilities. The literature will discuss the internal environment factors, which include various factors, namely: managerial competency and skill, access to finance and technological capabilities.

2.1.1.1 Technological capabilities

The primary reasons small businesses continue to face growth challenges in developing countries, despite significant support from governments and other organizations, is their technological capabilities or lack thereof (Arinaitwe, 2006). Small businesses are still hindered by their lack of technological implementation, despite great technological advancements globally. Without this technology, these small businesses find it difficult to neither compete, nor grow (Arinaitwe, 2006). SMEs around the world, like in China and India, face common challenges being upgrading technology and building product quality. China, with its abundance of cheap labor, has the comparative advantage in the labor-intensive, low cost industries. The operation of many of the Indian SMEs is low scale production which reduces their ability to reduce costs of products and engage in technological upgrades, which is a major obstacle (Singh, Garg & Deshmukh, 2010).

2.1.1.2 Lack of Managerial and Technical Skills

The problems of SME"s management arises from the limited knowledge and ability of the owner or shortage of competent staff to advice the owner on management policies (Stephen & Wasiu, 2013). Decision-making skills, sound management and accounting practices are very low for SSE operators in developing countries (Aremu & Adeyemi, 2011). In addition, lack of managerial skills leads to problems in production due to lack of coordination of production process, and inability to troubleshoot failures on machinery and/or equipment‟s and they cannot afford to employ specialists in the fields of planning, finance and administration (CLEP, 2006).

2.1.1.3 Capital Shortage

The author observes that small medium-scale enterprises have serious financial problem in at least three respect of: a) Securing funds in small amount at rates comparable with those paid by large industries. b) Building and manufacturing adequate financial reserves c) Securing long term equity capital.

2.1.1.4 Lack of Adequate Finance

Financial constraints such as inadequate investment capital, insufficient loan, and inefficient financial market are the major obstacles in doing business, and most SME‟s are highly risky ventures involving excessive administrative costs and lack of experience in dealing with financial institutions (CLEP, 2006). According to Sacerdoti (2005) in Habtamu et al. (2013), financial institutions such as micro finance and the banking systems in Africa are not in a position in providing enough financial support to the expansion of small and medium businesses. MUDC (2013) also identified that financing has become a principal challenge to small scale enterprises in Ethiopia; except City administrations and regional finance institutions, their savings and family supports, banks in Ethiopia do not provide finance in the form of loan to SME‟s due to collateral obligations and other requirement.

2.1.2 External environment factors

Enterprises are affected by external macroeconomic environment that can not be controlled such as political, economic, social, technological, environmental and legal factors (Morrison (2006). As already mentioned above, these factors can rarely be affected by management decisions because they are external factors beyond the control of SMEs.

2.1.2.1Access to markets

Although small medium enterprises have close relationships with customers, finding new customers is a major challenge for small medium business owners. Small businesses typically find themselves strapped for time but in order to create a continual stream of new business, they must work on marketing their business every day. The majority of small medium enterprises target the low income market areas because of low entry barriers. The enterprises in this market tend to compete for the same customers.

2.1.2.2 Supply of Raw Materials

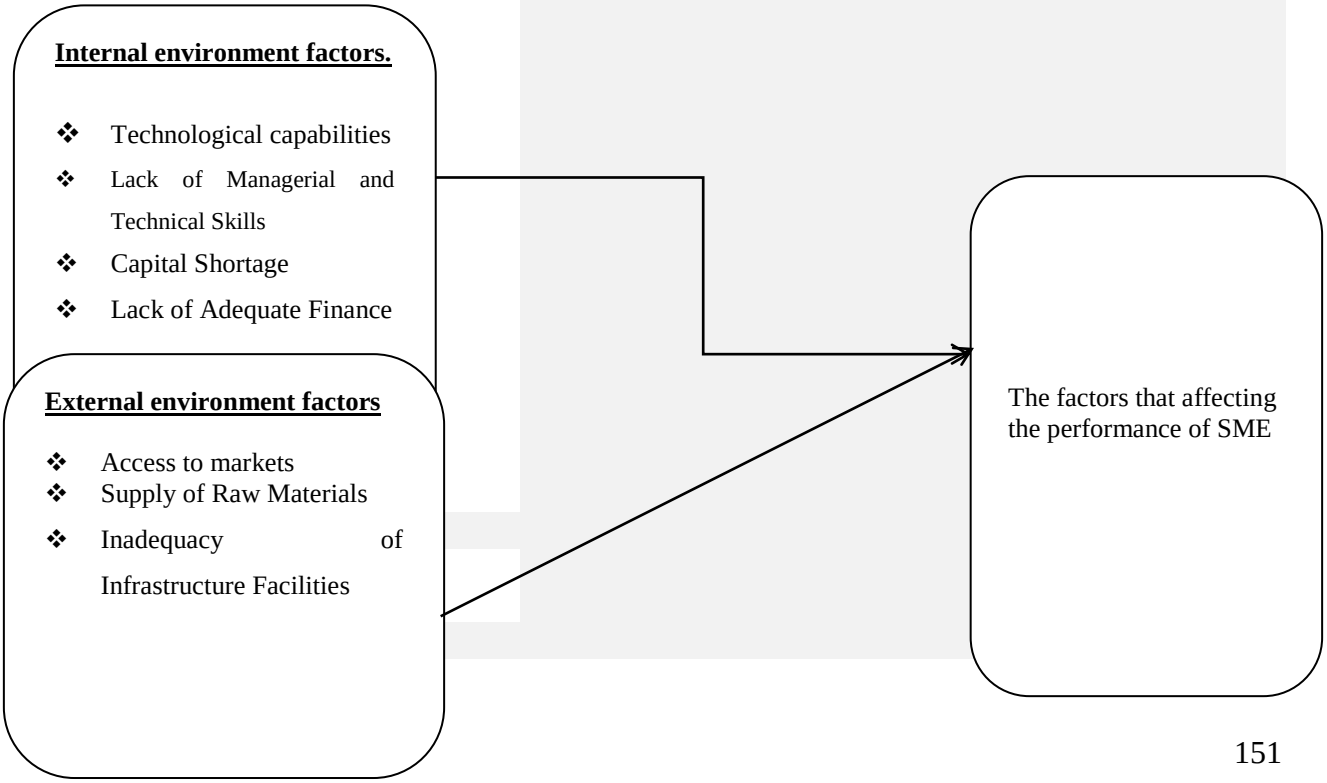
Linking SME to production input suppliers, improving suppliers‟ capacity and regular supply of quality information on input supply sources have positive effects on the success of SME‟s (Siva, 2012). As MUDC (2013) has pointed out one of the major problems, constraining the SME‟s development in Ethiopia was found to be erratic supply of raw materials. To ameliorate such a problem, an aggressive strategy needs to be craft to promote business ventures, which supply inputs, by local and international investors.

2.1.2.3 Inadequacy of Infrastructure Facilities

A research conducted by Daniel (2012) stated that unfavorable roads, power interruption, shortage of water, and inaccessible telecommunications are the major challenges and without which primary, secondary and tertiary production cannot function. Furthermore, Habtamu et al. (2013) indicated that operating with available infrastructure facilities has higher probability of long lasting existence and growth as compared to those. that are operating without adequate infrastructures; and electric power interruption and inadequate water supply in Ethiopia was highly affected the growth of the business. Therefore, emphasis should be give since the success or failures of SME‟s business growth and development depend on the availability and efficiency of infrastructure utilization.

2.2 Framework

Exceptional frame work factors that affecting the performance of SMEs



CHAPTER THREE

3. Research Methodology

Different Materials and Methods will be employed In order to analyze the potential impacts of factors on performance of SMEs, this study will use of a research methodology. This section provides an overview of the study's research approach which lays within the mixed methods strategies. The chapter discusses procedures and activities under taken, focusing on namely the study's research design, target population, data collection, Sample Size Determination and Sampling Techniques, data analysis method instrument development. Besides, the section deals with a discussion on the ethical issues.

3.1 Research Design

Research design is the blueprint for fulfilling research objectives and answering research questions (John A.H. et al., 2007:20-84). In other words, it is a master plan specifying the methods and procedures for collecting and analyzing the needed information. It ensures that the study will be relevant to the problem and that it uses economical procedures. The same authors discusses three types of research design, namely exploratory (emphasizes discovery of ideas and insights), descriptive (concerned with determining the frequency with which an event occurs or relationship between variables) and explanatory (concerned with determining the cause and effect relationships). The types of research employed under this study will be descriptive research. The major purpose of descriptive research is description of the state of affairs as it exists at present. Then this study describes and critically assesses the factors affecting the performance of SMEs in Quiha towns.

3.2 Data Collection

i. Sources of Data

The study will employee both primary and secondary sources of data collection.

a. Primary Sources

In order to realize the target, the study will use designed questionnaire as best instrument. This will be complete by the owner managers/or operators of the enterprises.

b. Secondary Sources

Secondary data from files, pamphlets, office manuals, circulars and policy papers will be used to provide additional information where appropriate. Besides, variety of books, published and/or

unpublished government documents, websites, reports and newsletters will review to make the study fruitful.

3.3 Target Population

In this study the target populations is all SMEs operating in Quiha Town. The population participate in the survey will select by using stratified sampling methods.because of the study area is consistent of different groups.

The total inhabitants of 147 enterprises with the member of 557 people from different site in Quiha Town which will have the number of each enterprise, with the proportion ?which includes material and wood with member of 165,cons traction with member of 111,text-ail and ma garment with member of 175,Agro processing with member of 50,mining with member of 30,chemical like soap, plastic with member of 26. According to Quiha wereda(2009) the study inhabitants deals with many clusters of citizens or society that will be include in the specific study area.

3.4 Sample Size Determination and Sampling Techniques

Stratified sampling will use to select respondents from different sectors of the SMEs. This technique is preferred because it is used to assist in minimizing bias when dealing with the population. With this technique, the sampling frame can be organized into relatively homogeneous groups (strata) before selecting elements for the sample.

According to Catherine Dawson (2009:54), the correct sample size in a study is dependent on the nature of the population and the purpose of the study. Although there are no general rules, the sample size usually depends on the population to be sampled. According to SME Enterprise of wereda quiha.the researcher will select 228 respondents a confidence level of 95% and alpha of 5% then will be selected the sample by using raosoft sample size calculator from Manufacturing 147 enterprises which includes material and wood (32),cons traction (65),text-ail and ma garment(24),agro processing(11),mining (11),chemical like soap, plastic (4) The sample size will select here is considered as representative of manufacturing.

3.5 Data analysis method

The data will be plan to collects in term of primary and secondary sources and analyzed by using simple statistical measurement such as percentage and tables.To analyze and interpret the data will be plan to use qualitative and quantitative.

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Work Plans and Budget Breakdown

Work Plans

		2011				
N0	Activities	February	March	April	May	June
1	Finalizing the research					✓
2	Data collection	✓				
3	Data Entry, cleaning and editing		✓			
4	Data Analysis			✓		
5	Report writing			✓		
6	Submitting first draft				✓	
7	Submitting a second draft				✓	

Budget Breakdown

no	item	cost		
		quantity	Unit cost	total
1	Paper	278	0.50	139
2	Telephone expense		25	25
3	Transportation	20	3	60
4	Photo copy	21	1.25	26.25
5	internet	80		80
6	pen	2	5	10
7	binder		15	15
	total			395.25