WOLLO UNIVERSITY
COLLEGE OF BUSINESS AND ECONOMICS
DEPARTMENT OF ACCOUNTING AND FINANCE

DISTANCE MODULE FOR DEGREE PROGRAM

RESEARCH METHODS IN ACCOUNTING & FINANCE (ACFN 2131)

Prepared by: Ahmed Fantaw (PhD)

Editor: Husein Fentaw (MBAF)

Distance Education Program

2020

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Preface

Dear Students!

Why This Course? *The study of research methodology gives the student the necessary training in gathering material and arranging or card-indexing them, participation in the field work when required, and also training in techniques for the collection of data appropriate to particular problems, in the use of statistics, questionnaires and controlled experimentation and in recording evidence, sorting it out and interpreting it.* In fact, importance of knowing the methodology of research or how research is done stems from the following considerations:

i. *For one who is preparing himself for a career of carrying out research*, the importance of knowing research methodology and research techniques is *obvious since the same constitute the tools of his trade*. The *knowledge of methodology provides good training especially to the new research worker and enables him to do better research. It helps him to develop disciplined thinking or a 'bent of mind' to observe the field objectively. Hence, those aspiring for careerism in research must develop the skill of using research techniques and must thoroughly understand the logic behind them.*

ii. *Knowledge of how to do research will inculcate the ability to evaluate and use research results with reasonable confidence.* In other words, we can state that the knowledge of research methodology is helpful in various fields such as government or business administration, community development and social work where persons are increasingly called upon to evaluate and use research results for action.

iii. When one knows how research is done, *then one may have the satisfaction of acquiring a new intellectual tool which can become a way of looking at the world and of judging every day experience. Accordingly, it enables us to make intelligent decisions concerning problems facing us in practical life at different points of time.* Thus, the knowledge of research methodology provides tools to look at things in life objectively.

iv. In this scientific age, all of us are in many ways consumers of research results and we can use them intelligently provided we are able to judge the adequacy of the methods by which they have been obtained. *The knowledge of methodology helps the consumer of research results to evaluate them and enables him to take rational decisions.*

About the Course

Course Information	
Course Number	AcFn 2131
Course Title	**Research Methods in Accounting & Finance**
Degree Program	BA Degree in Accounting and Finance
Module	**Research in Accounting and Finance**
ETCTS Credits	5
Contact Hours (per week)	3
Course Objectives & Competences to be Acquired	After successfully completing this course, the students should be able to: • Apply business research methods in doing research • Have foundation knowledge for scientific reasoning and solutions for business problems • Implement the research process in doing research, • Prepare research proposal for a project • Explain the various tools and techniques of research • Apply various methodologies of social research to solve Business problems • Define the sources of data and data collection techniques
Course Description	This course deals with the role of research; the method of scientific inquiry; experimentation, fact finding, design of data collection methods, and analysis of collected data and interpretation of results, and formulation of business related research projects by students.

Evaluation Type	Weight
Assignment	35%
Tutorial Attendance	5%
Final exam	60%
Total	100%

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Chapter One: Concepts of Scientific Research

Dear learner! Whether we are aware of it or not, we are surrounded by research. Educators, administrators, government officials, business leaders, human service providers, health care professionals, regularly use social research findings in their jobs. The study of research methods provides you with the knowledge and skills you need to solve the problem and meet the challenges of a fast-paced decision-making environment. The primary objective of research is to find solutions for problems in a methodical and systematic way. Research is simply the process of finding solutions to a problem after a thorough study and analysis of the situational factors.

Research, in some form or another, may help managers in organizations to make decisions at the workplace. As we all know, sometimes they make good decisions and the problem gets solved; sometimes they make poor decisions and the problem persists; and on occasions they make such big mistakes that they get stuck in the morass. The difference between making good decisions and committing mistakes often lies in how we go about the decision-making process. In other words, good decision making brings a "yes" answer to the following questions:

- Do we identify where exactly the problem lies?
- Do we correctly recognize the relevant factors in the situation needing investigation?
- Do we know what types of information are to be gathered and how?
- Do we know how to make use of the information so collected and draw appropriate conclusions to make the right decisions?
- And, finally, do we 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 to know how to go about making the right decisions by being knowledgeable about the various steps involved in finding solutions to problematic issues of interest to the organization and/or its stakeholders. This is what this module is all about.

Objectives of the Chapter

After studying this chapter, you should be able to:

[a] *Describe the meaning of research;*

[b] *Discuss the purpose and types of research;*

[c] *Distinguish between applied and basic research;*

[d] *Describe the characteristics of a good research*

[e] *Describe the process of conducting research;*

[f] *Analyse the importance of each steps involved in research process*.

1.1 The Concept of Research

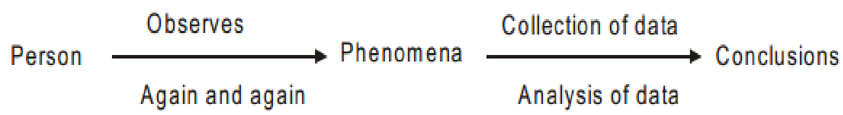
1.1.1 Defining Research

The word research is composed of two syllables, ***re*** and ***search***. The dictionary defines the former as a prefix meaning again, a new or over again and the latter as a verb, meaning to examine closely and carefully, to test and try, or to probe. Together they form a noun describing a careful, systematic, patient study and investigation in some field of knowledge, undertaken to establish facts or principles.

The term 'Research' consists of two words:

Research = Re + Search

'Re' means again and again and 'Search' means to find out something, the following is the process:



Therefore, research means to observe the phenomena again and again from different dimensions.

The research is a process of which a person observes the phenomena again and again and collects the data and on the basis of data he draws some conclusions.

Research is simply the process of finding solutions to a problem after through study and analysis of the situational factors. It is gathering information needed to answer a question, and thereby help in solving a problem. Research can also be defined as a scientific and systematic search for gaining information and knowledge on a specific topic or issue. It is also known as the art of scientific investigation. As such the term 'research' refers to the systematic method consisting of enunciating the problem, formulating a hypothesis, collecting the facts or data, analyzing the facts and reaching certain conclusions either in the form of solutions(s) towards the concerned problem or in certain generalizations for some theoretical formulation.

Several social scientists have defined research in different ways. Some of the definitions of research in literature are given below which can help you to understand proper meaning and concept of research:

Encyclopedia of Social Sciences defines research as “the manipulation of things, concepts or symbols for the purpose of generalizing to extend, correct or verify knowledge, whether that knowledge aids in construction of theory or in the practice of an art”.

According to Clifford Woody, “Research comprises defining and redefining problems, formulating hypothesis or suggested solutions; collecting, organizing and evaluating data; making deductions and reaching conclusions; and at last carefully testing the conclusions to determine whether they fit the formulating hypothesis”. In addition, the Advanced Learner’s Dictionary of Current English defines **research** as “a careful investigation or inquiry especially through search for new facts in any branch of knowledge.”

As shown above, different scholars may define research differently. For the purpose of this course, however, research may be defined as the **systematic and objective process of (planning), gathering, recording, analyzing and interpreting data to prove or disprove a hypothesis.**

Therefore, research may be considered as an **organized, systematic, data based, critical, objective, scientific inquiry or investigation into a specific problem, undertaken with the purpose of finding answers or solutions to it**. In this way research provides the needed information that guides the planners to make informed decisions to successfully deal with the problems. The information provided could be the result of a careful analysis of data gathered first hand or of the data that are already available with an organization.

Thus, research is an original addition to the available knowledge, which contributes to its further advancement. It is an attempt to pursue truth through the methods of study, observation, comparison and experiment. In sum, research is the search for knowledge, using objective and systematic methods of finding solution to a problem. The systematic approach concerning generalization and the formulation of a theory is also research.

Activity:

Question 1: What is the meaning of research?

……………………………………………………………………………………………………

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1.1.2 Business Research Defined

Business research is the application of the scientific method in searching for the truth about business phenomena. These activities include defining business opportunities and problems, generating and evaluating alternative courses of action, and monitoring employee and organizational performance. Business research is more than conducting surveys. This process includes idea and theory development, problem definition, searching for and collecting information, analyzing data, and communicating the findings and their implications.

Business research is systematic and organized effort to investigate a specific problem encountered in the work setting that needs a solution. It comprises a series of steps designed and executed, with the goal of finding answers to the issues that are of concern to the manager in the work environment. It is an organized, systematic, data-based critical, objective, scientific inquiry or investigation into a specific problem, undertaken with the purpose of finding answers or solutions to it.

It is also defined as the systematic inquiry that provides information to guide business decisions. The definition, as expanded by that used by the American Marketing Association, it is a process of determining, acquiring, analyzing, synthesizing, and disseminating relevant business data, information, and insights to decision makers in ways that mobilize the organization to take appropriate business actions that, in turn, maximize business performance.

Steps of business research:

- ✓ To know where the problem areas exist in the organization.
- ✓ To identify as clearly and specifically as possible the problems that need to be studied and resolved.
- ✓ Gather information, analyze the data, and determine the factors that are associated with the problem and solve it by taking the necessary corrective measures.

1.1.3 Criteria of Good Research

Good research generates dependable data that are derived by professionally conducted practices and that can be used reliably for decision making. Whatever may be the types of research works and studies, it is important to note that they all meet on the common ground of scientific method employed by them.

The following are the criteria, which we expect the scientific research to satisfy:

1. *Purpose clearly defined*: The purpose of the research, the problem involved or the decision to be made should be clearly defined and common concepts should be used. The statement of the decision problem should include its scope, its limitations, and the precise meanings of all words and terms significant to the research.

2. *Research process detailed*: The research procedure used should be described in sufficient details to permit another researcher to repeat the research for further advancement, keeping the continuity of what has already been done. This includes the steps to acquire participants, informed consent, sampling methods and representativeness, and data gathering procedures. Omission of significant procedural details makes it difficult or impossible to estimate the validity and reliability of the data and justifiably weakens the confidence of the reader in the research itself as well as any recommendations based on the research.

3. *Research design thoroughly planned*: The procedural design of the research should be carefully planned to yield results that are as objective as possible. Efforts should be made to minimize the influence of personal bias in selecting and recording data.

4. *High ethical standards applied*: Researchers often work independently and have significant latitude in designing and executing projects. A research design that includes safeguards against causing mental or physical harm to participants and makes data integrity a first priority should be highly valued. Ethical issues in research reflect important moral concerns about the practice of responsible behavior in society.

5. *Limitations frankly revealed*: The researcher should report with complete frankness, flaws in procedural design and estimate their effects upon the findings. There are very few perfect research designs. Some of the imperfections may have little effect on the

validity and reliability of the data; others may invalidate them entirely. A competent researcher should be sensitive to the effects of imperfect design.

6. *Adequate analysis for decision maker's needs*: The analysis of data should be sufficiently adequate to reveal its significance and the methods of analysis used should be appropriate. The validity and reliability of the data should be checked carefully. The data should be classified in ways that assist the researcher in reaching pertinent conclusions and clearly reveal the findings that have led to those conclusions. When statistical methods are used, appropriate descriptive and inferential techniques should be chosen, the probability of error should be estimated, and the criteria of statistical significance applied.
7. *Findings presented unambiguously*: Some evidence of the competence and integrity of the researcher may be found in the report itself. Presentation of data should be comprehensive, reasonably interpreted, easily understood by the decision maker, and organized so that the decision maker can readily locate critical findings.
8. *Conclusions justified*: Conclusions should be confined to those justified by the data of the research and limited to those for which the data provide an adequate basis. Good researchers always specify the conditions under which their conclusions seem to be valid.
9. *Researcher's experience reflected*: Greater confidence in research is warranted if the researcher is experienced, has a good reputation in research and is a person of integrity.

1.1.4 Purpose of Studying Research Methods

The purpose of research is to discover answers 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 or to achieve new insights into a phenomenon (studies with this object in view are termed as *exploratory* or *formulative* research studies);
2. To accurately portray the characteristics of a particular individual, situation or a group (studies with this object in view are known as *descriptive* research studies);

3. To analyze 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 examine a hypothesis of a causal relationship between variables (such studies are known as *hypothesis-testing* research studies).

Purpose of Research in Accounting and Finance

The reaction of stakeholders such as investors, creditors and others to the need for historical facts and figure in terms of profit made on investment and revenue generation analysis to be published, has geared the accountant to be involved more in research. Bearing this interrelationship in mind, the researcher should select and expand his research questions with a view to controlling the empirical system within which accounting is practiced. Research according to Inanga, (2002) help in improving the behavior of the practice and makes it relevant to the society. More so, research will help to develop the accounting standards of the system in such a way that it will move towards intended goal.

1.1.5 Importance of Research

All progress is born of inquiry. Doubt is often better than overconfidence, for it leads to inquiry, and inquiry leads to invention. Increased amounts of research make progress possible. All development and progress in the society is an outcome of a research work. The development of logical thinking is promoted by conducting the research activities. The role of research in several fields of applied economics, whether related to the economy as a whole, has greatly increased in modern times. The increasingly complex nature of business and government has focused attention on the use of research in solving operational problems. Research, as an aid to economic policy, has gained added importance, both for government and business. Some of its importance are as below:

- ❖ Research provides base for the policies formation of the Government related to agriculture, industries and infrastructural services in the country.
- ❖ Decision-making may not be a part of research, but research certainly facilitates the decisions of the policy maker.

- ❖ Another area in government, where research is necessary, is collecting information on the economic and social structure of the nation.
- ❖ In this context investigation in the structure of economy is conducted through compilation of data and analysis of facts. Research provides for predicting of future prospects of the country.
- ❖ Research has special importance in relation to solving various problems of business and industries. Market research, operation research and motivation research are conducted in the business for various requirements.
- ❖ Research is equally important to social scientists for analyzing the social relationships and seeking explanations to various social problems.
- ❖ The importance of research can also be ascertaining through its application in socio political sector in order to find out solution to social and political problem of the society.
- ❖ To those students, professionals, among others who are to write project, thesis, dissertation, among others research may mean of careerism or a way to attain a high position in the social structure.

Thus, research is the fountain of knowledge and an important source of providing guidelines for solving different business, governmental and social problems. It is a sort of formal training which enables one to understand the new developments in one's field in a better way.

1.1.6 Motivation for Research

What makes people to undertake research? This is a question of fundamental importance. The possible motives for doing research may be either one or more of the following:

1. Desire to get a research degree along with its consequential benefits;
2. Desire to face the challenge in solving the unsolved problems, i.e., concern over practical problems initiates research;
3. Desire to get intellectual joy of doing some creative work;
4. Desire to be of service to society;
5. Desire to get respectability.

However, this is not an exhaustive list of factors motivating people to undertake research studies. Many more factors such as directives of government, employment conditions, curiosity about new things, desire to understand causal relationships, social thinking and awakening, and the like may as well motivate (or at times compel) people to perform research operations.

1.1.7 Managerial Value of Research

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

Identifying Problems and/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 scanning 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. Consider two examples:

Employee interviews undertaken to characterize the dimensions of an airline reservation clerks 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.

Diagnosis and Assessment

After an organization recognizes a problem or identifies a potential opportunity, an important aspect of business research is often the provision of diagnostic information that clarifies the situation. Managers need to gain insight about the underlying factors causing the situation. If there is a problem, they need to specify what happened and why. If an opportunity exists they may need to explore, clarify, and refine the nature of the opportunity. If multiple opportunities exist, research may be conducted to set priorities. Quantitative or qualitative investigations may help managers better to understand what alternative courses of action are practicable.

Selecting and Implementing a Course of Action

After the alternative courses of action have been clearly 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 glass manufacturer must decide to build a factory either in Addis Ababa or in Dessie, business research can be designed to supply the relevant information necessary to determine which course of action is best for 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.

Even 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 the 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, managers may use evaluation research 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 activity, project, 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 factors influencing the observed performance levels. In addition to business organizations, nonprofit organizations, such as agencies of the federal government, state government or any public sector may frequently conduct evaluation research on policies and programs implemented.

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. 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.

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

1.1.8 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.

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?

Major Topics for Research in Accounting and Finance

- 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

1.1.9 Characteristics of Good Research

a) Systematic Approach

It means that research is structured according to set of rules to follow certain steps in specified sequence. This implies that the procedure adopted to undertake an investigation follow a certain logical sequence. Systematic research also invites creative thinking, and certainly avoids use of guessing and intuition for arriving at the conclusion. Each step of the researcher's investigation must be planned so that it leads to the next step. Planning and organization are part of this approach. A planned and organized research saves your time and money.

b) Objectivity

It implies that True Research should attempt to find an unbiased answer to the decision-making problem. Research involves precise observation and accurate description. The researcher selects reliable and valid instruments to be used in the collection of data and uses some statistical measures for accurate description of the results obtained. Whatever you conclude on the basis of finding is correct and can be verified by yourself and others

c) Reproducible

A reproducible research procedure is one, which an equally competent researcher could duplicate, and from it deduces approximately the same results. Precise information regarding samples-methods, collection etc., should be specified.

d) Relevancy

It furnishes three important tasks:

- It avoids collection of irrelevant information, and saves time and money
- It compares the information to be collected with researcher's criteria for action
- It enables to see whether the research is proceeding in the right direction

e) Control

Research is not only affected by the factors, which one is investigating but some other extraneous factors also. It is impossible to control all the factors. All the factors that we think may affect the study have to be controlled and accounted for.

For Example

Suppose we are studying the relationship between incomes and shopping behavior, without controlling for education and age, it will be a height of folly, since our findings may reflect the effect of education and age rather than income.

Control Must Consider

- All the factors, which are under control, must be varied as per the study demands
- All those variables beyond the control should be recorded

1.2 The Scientific Method

Research produces knowledge which could be used for the solution of problems as well as for the generation of universal theories, principles and laws. But all knowledge is not science. The critical factor that separates scientific knowledge from other ways of acquiring knowledge is that it uses scientific approach. What is this approach? Or what is science?

Science is the knowledge ascertained by observation and experiment critically tested, systematized, and brought under general principles. **The scientific method** is the way researchers go about using knowledge and evidence to reach objective conclusions about the real world. This method is an impartial, consistent, and systematic process that may be employed in solving business problems.

Scientific research is a systematic and objective attempt to provide answers to certain questions. Its purpose is to discover and develop an organized body of knowledge. Therefore, scientific research may be defined as the systematic and empirical analysis and recording of controlled observation, basic process/concept in research which may lead to the development of theories, concepts, generalizations and principles, resulting in prediction and control of those activities that may have some cause-effect relationship.

While applying the scientific method to the research problems, we ask well-structured and likely truthful questions from the respondent. We devise a hypothesis to be tested during the research. We set the objectives and underlying assumptions. Then we draw logical consequences of these assumptions. We collect data and test the technique for relevance and reliability. The statistical tests are applied to data and results are interpreted.

The main distinguishing **characteristics** of **scientific research**:

1. **Purposiveness:** started the research with a definite aim or purpose, purposive focus.
2. **Rigor:** carefulness, scrupulousness, the degree of exactitude in research investigations. Good theoretical base and a sound methodological design.
3. **Testability:** researcher develops certain hypotheses, then these can be tested by applying certain statistical tests to the data collected for the purpose.
4. **Replicability:** the results of the tests of hypotheses should be supported again and yet again when the same type of research is repeated in other similar circumstances.
5. **Precision and confidence:**
   - **Precision:** the closeness of the findings to “reality” based on a sample. Reflects the degree of accuracy or exactitude of the results on the basis of the sample – to what really exist in the universe
   - **Confidence:** the probability that our estimations are correct

6. **Objectivity:** the conclusions drawn through the interpretation of the results of data analysis based on the facts of the findings derived from actual data and not on our own subjective or emotional values.

7. **Generalizability:** the scope of applicability of the research findings in one organizational setting to other settings. The research sampling design has to be logically developed and a number of other details in the data-collection methods need to be meticulously followed.

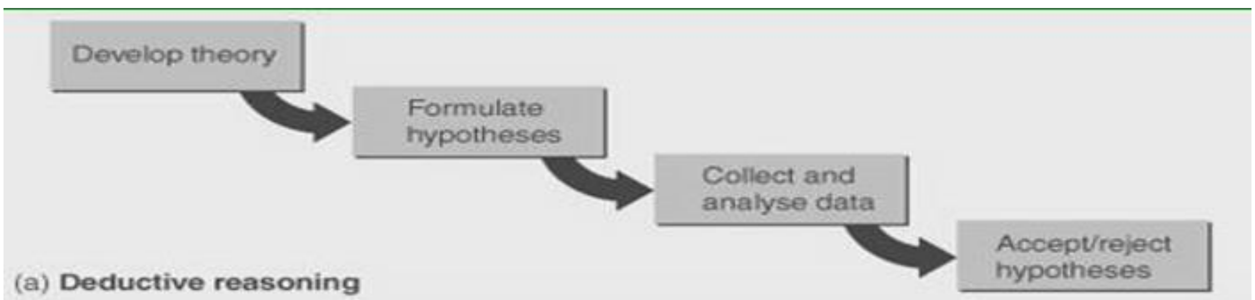
8. **Parsimony:** simplicity in explaining the phenomena or problems that occur, and in generating solutions for the problems. Introduced with a good understanding of the problem and the important factors that influences it; good conceptual theoretical model.

The reason for following a scientific method is that the results will be less prone to errors and more confidence can be placed in the findings because of the greater rigor in application of the design details. This also increases the replicability and generalizability of the findings.

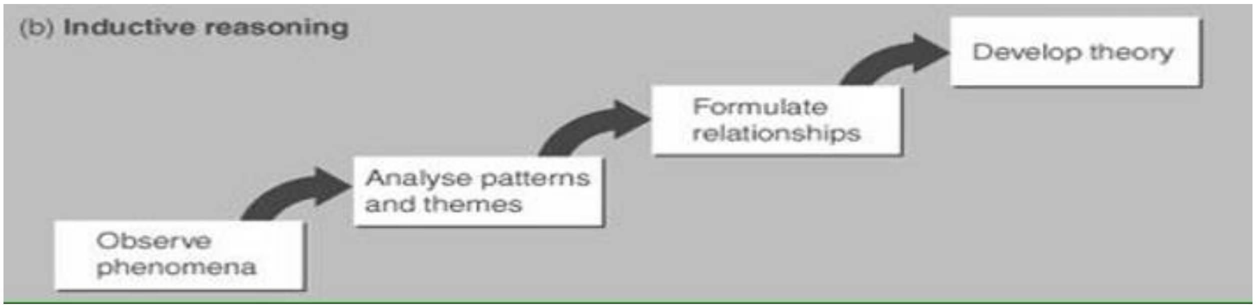
1.2.1 Building Blocks of Science in Research

Answers to issues can be found either by the process of induction or the process of induction, or by a combination of the two.

Deduction: the process by which we arrive at a reasoned conclusion by logical generalization of a known fact.



Induction: a process where we observe certain phenomena and on this basis arrive at conclusions.



1.2.2 Hypothetico-Deductive Method

7 steps in the hypothetico-deductive method:

1. **Observation**: is the first stage, in which one senses that certain changes are occurring or that some new behaviors, attitudes and feelings are surfacing in one's environment (i.e., the work place). How does one observe phenomena and changes in the environment?

2. **Preliminary information gathering**: it involves the seeking of information in depth, of what is observed. This could be done by talking informally to several people in the work setting or to clients or to other relevant sources, thereby gathering information on what is happening and why. (Unstructured interviews). Then it is followed by structured interviews. Additionally, by doing library research or obtaining information through other sources, the investigator would identify how such issues have been tackled in other situations.

3. **Theory formulation**: It is an attempt to integrate all the information in a logical manner, so that the factors responsible for the problem can be on conceptualized and tested. The theoretical framework formulated is often guided by experience and intuition. In this step the critical variables are identified and examined as to their contribution or influence in explaining why the problem occurs and how it can be solved.

4. **Hypothesizing**: It is the next logical step after theory formulation. From the theorized network of associations among the variables, certain testable hypotheses or educated conjectures can be generated. Hypothesis testing is called deductive research. Sometimes, hypotheses that were not originally formulated do get generated through the process of induction.

5. **Further scientific data collection**: After the development of the hypotheses, data with respect to each variable in the hypotheses need to be obtained. Further data are collected to test the hypotheses that are generated in the study.
6. **Data analysis**: Data gathered are statistically analyzed to see if the hypotheses that were generated have been supported. Co relational method will be used to analyze and determine the relationship of two or more factors in the hypotheses for example: stock availability and customer satisfaction.
7. **Deduction**: is the process of arriving at conclusions by interpreting the meaning of results of the data analysis.

1.3 Types of Research

Research comes in many shapes and sizes. Before a researcher begins to conduct a study, he or she must decide on a specific type of research. Good researchers understand the advantages and disadvantages of each type, although most end up specializing in one.

Research is conducted for various purposes and on the basis of the purpose of research and the methodology employed; the following are the common types of research:

Basic or Pure Versus Applied Research

Research can be undertaken for two different purposes. One is to solve a current problem faced by the manager in the work setting, demanding a timely solution. For example, a particular product may not be selling well and the manager might want to find the reasons for this in order to take corrective action. Such research is called **applied research**. The other is to generate a body of knowledge by trying to comprehend how certain problems that occur in organizations can be solved. This is called **basic, fundamental, or pure research.**

1.3.1 Basic or Fundamental Research

Basic or fundamental research mainly concerns generalizations and formulation of a theory. In other words, “Gathering knowledge for knowledge’s sake is termed ‘pure’ or ‘basic’ research.” It is designed to add an organized body of scientific knowledge and does not necessarily produce results of immediate practical value.

Researches relating to pure mathematics or concerning some natural phenomenon are instances of basic or fundamental research. Likewise, studies focusing on human behavior carried on with a view to make generalizations about human behavior, are also examples of fundamental research, but research aimed at certain conclusions (say, a solution) facing a concrete social or business problem is an example of applied research.

The objective of basic or fundamental research is to find information with a broad sense of application and add to the already existing organized body of scientific knowledge.

Activity:

Question 2: When do we use basic research?

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1.3.2 Applied Research

An attempt to find a solution to an immediate problem encountered by a firm, an industry, a business organization, or the society is known as ***applied research***. Researchers engaged in such researches aim at drawing certain conclusions confronting a concrete social or business problem. The primary purpose for applied research is discovering, interpreting, and the development of methods and systems for solving practical problems on a wide variety of real life situations of our world and the universe.

Research to identify social, economic or political trends that may affect a particular institution or the copy research (research to find out whether certain communications will be read and understood) or the marketing research or evaluation research are examples of applied research.

The principal objective of applied research is to find a solution to some pressing practical problem.

Activity:

Question 3: When do we use applied research?

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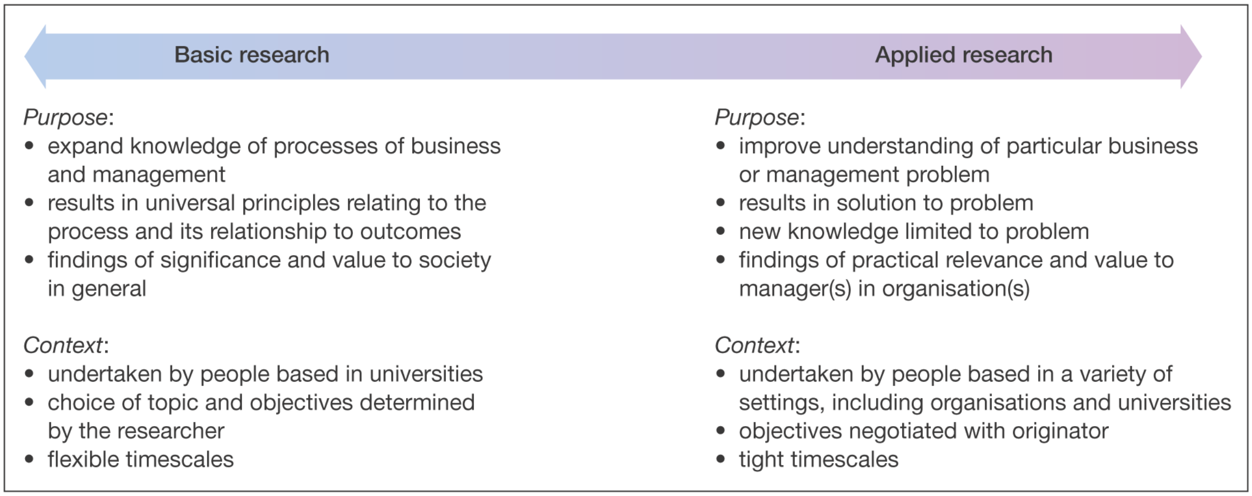


Figure 1.1 Basic and applied research

Quantitative Versus Qualitative Research

Every researcher collects data using one or more techniques. The techniques may be grouped into two categories: quantitative, collecting data in the form of numbers, and qualitative, collecting data in the form of words or pictures. This classification is also based on the nature of the variables to be analyzed and the technique of analysis to be used.

1.3.3 Quantitative Research

Quantitative research is the systematic and scientific investigation of quantitative properties and phenomena, and their relationships. It relates to aspects that can be quantified or can be expressed in terms of quantity. It also involves the measurement of quantity or amount. The objective of quantitative research is to develop and employ mathematical models, theories and hypotheses pertaining to natural phenomena. The process of measurement is central to quantitative research because it provides the fundamental connection between empirical observation and mathematical expression of an attribute. The statistical, mathematical and econometric methods adopted for analysis in such research include correlation, regression, time series analysis, etc.

1.3.4 Qualitative Research

Qualitative research involves studies that do not attempt to quantify their results through statistical summary or analysis. It is concerned with qualitative phenomenon, or more specifically, the aspects relating to or involving quality or kind. It seeks to describe various aspects about behavior and other factors studied in the social sciences and humanities. In qualitative research data are often in the form of descriptions, not numbers. But sometimes results of qualitative research are subjected to relatively less rigorous quantitative treatment. Often the goal of qualitative research is to look for meaning. For example, an important type of qualitative research is "Motivation Research", which investigates into the reasons for human behavior. The main aim of this type of research is discovering the underlying motives and desires of human beings, using in-depth interviews. Attitude or opinion research i.e., research designed to find out how people feel or what they think about a particular subject or institution is also qualitative research. Such research helps to analyze the various factors that motivate human beings to behave in a certain manner or which make people like or dislike a particular thing. However, it is worth nothing that conducting qualitative research in practice is considerably a difficult task. Hence, while undertaking such research, seeking guidance from experienced expert researchers is important.

Exploratory, Descriptive and Causal Research

The purposes of research may be organized into three groups based on what the researcher is trying to accomplish – explore a new topic, describe a social phenomenon, or explain why something occurs. Studies may have multiple purposes (e.g. both to explore and to describe) but one purpose is usually dominates.

1.3.5 Exploratory/Formulative Research

You may be **exploring a new topic** or issue in order to learn about it. If the issue was new or the researcher has written little on it, you began at the beginning. This is called **exploratory research**. The researcher's goal is to formulate more precise questions that future research can answer. Exploratory research may be the first stage in a sequence of studies. A researcher may need to know enough to design and execute a second, more systematic and extensive study.

Initial research conducted to clarify the nature of the problem. When a researcher has a limited amount of experience with or knowledge about a research issue, **exploratory research** is useful preliminary step that helps ensure that a more rigorous, more conclusive future study will not begin with an inadequate understanding of the nature of the management problem. The findings discovered through exploratory research would the researchers to emphasize learning more about the particulars of the findings in subsequent conclusive studies.

Exploratory research rarely yields definitive answers. It addresses the "what" question: "what is this social activity really about?" It is difficult to conduct because there are few guidelines to follow. Specifically, there could be a number of goals of exploratory research.

Goals of Exploratory Research:

1. Become familiar with the basic facts, setting, and concerns;
2. Develop well-grounded picture of the situation;
3. Develop tentative theories, generate new ideas, conjectures, or hypotheses;
4. Determine the feasibility of conducting the study;
5. Formulate questions and refine issues for more systematic inquiry; and
6. Develop techniques and a sense of direction for future research.

For exploratory research, the researcher may use different sources for getting information like:

1. Experience surveys,
2. Secondary data analysis,
3. Case studies
4. Pilot studies.

As part of the experience survey the researcher tries to contact individuals who are knowledgeable about a particular research problem. This constitutes an informal experience survey.

Another economical and quick source of background information is secondary data analysis. It is preliminary review of data collected for another purpose to clarify issues in the early stages of a research effort.

The purpose of case study is to obtain information from one or a few situations that are similar to the researcher's problem situation. A researcher interested in doing a nationwide survey among union workers, may first look at a few local unions to identify the nature of any problems or topics that should be investigated.

A pilot study implies that some aspect of the research is done on a small scale. For this purpose, focus group discussions could be carried out.

1.3.6 Descriptive Research

Descriptive research comprises surveys and fact-finding enquiries of different types. The main purpose of descriptive research is describing the state of affairs of objects, people, groups, organizations, or environments as it prevails at the time of study. Descriptive research seeks to determine the answers to **who, what, when, where, and how** questions. The term *Ex post facto research is* quite often used for descriptive research studies in social science and business research. The most distinguishing feature of this method is that the researcher has no control over the variables; he can only report what has happened or what is happening. Majority of the *ex post facto* research projects are used for descriptive studies in which the researcher attempts to examine phenomena, such as, the preferences of consumers'', frequency of purchases, shopping, or similar data. *Ex post facto studies* also include attempts by researchers to discover causes of the selected problem. The methods of research adopted in conducting descriptive research are survey methods of all kinds, including comparative and correlational methods.

Goals of Descriptive Research:

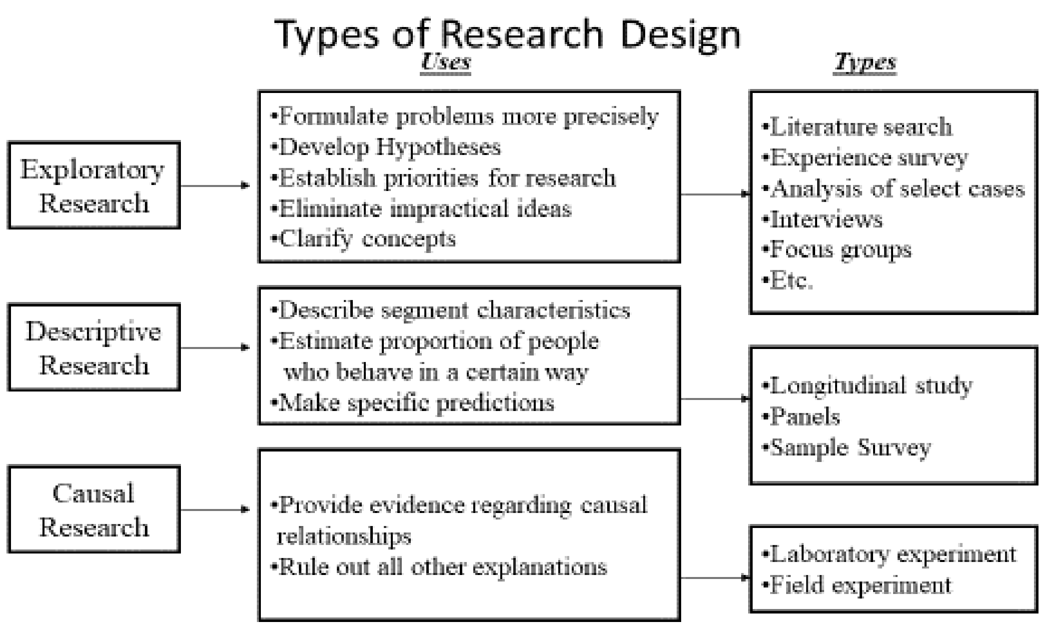
1. Describe the situation in terms of its characteristics i.e. provide an accurate profile of a group;
2. Give a verbal or numerical picture (%) of the situation;
3. Present background information;
4. Create a set of categories or classify the information;
5. Clarify sequence, set of stages; and
6. Focus on 'who,' 'what,' 'when,' 'where,' and 'how' but not why?

A great deal of social research is descriptive. Descriptive researchers use most data –gathering techniques – surveys, field research, and content analysis.

1.3.7 Causal Research

If a decision maker knows what causes important outcomes like sales, stock price, and employee satisfaction, then he or she can shape firm decisions in a positive way. Causal inferences are very powerful because they lead to greater control. Causal research seeks to identify cause-and-effect relationships. When something causes an effect, it means it brings it about or makes it happen. The effect is the outcome. Rain causes grass to get wet. Rain is the cause and wet grass is the effect.

The different types of research discussed here are often building blocks—exploratory research builds the foundation for descriptive research, which usually establishes the basis for causal research. Thus, before causal studies are undertaken, researchers typically have a good understanding of the phenomena being studied. Because of this, the researcher can make an educated prediction about the cause-and-effect relationships that will be tested. Although greater knowledge of the situation is a good thing, it doesn't come without a price. Causal research designs can take a long time to implement. Also, they often involve intricate designs that can be very expensive. Even though managers may often want the assurance that causal inferences can bring, they are not always willing to spend the time and money it takes to get them.



1.4 The Systematic Process of Research

Research process consists of series of actions or steps necessary to effectively carry out research and the desired sequencing of these steps. One should remember that the various steps involved in a research process are not mutually exclusive; nor they are separate and distinct. They do not necessarily follow each other in any specific order and the researcher has to be constantly anticipating at each step in the research process the requirements of the subsequent steps.

The research process is a step-by-step process of developing a research paper. As you progress from one step to the next, it is commonly necessary to backup, revise, add additional material or even change your topic completely. This will depend on what you discover during your research. There are many reasons for adjusting your plan. For example, you may find that your topic is too broad and needs to be narrowed, sufficient information resources may not be available, what you learn may not support your thesis, or the size of the project does not fit the requirements.

However, the following order concerning various steps provides a useful procedural guideline regarding the research process:

1) Formulating the research problem;
2) Extensive literature survey;
3) Developing the hypothesis;
4) Preparing the research design;
5) Determining sample design;
6) Collecting the data;
7) Data analysis and interpretation, and testing hypothesis if there is any;
8) Preparation of the report or presentation of the results, i.e., formal write-up of conclusions reached.

A brief description of the above stated steps will be helpful.

1.4.1 Determining /Recognizing a Research Problem

At the very outset the researcher must single out the problem he wants to study, i.e., he must decide the general area of interest or aspect of a subject-matter that he would like to inquire into. Initially the problem may be stated in a broad general way and then the ambiguities, if any, relating to the problem be resolved. Then, the feasibility of a particular solution has to be considered before a working formulation of the problem can be set up. The formulation of a general topic into a specific research problem, thus, constitutes the first step in a scientific enquiry. Essentially two steps are involved in formulating the research problem, viz., understanding the problem thoroughly, and rephrasing the same into meaningful terms from an analytical point of view.

The best way of understanding the problem is to discuss it with one's own colleagues or with those having some expertise in the matter. The researcher must at the same time examine all available literature to get himself acquainted with the selected problem. He may review two types of literature—the conceptual literature concerning the concepts and theories, and the empirical literature consisting of studies made earlier which are similar to the one proposed. After this the researcher rephrases the problem into analytical or operational terms i.e., to put the problem in as specific terms as possible. This task of formulating, or defining, a research problem is a step of greatest importance in the entire research process. The problem to be investigated must be defined unambiguously for that will help discriminating relevant data from irrelevant ones.

1.4.2 Extensive Literature Survey

Once the problem is formulated, a brief summary of it should be written down. 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 to. Academic journals, conference proceedings, government reports, books etc., must be tapped depending on the nature of the problem. In this process, it should be remembered that one source will lead to another. The earlier studies, if any, which are similar to the study in hand should be carefully studied. A good library will be a great help to the researcher at this stage.

1.4.3 Formulating a Hypothesis/ Research Question

After extensive literature survey, researcher should state in clear terms the working hypothesis or hypotheses. Working hypothesis is tentative assumption made in order to draw out and test its logical or empirical consequences. As such the manner in which research hypotheses are developed is particularly important since they provide the focal point for research. They also affect the manner in which tests must be conducted in the analysis of data and indirectly the quality of data which is required for the analysis. In most types of research, the development of working hypothesis plays an important role. Hypothesis should be very specific and limited to the piece of research in hand because it has to be tested. The role of the hypothesis is to guide the researcher by delimiting the area of research and to keep him on the right track. It sharpens his thinking and focuses attention on the more important facets of the problem. It also indicates the type of data required and the type of methods of data analysis to be used.

How does one go about developing working hypotheses? The answer is by using the following approach:

a) Discussions with colleagues and experts about the problem, its origin and the objectives in seeking a solution;

b) Examination of data and records, if available, concerning the problem for possible trends, peculiarities and other clues;

c) Review of similar studies in the area or of the studies on similar problems; and

d) Exploratory personal investigation which involves original field interviews on a limited scale with interested parties and individuals with a view to secure greater insight into the practical aspects of the problem.

1.4.4 Designing the Study

The research problem having been formulated in clear cut terms, the researcher will be required to prepare a research design, i.e., he will have to state the conceptual structure within which research would be conducted. The preparation of such a design facilitates research to be as efficient as possible yielding maximal information. In other words, the function of research design is to provide for the collection of relevant evidence with minimal expenditure of effort, time and money.

The preparation of the research design, appropriate for a particular research problem, involves usually the consideration of the following:

i. The means of obtaining the information;
ii. The availability and skills of the researcher and his staff (if any);
iii. Explanation of the way in which selected means of obtaining information will be organized and the reasoning leading to the selection;
iv. The time available for research; and
v. The cost factor relating to research, i.e., the finance available for the purpose.

1.4.5 Determining Sample Design

All the items under consideration in any field of inquiry constitute a 'universe' or 'population'. A complete enumeration of all the items in the 'population' is known as a census inquiry. It can be presumed that in such an inquiry when all the items are covered no element of chance is left and highest accuracy is obtained. But, census inquiry is not possible in practice under many circumstances. For instance, blood testing is done only on sample basis. Hence, quite often we select only a few items from the universe for our study purposes. The items so selected constitute what is technically called a sample.

The researcher must decide 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. Thus, the plan to select 12 of a city's 200 drugstores in a certain way constitutes a sample design.

1.4.6 Developing Instrument for Collecting Data

When the research design has been formulated, the next step is to construct or choose appropriate tools of research for scientific observation and measurement. Questionnaire and interview schedule are the most common tools which have been developed for the research. If the readymade tools are not available, then the researcher may have developed appropriate tools before undertaking the study. All these tools of research are ways through which data are collected by asking for information from person rather than observing them.

1.4.7 Collecting Data

In dealing with any real life problem it is often found that data at hand are inadequate, and hence, it becomes necessary to collect data that are appropriate. There are several ways of collecting the appropriate data which differ considerably in context of money costs, time and other resources at the disposal of the researcher.

Primary data can be collected either through experiment or through survey. If the researcher conducts an experiment, he observes some quantitative measurements, or the data, with the help of which he examines the truth contained in his hypothesis. But in the case of a survey, data can be collected by any one or more of the following ways: *By observation, through personal interview, through telephone interviews, by mailing of questionnaires, etc.*

1.4.8 Analyzing the Data

After the data have been collected, the researcher turns to the task of analyzing them. The analysis of data requires a number of closely related operations such as establishment of categories, the application of these categories to raw data through coding, tabulation and then drawing statistical inferences.

1.4.9 Determining the Implications & Findings

The researcher, after analyzing the results, draws some conclusions. In fact, the investigator wants to make some statement about the research about the research problem which he could not make without conducting his research. Whatever conclusion drawn, researcher generalizes it to the whole population. During this phase, hypotheses are accepted or rejected. At the same time the conclusions of the study are related to the theory or research findings from which the hypotheses originally came. Depending on the new findings the original theory may have to be modified. Making recommendations may also be part of this process.

1.4.10 Preparation of the Report

Finally, the researcher has to prepare the report of what has been done by him. Writing of report must be done with great care keeping in view the following:

The layout of the report should be as follows:

(i) the preliminary pages;

(ii) the main text, and

(iii) the end matter.

In its preliminary pages the report should carry title and date followed by acknowledgements and foreword. Then there should be a table of contents followed by a list of tables and list of graphs and charts, if any, given in the report.

The main text of the report should have the following parts:

- **a)** *Introduction:* It should contain a clear statement of the objective of the research and an explanation of the methodology adopted in accomplishing the research. The scope of the study along with various limitations should as well be stated in this part.
- **b)** *Summary of findings:* After introduction there would appear a statement of findings and recommendations in non-technical language. If the findings are extensive, they should be summarized.
- **c)** *Main report:* The main body of the report should be presented in logical sequence and broken-down into readily identifiable sections.
- **d)** *Conclusion:* Towards the end of the main text, researcher should again put down the results of his research clearly and precisely. In fact, it is the final summing up.

At the end of the report, appendices should be enlisted in respect of all technical data. Bibliography, i.e., list of books, journals, reports, etc., consulted, should also be given in the end. Index should also be given specially in a published research report.

Summary

Business research is the systematic and objective process of gathering, recording, and analyzing data for decision making.

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.

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.

This unit has provided an overview of the research process. The steps of research process include problem identification, formulation of hypothesis, formulation of research design, constructing devices for observation, sample selection and data collection, data analysis and interpretation, drawing conclusions and preparation of report

Self-Examination Questions

Choose the best answer for each of the following questions and ENCIRCLE the letter of your choice

1. The type of research concerned with increasing the boundary of human knowledge is:
    a) Applied research
    b) Evaluative research
    c) Pure research
    d) Descriptive research
2. Which of the following statements is **false** about research?
    a) Research is systematic because it employs scientific techniques
    b) Qualitative research is often subjective

c) The process of research involves planning

d) The objectivity of research can be measured by the procedures and techniques prescribed

3. Which of the following is **true** about research?

    a) The choice of research topic is greatly influenced by the interest of the researcher.

    b) The starting point for social research is always a problem.

    c) Explanatory research is used to fill a gap in lack of information.

    d) The fact that research topic is not made in a vacuum implies that research can be biased.

    e) a and b only

4. Which of the following stages of research identify the relationship between variables?

    a) Problem definition

    b) Problem reformulation

    c) Selection of research design

    d) Hypothesis formulation

5. Initial research conducted to clarify and define the nature of a problem is:

    a) explanatory research

    b) exploratory research

    c) causal research

    d) descriptive research

Answer the following questions

1. What is research? Discuss qualities of good research.
2. Discuss importance and relevance of business research.
3. What is the difference between applied research and basic or pure research?
4. List the steps involved in research process
5. What is the role of review of literature in research process?
6. Why formulates of hypothesis is necessary while conducting it?

Glossary of Terms

Applied Research is conducted when a decision is made about a specific real life problem.

knowledge.

Basic/Pure Research is an attempt to verify the acceptability of theory or to expand the limits of

Business Research is systematic and objective process of collecting, recording and analyzing data to facilitate business decisions.

Causal Research is the research which attempts to study cause-effect relationship between events.

Deduction: It is a way of making a particular inference from a generalization.

Descriptive Research is oriented towards finding description of the characteristics of a population of phenomenon.

Exploratory Research is conducted with the expectation that subsequent researcher will be required to provide conclusive evidence.

Induction: It is a process of reasoning to arrive at generalizations from particular facts. **Research** is simply the process of finding solution to a problem after thorough examination and analysis of factors.

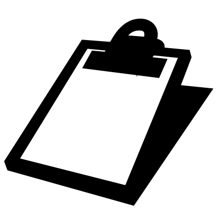
Science is the knowledge ascertained by observation and experiment critically tested, systematized, and brought under general principles.

The scientific method is the way researchers go about using knowledge and evidence to reach objective conclusions about the real world.

Chapter Two: Formulation of the Research Problem and Hypotheses

In chapter 1, we have discussed the meaning and significance of business research, types of research, and the business research process. There we have shown that the research process begins with the raising of a problem, leading to the gathering of data, their analysis and interpretation and finally ends with the writing of the report. In this chapter, we propose to give a complete coverage on selection and specification of the research problem, formulation of research hypotheses. Now we will dwell in detail on these aspects along with the associated features which are interwoven with the research problem and hypothesis formulation and testing.

Objectives of the Chapter



After studying this chapter, you should be able to:

[a] Formulate a research problem and identify the selection of the research problem;

[b] Select a research problem and identify sources of research problem,

[c] Identify sources of research problem,

[d] Understand that proper problem definition is essential for effective business research;

[e] Define and specify a research problem,

[f] Define hypothesis and classify the hypotheses,

[g] Suggest criteria for a good hypothesis,

[h] Test a hypothesis.

2.1 What is Research Problem?

A research problem, in general, refers to some difficulty which a researcher experiences in the context of either a theoretical or practical situation and wants to obtain a solution for the same. Research problem is a condition that causes a researcher to feel anxious, uneasy and confused. It involves the complete analysis of the problem area involving who, what, where, when and why of the problem situation.

In research process, the first and most important step happens to be that of selecting and properly defining a research problem. It is like the identification of destination before undertaking a journey. As in the absence of a destination, it is impossible to identify the shortest or indeed any route, in the absence of a clear research problem, a clear and economical plan is impossible. A research problem is like the foundation of a building. The type and design of the building is dependent upon the foundation. If the foundation is well designed ad strong you can expect the building to be also. The research problem serves as the foundation of a research study: It is well formulated; you can expect a good study to follow.

A researcher must find the problem and formulate it so that it becomes susceptible to research. To define a problem correctly, a researcher must know: what a problem is? If one wants to solve a problem one must generally know what the problem is. It can be said that a large part of the problem lies in knowing what one is trying to do.

Activity:

Question 1: What do you mean by a research problem?

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2.1.1 Defining/Formulating the Research Problem

Defining research problem is crucial and very hard part of a research process. It is crucial because, the problem identified will provide us the topic of the designed research and the objective of the research. It is the most difficult and hard part of the research study because; there is a cause and effect issue. It is commonly difficult to distinguish effect of problem from the cause of the problem. The researcher should be certain that the problem identified is a cause but not the effect. There is a famous saying that **"problem well-defined is half solved"**. This shows how important it is to "define the problem correctly".

Problem definition or problem statement is a clear, precise, and succinct statement of the question or issue that is to be investigated with the goal of finding an answer or solution. For example, the problem could pertain to (1) existing business problems where the manager is looking for a solution, (2) situation that may not pose any current problems but which the manager feels have scope for improvement, (3) areas where some conceptual clarity is needed for better theory building, or (4) situations in which a researcher is trying to answer a research question empirically because of interest in the topic.

A proper definition of research problem will enable the researcher to find answers to questions such as

- What characteristics of data are relevant and need to be studied?
- What relations are to be explored among variables?
- What technique has to be used to collect and analyze data? And so forth

Therefore, 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.

The following points may be observed by a researcher in selecting a research problem or a subject for research as a researchable research problem:

1. The topic selected should be original or at least less explored. The purpose of research is to fill the gaps in existing knowledge or to discover new facts and not to repeat already known facts. Therefore, a preliminary survey of the existing literature in the proposed

area of research should be carried out to find out the possibility of making an original contribution. Knowledge about previous research will serve at least three purposes.

   a) It will enable the researcher to identify his specific problem for research.
   b) It will eliminate the possibility of unnecessary duplication of effort, and
   c) It will give him valuable information on the merits and limitations of various research techniques which have been used in the past.

2. It should be of significance and socially relevant and useful.
3. It should be interesting to the researcher and should fit into his aptitude.
4. It should be big enough to be researchable and small enough to be handled - the topic should be amenable for research with existing and acquirable skills. Too narrow or too vague problems should be avoided.
5. The feasibility of carrying out research on the selected problem should be checked against the following considerations.
   a) Whether adequate and suitable data are available?
   b) Whether there is access to the organization and respondents?
   c) Whether cooperation will be forth coming from the organization and respondents?
   d) What are the resources required and how are they available?
   e) Whether the topic is within the resources (money and man power) position of the researcher?
6. It should be completed within the time limits permissible.
7. The importance of the subject, the qualifications and the training of a researcher, the costs involved, and the time factor are few other criteria that must also be considered in selecting a problem. In other words, before the final selection of a problem is done, a researcher must ask himself the following questions:
   a) Whether he is well equipped in terms of his background to carry out the research?
   b) Whether the study falls within the budget he can afford?
   c) Whether the necessary cooperation can be obtained from those who must participate in research as subjects?
8. The selection of a problem must be preceded by a preliminary study (if the research relatively new).

Activity:

Question 2: List any five points which will weigh in selecting a problem.

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2.1.2 Importance of Formulating a Research Problem

The common say regarding the problem is, ‘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.

The following Questions and Answers crop up in the mind of the researcher who can well plan his strategy:

i. What data are to be collected?
ii. What characteristics of data are relevant and need to be studied?
iii. What relations are to be explored?
iv. What techniques are to be used for the purpose?

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 what we can work out the research design and can smoothly carry on all the consequential steps involved while doing research.

2.1.3 Identifying Research Problem

There is a famous saying that "Problem well defined is half solved." This statement is true in research because if the problem is not stated properly, the objectives will not be clear. Once objective is not clearly defined, data collection becomes meaningless.

The first step in research is to formulate the problem. In order to conduct research, problem must be defined accurately. While formulating the problem, clearly define,

- Who is the focus?
- What is the subject matter of research?
- To which geographical territory / area the problem refers to?
- To which period the study pertains to?

When choosing an area for research, we usually start either with a broad area of Finance, which particularly interests us e.g. Investment or Source of fund, or we start with a very practical question like those in the last paragraph, which need answers to help with managerial decision-making. Refining from this point to a researchable question or objective is not easy. We need to do a number of things:

1. Narrow down the study topic to one, which we are both interested in and have the time to investigate thoroughly
2. Choose a topic context where we can find some access to practitioners if possible; either a direct connection with an organization or professional body, or a context which is well documented either on the web or in the literature
3. Identify relevant theory or domains of knowledge around the question for reading and background understanding.
4. Write and re-write the question or working title, checking thoroughly the implications of each phrase or word to check assumptions and ensure we really mean what we write. This is often best done with other people to help us check assumptions and see the topic more clearly.
5. Use the published literature and discussion with others to help us narrow down firmly to an angle or gap in the business literature, which will be worthwhile to explore.

6. Identify both the possible outcomes from this research topic, both theoretical and practical. If they are not clear, we can refine the topic so that they become clear?

2.1.4 Sources of Research Problem

The selection of a suitable problem is not an easy task. It is a serious responsibility to commit oneself to a problem that will inevitably require much time and energy and which is so academically significant. The following are the main sources to which one may proceed for a suitable research problem:

1. Personal experiences of the investigator in the field of education are the main source for identifying suitable problem. Many of the problems confronted in the classroom, the school or the community lend themselves to investigation and they are perhaps more appropriate for the beginning researcher than are problems more remote from his own teaching experiences.
2. The other source of problem which is most frequently used by the investigator as suggested by the supervisors is the extensive study of available literature-research abstracts, journals, hand-books of research international abstracts etc. He can draw an analogy for selecting a research problem or can think parallel problem in the field studied.
3. In the choice of a suitable problem, the researcher has to decide his field of investigation. He should study the field intensively in the specific area; this may enable him to identify a problem from the specific field.
4. The new innovations, technological changes and curricular developments are constantly bringing new problems and new-opportunities for Social Studies Research.
5. The most practical source of problem is to consult supervisor, experts of the field and most experienced person of the field. They may suggest most significant problem of the area. He can discuss certain issues of the area to emerge a problem.
6. It is a general practice that researchers suggest some problems in their research reports. The researcher can pick up a suitable problem for his own study.

2.1.5 Guidelines for the Statement of the Problem

The research problem should be defined in a systematic manner. The technique involved in defining a research problem has a number of steps, which should be under taken one after another.

1. **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 (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.

2. **Understanding the nature of the problem:** The next step is to understand the nature and the origin of the problem. The best ways of understanding the problem are:

- 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
- To discuss it with those who have good knowledge of the problem concerned or similar other problem.

3. **Surveying the available literature:** All available literature concerning the problem must be surveyed and examined before a definition of the research problem is given. This means that the researcher must be familiar with:

- The relevant theories in the area. Theories has got the following role in over all research studies:
  - ✓ Theories provides patterns of the interpretation of data
  - ✓ It links on the study with others
  - ✓ It supplies frameworks within which concepts and variables acquire special significance
  - ✓ It allows us interpret the large meaning of our findings for ourselves and others
- Reports and records as also all other relevant literature.

Reviewing of research works on related problems is done to find out what data and other materials, if any, are available for operational purposes. Knowledge about these 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
- Studies on related problem are also useful for indicating the type of difficulty that may be encountered in the present study.

4. **Developing the ideas through discussions:** Discussion on 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. Such practice is called '*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.

5. **Rephrasing the research problem:** Finally, the researcher at this stage should be able to reformulate the problem that has been stated in broad and general way in to working proposition. The researcher should narrow and break down the problem in to its components variables and relationships. That problem should be expresses as:
   - A relationship between two or more variables
   - The problem should be stated either in question form or hypotheses form.

Question form is appropriate mostly when the research is descriptive in nature. What important is that when a researcher state the problem in question form the formulated problem should be free from ambiguity and the relationship among variables should be clearly expressed.

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

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

2.1.6 Evaluation of the Problem

Before the final decision is made on the investigation of the problem, the feasibility of the problem has to be tested with regard to personal suitability of the researcher and social value of the problem. In short, the research problem should be evaluated in terms of the following criteria:

- ❖ **Is the problem researchable?** Some problem cannot be effectively solved through the process of research. Particularly research cannot provide answers to philosophical and ethical questions that don't show the relationship exiting between two or more variables.

A problem may be unsolvable due to two reasons:

1. It may concern some super natural or amorphous phenomenon. For example, how does mind work? Who created this world?
2. It cannot be operationally defined. For example, to measure sex or social class is every easy but to measure anxiety, creatively is difficult.

- ❖ **Is the problem new?** As much as possible, the research problems need to be new. One should not target his investigation to the problem that has already been thoroughly investigated by other researchers. To be safe from such duplication, the researcher has to go through the record of previous studies in a given field. However, there are times where by a problem that has been investigated in the past could be worthy of study. A researcher may repeat a study when he/she wants to verify its conclusions or extend the validity of its findings in a situation entirely different from the previous one. The purpose if research is to fill the gaps in existing knowledge to discover new facts and not to repeat already known facts. Therefore, a preliminary survey of the existing literature in the proposed area of research should be carried out to find out the possibility of making original contribution.

- **Is the problem significant?** The question of significance of the problem usually relates to what a researcher hopes to accomplish in a particular study. What his /her purpose in undertaking to solve the particular problem selected/chosen? What new knowledge does he/she hope to add to the sum total of what is known? And what value is this knowledge likely to have? When all this questions are answered by the researcher the problem should be considered for further investigation. The major dimensions are academic awareness and policy.

- **Is the problem feasible for the particular researcher?** In addition to the above points, the feasibility of the research problem should also be examined from the point of view of the researcher's personal aspect.

  - **Research competency**: the problem should be in an area in which the researcher is qualified and competent. The researcher has to make sure that he/she is familiar with the existing theories, concepts, laws and related to the problem. He/she must also posses the necessary skills and competence that may be needed to develop, administer, and interpret the necessary data gathering tools. What is more, he needs to consider whether he has the necessary knowledge of research design and statistical procedure that may be required to carry out the research through its completion.

  - **Interest and enthusiasm**: the researcher has to make sure that the problem really interests him/her. He/she must also be truly enthusiastic about the problem. If the problem is chosen properly by observing these points, the research will not be boring; rather its will be love's labor.

  - **Financial consideration**: research is an expensive endeavor, which requires a great deal of money invest. In this regard, the researcher should ascertain whether he has necessary financial resources to carry on the investigation of the selected problem. An estimate of the expenditure involved in the data gathering equipment, printing, test material, travel, and clerical assistance to be specified.

- **Time requirement**: research should be undertaken within a given scope of time, which was allocated, with careful analysis of the prevailing situation. Each and every of research process require time. Particularly, it is worthwhile to plan for the time that will be needed for the development and administration of tools, processing and analysis of data and writing of the research report.

- **Administration consideration**: the researcher has to pay attention to all administrative matter that is necessary to bring his/her study to its full completion. In this regard the researcher should consider kinds of data, equipment, specialized personnel and administrative facilities that are needed to complete study successfully. The researcher must assure whether the pertinent data are available and accessible to him/ her.

2.2 Hypothesis Formulation

2.2.1 Defining Hypothesis

Hypothesis may be defined as a proposition or a set of propositions set forth as an explanation for the occurrence of some specified group of phenomena either asserted merely as a provisional conjecture to guide some investigation in the light of established facts. The word Hypothesis is composition of two words, “Hypo” and “Thesis”. Hypo means “under or below” and thesis means “a reasoned theory or a rational viewpoint”. Thus hypothesis means a theory which is not fully reasoned. Hypotheses are a set of suggested tentative solution of a research problem, which can be or may not be a real solution.

A hypothesis is a tentative explanation for certain behaviors, phenomena, or events that have occurred or will occur. A hypothesis states the researcher’s expectations concerning the relationship between the variables in the research problem; a hypothesis is the most specific statement of the problem. It states what the researcher thinks the outcome of the study will be. The researcher does not then set out to “prove” his or her hypothesis but rather collects data that either support the hypothesis or do not support it; research studies do not “prove” anything. Hypotheses are essential to all research studies with the possible exception of some descriptive studies whose purpose is to answer certain specific questions.

The hypothesis is formulated following the review of related literature and prior to the execution of the study. It logically follows the review since it is based on the implications of previous research. The related literature leads one to expect a certain relationship. Hypotheses precede the study proper because the entire study is determined by the hypothesis. Every aspect of the research is affected by the hypothesis, including subjects (the sample), measuring instruments, design, procedures, data-analysis techniques, and conclusions. Although all hypotheses are based on previous knowledge and aimed at extending knowledge, they are not all of equal worth. There are a number of criteria that can be, and should be, applied to a given hypothesis to determine its value.

Activity:

Question 3: What do you mean by a hypothesis?

…………………………………………………………………………………………………

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2.2.2 Possible Sources of Hypothesis

Hypothesis may be developed from a variety of sources, including the following:

1. **Hypothesis originates in the science itself or in the scientist:** The history of science provides an eloquent testimony to the fact that personal and idiosyncratic experiences of the scientist contribute a great deal to the type and form of questions one may ask, as also the kinds of tentative answers to this question (hypothesis) that he/she might provide. Here the kinds of a person's perception and conception would play a major role. Researchers should think differently and carefully.

2. **Analogies** are often a fountainhead of valuable hypothesis. This involves comparisons or analogies between social and natural systems.

3. **Hypothesis may rest also on the findings of other studies**- in social science research is usually exploratory. i.e., They start with explicit hypothesis

4. **A hypothesis may stem from a body of theory**, which may afford by way of logical deduction, the prediction that if certain conditions are present certain results would follow.
5. It is worthy of note that **value orientation of the culture** in which a science develops may furnish many of its basic hypotheses.

To conclude the ideal source of fruitful and relevant hypothesis is a fusion of past experience and imagination of the researcher.

2.2.3 Null and Alternative Hypothesis

- **Null hypothesis:** a proposition that states a definitive, exact relationship between two variables
  - ➢ States that the population correlation between two variables is equal to zero or that the difference in the means of two groups in the population is equal to zero (or some *definite* number)
  - ➢ Expressed as no (*significant*) relationship between two variables or no (*significant*) difference between two groups
- **Alternate hypotheses**: the opposite of the null
  - ➢ Statement expressing a relationship between two variables or indicating differences between groups

If we reject the null hypothesis, then all permissible alternative hypotheses relating to the particular relationship tested could be supported

2.2.4 Basic Characteristics of Good Hypothesis

Hypotheses can be useful if and only if they are carefully formulated. There are several criteria used to evaluate hypothesis. These include the following:

- Hypothesis should be clear and precise. If it is not precise and clear, then the inferences drawn on its basis would not be reliable.
- Hypothesis should be capable of being tested or verified (should be tested).

- Hypothesis should state relationship between variables, if it happens to be a relational hypothesis.
- Hypothesis should be limited in scope and must be specific. A researcher must remember that narrower hypotheses are generally more testable and he should develop such hypotheses.
- Hypothesis should be stated as far as possible in most simple terms so that the same is easily understandable by all concerned. But one must remember that simplicity of hypothesis has nothing to do with its significance.
- Hypothesis should be consistent with most known facts i.e., it must be consistent with a substantial body of established facts. That is, it must be in the form of a statement which is most likely to occur.
- Hypothesis should be amenable to testing within a reasonable time. No matter how excellent a hypothesis, a researcher should not use it if it cannot be tested within a given period of time, as no one can afford to spend a life-time on collecting data to test it.
- Hypothesis must explain the facts that gave rise to the need for explanation. This means that by using the hypothesis plus other known and accepted generalizations, one should be able to deduce the original problem condition.

2.2.5 Steps in Hypotheses Testing

1. *State* the *null and the alternate* hypotheses
2. *Choose the appropriate statistical test* depending on whether the data collected are parametric or nonparametric
3. *Determine* the *level of significance* desired (p=0.05, or more, or less)
4. *See* if the *output results* from computer analysis *indicate* that the *significance level is met*.
5. When the *resultant value* is *larger than critical value, the null hypotheses is rejected, and the alternate accepted*. If the calculated value is less than the critical value, the null is accepted and the alternate rejected.

Summary

Proper problem formulation is the key to success in research. It is vital and any error in defining the problem incorrectly can result in wastage of time and money.

The problem is stated in a general way, the ambiguities are resolved, thinking and rethinking process results in a more specific formulation of the problem. It is done so that it may be a realistic one in terms of the available data and resources and is also analytically meaningful. All this results in a well-defined research problem that is not only meaningful from an operational point of view. But is equally capable of paving the way for the development of working hypotheses and for means of solving the problem itself.

A hypothesis is an unproven proposition or a possible solution to be problem. Hypotheses state relationships between variables that can be empirically tested.

Self-Examination Questions

Choose the best answer for each of the following questions and ENCIRCLE the letter of your choice.

1. Sources of researchable problems can include:
    a) Researchers’ own experiences
    b) Practical issues that require solutions
    c) Theory and past research
    d) All of the above
2. Research hypotheses are ______.
    a) Formulated prior to a review of the literature

b) Statements of predicted relationships between variables

c) Stated such that they can be confirmed or refuted

d) b and c

3. Which of the following statements is **false** about research hypothesis?

a) A hypothesis is used to appreciate the kind of data to be collected for study.

b) A hypothesis refers to a set of tentative propositions that might be disproved.

c) It helps the researcher in organizing the data to be collected in the most appropriate ways.

d) All of the above

e) None of the above

Answer the following questions

1. What is a research problem? Explain the sources of research problems.
2. Defining a research problem properly is a prerequisite for any study. Why?
3. If you are appointed to do a research for some problem with the client, what would you take as the sources for problem identification?
4. A problem well defined is half solved. Comment.
5. While you define a research problem what do you try to do?
6. What is the necessity of defining a research problem? Explain.
7. What are the characteristics of good hypothesis testing?
8. What are the different types of hypotheses?

Glossary of Terms

Alternative hypothesis: Statistical term for research hypothesis that specifies values that researcher believes to hold true.

Hypothesis: A hypothesis is a tentative answer / solution to the research problem, whose validity remains to be tested.

Null hypothesis: The hypothesis that is of no scientific interest; sometimes the hypothesis of no difference.

Problem Definition: The process in order to clear understanding (explanation) of what the problem is.

Research Problem: It focuses on the relevance of the present study.

Chapter Three: Developing A Research Proposal

Learning Objectives

After reading this chapter you should be able to:

- Explain the purpose of the research proposal; and
- Outline a research proposal.

3.1 Defining a Research Proposal

Every researcher has to write a research proposal before he/she undertakes any research work. A proposal is known as a work plan, prospectus, outline, statement of intent, or draft plan. So the proposal tells us what, why, how, where, and to whom the research will be done. It is the detailed plan of study. The term "research proposal" indicates that a specific course of action will be followed. It is a document which sets out the researchers' ideas in an easily accessible way. The intent of the written research proposal is to present a focused and scholarly presentation of a research problem and plan. The objective in writing a proposal is to describe what the researcher will do, why it should be done, how the researcher will do it and what the researcher expect will result. A clean, well thought-out, proposal forms the backbone for the research itself.

3.2 The Purpose Research Proposal

Research proposal may function at least in three ways,

i. ***Proposal as a means of communication*** serves to communicate the investigator's research plan to those who-give consultations and / or disburse fund. Proposal is the primary source on which the graduate students' **thesis or dissertation** committee must base the function of: review, consultation and more importantly, approval for implementation of the research project

In general**,** the quality of assistance and the probability of financial support will all depend directly on the clarity and justification of the proposal.

ii. ***Research proposal as blueprint/plan*** helps the researcher to organize his idea in a systematic manner and to look for strengths and flaws. A successful proposal sets out the plan in step-by-step detail. That is, it provides an inventory of what must be done and which materials have to be collected as a preliminary step.

Generally, the acceptability of results is judged exclusively in terms of the adequacy of the methods employed in recording, analyzing and interpreting the data in the planned study.

iii. ***Proposal also functions as a contract.*** A completed proposal approved for execution and signed by all members of the sponsoring committee, constitute a bond of agreement between the researcher and that committee. An approved grant proposal results in a contract between the investigator (and often the university) and funding sources.

A research proposal *should convince* your research supervisor or a reviewer *that your proposed methodology is* ***commendable***, ***valid***, ***appropriate*** and ***workable*** in terms of obtaining answers to your research questions or objectives.

Proposal for thesis and dissertation should be in final form prior to the collection of data. Once document is approved in final form, neither the student nor the sponsoring faculty members should be free to alter the fundamental terms of the contract by unilateral decision.

Activity:

Question 1: Why do you need to write a good research proposal?

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3.3 Structure of a Research Proposal

There is no a hard and a fast format in scientific research proposal writing. It varies from one organization to anther and from one country to another. Some universities and funding agencies make very specific demand for the format of proposals. Others provide general guidelines for form and content. Though the format varies, the essence expressed in different proposal remains the same.

- The title
- Cover page
- Abstract

I. Introduction

Background of the study

Statement of the problem

Research questions

Objectives of the study

The Hypothesis

The Significance of the Study

Scope of the study/ delimitations of the study

Limitation of the study (optional)

Definition of key terms

Organization of the study

II. Literature Review

III. Research Methodology

IV. Work plan and budget/logistics

- Reference
- Appendixes

Each of them can have their own separate section in research proposal. Some can be merged some on the other hand can be split in to separate section or into further subsections.

A. Preliminary

I. Title:

- The title should be as explicit as possible and transparent
- It should be clear and short
- It should capture and reflect the content of the proposal. It should enable the readers to understand the concepts of the study

Try to get the title down to one line or two

II. Cover page

The cover page contains the name of the investigator, the name of your department, college, university, the name of your advisor(s) and date of delivery under the title.
The title page has no page number and it is not counted in any page numbering.

III. Summary/Abstract:

The abstract is a one-page brief summary of the research proposal (most of the time less than 300 words). It should be concise, informative and should provide brief information about the whole problem to be investigated. The abstract should not include any information that is not in the main text of the research proposal. Do not put references, figures, or tables in the abstract.

The 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)

IV. Table of Content

After accomplishment of research proposal writing table of content which comprises title and page number can be developed manually or automatically from the computer references menu.

B. Body of the proposal

I. Introduction

3.3.1 Background of the Study

The first part of any research proposal is background of the study. It is of special importance on account of its strategic location. It is the part of the proposal that provides readers with the background information for the research proposal. Its purpose is to establish a framework for the research, so that readers can understand how it is related to other research. Be sure to include a hook at the beginning of it. This is a statement of something sufficiently interesting to motivate the reader to read the rest of the proposal, it is an important/interesting scientific problem that the study either solves or addresses. This section should cite those who had the idea or ideas first, and should also cite those who have done the most recent and relevant work. The researcher should then go on to explain why more work is necessary (his/her work of course).

The background of the research should identify the variables of the research problem, discuss the variables which are selected for the research study. Other important variables which are not included in the research study should also be briefly discussed. It should also be made clear that which criteria were used for the selection of the variables. This part of the research proposal should be written in simple language and should also be précised.

Areas to cover in the background are:

i. The domain of the study. That is background theory, for example: financial accounting, taxation, Auditing.

ii. The sector or business segment. That is forcal theory. For example, Banking industry, government sector, textile industry and

iii. The obligation why the study is to be conducted in the domain, in relation to the previous studies.

The last paragraph must explain the primary purpose of the study.

3.3.2 Statement of the problem

Most research proposals are considered as responses to a problem. A problem might be defined as the issue that exists in the literature, theory, or practice that leads to a need for the study. The prospective researcher should think on what caused the need to do the research (problem identification). The research problem should be stated in such a way that it would lead to analytical thinking on the part of the researcher with the aim of possibly concluding solutions to the stated problem. The problem statement describes the context for the study and it also identifies the general analysis approach. It is important in a proposal that the problem stand out—that the reader can easily recognize it.

What information should be included in the problem statement?

1. *A brief description of socio-economic and cultural characteristics* in the country/district *in as far as these are relevant to the problem*. Include a few illustrative statistics, if available, to help describe the context in which the problem occurs.
2. *A concise description of the nature of the problem* (the discrepancy between what is and what should be) and of the size, distribution and severity of the problem (who is affected, where, since when, and what are the consequences for those affected and for the services). For a descriptive or evaluation study you will elaborate the different components of the problem.
3. *An analysis of the major factors* that may influence the problem and a discussion of why certain factors need more investigation if the problem is to be fully understood.
4. *A brief description of any solutions to the problem* that have been tried in the past, how well they have worked, and why further research is needed (***justification*** for your study).
5. A description of the type of information expected to result from the project and how this information will be used to help solve the problem.
6. If necessary, a short list of ***definitions*** of crucial concepts used in the statement of the problem.

Effective problem statements answer the questions:

Why does this research need to be conducted?

Are there questions about this problem to which answers have not been found up to the present?

3.3.3 Research Questions

Once a statement of the research problem is defined, the next step is to pose the research question which forms the basis of the inquiry.

A research question is a statement which depicts the *relationship between two or more variables of interest* to the researcher. The relationship is presented in question form.

Example:

The following are a set of *possible* **research questions** on a study of *'capacity building linkages at the community level':*

- What are *the grassroots initiatives* of community based organizations?
- What are the *decision making processes* at the community level?
- How are *the linkages* at the community level important to the promotion of capacity building?

3.3.4 Research Objectives

The objectives of a research delineate the ends or aim which the inquirer seeks to bring about as a result of completing the research undertaken. An objective may be thought of as either a solution to a problem or a step along the way toward achieving a solution; an end state to be achieved in relation to the problem. The objectives of a research project summarize what is to be achieved by the study. Objectives should be closely related to the statement of the problem.

Generally, this section should focus on the points

- What is to be achieved by the proposed investigation has to be stated plainly and concisely
- Should be to the point and logically arranged
- Should be stated in a form which shows the relations between variables
- Must clearly state the target of the research activity, i.e., what kind of results are expected or sought from conducting research.

It should be SMART; Specific/not vague, Measurable, Achievable, Realistic and Time bound.

Objectives should be stated *using "action verbs*" that are *specific enough to be measured*:

Examples: To determine …, To compare…, To verify…, To calculate…, To describe…, etc.

Do not use vague non-action verbs such as: To appreciate … To understand… To believe.

Commonly, research objectives are classified into **general objectives and specific objectives.** The general and specific objectives are logically connected to each other and the *specific objectives are commonly considered as smaller portions of the general objectives*. It is important to ascertain that the general objective is closely related to the statement of the problem.

General objective: These are understood as the overall objectives of the research project.

- What exactly will be studied?
- General statements specifying the desired outcomes of the proposed project

Specific objectives: These are understood as the elements of the research which are directly addressable by the methodology and which are followed in order to achieve the general objectives.

- Specific statements summarizing the proposed activities and including description of the outcomes and their assessment in **measurable terms.**
- It identifies in greater detail the specific aims of the research project, often breaking down what is to be accomplished into smaller logical components.
- Specific objectives should systematically address the various aspects of the problem as defined under 'Statement of the Problem' and the key factors that are assumed to influence or cause the problem.

3.3.5 Research Hypothesis

The researcher should review the related literature thoroughly before formulating hypotheses. Hypotheses are linked to the speculative proposition of the problem statement, can be inferred from the overall conceptual framework of a study, and are of critical importance to data analysis and interpretation. In research studies, the term hypotheses imply a derivation, within a hypothetic-deductive theoretical system, of a particular assertion or prediction. The hypothesis is subject to test, i.e., to confirmation or rejection on empirical grounds. The term question implies an interrogative statement that can be answered by data, which is logically related to the same conceptual framework, but which does not necessarily stem from that framework through logical deduction.

The following criteria should be used for the formulation of testable and significant hypothesis;

(i) The hypothesis must be clearly stated in operational terms.

(ii) The hypothesis must be specific and testable.

(iii) Research problems should be selected which are directly related to previous research or theoretical formulations.

3.3.6 Significance of the Research

What contributions do you think your study intend to make to the advancement of knowledge and/or to the solution of some practical or theoretical problem(s)? What are the intrinsic and extrinsic benefits of the study? What is the potential usefulness of the findings of the study to all stakeholders? How will the findings assist or be of benefit to each stakeholder? How would the solution to the problem influence educational theory and practice? What are the educational, social, theoretical, cultural, etc. significance of the study? Convince the stakeholders of your study of the potential impact of the study for them. Formulate and present the anticipated implications or possible applications of the results of your study. Indicate significance to all related stakeholders of the study including:

(1) theory or advancing accumulated knowledge;
(2) existing body of literature;
(3) policy development and implementation;
(4) practices in the field;
(5) the study's subjects or participants;
(6) teachers and other practitioners;
(7) researchers;
(8) parents, government and other stakeholders, etc.

3.3.7 Scope of the Study

Scope of the study is the entire area to be covered when carrying out investigation. The study must explain precisely the time, population, among others under the heading. In fact, the following issues must be covered. A study in particular, must have very clearly defined limits. You cannot tackle everything. Rather than trying to do too much in a superficial way, focus on a small area which you aim to investigate in depth. All research projects must have a starting point and an end point. That necessarily means that you have to set clear boundaries. This will serve to orient your reader and to make your study a manageable one.

Narrow down the study by limiting it to a particular group, to a particular time, or a particular region (e.g. Amhara, Oromia), or a particular kind of enterprise or occupation or a particular function (ask yourself: Who, when, where, what, how, why? With each of the answers, you might be able to define your field of study more and more.

i. The researcher is expected to explain the time, area, specialization, place of the research study and
ii. The last paragraph must explain that, any area that is not mentioned is not part of the study.

3.3.8 Limitations of the Study (optional)

This is a part that you will include some constraints or difficulties you think that they have influence on the results of your study. This may be in relation to the ***weaknesses*** in the methodology, lack of access to data, faulty instruments, sampling restrictions, lack of recent literature in the area etc. Any restrictions or areas of the problem that will not be addressed must be indicated.

3.3.9 Definition of Key Terms

If there are terms that have unique meaning in the study, then explanation is needed right from the onset. This will avoid different interpretation by readers. If a specialized or a generic dictionary is adopted or an intuitive terminology the sources must be identified and indicated. For example, dictionary of accounting, or oxford dictionary in case of generic dictionary what is required is to give reader enough information to such terms.

At the end of your research you may come across other terminology which you must also defined them. For example, *college* to some people it means a university, to some, it means secondary school, or tertiary institution.

Therefore, definition of terms is an important part of research study, since without a common understanding of those terms, the value of the research may be lost through misunderstanding and misinterpretation of your work.

II. Literature Review

Literature review is an aspect of research that is usually set out in second chapter of a research study. Literature review is *not* a compilation of every work written about a topic. It is *not* simply a list of sources reviewed separately for their own merit. A literature review is a description of the literature relevant to a particular field or topic. It gives an overview of what has been said, who the key writers are, what are the prevailing theories and hypotheses, what questions are being asked, and what methods and methodologies are appropriate and useful. As such, it is not in itself primary research, but rather it reports on other findings.

Objective of the literature review

- To establish a familiarity with a body of knowledge and establishes credibility: A review tells a reader that he knows the research in an area and knows the major issue.
- To show the path of prior research and how a current project is linked to it: A review outlines the direction of research on a question and shows the development of knowledge A good review places a research project in a context and demonstrates its relevance by making connections to a body of knowledge.
- To integrate and summarize what is known in the area. A review pulls together and synthesizes different results. A good review points out areas where prior studies agree, where they disagree, and major questions remain. It collects what is known up to a point in time and indicates the direction for future research.
- To learn from others and stimulate new ideas. A review tells what others have found so that a researcher can benefit from the efforts of others. A good review identifies blind alleys and suggests hypotheses for replication. It divulges procedures, techniques, and research design worth copying so that a researcher can better focus hypotheses and gain new insights.

Steps and strategies for writing a literature review. They are:

Steps	Strategies
1. Identify key authors	a. Locate relevant literature

	b. Use state of the art articles c. Use computerized searches d. Use Google scholar e. Use reference list from sources and f. Read Primary Sources.
2. Critically Read the literature	a. Identify themes in the literature b. Identify strengths and weaknesses of individual articles and fields as a whole and c. Collect photocopies of articles
3. Prepare to write	a. Investigate the length and format of the literature review b. Make a preliminary outline c. Organized the literature you will cover and d. Limit the scope of the review to the topic at hand
4. Write the review and	a. Write the introduction b. write sub-section c. be careful not to plagiarize and d. Practice summarizing and paraphrasing (that is, using different words) activities.
5. Indicate the gap	a. Use the review to lead to your Study and research question(s)

The theoretical part of the review is based on group of assumptions

III. Research methodology

The methods or procedures section is really **the heart** of the research proposal. The researcher must decide exactly how he/she is going to achieve the stated objectives: *i.e.*, what new data is need in order to shed light on the problem the researcher have selected and how he/she is going to collect and process this data. The activities should be described with as much detail as possible, and the continuity between them should be apparent. Indicate the methodological steps the researcher will take to answer every question, to test every hypothesis illustrated in the Questions/Hypotheses section or address the objectives set.

i. **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.

In fact, the research design is the conceptual structure within which research is conducted; it constitutes the blueprint for the collection, measurement and analysis of data. 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.

ii. **Population, Sampling Technique and Sample Size:**

In concluding a research study, it is hardly possible to include all members of a given population in the investigation. All the items under consideration in any field of inquiry constitute a population. The method of sampling should be specified in the research proposal. If the sample is not thoroughly analyzed and precisely described, faulty generalizations may be made. The sample should be made the true representative of the population. The sampling plan should also be described in the proposal. It should describe how the units in the target population will be selected and used. Thus, the more the samples involved in the study, the more the power of generalization on the entire population and the less the level of biasness.

iii. **Source and Method of Data Collection:**

In this subsection of the methodology, information required to attack the problem is explained. The source of the data, the site (location) of the study and time that will be included (relevant time period) should also be specified.

The research proposal should identify the schedules and procedures to be used for acquiring the data and recording it accurately. All available methods are expected to be considered by a researcher and the best one is selected. The researcher explains and justifies how his selection of a method is relevant and appropriate to his study. If they are lengthy, they should be placed in an appendix and reference be given in the body of the proposal.

iv. Method of Data Analysis:

The researcher should specify how the data will be ordered and reduced to relate directly to the research problem. The statistical procedure to be used in the analysis of data should be described. It will be done hypothesis wise or not, it should be indicated in the research proposal.

IV. Work plan and Budget / Logistics

Work Plan

Work plan is a schedule and chart that summarizes the different components of a research proposal and how they will be implemented in a coherent way within a specific time-span.

It may include:

- The tasks to be performed;
- When and where the tasks will be performed;
- Who will perform the tasks and the time each person will spend on them;
- It describes the plan of assessing the ongoing progress toward achieving the research objectives;
- The plan specifies how each project activity is to be measured in terms of completion, the time line for its completion;

Cost Plan

Most often than not, you will require to secure funds from a funding organization to cover the cost of conducting a research project. The items to consider when drawing up a budget requirement are outlined below. In addition, it is important to remember that the funding agency will invariably also read through the whole proposal (not just the budget requirement). Therefore, it is critical that the entire proposal document is well thought out and written to effectively communicate the aim of the research and how you plan to achieve it. Budget breakdown has to be prepared for all activities. It may include the details of:

- *Personal Costs* - Principal researcher- subsistence and boarding
  - Research assistants- salary/per-diems
- *Support Services* - Secretarial Costs/ data input and analysis
- *Fieldwork costs* - Transport/ other relevant expenses/ subsistence
- *Overheads* - Stationery/ photocopy/ printing/ computer media
- *Books/journal costs* - Books and journals to be purchased
- *Equipments* - Equipment to be bought/ hired (if any)
- *Other relevant costs*

References

The researcher must give references to all the information that he/she obtained from books, papers in journals, and other sources. References may be made in the main text using index numbers in brackets (Vancouver style) or authors name (Harvard style). The researcher will also need to place a list of references, numbered as in the main text (or alphabetically ordered), at the end of the research proposal.

For a journal paper give:

- The names of the authors,
- The year of publication,
- The title of the paper,
- The title of the journal,
- The volume number of the journal,
- The first and last page numbers of the paper.

For a book give:

- The author,
- The year of publication,
- The title, and the edition number if there is one,
- The name of the publisher,
- The page numbers for your reference.

For an internet reference give:

- The author of the web page,
- The title of the item on the web page,
- The date the item was posted on the web page,
- The date the item was accessed from the web page,
- The complete and exact URL.

Appendices/Annexes

Include in the appendices of the proposal any additional information that the researcher think might be helpful to a proposal reviewer. For example, include:

- Questionnaire & other collection forms
- Dummy tables
- Biographical data on the principal investigator
- The consent form (if any)

Flowchart: Steps in the development of a research proposal

Questions you must ask	Steps you will take	Important elements of each step
What is the problem and why should it be studied?	Selection, analysis and statement of the research problem	- problem identification - prioritising problems - analysis - justification
What information is available?	Literature review	- literature and other available information
Why do we want to carry out the research? What do we hope to achieve?	Formulation of research objectives	- general and specific objectives - hypotheses
What additional data do we need to meet our research objectives? How are we going to collect this information?	Research methodology	- variables - types of study - data collection techniques - sampling - plan for data collection - plan for data processing and analysis - ethical considerations - pre-test or pilot study
Who will do what, and when?	Work plan	- human resources - timetable
What resources do we need to carry out the study? What resources do we have?	Budget	- material support and equipment - money
How will the project be administered? How will utilisation of results be ensured?	Plan for project administration and utilisation of results	- administration - monitoring - identification of potential users
How will we present our proposal to relevant authorities, community and the funding agencies?	Proposal summary	- briefing sessions and lobbying

Adapted from the International Development Research Center: Designing and Conducting Health Systems Research Projects, VOLUME 1

Summary

The objective in writing a proposal is to describe what the researcher will do, why it should be done, how the researcher will do it and what the researcher expect will result. There is no a hard and a fast format in scientific research proposal writing. It varies from one organization to anther and from one country to another. Some universities and funding agencies make very specific demand for the format of proposals.

The contents of research proposal are arranged under the following headings: introduction/background of the study, the problem, objectives of the study, hypotheses to be tested, significance of the study, scope and limitation of the study, structure of the study, literature review, study design, sampling design, data collection, and analysis of data. The specifics, under each heading, will vary with the type of study you are proposing to undertake.

A work schedule provides a time-frame for your study.

As an appendix, in the case of quantitative studies, attach your research instrument. Also, attach a list of references in the appendix of the proposal.

Self-Examination Questions

Choose the best answer for each of the following questions and ENCIRCLE the letter of your choice.

1. Which of the following is **not true** about the purpose of research proposals?
   a) It presents the problem to be researched and its importance
   b) It sets forth the data necessary for solving the problem
   c) It suggests how the data will be collected, processed and analyzed
   d) None of the above
2. We review the relevant literature to know:
   a) What is already known about the topic
   b) What concepts and theories have been applied to the topic
   c) Who are the key contributors to the topic
   d) All of the above
3. Which of the following does a research proposal not attempt to communicate?
   a) Purpose of the intended study
   b) Actual results from the study, along with a discussion about them
   c) Importance of the intended study
   d) Step-by-step plan for conducting the study
4. Which of the following should be included in a research proposal?
   a) Your academic status and experience.
   b) The difficulties you encountered with your previous reading on the topic.
   c) Your choice of research methods and reasons for choosing them.
   d) All of the above.
5. In which section of a research proposal must researchers state the particular question to be investigated?
   a) justification of the study
   b) research question
   c) definition of terms
   d) objective of the study

Answer the following questions

1. Identify any two purposes of a research proposal
2. Why is literature review important when preparing a proposal?
3. Define general objectives, specific objectives and hypotheses by giving your own examples.
4. List the characteristics of research objectives.

Chapter Four: Sampling Design

Learning Objectives

After Studying this chapter, you should be able to:

- Define sampling;
- Explain the purpose of sampling;
- Compare census and sample survey studies; and
- Describe and apply various probability and non-probability sampling methods.

4.1 Introduction

In this chapter, we shall discuss the basics of sampling, particularly how to get a sample that is representative of a population. It covers different methods of drawing samples which can save a lot of time, money and manpower in a variety of situations. These include random sampling methods, such as, simple random sampling, stratified sampling, systematic sampling, multistage sampling, cluster sampling methods (and non-random sampling methods viz., convenience sampling, judgement sampling and quota sampling.

4.2 Sampling Design

Sampling is the process of using a small or parts of a larger population to make conclusions about the whole population. A sample design is a definite plan for obtaining a sample from a given population. Sampling design refers to the technique or the procedure the researcher adopts for selecting items for the sample from the population or universe. It helps to decide the number of items to be included in the sample, i.e., the size of the sample.

The basic idea of sampling is that by selecting some of the elements in a population, we may draw conclusions about the entire population. A **population element** is the individual participant or object on which the measurement is taken. It is the unit of study or analysis. A **population** is the total collection of elements about which we wish to make some inferences. A **census** is a count of all elements in the population. The listing of all population elements from which the sample will be drawn is called **sample frame**.

4.3 Census and Sample Survey

All items in any field of inquiry constitute a 'Universe' or 'Population.' A complete enumeration of all items in the 'population' is known as a census inquiry. It can be presumed that in such an inquiry, when all items are covered, no element of chance is left and highest accuracy is obtained. But in practice this may not be true. Even the slightest element of bias in such an inquiry will get larger and larger as the number of observation increases. Moreover, there is no way of checking the element of bias or its extent except through a resurvey or use of sample checks. Besides, this type of inquiry involves a great deal of time, money and energy. Therefore, when the field of inquiry is large, this method becomes difficult to adopt because of the resources involved. At times, this method is practically beyond the reach of ordinary researchers. Perhaps, government is the only institution which can get the complete enumeration carried out. Even the government adopts this in very rare cases such as population census conducted once in a decade. Further, many a time it is not possible to examine every item in the population, and sometimes it is possible to obtain sufficiently accurate results by studying only a part of total population. In such cases there is no utility of census surveys.

However, it needs to be emphasized that when the universe is a small one, it is no use resorting to a sample survey. When field studies are undertaken in practical life, considerations of time and cost almost invariably lead to a selection of respondents i.e., selection of only a few items. The respondents selected should be as representative of the total population as possible in order to produce a miniature cross-section. The selected respondents constitute what is technically called a '**sample**' and the selection process is called '**sampling technique**.' The survey so conducted is known as 'sample survey'. Algebraically, let the population size be N and if a part of size n (which is $< N$) of this population is selected according to some rule for studying some characteristic of the population, the group consisting of these n units is known as 'sample'. Researcher must prepare a sample design for his study i.e., he must plan how a sample should be selected and of what size such a sample would be.

Activity:

Question 1: Which do you think is more appropriate? Survey or census? Why?

……………………………………………………………………………………………………

……………………………………………………………………………………………………

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4.4 The Need for Sampling

There are several compelling reasons for sampling, including

- **Lower cost** – the economic advantage of taking sample rather than a census are massive.
- **Greater accuracy of results** – sampling processes the possibility of better interviewing (testing), more thorough investigation of missing, wrong, or suspicious information, better supervision, and better processing than is possible with complete coverage.
- **Greater speed of data collection** – sampling's speed of execution reduces the time between the recognition of a need for information and the availability of that information.
- **Availability of population elements** – sampling the only process possible if the population is infinite.

4.5 Steps in sampling Design

Sampling process consists of seven steps. They are:

1. Define the population
2. Identify the sampling frame
3. Specify the sampling unit
4. Selection of sampling method
5. Determination of sample size
6. Specify sampling plan
7. Selection of sample

a. Define the population:

Population is defined in terms of:

a) Element - Company's product

b) Sampling unit - Retail outlet, super market
c) Extent - Dessie and Kombolcha
d) Time - April 10 to May 10, 2020

b. Identify the sampling frame:

Sampling frame could be

a) Telephone Directory
b) Localities of a city using the municipal corporation listing
c) Any other list consisting of all sampling units.

c. Specify the sampling unit:

Individuals who are to be contacted are the sampling units. If retailers are to be contacted in a locality, they are the sampling units.

Sampling unit may be husband or wife in a family. The selection of sampling unit is very important. If interviews are to be held during office timings, when the heads of families and other employed persons are away, interviewing would under-represent employed persons, and over-represent elderly persons, housewives and the unemployed.

d. Selection of sampling method:

This refers to whether

(a) probability or

(b) non-probability methods are used.

e. Determine the sample size:

This means we need to decide "how many elements of the target population are to be chosen?" The sample size depends upon the type of study that is being conducted. For example: If it is an exploratory research, the sample size will be generally small. For conclusive research, such as descriptive research, the sample size will be large.

The sample size also depends upon the resources available with the company.

f. Specify the sampling plan:

A sampling plan should clearly specify the target population. Improper defining would lead to wrong data collection.

g. **Select the sample**: This is the final step in the sampling process.

4.6 Criteria for selecting a sampling procedures

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.

The Accuracy may be affected by sampling error and systematic bias

Sampling errors (random errors) are the random variations in the sample estimates around the true population parameters. They decrease with the increase in the size of the sample and happen to be a smaller magnitude in case of homogeneous population and can be measured for a given sample design and size.

If we increase the sample size, the precision can be improved. But increasing the size of the sample has its own limitations viz., a large sized sample, because it increases the cost of collecting data and enhances the systematic bias. Thus, the effective way to increase precision is usually to select a better sampling design which has a smaller sampling error for a given sample size at a given cost

In brief, while selecting a sampling procedure, researcher must ensure that the procedure causes a relatively small sampling error and helps to control the systematic bias in a better way. Sampling errors arise only in the case of sample survey.

A systematic bias (non-sampling error) results from errors in the sampling procedures, and it cannot be reduced or eliminated by increasing the sample size, it occurs in all surveys, whether in sample survey or census surveys.

It comes from sources such as sampling frame error, mistakes in recording responses, or nonresponses from persons who are not contacted or who refuse to participate

At best the causes responsible for these errors can be detected and corrected. It is a type of systematic error in the design or conduct of a sampling procedure; results in distortion of the sample and results; can be eliminated by careful design of the sampling procedure but not by increasing the sample size.

It is usually the result of one or more of the following factors:

Defective measuring device*:* If the measuring device is constantly in error, it will result in systematic bias. In survey work, systematic bias can result if the *questionnaire or the interviewer* is biased.

Non-respondents: If we are *unable to sample all the individuals initially* included in the sample, there may arise a systematic bias. The *likelihood of establishing contact or receiving a response from an individual* is often correlated with the measure of what is to be estimated.

Natural bias in the reporting of data: People in general ***understate*** *their incomes if asked about it for tax purposes*, but they ***overstate*** the same *if asked for social status or their affluence*.

Errors in Data: It can *occur because of distortions in the data collected* or from *mistakes in data coding, analysis, or interpretation* of statistical analysis.

There are ways to reduce data error;

- Ensure that *survey instruments are well prepared*, be *simple to read, and easy to understand.*
- Properly *select and train interviewer* to control data gathering bias or error.
- Use *sound editing, coding, and tabulating procedures* to reduce the possibility of data processing error.

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 optional 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, such as a short telephone survey using random digit dialing, 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.

4.7 Types of sample Design

There are different types of sample designs 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 sampling is 'non-random' sampling. On element selection basis, the sample may be either unrestricted or restricted. 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'.

4.8 Probability sampling Design

Probability sampling (or **random sampling**) is most commonly associated with survey based research strategies where you need to make inferences from your sample about a population to answer your research question(s) or to meet your objectives. In probability sampling all units or items in the population have a chance of being chosen in the sample. In other words, a probability sample is a sample in which each element of the population has a known and non-zero chance of being selected. Probability sampling always produces the smallest possible sampling error. In the real sense, the size of the sampling error in a probability sample is affected only by a random chance. Because a probability sample contains the least amount of sampling error, we may say that it is an unbiased sample.

Probability sampling provides an *efficient method for selecting a sample* that should adequately reflect the variation that exists in the population. The method *removes human judgment* from the sampling process and *ensure a more representative* sample. It provides to obtain unbiased samples.

In probability sampling researchers use a randomization process in order to reduce or eliminate sampling bias. Under such circumstances one would have substantial confidence that the sample is representative of the population from which it is drawn. So, all probability samples must provide a known chance of selection for each population element.

Advantages

Probability sampling has considerable advantages over all other forms of sampling.

- *First, sampling errors can be calculated from probability samples.*
- *Second, probability samples rely on random process.*
- *Finally, in a true random process, each element has an equal chance or probability of being selected. It is possible to get consistent and unbiased estimate of the population parameter.*

Five main techniques can be used to select a probability sample. These are:

A. Simple random;
B. Systematic;
C. Stratified random;

D. Cluster;
E. Multi-stage.

A. Simple Random Sampling

Simple random sampling (sometimes called just **random sampling**) involves you selecting the sample at random from the sampling frame using random number tables, a computer or an online random number generator, such as Research Randomizer. To do so you need to

- Number each of the cases in your sampling frame with a unique number. The first case is numbered 0, the second 1 and so on.
- Select cases using random numbers until your actual sample size is reached.

It is usual to select your first random number at random (closing your eyes and pointing with your finger is one way!) as this ensures that the set of random numbers obtained for different samples is unlikely to be the same. If you do not, you will obtain sets of numbers that are random but identical.

Starting with this number, you read off the random numbers (and select the cases) in a regular and systematic manner until your sample size is reached. If the same number is read off a second time it must be disregarded as you need different cases. This means that you are not putting each case's number back into the sampling frame after it has been selected and is termed 'sampling without replacement'. If a number is selected that is outside the range of those in your sampling frame, you simply ignore it and continue reading off numbers until your sample size is reached.

If you are using a computer program such as a spreadsheet or a website to generate random numbers, you must ensure that the numbers generated are within your range and that if a number is repeated it is ignored and replaced. If details of your population are stored on the computer, it is possible to generate a sample of randomly selected cases.

Random numbers allow you to select your sample without bias. The sample selected, therefore, can be said to be representative of the whole population. Simple random sampling is best used when you have an accurate and easily accessible sampling frame that lists the entire population, preferably stored on a computer. If your population covers a large geographical area, random selection means that selected cases are likely to be dispersed throughout the area. Consequently, this form of sampling is not suitable if you are collecting data over a large geographical area using a method that requires face-to-face contact, owing to the associated high travel costs. Simple random sampling would still be suitable for a geographically dispersed area if you used an alternative technique of collecting data such as online or postal questionnaires or telephone interviewing.

Sampling frames used for telephone interviewing have been replaced increasingly by random digital dialing. By selecting particular within-country area dialing codes this provides a chance to reach any household within that area represented by that code which has a telephone, regardless of whether or not the number is ex-directory. However, care must be taken as, increasingly, households have more than one telephone number. Consequently, there is a higher probability of people in such households being selected as part of the sample.

B. Systematic Sampling

Systematic sampling involves you selecting the sample at regular intervals from the sampling frame. To do this you:

- Number each of the cases in your sampling frame with a unique number. The first case is numbered 0, the second 1 and so on.
- Select the first case using a random number.
- Calculate the sampling fraction.
- Select subsequent cases systematically using the sampling fraction to determine the frequency of selection.

To calculate the **sampling fraction** – that is, the proportion of the total population that you need to select – you use the formula

$$K = \frac{n}{N}$$

Where:

K is sampling fraction

n is the actual sample size

N is the total population

Once you have computed sampling fraction (K) you need to select one in every K^{th} cases from the sampling frame. Unfortunately, your calculation will usually result in a more complicated fraction. In these instances, it is normally acceptable to round your population down to the nearest 10 (or 100) and to increase your minimum sample size until a simpler sampling fraction can be calculated.

On its own, selecting one in every K^{th} would not be random as every K^{th} case would be bound to be selected, whereas those between would have no chance of selection. To overcome this random number is used to decide where to start on the sampling frame. If your sampling fraction is 4 the starting point must be one of the first four cases. You, therefore, select a random number (in this example a one-digit random number between 0 and 3) as described earlier and use this as the starting point.

Once you have selected your first case at random you then select, in this example, every fourth case until you have gone right through your sampling frame. As with simple random sampling, you can use a computer to generate the first random and subsequent numbers that are in the sample. Systematic sampling is therefore not suitable without reordering or stratifying the sampling frame

Unlike simple random sampling, systematic sampling works equally well with a small or large number of cases. However, if your population covers a large geographical area, the random selection means that the sample cases are likely to be dispersed throughout the area. Consequently, systematic sampling is suitable for geographically dispersed cases only if you do not require face-to-face contact when collecting your data.

C. Stratified Random Sampling

Stratified random sampling is a modification of random sampling in which you divide the population into two or more relevant and significant strata based on one or a number of attributes. In effect, your sampling frame is divided into a number of subsets. A random sample (simple or systematic) is then drawn from each of the strata. Consequently, stratified sampling shares many of the advantages and disadvantages of simple random or systematic sampling.

Dividing the population into a series of relevant strata means that the sample is more likely to be representative, as you can ensure that each of the strata is represented proportionally within your sample. However, it is only possible to do this if you are aware of, and can easily distinguish, significant strata in your sampling frame. In addition, the extra stage in the sampling procedure means that it is likely to take longer, to be more expensive, and to be more difficult to explain than simple random or systematic sampling.

In some instances, your sampling frame will already be divided into strata. A sampling frame of employee names that is in alphabetical order will automatically ensure that, if systematic sampling is used (discussed earlier), employees will be sampled in the correct proportion to the letter with which their name begins. Similarly, membership lists that are ordered by date of joining will automatically result in stratification by length of membership if systematic sampling is used. However, if you are using simple random sampling or your sampling frame contains periodic patterns, you will need to stratify it. To do this you need to:

- Choose the stratification variable or variables.
- Divide the sampling frame into the discrete strata.
- Number each of the cases within each stratum with a unique number.
- Select your sample using either simple random or systematic sampling.

The stratification variable (or variables) chosen should represent the discrete characteristic (or characteristics) for which you want to ensure correct representation within the sample. Samples can be stratified using more than one characteristic.

In some instances, the relative sizes of different strata mean that, in order to have sufficient data for analysis, you need to select larger samples from the strata with smaller populations (called disproportionate stratified sampling). Here the different sample sizes must be taken into account when aggregating data from each of the strata to obtain an overall picture.

D. Cluster Sampling

Cluster sampling is, on the surface, similar to stratified sampling as you need to divide the population into discrete groups prior to sampling. The groups are termed *clusters* in this form of sampling and can be based on any naturally occurring grouping. For example, you could group your data by type of manufacturing firm or geographical area. For cluster sampling your sampling frame is the complete list of clusters rather than a complete list of individual cases within the population. You then select a few clusters, normally using simple random sampling.

Data are then collected from every case within the selected clusters. The technique has three main stages:

- Choose the cluster grouping for your sampling frame.
- Number each of the clusters with a unique number. The first cluster is numbered 0, the second 1 and so on.
- Select your sample using some form of random sampling as discussed earlier.

Selecting clusters randomly makes cluster sampling a probability sampling technique. Despite this, the technique normally results in a sample that represents the total population less accurately than stratified random sampling. Restricting the sample to a few relatively compact geographical sub-areas (clusters) maximize the amount of data you can collect using face to face methods within the resources available. However, it may also reduce the representativeness of your sample. For this reason, you need to maximize the number of sub-areas to allow for variations in the population within the available resources. Your choice is between a large sample from a few discrete sub-groups and a smaller sample distributed over the whole group. It is a trade-off between the amount of precision lost by using a few sub-groups and the amount gained from a larger sample size.

E. Multi-stage Sampling

Multi-stage sampling, sometimes called *multi-stage cluster sampling,* is a development of cluster sampling. It is normally used to overcome problems associated with a geographically dispersed population when face-to-face contact is needed or where it is expensive and time consuming to construct a sampling frame for a large geographical area. However, like cluster sampling, you can use it for any discrete groups, including those that are not geographically based. The technique involves taking a series of cluster samples, each involving some form of random sampling.

Because multi-stage sampling relies on a series of different sampling frames, you need to ensure that they are all appropriate and available. In order to minimize the impact of selecting smaller and smaller sub-groups on the representativeness of your sample, you can apply stratified sampling techniques (discussed earlier). This technique can be further refined to take account of the relative size of the sub-groups by adjusting the sample size for each sub-group. As you have selected your sub-areas using different sampling frames, you only need a sampling frame that lists all the members of the population for those sub-groups you finally select. This provides considerable savings in time and money.

4.9 Non probability sampling Design

Non-probability sampling (or **non-random sampling**) provides a range of alternative techniques to select samples based on your subjective judgment. In the exploratory stages of some research projects, such as a pilot survey, a non-probability sample may be the most practical, although it will not allow the extent of the problem to be determined. Subsequent to this, probability sampling techniques may be used.

To answer your research question(s) and to meet your objectives you may need to undertake an in depth study that focuses on a small, perhaps one, case selected for a particular purpose. This sample would provide you with an information-rich case study in which you explore your research question and gain theoretical insights. Alternatively, limited resources or the inability to specify a sampling frame may dictate the use of one or a number of non-probability sampling techniques.

Deciding suitable sample size

For all non-probability sampling techniques, other than for quota samples the issue of sample size is ambiguous and, unlike probability sampling, there are no rules. Rather the logical relationship between your sample selection technique and the purpose and focus of your research is important, generalizations being made to theory rather than about a population. Consequently, your sample size is dependent on your research question(s) and objectives – in particular, what you need to find out, what will be useful, what will have credibility and what can be done within your available resources. This is particularly so where you are intending to collect qualitative data using interviews. Although the validity, understanding and insights that you will gain from your data will be more to do with your data collection and analysis skills than with the size of your sample, it is possible to offer guidance as to the sample size to ensure you have conducted sufficient interviews.

Collection of qualitative data, such as by conducting additional interviews, will continue until **data saturation** is reached. In other words, until the additional data collected provides few, if any, new insights. For research where your aim is to understand commonalities within a fairly homogenous group, 12 in-depth interviews should suffice. However, they also note that 12 interviews are unlikely to be sufficient where the sample is drawn from a heterogeneous population or the focus of the research question is wide ranging. Given this, we would suggest that, for a general study, you should expect to undertake between 25 and 30 interviews.

Types of Non-probability sampling

Convenience Sampling

It involves selecting haphazardly those cases that are easiest to obtain for your sample, such as the person interviewed at random in a shopping centre for a television programme or the book about entrepreneurship you find at the airport. The sample selection process is continued until your required sample size has been reached. Although this technique of sampling is used widely, it is prone to bias and influences that are beyond your control, as the cases appear in the sample only because of the ease of obtaining them.

Non-probability samples that are unrestricted are called convenience samples. They are the least reliable design but normally the cheapest and easiest to conduct. Researchers or field workers have the freedom to choose whomever they find, thus the name “convenience”. While a convenience has no control to ensure precision, it may still be a useful procedure. Often you will take such a sample to test ideas about subject of interest. In early stages of exploratory research, when you are seeking guidance, you might use this approach. The results may present evidence that is so overwhelming that a more sophisticated sampling procedure is unnecessary.

Purposive Sampling

A non-probability sample that conforms to certain criteria is called Purposive sampling. There are two major types- judgmental and quota sampling.

Judgmental sampling enables you to use your judgment to select cases that will best enable you to answer your research question(s) and to meet your objectives. It is a non-probability 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.

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 behavior of the state's population.

Quota Sampling: 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. Stratified sampling, a probability sampling procedure also has this objective, but it should not be confused with quota sampling. In quota sampling, the interviewer has a quota to achieve. Quota sampling is normally used for large populations. For small populations, it is usually possible to obtain a sampling frame. Decisions on sample size are governed by the need to have sufficient responses in each quota to enable subsequent statistical analyses to be undertaken. In addition, it does not require a sampling frame and, therefore, may be the only technique you can use if one is not available.

For example, an interviewer in a particular city may be assigned 100 interviews, 35 with owners of Sony TVs, 30 with owners of Samsung TVs, 18 with owners of Panasonic TVs, and the rest with owners of other brands. 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. To select a quota sample, you:

1. Divide the population into specific groups.
2. Calculate a quota for each group based on relevant and available data.
3. Give each interviewer an 'assignment', which states the number of cases in each quota from which they must collect data.
4. Combine the data collected by interviewers to provide the full sample.

Snowball sampling

Snowball sampling is commonly used when it is difficult to identify members of the desired population, for example people who are working while claiming unemployment benefit. You, therefore, need to:

1. Make contact with one or two cases in the population.
2. Ask these cases to identify further cases.
3. Ask these new cases to identify further new cases (and so on).
4. Stop when either no new cases are given or the sample is as large as is manageable.

The main problem is making initial contact. Once you have done this, these cases identify further members of the population, who then identify further members, and so the sample snowballs. For such samples the problems of bias are huge, as respondents are most likely to identify other potential respondents who are similar to themselves, resulting in a homogeneous sample. The next problem is to find these new cases. However, for populations that are difficult to identify, snowball sampling may provide the only possibility.

Summary

Sampling is the process of using a small or parts of a larger population to make conclusions about the whole population. A complete survey of population is called census. When compared with census, sampling is less expensive, requires less time and other resources and is more accurate when samples are taken properly.

There are two broad categories of sampling methods. These are: (a) probability sampling methods, and (b) non-probability sampling methods. The probability sampling methods are based on the chance of including the units of population in a sample.

Some of the sampling methods covered in this chapter are: (a) simple random sampling, (b) systematic random sampling, (c) stratified random sampling, (d) cluster sampling, and (e) multistage sampling. With an appropriate sampling plan and selection of random sampling method the sampling error can be minimized. The non-random sampling methods include: (a) convenience sampling, (b) judgment sampling, and (c) Quota sampling. These methods may be convenient to the researcher to apply. These methods may not provide a representative sample to the population and there are no scientific ways to check the sampling errors.

Self-Assessment Questions

Choose the best answer for each of the following questions and ENCIRCLE the letter of your choice.

1. A sampling frame is:
    a) A summary of the various stages involved in designing a survey
    b) An outline view of all the main clusters of units in a sample
    c) A list of all the units in the population from which a sample will be selected
    d) A wooden frame used to display tables of random numbers
2. A simple random sample is one in which:
    a) From a random starting point, every nth unit from the sampling frame is selected
    b) A non-probability strategy is used, making the results difficult to generalize
    c) The researcher has a certain quota of respondents to fill for various social groups
    d) Every unit of the population has an equal chance of being selected
3. Which of the following is not a type of non-probability sampling?
    a) Snowball sampling
    b) Stratified random sampling
    c) Quota sampling
    d) Convenience sampling
4. Snowball sampling can help the researcher to:
    a) Access deviant or hidden populations
    b) Theorize inductively in a qualitative study
    c) Overcome the problem of not having an accessible sampling frame
    d) All of the above
5. Which of the following is not a characteristic of quota sampling?
    a) The researcher chooses who to approach and so might bias the sample
    b) Those who are available to be surveyed in public places are unlikely to constitute a representative sample
    c) The random selection of units makes it possible to calculate the standard error
    d) It is a relatively fast and cheap way of finding out about public opinions

Answer the following questions

5. What do you mean by sample design?
6. What are the advantages of sampling over census?
7. What are probability and non-probability sampling designs?
8. Why probability sampling is generally preferred in comparison to non-probability sampling?
9. How would you differentiate between simple random sampling and a stratified random sampling designs? Explain clearly giving examples.
10. Explain the procedures of selecting a simple random sample.
11. What type of sampling technique do you use? Why?

Glossary of Terms

Census: A complete survey of population is called census.

Convenient Sampling: Here the units of the population are included in the sample as per the convenience of the researcher.

Cluster Sampling: In cluster sampling method we divide the population into groups called clusters, selective sample of clusters using simple random sampling and then cover all the units in each of the clusters included in the sample.

Judgment Sampling: In this sampling method the selection of sample is based on the researcher's judgment about some appropriate characteristics required of the sample units.

Multi-stage Sampling: Here we select the sample units in a number of stages using one or more random sampling methods.

Non-Probability Sampling: In this sampling method the probability of any particular unit of the population being included in the sample is unknown.

Quota Sampling: In this sampling method the samples are selected on the basis of some parameters such as age, gender, geographical region, education, income, occupation etc.

Probability Sampling: If all the units of the population have a chance of being chosen in the sample, the sampling method is called random sampling/probability sampling.

Simple Random Sampling: This is one of the basic methods of random sampling where each unit in the population has equal chance of being included in the sample.

Stratified Sampling: The stratified sampling method is used when the population is heterogeneous. Here the population is divided into some homogeneous groups called stratums.

Systematic Sampling: In systematic sampling the sample units are selected from the population at equal intervals in terms of time, space or order.

Chapter Five: The Sources and Collection of Data

Learning Objectives

After studying this chapter, you should be able to:

- Understand and distinguish between primary and secondary data and their characteristics
- Describe secondary data and their sources
- Understand and apply the methods for collecting primary data
- Design and apply questionnaires and focus group discussions

Introduction

In chapter 4, we have discussed about sampling design. As we have mentioned earlier, the collection of data is an important part in the process of research work. With the help of data, the information can be presented in such a manner so that the same may be useful for decision-making by the managers. In the whole process of gathering information, the source of data should be taken care of very seriously. The quality and credibility of the results derived from the application of research methodology depends upon the relevant, accurate and adequate data. In this unit, we shall study about the various sources of data and methods of collecting primary and secondary data with their merits and limitations and also the choice of suitable method for data collection.

5.1 Meaning and Need for Data

Data collection is a process of gathering data systematically for a particular purpose from various sources, including questionnaires, interviews, observation, existing records, and electronic devices. The process is usually preliminary to statistical analysis of the data. It is, therefore, the information collected from various sources, which can be expressed in quantitative form, for a specific purpose, which is called data. The rational decision maker seeks to evaluate information in order to select the course of action that maximizes objectives. For decision making, the input data must be appropriate. This depends on the appropriateness of the method chosen for data collection.

5.2 Types and Sources of Data

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 viz., primary and secondary. The *primary data* are those which are collected afresh and for the first time, and thus happen to be original in character. The *secondary data*, on the other hand, are those which have already been collected by someone else and which have already been passed through the statistical process.

The choice between primary and secondary data mainly depends upon the nature, objectives, and scope of enquiry, availability of time & money; degree of accuracy desired the status of the investigator. Data can also be obtained from secondary sources, as for example, company records or achieves, government publications, industry analyses offered by the media, web sites, the internet, and so on.

Activity:

Question 1: What do you mean by data? Why it is needed for research?

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Question 2: Distinguish between primary and secondary data. Illustrate your answer with examples.

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5.3 Methods of Primary Data collection

There are several methods of collecting primary data, particularly in surveys and descriptive researches. Important ones are: (i) observation method, (ii) interview method, (iii) through questionnaires, (iv) through schedules, and (v) other methods.

1. Observation method

Observation involves the recording of the respondent's behavior: it is the process of recognizing and recording the behavior of people, objects, and events. It is used to evaluate the overt behavior of individuals in controlled and uncontrolled situations. Observational methods have occupied an important place in descriptive research. As a good research too, observation needs proper planning, expert execution and adequate recording and interpretation.

This method is the most commonly used method especially in studies relating to behavioral sciences. In a way we all observe things around us, but this sort of observation is not scientific observation. Observation becomes a scientific tool and the method of data collection for the researcher, when it serves a formulated research purpose, is systematically planned and recorded and is subjected to checks and controls on validity and reliability. Under the observation method, the information is sought by way of investigator's own direct observation without asking from the respondent.

Advantages of observation

1. Subjective bias is eliminated, if observation is done accurately;
2. The information obtained under this method relates to what is currently happening;
3. Independent of respondents' willingness to respond;
4. Suitable in studies which deal with subjects (i.e., respondents) who are not capable of giving verbal reports of their feelings for one reason or the other

Limitations of observation

1. Expensive method
2. Information provided by this method is very limited
3. Unforeseen factors may interfere with the observational task
4. Some people are rarely accessible to direct observation creates obstacle for this method to collect data effectively.

In case the observation is characterized by a careful definition of the units to be observed, the style of recording the observed information, standardized conditions of observation and the selection of pertinent data of observation, then the observation is called as *structured observation.* But when observation is to take place without these characteristics to be thought of in advance, the same is termed *as unstructured observation.* Structured observation is considered appropriate in descriptive studies, whereas in an exploratory study the observational procedure is most likely to be relatively unstructured.

If the observer observes by making himself, more or less, a member of the group he is observing so that he can experience what the members of the group experience, the observation is called as the *participant observation.* But when the observer observes as a detached emissary without any attempt on his part to experience through participation what others feel, the observation of this type is often termed as *non-participant observation.* (When the observer is observing in such a manner that his presence may be unknown to the people he is observing; such an observation is described as *disguised observation.*)

There are several merits of the participant type of observation: (i) the researcher is enabled to record the natural behavior of the group. (ii) The researcher can even gather information which could not easily be obtained if he observes in a disinterested fashion. (iii) The researcher can even verify the truth of statements made by informants in the context of a questionnaire or a schedule. But there are also certain demerits of this type of observation viz., the observer may lose the objectivity to the extent he participates emotionally; the problem of observation-control is not solved; and it may narrow-down the researcher's range of experience.

Sometimes it is classified as *controlled* and *uncontrolled observation.* If the observation takes place in the natural setting, it may be termed as uncontrolled observation, but when observation takes place according to definite pre-arranged plans, involving experimental procedure, the same is then termed controlled observation.

2. Interview

The interview is the process of communication or interaction in which the subject or interviewee gives the needed information verbally in the face to face situation or through telephone. Although the interview is generally associated with counseling, it can be used effectively to collect useful information about individuals in many research situations.

Interview can be **structured** or **unstructured**. Structured interview involves the use of a set of predetermined questions and of highly standardized techniques of recording and it follows a rigid procedure laid down, asking questions in a form and order prescribed. The interviewer has no freedom to rephrase the questions also. Whereas, unstructured interview do not follow a system of pre-determined questions and standardized techniques of recording information. In a non-structured interview, 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. Unstructured interview is the central technique of collecting information in case of exploratory or formulative research studies. But in case of descriptive studies, we quite often use the technique of structured interview because of its being more economical, providing a safe basis for generalization and requiring relatively lesser skill on the part of the interviewer.

This method can be used through personal interviews and, if possible, through telephone interviews.

a) *Personal interviews:* Personal interview method requires a person known as the interviewer asking questions generally in a face-to-face contact to the other person or persons. This can be direct personal investigation or indirect oral investigation. In the former case, the interviewer has to collect the information personally from the sources concerned and it is suitable for intensive investigations. Whereas, indirect oral examination can be conducted under which the interviewer has to cross-examine other persons who are supposed to have knowledge about the problem under investigation and the information, obtained is recorded. Most of the commissions and committees appointed by government to carry on investigations make use of this method.

b) *Telephone interviews:* This method of collecting information consists in contacting respondents on telephone itself. It is not a very widely used method, but plays important part in industrial surveys, particularly in developed regions.

Interviewing is an art governed by certain scientific principles. Every effort should be made to create friendly atmosphere of trust and confidence, so that respondents may feel at ease while talking to and discussing with the interviewer. The interviewer must ask questions properly and intelligently and must record the responses accurately and completely. At the same time, the interviewer must answer legitimate question(s), if any, asked by the respondent and must clear any doubt that the latter has. The interviewers approach must be friendly, courteous, conversational and unbiased. The interviewer should not show surprise or disapproval of a respondent's answer but he must keep the direction of interview in his own hand, discouraging irrelevant conversation and must make all possible effort to keep the respondent on the track.

Activity:

Question 3: How can data be collected through the Observation Method?

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Question 4: Distinguish between the observation and the interview method of data collection.

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3. Questionnaires

It is list of questions related to one topic. It may be defined as;

"A questionnaire is a systematic compilation of questions that are submitted to a sampling of population from which information is desired."

A questionnaire consists of a number of questions printed or typed in a definite order on a form or set of forms. The questionnaire is mailed to respondents who are expected to read and understand the questions and write down the reply in the space meant for the purpose in the questionnaire itself. The respondents have to answer the questions on their own. Questioners can be used to measure: 1) past behavior; 2) attitudes; and 3) respondents' characteristics.

The questionnaire is probably most used and most abused of the data gathering devices. It is easy to prepare and to administer.

Questioners can either be close-ended or open-ended questionnaire.

Close-ended questionnaires are those questionnaires in which there are definite, concrete and pre-determined questions. The questions are presented with exactly the same wording and in the same order to all respondents. Resort is taken to this sort of standardization to ensure that all respondents reply to the same set of questions. The form of the question may be either closed (i.e., of the type 'yes' or 'no') or open (i.e., inviting free response) but should be stated in advance and not constructed during questioning. Structured questionnaires may also have fixed alternative questions in which responses of the informants are limited to the stated alternatives. Structured questionnaires are simple to administer and relatively inexpensive to analyze. The provision of alternative replies, at times, helps to understand the meaning of the question clearly. But it have also limitations like, wide range of data and that too in respondent's own words cannot be obtained with structured questionnaires.

In **open-ended questioners**, questions and answers are not specified and comments in the respondent's own words are not held to the minimum. And there is a use open ended questions like unstructured interview.

Merits of Questionnaire Method:

1. It's very economical.
2. It's a time saving process.
3. It covers the research in wide area.
4. It's very suitable for special type of responses.
5. It is most reliable in special cases.

Demerits of Questionnaire Method:

1. Through this we get only limited responses.
2. Lack of personal contact.
3. Greater possibility of wrong answers.
4. Chances of receiving incomplete response are more.
5. Sometimes answers may be illegible.
6. It may be useless in many problems.

Questionnaire Design

Questionnaire design forms the central role in the data collection process as the questionnaire is often the first point of contact with the respondent. Good questionnaire design is crucial in terms of:

- encouraging the respondent to participate in the data collection; and
- Eliciting the required information from the respondent in a valid way.

The main objectives of a questionnaire are to:

- obtain accurate information from respondents;
- provide a logical structure to the questionnaire/ interview so that it flows smoothly;
- provide a standard form on which responses can be recorded; and
- Facilitate data entry and processing through the use of coding.

Principles of Questionnaire Design

When designing a questionnaire there are some general principles that should be considered.

I. Establishing the objectives of the data collection

When researchers design a data collection the first step that they will take is to decide what they want to learn from the data collection as this will determine the objectives of the data collection. The objectives help researchers decide who they need to collect data from and the data required. If data collection objectives are unclear it is highly likely the data collected with be unclear. The more specific the objectives, the more usable the data collected.

When we establish our objectives, we should list them, split them into topic areas and then design questions based on these topics.

II. Overall layout of the questionnaire: Before you start to think about the questions that you will ask it is important to consider what the overall layout of the questionnaire will be. Ideally you want to ensure that the questionnaire is kept short and simple. This can be achieved by:

a. **Minimizing Clutter:** All questionnaires should be kept as uncluttered as possible. Nearly all aspects of the questionnaire will require some response from the respondent. This might simply be that they have to read the instructions or questions, or they may have to assimilate what is needed in a response box. The more cluttered a questionnaire is with text, graphics and symbols, the greater the burden on the respondent. White space within a questionnaire should be maximized; not only does it make the questionnaire easier to read but it is thought that it will also help to relax the respondent.

b. **Questionnaire/Section Title:** The first thing that the respondent will read is the questionnaire title. It will set the tone of the questionnaire and inform the respondent of its relevance to them. Titles should also be used throughout the questionnaire, in order for respondents to distinguish one section from the next. All titles should be clear and easily understood.

c. **Accessibility and clarity:** We all have a different perception of what we see; therefore, we should consider this within our questionnaire design and ensure that it is accessible/easy to understand for all respondents. We often assume the level of comprehension of our respondents and that all are at the same level. This is often not the case and care must be taken to ensure that all respondents can understand what is being asked of them.

d. **Wording:** The major problem faced when designing questionnaires is designing questions that the respondent can understand and interpret in the way in which we desire them to. The following should all be considered:

e. **Terminology:** When designing a questionnaire, you should always use language and terminology that the respondent is familiar with. Therefore, you should look to:

- avoid jargon, shorthand or uncommon words;
- avoid ambiguous words that do not have a specific meaning, for example the words 'often', 'usually' and 'frequently' have no specific meaning and should be made more specific;
- avoid words which can be misinterpreted;

III. **Question Structure:** As well as considering the terminology of questions we should also consider their structure.

- **'Least Read' –** respondents only read as much of the question as they think is necessary. It is therefore important that questions are structured so respondents are more likely to read the whole question before they answer it. As a guide, keep questions short and concise.

- **Multi-part questions** will only lead to confusion. Even though they may appear to save space they should be avoided.

- **Double-hollowed questions** that ask the respondent for two pieces of information at the same time may confuse respondents. Some respondents may only answer one part of the question whilst others will answer the other part.

- **Leading or biased questions** will force a respondent to answer in a certain way thus biasing the response. Questions should be worded in a neutral and balanced way to guard against response bias.

IV. **Layout of the Questionnaires:** The layout of the questionnaire should be inviting and interesting and should provide a clear and logical path for the eye to follow. Throughout the questionnaire this layout should stay consistent to help respondents navigate through the questionnaire. Much of this can be achieved through the effective use of blank space so that it is clear and easy to read. There should be more space between the questions than there is within them (this helps the respondent to group question parts together). Questions, response options, response boxes and instructions should be laid out in a standard format. Where appropriate there should be enough space made available for the respondent to write their responses.

V. **The order of Questions**: The questions and sections within a questionnaire should be ordered in a logical manner that makes sense to the respondent. For example, all demographic questions such as age and sex should be contained within the same section. The respondent should be able to work through the questionnaire without having to look back or forwards for references. It is also sensible to ensure that questions are ordered in a way that minimizes the need for routing or filtering to other questions. You should ensure that the questionnaire starts with easy or less sensitive questions to encourage the respondent to participate. Respondents are more likely to answer sensitive questions, for example, those relating to income or alcohol consumption, if they are placed towards the end of the questionnaire rather than at the beginning. As a whole, the questions should be grouped into topics in a logical sequence and should flow easily.

VI. **Routing or Filtering**: Routing questions can be used to guide respondents to questions that are applicable to them and to ensure that they do not respond to questions that are not applicable. The use of routing should be kept to a minimum, respondents can find them difficult to follow and they can disrupt a respondent's flow through the questionnaire. Where routing is used, instructions should be included that aid the respondent and these should be placed with the appropriate questions rather than with the general instructions for the questionnaire.

VII. **Front Page:** The front page of a questionnaire should contain all of the information that the respondent will need to know to complete the questionnaire. However, we should ensure that respondents are not overloaded with information as this can be confusing.

The front page should act as an introduction or covering letter and should inform the respondent of: Who is conducting the data collection activities; Why they have been selected to take part; Whether the data collection is compulsory; Confidentiality; Who should complete the questionnaire; How and when they should return the questionnaire; What the data collected will be used for, i.e. the objectives of the data collection; and

Contact details for advice and further information. Where possible, questionnaires should be personalized. This can be done by using the name and address of the respondent and including a signature of the person responsible for the data collection.

VIII. **Instructions for the Respondents:** A respondent needs to know how to complete a questionnaire. As such, the questionnaire should include some clear guidance on how to complete it. Instructions should be presented where they are needed and before the respondent is required to put pen to paper. For example, where a question requires a tick or cross in a box the respondent should be informed of this. Instructions that are presented away from the questionnaire, for example in a booklet or on a separate page, can confuse respondents and will often be forgotten. Instructions should also be repeated throughout the questionnaire to remind the respondent.

There may be cases where specific instructions are needed for a particular question. Where this is the case the instructions should be integrated into the question. If this is not possible, they should be placed immediately after the question but before the respondent is required to respond.

IX. **Question Styles:** There are many types of questions available for a questionnaire. Two such types are *open* and *closed* questions. The type of question used depends on the data required. By using a variety of question styles the respondent will become more interested and engaged in the data collection.

a) **Open-ended Questions**

Open questions require the respondent to produce their own answers. In a self-completion questionnaire respondent write in their own answers constrained only by the space available. In an interview, the interviewer writes down the respondent's answer verbatim.

Open questions are used when rich, detailed information is required from the respondent. They provide a source of ***qualitative*** data, where qualitative data refers to descriptive rather than numeric data.

Let's assume that a theatre director wants to know what the audience thought of his latest play. He designs a questionnaire and distributes them to the audience to complete. An open question that he could have asked is: What did you think of tonight's show?

b) **Closed-Ended Questionnaires**

Closed questions offer respondents a choice of answers, or response categories. Some closed questionnaires require 'yes/no' answers; others provide a list of possible choices. Closed questionnaires tend to be used when high level, quantifiable data is required. Quantifiable refers to data that is numeric or can be summarized in numeric form.

In relation to the theatre director's questionnaire above the question, "What did you think of tonight's show?", can be changed into a closed question by offering the audience a set of response categories and asking them to choose one. For example:

What did you think of tonight's show? *(Please tick one box only)*

a) Very good ☐
b) Good ☐
c) Poor ☐
d) Very poor ☐
e) No opinion ☐

The advantages and disadvantages of open-ended and closed-ended questions should be balanced against the response that we require before we decide which type of question to use.

Advantages and Disadvantages of Open Questions

Advantages	Disadvantages
• They allow an unlimited number of possible answers. • Respondents can answer in detail and can clarify responses. • Unanticipated responses can be discovered. • They enable adequate answers to be given to complex issues/questions. They encourage creativity, self-expression and richness of detail. • They reveal a respondent's logic, thinking process and frame of reference	• Different respondents give different degrees of detail in their answers making them difficult to compare. • Responses may be irrelevant or buried in useless detail. • Comparisons and statistical analysis can be difficult and indeed there is a methodological argument against converting qualitative data into a quantifiable form. • Coding of responses can be time consuming and difficult especially where responses are incomplete or unclear. Questions may be too general causing respondents to lose focus. • A large amount of respondent time, effort and energy is required to answer open questions Response boxes for open questions often take up a lot of space on a questionnaire. • Articulate and highly literate respondents have an advantage over those who are less literate

Compare the above with the advantages and disadvantages of closed questions.

Advantages and Disadvantages of Closed Ended Questions

Advantages	**Disadvantages**
• They are easy and quick to answer. • The answers of different respondents are comparable • Responses are easier to code and analyze compared to open questions. • Response categories can clarify the question meaning to respondents • Respondents are more likely to respond to closed questions that relate to a sensitive topic than they are to an open question on the same topic. • Less articulate or less literate people are not disadvantaged by closed questions.	• Misinterpretation of a question may go unnoticed. • They force respondents to give simplistic answers to potentially complex questions. • It can be confusing for the respondent if many response categories are offered (especially where the categories are read by an interviewer). • The response categories can suggest ideas that respondents would not otherwise have considered thereby influencing their response. • Respondents with no opinion or knowledge may just choose a category anyway. • A respondent's desired answer may not be listed and as such they may feel forced to choose an available category instead of their preferred option. (This problem should not occur if an 'Other' category is provided.)

4. Focus group discussion

Focus group discussion is an important, yet, structured discussion in which a small number of participants (usually six to twelve), guided by a moderator or facilitator, talk about topics of special importance to a particular research issue participants are selected from a narrowly defined population whose opinions and ideas are relevant to the research. The discussion is observed and recorded and provided the basis from which information and recommendations are obtained, unlike interview focus group discussion helps to get an in depth data since participants' interaction with each other is common feature of focus group discussion.

In focus group discussion participants should not be too large or too small (the optimum No. of participant is 10 - 12) but if participants are 6 or 7 it would be better. Social, intellectual and educational homogeneity are important for effective participation of all group members.

When selecting respondents careful screening is essential to the success of the focus group discussion. So group members must have had adequate experience with the object or issue being discussed. The group members should be allowed to contain relatives, neighbor or friends. The typical focus group discussion lasts $1^{1}/_{2}$ to 2 hours.

Role of the moderator

The selection of and role played by the moderator are critical. The moderator introduces the topic, observes, and takes notes and or tapes the discussions. The moderator never becomes an integral part of the discussions, but merely steers the group persuasively to obtain all the relevant information and helps the group members to get through any impasse that might occur. The moderator also ensures that all members participate in the discussion and that no member dominates the group. Someone from the research team may also observe the proceedings through a one-way mirror, listening to the verbal statements and noticing the non-verbal cues of the members.

The nature of data obtained through focus groups

It should be noted that though data obtained through these homogeneous group members are the least expensive of the various data collection methods, and also lend themselves for quick analysis, the content analysis of the data so obtained provides only qualitative and not quantitative information. Also, since the members are not selected scientifically to reflect the opinions of the population at large (see the next chapter on sampling for more details on this), their opinions cannot be considered to be truly representative. However, when exploratory information is collected as a basis for further scientific research, focus groups serve an important function. Consider for example, the value of focus groups in exploring the concept of "intellectual Property". When animated discussions take place, there is a serendipitous flow of new ideas among the group members who discuss the nuances of each thought process. Researchers are thereby helped to obtain valuable insights from the snowballing effects of the discussions.

In sum, focus groups are used for (1) exploratory studies, (2) making generalizations based on the information generated by them, and (3) conducting sample surveys. Focus groups have been credited with enlightening investigators as to why certain products are not doing well, why certain advertising strategies are effective, why specific management techniques do not work, and the like.

Video-conferencing

If regional variations in responses are expected, several focus groups could be formed including trained moderators at different locations. This process is easily facilitated through videoconferencing. By zooming in on a particular member the non-verbal cues and gestures of that individual can be captured, as and when desired. This also obviates the need for an observer looking through a one-way mirror.

With the great strides in technological advancement, and with the facility for communication with the moderator by relaying instant messages, videoconferencing as a means of gathering information from different groups in distant locations is indeed a promising prospect for the future.

It should be noted that online focus groups are also common. Email, web sites, and internet chat rooms facilitate focus group sessions as well.

Activity:

Question 5: List out the methods of collecting primary data.

……………………………………………………………………………………………………

……………………………………………………………………………………………………

……………………………………………………………………………………………………

5.4 Methods of Secondary Data collection

Secondary data means data that are already available i.e., they refer to the data which have already been collected and analyzed by someone else. When the researcher utilizes secondary data, then he has to look into various sources from where he can obtain them. In this case he is certainly not confronted with the problems that are usually associated with the collection of original data. Secondary data may either be published data or unpublished data. There are several sources of secondary data, including books and periodicals, government publications of economic indicators, census data, statistical abstracts, databases, the media, annual reports of companies, etc.

Usually published data are available in:

a) various publications of the central, state are local governments;
b) various publications of foreign governments or of international bodies and their subsidiary organizations;
c) technical and trade journals;
d) books, magazines and newspapers;
e) reports and publications of various associations connected with business and industry, banks, stock exchanges, etc.;
f) reports prepared by research scholars, universities, economists, etc. in different fields; and
g) public records and statistics, historical documents, and other sources of published information.

The sources of unpublished data are many; they may be found in diaries, letters, unpublished biographies and autobiographies and also may be available with scholars and research workers, trade associations, labor bureaus and other public/ private individuals and organizations.

(i) Advantages of Secondary Data:

Advantages of secondary data are following:

- ❖ The primary advantage of secondary data is that it is cheaper and faster to access.
- ❖ Secondly, it provides a way to access the work of the best scholars all over the world.
- ❖ Thirdly, secondary data gives a frame of mind to the researcher that in which direction he/she should go for the specific research.
- ❖ Fourthly secondary data save time, efforts and money and add to the value of the research study.

(ii) Disadvantages of Secondary data:

Following are the disadvantage of secondary data:

- ❖ The data collected by the third party may not be a reliable party so the reliability and accuracy of data go down.
- ❖ Data collected in one location may not be suitable for the other one due variable environmental factor.
- ❖ With the passage of time the data becomes obsolete and very old

- Secondary data collected can distort the results of the research. For using secondary data, a special care is required to am3end or modify for use.
- Secondary data can also raise issues of authenticity and copyright.

Summary

In this chapter we elaborated on the meaning of data, methods of data collection, merits and limitations of data collection, precautions which are needed for the collection of data.

Data which is collected originally for a specific purpose is called primary data. The data which is already collected and processed by someone else and is being used now in the present study, is called secondary data. Secondary data can be obtained either from published sources or unpublished sources. It should be used if it is reliable, suitable and adequate, otherwise it may result in misleading conclusions. It has its own merits and demerits. There are several problems in the collection of primary data. These are: tools and techniques of data collection, degree of accuracy, designing the questionnaire, selection and training of enumerators, problem of tackling non-responses and other administrative aspects.

Several methods are used for collection of primary data. These are: observation, interview, questionnaire and schedule methods. Every method has its own merits and demerits. Hence, no method is suitable in all situations. The suitable method can be selected as per the needs of the investigator which depends on objective nature and scope of the enquiry, availability of funds and time.

Self-Assessment Questions

Choose the best answer for each of the following questions and ENCIRCLE the letter of your choice.

1. Which of the following is not a data-collection method?
    a) Research questions
    b) Unstructured interviewing
    c) Postal survey questionnaires
    d) Participant observation
2. Closed ended questions are those that:
    a) Have a fixed range of possible answers
    b) Prevent respondents from allocating themselves to a category
    c) Encourage detailed, elaborate responses
    d) Relate to the basic demographic characteristics of respondents
3. Which of the following terms best describes data that were originally collected at an earlier time by a different person for a different purpose?
    a) Primary data
    b) Secondary data
    c) Experimental data
    d) Field notes
4. Researchers use both open-ended and closed-ended questions to collect data. Which of the following statements is true?
    a) Open-ended questions directly provide quantitative data based on the researcher's predetermined response categories.
    b) Closed-ended questions provide quantitative data in the participant's own words.
    c) Open-ended questions provide qualitative data in the participant's own words.
    d) Closed-ended questions directly provide qualitative data in the participants' own words.

Answer the following questions

1. Distinguish between primary and secondary data.
2. Explain the various methods of collecting primary data pointing out their merits and demerits?
3. Explain questionnaire and examine its main characteristics. (refer to the introduction part of the questionnaire section)
4. Explain main requirements of a good questionnaire.
5. Explain the different sources of secondary data and precaution in using secondary data.

Glossary Terms

Data: Quantitative or/ and qualitative information, collected for study and analysis.

Interview: A method of collecting primary data by meeting the informants and asking the questions.

Observation: The process of observing individuals in controlled situations.

Questionnaire: is a device for collection of primary data containing a list of questions pertaining to enquiry, sent to the informants, and the informant himself writes the answers.

Primary Data: Data that is collected originally for the first time.

Secondary Data: Data which were collected and processed by someone else but are being used in the present study.

Published Sources: Sources which consist of published statistical information.

Chapter Six: Data Analysis Software

Once the data are collected, the next logical step of the research process is **data analysis.** Data analysis is the process of systematically applying statistical and/or logical techniques to describe and illustrate, condense and recap, and evaluate the data. Data Analysis is the process of evaluating data using analytical and logical reasoning to examine each component of the data collected. Data analysis is the science of examining raw data with the purpose of drawing conclusions about that information.

6.1 Spread sheet application in data analysis

A spreadsheet is a computer program that turns your computer screen into a smart piece of paper. Traditionally accountants have used spreadsheets to do bookkeeping and budgets, but they make outstanding tools for scientists as well. With a spreadsheet, we can enter raw data, manipulate it and plot it all with a few simple commands. They are especially useful because of their built in ability to plot data.

Spreadsheets are extremely useful for **data analysis** is because of their ability to plot data. Rather than having to draw a graph by hand, you can just select the numbers you want to plot and the spreadsheet will do the work. Even better, if you change the numbers or formulas, the graph changes automatically. Still another advantage of a spreadsheet is that it can easily handle the **statistical analysis** of data sets with hundreds, thousands, or even tens of thousands of points, something that you would never want to try doing on a calculator. Several examples of functions that are particularly useful in analyzing real data are the **average**, the **standard deviation** and a least square fits of a straight line (known as a linear regression) to find the **slope** and the **intercept**.

The Basics

A spreadsheet consists of a collection of cells arranged in a big table. The cells are labeled by their column and row location (see Table 1 below). For example, cell A4 is in the first column, the fourth cell down. A cell can contain a label (text), a number, or a formula. If you click on a cell, type in some text and hot enter, the spreadsheet will display the text in the cell. See cell A1 or cell C1 below in Table 1. We can also enter numbers like 15 (see A2). We can also put in formulas (see A2 and A3). Cell B1 contains a very simple formula that is, of course, equal to 6. In Excel, all formulas begin with an equals sign.

Table 1- This shows what to put in various cells in the spreadsheet

	A	B	C	D	E	F	G
1	text	=3*2	mass				
2	15	=2*A2					
3	=A2+1	=2*A3					
4							

You can start Excel by clicking the Microsoft EXCEL icon in Windows. Once EXCEL is started you should see a screen that should look similar to the one shown below.

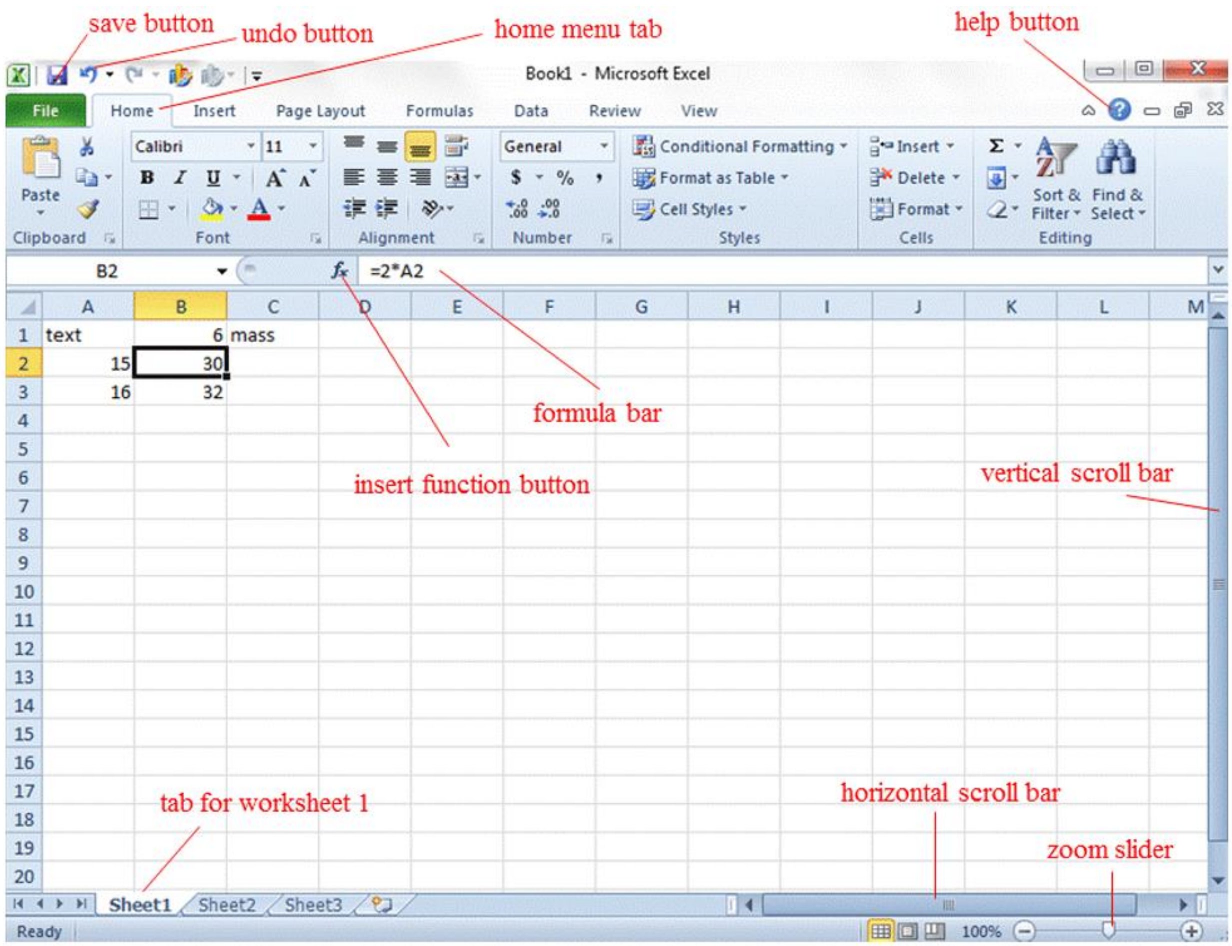


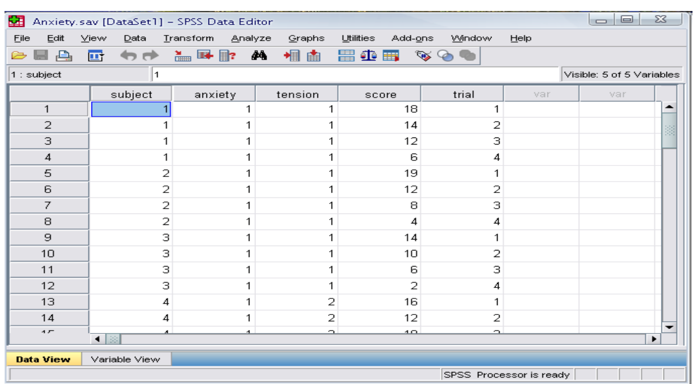
Figure 1. Layout of an Excel 2010 spreadsheet, highlighting some of the most important buttons, bars and menus. The "Home" menu is clicked and some text and formulas have been entered into the worksheet. Cell B2 has been selected and the contents are displayed in the formula bar.

Entering Information

To enter information (text, numbers, formulas) into a cell, move to that cell and type the information. When you start to type in a cell, whatever you type appears in the cell and also on the top left of the page in the formula bar or display line (see Figure 1). If you press enter after typing something, it will enter it on the sheet; or if you press the escape key, it will abort the entry and leave the cell unchanged. When you are entering an expression in a cell, you can edit that expression by moving the mouse to the spot you want to change (on display line). Pressing enter or moving the cursor to another cell enters the expression. If you want to change a previously entered expression, you can move to the cell and retype the whole thing or move the mouse to the display line, click the left mouse button, and then revise the expression.

6.2 Software application in data analysis (SPSS, STATA, E-view)

SPSS-format data files are organized by cases (rows) and variables (columns). There are two views-variable view and data view. **In Variable View**, each row is a variable, and each column is an attribute that is associated with that variable-it contains columns.



	subject	anxiety	tension	score	trial	var	var
1	1	1	1	18	1		
2	1	1	1	14	2		
3	1	1	1	12	3		
4	1	1	1	6	4		
5	2	1	1	19	1		
6	2	1	1	12	2		
7	2	1	1	8	3		
8	2	1	1	4	4		
9	3	1	1	14	1		
10	3	1	1	10	2		
11	3	1	1	6	3		
12	3	1	1	2	4		
13	4	1	2	16	1		
14	4	1	2	12	2		

In Data view: columns represent variables, and rows represent cases (observations). Variables are used to represent the different types of data that you have compiled. The response to each question on a survey is equivalent to a variable. Variables come in many different types, including numbers, strings, currency, and dates.

Data can be entered into the Data Editor, which may be useful for small data files or for making minor edits to larger data files. Click the Variable View tab at the bottom of the Data Editor window. You need to define the variables that will be used. For example, variables like age, marital status, and income.

Entering Data

In Data View, you can enter data directly in the Data Editor. You can enter data in any order either by case or by variable, for selected areas or for individual cells.

The active cell is highlighted.

The variable name and row number of the active cell are displayed in the top left corner of the Data Editor. When you select a cell and enter a data value, the value is displayed in the cell editor at the top of the Data Editor.

Data values are not recorded until you press Enter or select another cell.

To enter anything other than simple numeric data, you must define the variable type first.

If you enter a value in an empty column, the Data Editor automatically creates a new variable and assigns a variable name.

Inserting New Cases

To Insert New Cases between Existing Cases

In the Data view, select any cell in the case (row) below the position where you want

From the menus choose:

Edit

Insert Cases

A new row is inserted for the case and all variables receive the system-missing value.

Inserting New Variables

To Insert New Variables between Existing Variables

Select any cell in the variable to the right of (Data view) or below (Variable view) the position where you want to insert the new variable.

From the menus choose:

Data

Insert Variable

A new variable is inserted with the system-missing value for all cases.

Data Preparation

Once you've opened a data file or entered data in the Data Editor, you can start creating reports, charts, and analyses without any additional preliminary work. However, there are some additional data preparation features that you may find useful, including the ability to:

Assign variable properties that describe the data and determine how certain values should be treated.

Identify cases that may contain duplicate information and exclude those cases from analyses or delete them from the data file.

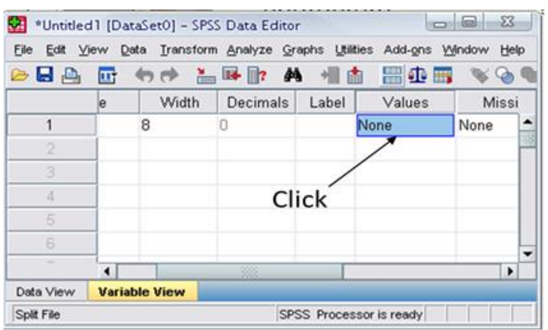
Assigning Value Labels

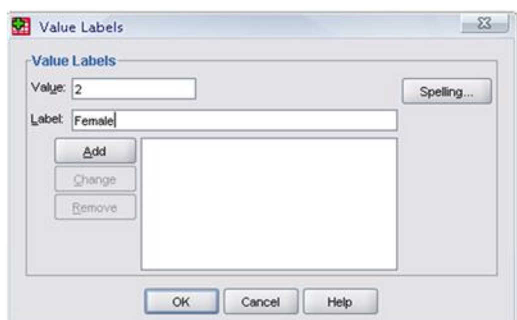
You can assign descriptive value labels for each value of a variable. This process is particularly useful if your data file uses numeric codes to represent non-numeric categories (for example, codes of 1 and 2 for male and female).

Click the cell in the values column as shown below

For the value, and the label, you can put up to 60 characters.

After defining the values click add and then click OK.





Obtaining Frequency Tables

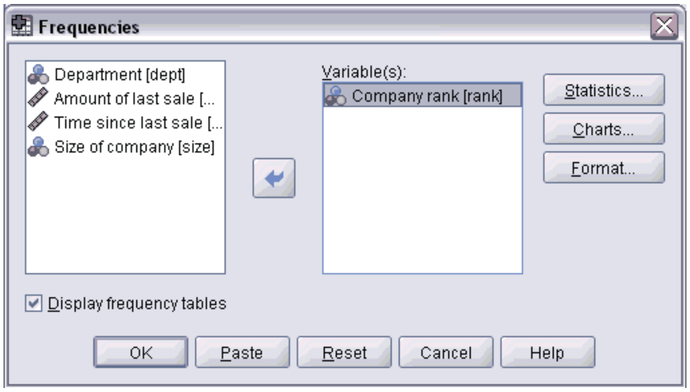
To Obtain Frequency Tables

From the menus choose:

Analyze

Descriptive Statistics

Frequencies



Obtaining Descriptive Statistics

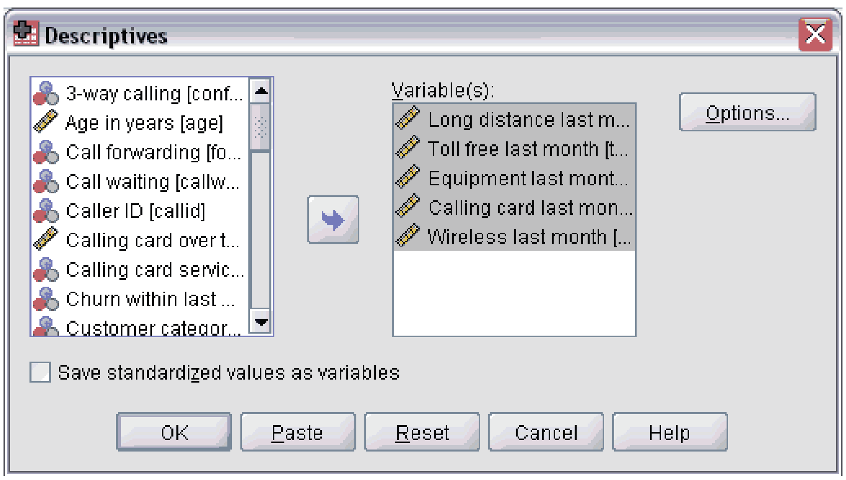
To Obtain Descriptive Statistics

From the menus choose:

Analyze

Descriptive Statistics

Descriptives



Exploring Data

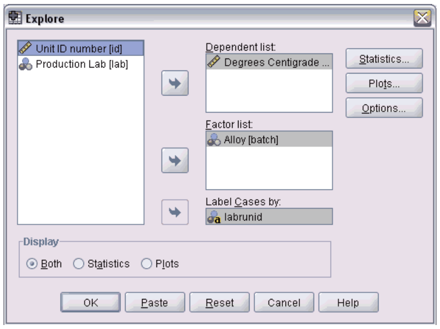
To Explore Data

From the menus choose:

Analyze

Descriptive Statistics

Explore



Obtaining cross tabulation

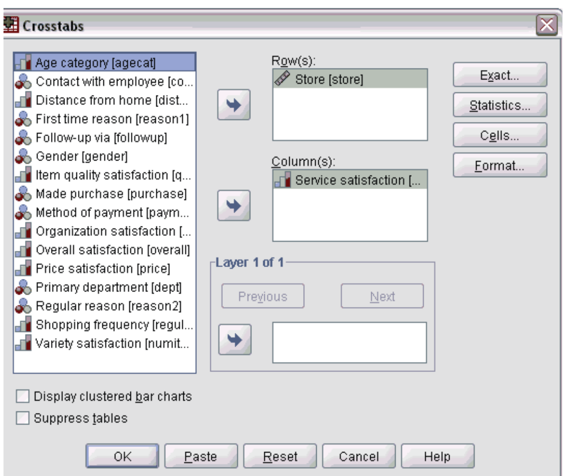
To Obtain Cross-tabulations

From the menus choose:

Analyze

Descriptive Statistics

Crosstabs...



Obtaining Case Summaries

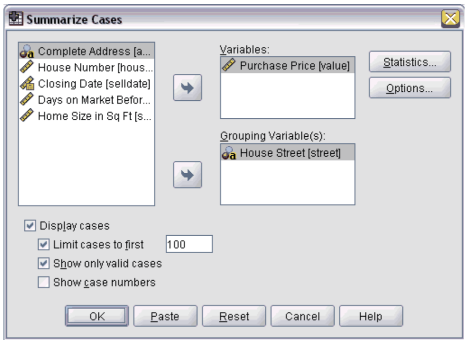
To Obtain Case Summaries

From the menus choose:

Analyze

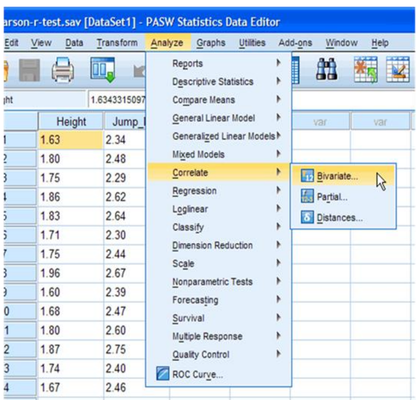
Reports

Case Summaries...



Correlation in SPSS

- Click **Analyze > Correlate > Bivariate...** on the menu system as shown below:



Correlation in SPSS - Output

Click Continue and Click OK

Correlations

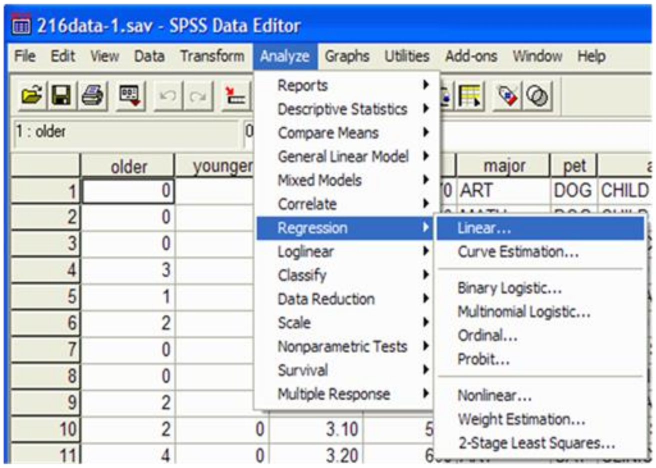
		Time Spent Revising	Exam Performance (%)	Exam Anxiety
Time Spent Revising	Pearson Correlation	1	.397**	-.709**
	Sig. (1-tailed)		.000	.000
	N	103	103	103
Exam Performance (%)	Pearson Correlation	.397**	1	-.441**
	Sig. (1-tailed)	.000		.000
	N	103	103	103
Exam Anxiety	Pearson Correlation	-.709**	-.441**	1
	Sig. (1-tailed)	.000	.000	
	N	103	103	103

**. Correlation is significant at the 0.01 level (1-tailed).

SPSS Output provides a matrix of the correlation coefficients for the three variables. Underneath each correlation coefficient both the significance value of the correlation and the sample size (N) on which it is based are displayed. Each variable is perfectly correlated with itself (obviously) and so r = 1 along the diagonal of the table.

Doing Simple Regression on SPSS

- The linear regression command is found at Analyze | Regression | Linear



References

- Alan Bryman and EmmaBell (2007), Business Research Methods, (paper back-).
- C. William Emory, Donald R. Cooper. Business Research Methods, 4th ed., 1991.
- Joe Hair, Arthur Money, Phillip samouel, and BarryBabin (2003), Essentials of Business Research Methods.
- Kothari C.R. (1990) Research Methodology: Methods and Technique. Wishwa Prakashan, New Delhi.
- Mark N.K Saunders, Adrian Thorn hill, and Philip Lewis (2009), Research Methods for Business students, 5th Edition.
- Wallace A. W., Accounting research methods: Do the facts speak for themselves?
- White John Adams, Hafiz TaKhan, Robert Raeside, and David I (2007), Research Methods for Graduate Business and social science students, Sage Publications LTD.
- William G. Zikmund, Babin, jon c. carr, and Mitch Griffin (2009), Business Research Methods, (hardcover-).

Answers for Self Examination Questions

- Chapter One Self-Examination Questions Answers -1: C, 2: C, 3: E, 4: D, 5: A
- Chapter Two Self-Examination Questions Answers - 1: D, 2:C, 3: B,
- Chapter Three Self-Examination Questions Answers - 1: D, 2: D, 3: B, 4: C, 5: B,
- Chapter Four Self-Examination Questions Answers - 1:C, 2: D, 3: B, 4: D, 5: C
- Chapter Five Self-Examination Questions Answers -1: A, 2: A, 3: B, 4: C,