Chapter 1

Introduction to Research

What is Research?

The word research is composed of two syllables, *re* and *search.*
- **re** is a prefix meaning again, anew or over again
- **search** is 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.

Research is a structured enquiry that utilizes acceptable scientific methodology to solve problems and create new knowledge that is generally applicable. Scientific methods consist of systematic observation, classification and interpretation of data.

Research means "Search for Knowledge". It aims at discovering the truth. It is the search for knowledge through objective and systematic method of finding solution to problems. It is carried on both for discovering new facts and verification of old ones. Therefore, research is a process of systematic and in-depth study or search of any particular topic, subject or area of investigation backed by collection, computation, presentation and interpretation of relevant data.

Aims of Research

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.
1. To gain familiarity with a phenomenon or to achieve new insights into it
2. To portray accurately the characteristics of a particular individual, situation or a group
3. To determine the frequency with which something occurs or with which it is associated with something else
4. To test a hypothesis of a causal relationship between variables

Types of Research

The basic types of research are as follows:

i). **Descriptive vs. Analytical**: Descriptive research includes surveys and fact-finding enquiries of different kinds. The major purpose of descriptive research is description of the state of affairs as it exists at present. The main characteristic of this method is that the researcher has no control over the variables; he can only report what has happened or what is happening. In analytical research, on the other hand, the researcher has to use facts or information already available, and analyze these to make a critical evaluation of the material.

ii). **Applied vs. Fundamental**: Research can either be applied (or action) research or fundamental (to basic or pure) research. Applied research aims at finding a solution for an immediate problem facing a society or an industrial/business organisation, whereas fundamental research is mainly concerned with generalisations and with the formulation of a theory. "Gathering knowledge for knowledge's sake is termed 'pure' or 'basic' research." Whereas basic research is directed towards finding

information that has a broad base of applications and thus, adds to the already existing organized body of scientific knowledge.

iii). **Quantitative vs. Qualitative**: Quantitative research is based on the measurement of quantity or amount. It is applicable to phenomena that can be expressed in terms of quantity. Qualitative research, on the other hand, is concerned with qualitative phenomenon, i.e., phenomena relating to or involving quality or kind. For instance, when we are interested in investigating the reasons for human behavior, we quite often talk of 'Motivation Research', an important type of qualitative research. Qualitative research is especially important in the behavioral sciences where the aim is to discover the underlying motives of human behavior. Qualitative research in practice is relatively a difficult job and therefore, while doing such research, one should seek guidance from experimental psychologists.

iv). **Conceptual vs. Empirical**: Conceptual research is related to some abstract idea(s) or theory. It is generally used by philosophers and thinkers to develop new concepts or to reinterpret existing ones. On the other hand, empirical research relies an experience or observation alone, often without due regard for system and theory. It is databased research, coming up with conclusions which are capable of being verified by observation or experiment. Empirical research is appropriate when proof is sought that certain variables affect other variables in some way. Evidence gathered through experiments or empirical studies is today considered to be the most powerful support possible for a given hypothesis.

v). **Some Other Types of Research:** All other types of research are variations of one or more of the above stated approaches, based on either the purpose of research, or the time required to accomplish research, on the environment in which research is done, or on the basis of some other similar factor.

   a). *One Time Research:* From the point of view of time, we can think of research either as one-time research or longitudinal research. In the former case the research is confined to a single time-period, whereas in the latter case the research is carried on over several time-periods.

   b). *Laboratory Research:* Research can be *field-setting research or laboratory research or simulation research*, depending upon the environment in which it is to be carried out. Research can as well be understood as *clinical or diagnostic research*.

   c). *Exploratory Research:* The research may be *exploratory* or it may be formalized. The objective of exploratory research is the development of hypotheses rather than their testing, whereas formalized research studies are those with substantial structure and with specific hypotheses to be tested.

   d). *Historical Research: Historical research* is that which utilizes historical sources like documents, remains, etc., to study events or ideas of the past, including the philosophy of persons and groups at any remote point of time.

   e). *Conclusion-oriented Research:* Research can also be classified as *conclusion-oriented* and decision-oriented. While doing conclusion-oriented research, a researcher is free to pick up a problem, redesign the enquiry as he proceeds and is prepared to conceptualize as he wishes. Decision-oriented research is always for the need of a decision maker and the researcher in this case is not free to embark upon research according to his own inclination.

Process of Research

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) Execution of the project;
8) Analysis of data;
9) Hypothesis testing;
10) Generalisations and interpretation, and
11) Preparation of the report or presentation of the results, i.e., formal write-up of conclusions reached.

1. Formulating the Research Problem

There are two types of research problems, viz., those which relate to states of nature and those which relate to relationships between variables. 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.

2. Extensive Literature Survey

Once the problem is formulated, a brief summary of it should be written down. It is compulsory for a research worker writing a thesis for a Ph.D. degree to write a synopsis of the topic and submit it to the necessary Committee or the Research Board for approval.

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.

3. Development of Working Hypotheses

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.

Hypothesis should be very specific and limited to the piece of research in hand because it has to be tested. Thus, working hypotheses arise as a result of a priori thinking about the subject, examination of the available data and material including related studies and the counsel of experts and interested parties.

4. Preparing the Research Design

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. 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. Research purposes may be grouped into four categories, *viz.,*

- a). Exploration,
- b). Description,
- c). Diagnosis,
- d). Experimentation.

A flexible research design which provides opportunity for considering many different aspects of a problem is considered appropriate if the purpose of the research study is that of exploration.

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 in practice this may not be true.

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.

6. Collecting the 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.

7. Execution of the Project

Execution of the project is a very important step in the research process. If the execution of the project proceeds on correct lines, the data to be collected would be adequate and dependable. If the survey is to be conducted by means of structured questionnaires, data can be readily machine-processed. In such a situation, questions as well as the possible answers may be coded. If the data are to be collected through interviewers, arrangements should be made for proper selection and training of the interviewers.

8. Analysis of Data

After the data have been collected, the researcher turns to the task of analysing 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.

Coding operation is usually done at this stage through which the categories of data are transformed into symbols that may be tabulated and counted. Editing is the procedure that improves

the quality of the data for coding.

Tabulation is a part of the technical procedure wherein the classified data are put in the form of tables. Computers not only save time but also make it possible to study large number of variables affecting a problem simultaneously.

Analysis work after tabulation is generally based on the computation of various percentages, coefficients, etc., by applying various well-defined statistical formulae.

9. Hypothesis Testing

After analysing the data as stated above, the researcher is in a position to test the hypotheses, if any, he had formulated earlier. Do the facts support the hypotheses or they happen to be contrary? This is the usual question which should be answered while testing hypotheses. Various tests, such as Chi square test, t-test, F-test, have been developed by statisticians for the purpose.

10. Generalisations and Interpretation

If a hypothesis is tested and upheld several times, it may be possible for the researcher to arrive at generalisation, i.e., to build a theory. If the researcher had no hypothesis to start with, he might seek to explain his findings on the basis of some theory. It is known as interpretation. The process of interpretation may quite often trigger off new questions which in turn may lead to further researches.

11. Preparation of the Report or the Thesis

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,

(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 summarised.

(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.

Purpose of Research

1. Progress and Good Life

The purpose of all research is progress and good life. Progress results if the space of ignorance is occupied by knowledge and wisdom. Knowledge and wisdom drive the mankind to live an orderly good life.

2. Development of Scientific Attitude

One of the purposes of research is to develop scientific attitude. Scientific attitude is one that asks 'Why' and 'How' and answers are found. This 'Know-why' and 'Know-how' attitude nurtures talents and such intellectual talents are the great assets of society.

3. Creativity and Innovativeness

One of the purposes of research is encouragement to creativity and innovation. New products, new processes and new uses are the means through which the world goes dynamic. A dynamic world is not possible without newness introduced every now and then in every walk of life. And this is possible only through creativity and innovation.

4. Testing Hypothesis and Establishing Theories

A very important purpose of research is testing of hypothesis and establishing theories. As was already pointed out knowledge is power. That knowledge comes from testing hypotheses and establishing new theories.

5. Prediction and Control

Applied research has a great say in prediction and control in almost all walks of human endeavour Prediction is jumping into the future and the theories constitute the launch pad. Control looks for deviation between actual happening and predicted happening.

6. Purposive Development

Development = Growth + Change, Growth is uni-scaled while change is multi-scaled. In the natural process development does take place through trial and error through casual observations, through actual exposure and the like.

7. Problem Solving

The purpose of any research is problem solving. What is a problem? How can these be solved?

8. Schematic Evaluation

Research is also carried out to systematically evaluate a process or practice of an organisation to know its strengths and weaknesses so that areas for improvement process can be identified.

9. Impact Analysis

Research is undertaken to assess the impact of certain measures or change introduced on relevant variables.

10. Methodological Improvement

Another purpose of research is improving research methodology itself. To answer the question research needs to be done. Validation, revalidation and de-validation of methodological aspects thus constitute good piece of research.

Chapter 2

Scientific Method

Introduction to Scientific Method

To be termed scientific, a method of inquiry must be based on empirical and measurable evidence subject to specific principles of reasoning. The "scientific method" attempts to minimize the influence of the researchers' bias on the outcome of an experiment. Another common mistake is to ignore or rule out data which do not support the hypothesis. The scientific method is the process by which scientists, collectively and over time, endeavour to construct an accurate (that is, reliable, consistent and non-arbitrary) representation of the world.

Difference between Scientific and non-scientific Method

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. The scientific approach to knowledge is empirical. The empirical approach emphasizes direct observation and experimentation as a way of answering questions.

When observing phenomena, a scientist likes to exert a specific level of control. When utilizing control, scientists investigate the effects of various factors one by one. Non-scientific approaches to knowledge are often made unsystematically and with little care. The non-scientific approach does not attempt to control many factors that could affect the events they are observing. This lack of control makes it difficult to determine cause-and-effect relationships.

How can two people witness the same event but see different things? This often occurs due to personal biases and subjective impressions. These characteristics are common traits among non-scientists.

Important Characteristics of Scientific Method

a). Empirical

Scientific method is concerned with the realities that are observable through "sensory experiences." It generates knowledge which is verifiable by experience or observation. Some of the realities could be directly observed, like the number of students present in the class and how many of them are male and how many female.

b). Verifiable

Observations made through scientific method are to be verified again by using the senses to confirm or refute the previous findings. Such confirmations may have to be made by the same researcher or others. We will place more faith and credence in those findings and conclusions if similar findings emerge on the basis of data collected by other researchers using the same methods.

c). Cumulative

Prior to the start of any study the researchers try to scan through the literature and see that their study is not a repetition in ignorance. Instead of reinventing the wheel the researchers take stock of the existing body of knowledge and try to build on it. Facts and figures are to be provided with language and thereby inferences drawn. The results are to be organized and systematized.

d). Deterministic

Science assumes that all events have antecedent causes that are subject to identification and logical understanding. For the scientist, nothing "just happens" – it happens for a reason. The scientific researchers try to explain the emerging phenomenon by identifying its causes.

Induction

It is one of the scientific methods. It follows the logical reasoning process. It is a process of reasoning whereby the researcher arrives at universal generalizations from particular facts. In other words, this method involves studying several individual cases and drawing a generalization. Conclusions drawn from induction and tentative inferences and they are subject to further confirmation based on more evidence.

Deduction

Deductive reasoning is a basic form of valid reasoning. Deductive reasoning, or deduction, starts out with a general statement, or hypothesis, and examines the possibilities to reach a specific, logical conclusion. The scientific method uses deduction to test hypotheses and theories. In deductive reasoning, if something is true of a class of things in general, it is also true for all members of that class. For example, "All men are mortal. Harold is a man. Therefore, Harold is mortal."

What are the Scope of Scientific Methods?

- **Economic Planning:** Research can be of immense use in economic planning in a given society. Economy planning requires basic data on the various aspects of our society and economy, resource endowment and the needs, hopes and problems of the people, etc. Economic planning is undertaken to achieve certain objectives such as:
  - ✓ To bring about regional development.
  - ✓ To make optimum use of available resources.
  - ✓ To bring out self-reliance.
  - ✓ To generate employment, etc.

  A systematic research provides the required data for planning and developing various schemes or programmes such as employment generation programmes, rural development programmes, etc.

- **Control over Social Phenomena:** Through research, first-hand information can be obtained in respect of the working of institutions and organisation, which in turn provides greater power of control over the social phenomena. The social science research has practical implications for formal and informal styles of managing, organisation structures, and introduction of changes in the organisation.

- **Social Welfare:** Social research can be used to collect the required data on different aspects of social life in a given society, so as to develop social welfare programmes.

- **Helps to Solve Problems:** Research can be undertaken to find solutions to solve specific problems. For instance, an organization may initiate research to find solution to the problem of declining sales of their products in the market. An educational institution can undertake research to find out the causes of low attendance or poor results. A government organisation may undertake research to solve the problem or to ascertain the impact of slums on the quality of life in a particular city, and such other research activities. The research enables to find appropriate solutions to specific

problems which in turn helps to improve the quality of performance in various organizations or institutions.

- **Verifies and Tests Existing Laws:** Research may be undertaken to verify and test existing laws or theories. Such verification and testing of existing theories help to improve the knowledge and ability to handle situations and events.

- **Develops New Tools and Theories:** Research helps to develop new tools, concepts and theories for a better study of an unknown phenomenon. For this purpose, exploratory research is undertaken to achieve new insights into such phenomenon.

- **Helps to Predict Events:** Research may be undertaken to predict future course of events. For instance, research may be undertaken to find out the impact of growing unemployment of educated youth on the social life of the society in future.

- **Extends Knowledge:** Researchers undertake research to extend the existing knowledge in physical sciences (such as physics, chemistry, mathematics, etc). as well as in social sciences (like sociology, management, psychology) etc. The knowledge can be enhanced by undertaking research in general and by fundamental research in particular.

What are the scopes of the scientific research?

The scope of scientific research is vast and encompasses a wide range of disciplines and fields. Scientific research aims to expand our understanding of the natural world, solve problems, and improve our lives. Here are some key scopes of scientific research:

- **Basic Research:** Investigating fundamental principles and phenomena to enhance our understanding of the natural world. Often exploratory, with the goal of expanding scientific knowledge without immediate practical applications.

- **Applied Research:** Focusing on solving specific problems or developing new technologies. Applies scientific knowledge to address practical issues and improve existing processes or products.

- **Interdisciplinary Research:** Collaborating across different scientific disciplines to address complex challenges. Involves integrating knowledge and methodologies from multiple fields to gain a comprehensive understanding of a topic.

- **Medical and Health Research:** Conducting research to understand diseases, develop new treatments, and improve healthcare practices. Involves clinical trials, epidemiological studies, and biomedical research.

- **Environmental Research:** Studying the environment, ecosystems, and the impact of human activities on the planet. Research in this scope aims to address environmental challenges, such as climate change, pollution, and biodiversity loss.

- **Space and Astronomy Research:** Exploring the cosmos to understand celestial bodies, the universe's origins, and the possibilities of extraterrestrial life. Involves astrophysics, cosmology, and space exploration.

- **Social Science Research:** Investigating human behavior, societies, and social systems. Research in this scope includes psychology, sociology, economics, political science, and anthropology.

- **Technological Research:** Developing and improving technologies to address societal needs. Involves research in fields such as computer science, engineering, nanotechnology, and materials science.

- **Educational Research:** Studying teaching and learning processes to improve educational outcomes. Research in education aims to enhance educational methods, curriculum design, and student engagement.

- **Psychological Research:** Exploring the mind and behavior of individuals. Research in psychology covers areas such as cognitive psychology, behavioral psychology, and clinical psychology.

- **Economic Research:** Investigating economic systems, markets, and policies. Economic research informs decision-making, policy development, and understanding economic phenomena.

- **Energy Research:** Developing sustainable and efficient energy sources. Research in energy encompasses renewable energy technologies, energy storage, and energy efficiency.

- **Biotechnology and Genetics Research:** Advancing knowledge in genetics and applying biotechnological techniques. Research in this scope includes genetic engineering, genomics, and biopharmaceuticals.

- **Cultural and Historical Research:** Examining cultural practices, historical events, and societal developments. Research in this scope contributes to our understanding of human history and cultural evolution.

- **Philosophical and Ethical Research:** Exploring philosophical questions and ethical considerations related to scientific advancements. Research in this scope addresses the broader implications of scientific discoveries and technological innovations.

Chapter 3

Planning of Research

Essentials of A Good Research Problem

1. Question Mark?

The research problem can be in a declarative or in a question form. We recommend you to formulate your research problem as a question.

2. Possibility to Respond

Some questions are impossible to answer in a scientific way, for example: 'how beautiful is the color yellow'. We don't have the scientifically justified instruments to answer this question. It must also be possible to answer the question in a practical way so it must be researchable, meaning you have to be able to collect evidence that will answer the question.

3. Attainability

The problem must be one that can be solved during the amount of time you have. So it can't be too broad (ex: 'How can we have world peace?'). But it also can't be too narrow (ex: How does my neighbor think about Indians?').

4. Open Question

The research problem should be an open question. That means it cannot be answered by "yes" or "no". But also, with open questions you should watch out for the possibility of a shallow answer.

5. Unmistakability

Your research problem must be clear and there has to be only one way to interpret it. For example: The question 'What do you think about the West?' is un mistakable because it is not clear what is meant by 'the West', it can be a lot of things.

6. Punctuality

The problem must be clearly specified. For example: Don't write 'How can prejudices against Americans be combated?' if you mean: 'How can prejudices that live among jazan students for Americans be combated?'

Sources of Research Problems

a). Research Problem from Expert

The simplest source of a problem to solve is to have it given to you as a class assignment, as a directed research project, or as a task while you are an apprentice in someone's lab. You are told what problem to research and how to do it.

b). Research Problem from Insight

Sometimes people research an issue simply because it occurred to them and it seemed important. The systematic development of the idea is lacking. It is risky because you may not be able to get other researchers to understand why the research is important.

c). Research Problem from Informal Discussion

This is a research problem that some discussion group feels is interesting. Discussion among friends can often spark our interest in a problem or provides us with the reinforces for pursuing a question.

d). Research Problem from Knowledge of Techniques and Apparatus

This is the selection of a research topic based on your special knowledge outside the field. A technique or apparatus with which you are familiar can offer the potential for a major advance in the field of psychology. Sometimes we realize that we can apply a new technique or apparatus to an area to which it has not yet been applied.

e). Research Problem from Reading the Literature

These are research problems which capture your interest while reading. While reading you will often wonder why, or will disagree, or will realize that you have a better idea than the original author.

f). Research Problem Deduced from Paradigms or Theories

Researchers who propose theoretical accounts for phenomena cannot think through every possible ramification. As you come to understand a theory, potential errors or extensions become apparent. This type of research tests the implications of theories to confirm or reject them. This is classic deductive "normal" science.

Factors Affecting Selection of Research Problem

A problem for the purpose of study must be selected only after considering certain factors or criteria. The criteria can be broadly grouped into two groups:
   a). Internal factors
   b). External factors

1. Internal Factors
The internal factors include personal interest of the researcher, competence of the researcher, and the resources available.

- **Researcher's Interest:** The researcher should be deeply interested in the problem. He should be determined to find solution to the problem.
- **Researcher's Competence:** It is not enough for the researcher to have dedication to research work, but there should be proper application or competence on the part of the researcher. The researcher should have the knowledge, ability and skills to handle the research activity.
- **Availability of Resources:** A more significant internal factor affecting problem selection is the availability of resources. The researcher should have adequate time and money to handle the research activity.

2. External Factors
- **Quality of Research Problem:** The research problem should of substance. There is no sense to study a research problem if it would not serve any purpose. One should not waste one's time and efforts on a problem studied thoroughly by others.

- **Availability** of **Facilities:** Research requires certain facilities such as appropriate library facilities, data processing facilities, etc. Therefore, the researcher must consider the availability of external facilities to make the research study effective.
- **Social Relevance:** The research should be socially relevant. It should serve some purpose to the society or to the organization that conducts the research. The factors of social relevance is especially important in the case of higher-level academic research and sponsored research.
- **Research Personnel:** At times, research activity requires a good deal of research personnel to undertake field interviews and other related activities. Therefore, the researchers should consider the availability of competent research personnel to assist him in research work. If necessary, the research personnel need to be provided with necessary guidance and training to undertake the research activities effectively.
- **Urgency and Importance of the Problem:** Business organizations and other institutions face a number of problems. They should list out the problems in the order of their urgency and importance. The more urgent and important problems should be researched first, as they are vital to the success of the organization and/or such problems if solved at the earliest may help to avert major crisis.
- **Feasibility of the Research:** Most of all, the researcher should consider the feasibility of the research. He should find well in advance whether or not he would be able to:
  - ✓ Collect the relevant data from the right sources.
  - ✓ Obtain proper responses from the respondents.
  - ✓ Get the required cooperation and guidance from concerned authorities in providing data or accessing the records. There are some organizations, such as private organizations, do not easily allow researchers to access their records.
  - ✓ Complete the research activity within the available time.

Chapter 6

Research Design

Structure:

6.1 INTRODUCTION

Designing of the research is done mainly to solve the problem of getting the various stages of the research under control. This control factor is very important for the researcher during any of the research operation. Preparation of the design for the research forms a very critical stage in the process of carrying out some research work or a research project.

Research Design in general terms can be referred to as the scheme of work to be done or performed by a researcher during the various stages of a research project. With the help of the research design, one can very easily handle and operate research work as research design acts as a working plan, which is made by a researcher even before he starts working on his research project. By this, researcher gets a great help and guidance in achieving his aims and goals.

According to Russell Ackoff, "research design is the process of making decisions before a situation arises in which the decision has to be carried out. It is actually a process of deliberate anticipation directed towards bringing an unexpected situation under control."

6.2 MEANING AND DEFINITIONS

1. According to Trochim (2005), research design "provides the glue that holds the research project together. A design is used to structure the research, to show how all of the major parts of the research project work together to try and address the central research questions." The research design is like a recipe. Just as a recipe provides a list of ingredients and the instructions for preparing a dish, the research design provides the components and the plan for successfully carrying out the study.

2. According to Claire Seltiz, Research Design is a catalogue of the various facts relating to the formulation of a research effort. It 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.

3. According to Paul E. Green and Tull, a Research Design is the specification of methods and procedures for acquiring the information needed. It is the overall operational pattern or

framework, of the project that stipulates what information is to be collected from which sources by what procedures. If it is a good design, it will ensure that the information obtained is relevant to the research questions and that it was collected by objective and economical procedures.

Research Design is the plan, structure and strategy of investigation conceived so as to obtain answers to research questions and to control variance. The plan is the overall scheme or programme of research. It includes an outline of what the investigator will do from writing the hypotheses and their operational implications to the final analysis of the data. To structure the research is to outline the scheme and paradigm of the operations of the variables strategy. It includes the methods to be used to gather and analyse the data. In other words, strategy implies how the research objectives will be reached and how the problems encountered in the research will be tackled. Like an architect prepares a blueprint before he approves a construction – in the same way researcher makes or prepares a plan or a schedule of his own study before he starts his research work. This helps the researcher to save time and also save some of his crucial resources. This plan or blueprint of study is referred to as the research design. A detailed outline of how an investigation will take place.

6.3 ESSENTIALS OF GOOD RESEARCH DESIGN

(**1**) **Reliability:** In general, reliability is concerned with the question of whether the results of a study are repeatable. It is an indication of the ability of a system to perform and maintain its functions consistently in routine circumstances as well as hostile or unexpected circumstances. Reliability is particularly important in quantitative research and may refer to:

- The statistical reliability of a set of data.
- The experimental reliability of an experiment.
- Data reliability, a property of some disk arrays in computer storage.
- Reliability engineering ensures a system will be reliable when operated in a specified manner.
- Reliability theory, as a theoretical concept, to explain biological aging and species longevity.
- Reliability (computer networking) is a category used to describe protocols.

(**2**) **Replication:** It is sometimes necessary for researchers to replicate (*i.e.* reproduce or duplicate) the findings of others; in order for this to happen, a study must be replicable. A study must be replicable in order that the reliability of a measure or a concept can be determined. Replications should not be confused with repeated measurements which refer literally to taking several measurements of a single occurrence of a specific phenomenon.

(**3**) **Validity:** Validity is concerned with the integrity of the conclusions that are generated from a piece of research. A valid measure is one which is measuring what it is supposed to measure. A valid measure must be reliable, but a reliable measure need not be valid. Validity refers to obtaining results that accurately reflect the concept being measured and it implies reliability (consistency). The main types of validity that are typically distinguished include:

- Measurement (or construct) validity, *e.g.,* does an IQ test really measure variations in intelligence?
- Internal validity, *e.g.,* if we suggest that $\underline{x}$ causes $\underline{y}$, can we be sure that it is $\underline{x}$ that is responsible for the variation in $\underline{y}$ and not something else?

- External validity, *e.g.,* can the results of a study be generalised beyond the specific research content?
- Ecological validity, *e.g.,* are social scientific findings applicable in people's everyday, natural social settings?

6.4 STEPS OF RESEARCH DESIGN

Following are the steps in research design:

1. **The Problem**: The first step involves the proper selection and then carefully defining the problem. By this researcher will be enabled to know about what he has to search, but it should be kept in mind that the problems selected should not be unmanageable in nature and should also not be based on desires.

2. **Objective of the Study**: The objective should be very clear in the mind of the researcher as this will lead to the clarity of design and proper response from the respondents.

3. **Nature of the Study**: The research design should be very much in relation with the nature of the study, which is to be carried out.

4. **Data Sources**: The various sources of the data or the information should be very clearly stated by the researcher.

5. **Techniques of Data Collection:** For the collection of the required information, it sometimes becomes very necessary to use some special techniques.

6. **Social Cultural Context**: Research design based on the social cultural concept is prepared in order to avoid the various study variations.

7. **Geographical Limit**: This step becomes a necessity at this point of time as with the help of this step, research linked to the hypothesis applies only to certain number of social groups.

8. **Basis of Selection**: Selecting a proper sample acts as a very important and critical Step and this is done with the help of some mechanics like drawing a random stratified, deliberate, double cluster or quota sample etc.

9. **Data Analysis:** Analysis of data is a process of inspecting, cleaning, transforming, and modeling data with the goal of highlighting useful information, suggesting conclusions and support decision making.

10. **Data Interpretation:** Data interpretation can be defined as "the application of statistical procedures to analyze specific observed or assumed facts from a particular study".

11. **Conclusions and Recommendations:** Conclusion means a position or opinion or judgment reached after consideration. On the basis of the research findings the conclusion needs to be drawn and suitable recommendations should be made to help improve the research problem.

6.5 EVALUATION OF RESEARCH DESIGN

The research design must be good. The question of good design is related to the purpose or objective of the research problem and also with the nature of it the problem to be studied.

A good design is often characterized by features like flexibility, appropriateness, economical and so on. Generally, the design which minimizes bias and maximizes the reliability of the data collected and analysed is considered a good design. The design which gives the smallest experimental error is supposed to be the best design in many investigations. Similarly, a design which yields maximal

information and provides an opportunity for considering many different aspects of a problem is considered most appropriate and efficient design in respect of many research problems. A design may be quite suitable in one case, but may be found wanting in one respect or the other in the context of some other research problem.

The fundamental questions in evaluating a research design pertain to the precision, reliability and relevance of the data and their analysis. Before actually carrying out research, it is better if the researcher evaluates his research design. This can be achieved if he verifies the following aspects for their explicitness.

- How relevant are the objectives?
- How relevant are the hypotheses?
- How explicit are the hypotheses?
- Have the problems and hypotheses been stated in operational terms scientifically?
- Has the research plan been presented in detail so that its logic is apparent?
- How scientific is data collection tool?
- How scientific is method of data collection?
- How precise are the observations?
- Can other investigators repeat the observations?
- Do the data actually satisfy the demands of the problem, i.e., do they actually demonstrate the conclusion?
- Does the research design ensure a comparison that is not subject to the alternate interpretations?
- Are the statistical designs appropriate?

6.6 QUESTIONS

1. Explain the Essentials of a good research design.
2. Explain the important steps involved in a research design?
3. Explain the process of Evaluation of a good research design.
4. Explain the significance of a good research design.

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Chapter 7

Methods of Data Collection

Structure:

7.1 WHAT IS DATA?

Data can exist in a variety of forms as numbers or text on pieces of paper, as bits and bytes stored in electronic memory, or as facts stored in a person's mind. Strictly speaking, data is the plural of datum, a single piece of information. In practice, however, people use data as both the singular and plural form of the word.

Data that is accurate and timely, specific and organized for a purpose, presented within a context that gives it meaning and relevance, and can lead to an increase in understanding and decrease in uncertainty.

7.2 WHAT IS INFORMATION?

Information in raw or unorganized forms (such as alphabets, numbers, or symbols) that refers to, or represent, conditions, ideas or objects. Information is valuable because it can affect behaviour, a decision or an outcome. For example, if a manager is told his/her company's net profit decreased in the past month, he/she may use this information as a reason to cut their financial spending. A piece of information is considered valueless if, after receiving it, things remain unchanged.

Data v/s Information

Data is raw, unorganized facts that need to be processed. Data can be something simple and seemingly random and useless until it is organized. Whereas when data is processed, organized, structured or presented in a given context so as to make it useful, is called Information.

Each student's test score is one piece of data. Whereas the classes, average score or the school's average score is the information that can be concluded from the given data.

The terms data, information and knowledge are frequently used for overlapping concepts. The main difference is in the level of abstraction being considered. Data is the lowest level of abstraction, information is the next level, and finally, knowledge is the highest level among all three. Data on its own carries no meaning. For data to become information, it must be interpreted and take on a meaning. For example, the height of Mt. Everest is generally considered as "data", a book on Mt. Everest geological characteristics may be considered as "information", and a report containing practical information on the best way to reach Mt. Everest's peak may be considered as "knowledge".

7.3 TYPES OF DATA

1. SECONDARY DATA

Secondary data are data that are taken from research works already done by somebody and used for the purpose of the research data collection. The reason why secondary data are being increasingly used in research is that published statistics are now available covering diverse fields so that an investigator finds required data readily available to him in many cases. For certain studies like stock price behavior, interest and exchange rate scenario, etc., only secondary data are used.

2. PRIMARY DATA

Primary data means original data that has been collected specially for the purpose in mind. It means someone collected data from the original source firsthand. Data collected in this way is called primary data. Primary data is the data observed or collected directly from first-hand experience. Primary data is collected by the researcher himself. Primary data is original research data in its raw form, without any analysis or processing. This data provides a wealth of information for researchers. This data can contain results from empirical testing, transcripts of interviews and surveys, and recorded observations. A person conducting a study on mice, for example, would have primary data like test results from blood and urine analysis, along with detailed observations of the mice on a day to day basis.

7.4 SOURCES OF PRIMARY DATA

People can distinguish primary data from other kinds of data by the fact that it is directly collected and presented without commentary. Secondary data consists of things like research papers based on the data. The major disadvantage of primary data is the sheer volume of information. People would need to read through pages and pages of information to extract usable data. In data processing, researchers use statistics and other tools to present the data in a more accessible format, turning raw results into meaningful statements like "20% of study participants reported feeling nauseous."

7.5 SOURCES OF PRIMARY DATA

1. Experiments

Experiments requires an artificial or natural setting in which one has to perform logical study to collect data. It is more suitable for medicine, nutrition and psychological studies. In experiment the experimenter has to keep control over the influence of any external variable on the results.

2. Survey

Surveying means contacting for getting certain information. **Survey method** is a method of collecting data for research purpose. There are personal surveys, mail surveys, telephone surveys and Internet surveys. Survey may be sample survey or census survey.

1. Personal Survey

Personal survey involves meeting personally every number who has to be surveyed. The features of this method of data collection are as follows.

- The number of respondents that can be contacted is not very high, as the time taken to contact the respondent, and the time spent on the interview itself is very high in relative terms.

- When the time available for research in large, the personal method is used.

- The cost involved is highest in the personal method since it requires field interviewers as well as their conveyance/travelling costs. Also, if a person is not available he may have to be contacted again and again.

- The accuracy obtained is very high, as the right persons are contacted and if there is difficulty in their understanding certain questions the interviewer can take care of it. Also, if the interviewer feels that the respondent is not furnishing the correct facts, by observing he can make his own interpretations, record the responses for better results. The responses rate is high compared to the mail survey, making the accuracy of the results better.

- When a large geographical area is to be covered and the time and cost constraints are high, personal survey method is not resorted to. However, if it is an ongoing syndicated research or census surveys, such in time and costs have to be necessarily borne for the sake of better coverage and accuracy.

- This method would require the agency to have a good infrastructure of data collection, in terms of field force, its supervision and control.

- When the literacy levels are low and the respondent would find it difficult to fill up the questionnaire on his own, this method is the best alternative available.

- A very length questionnaire under a structured survey is difficult to administer personally, with inaccuracy creeping in on account of the monotonous nature and fatigue effect on the part of the interviewer. At times, in certain socio-economic studies when this is unavoidable, the number of interviewers is made larger and certain incentives may be given to the respondents to extend their cooperation in filling up the set of questions, asked.

- The availability of skilled interviewers can reduce the interviewer bias on account of recording incorrect responses of the fatigue effects.

- When the questions require spontaneous answers, this is the best method, However, if the questions are of a personal nature or require too much thought on the part of the respondent he may feel embarrassed or make up the answers without thinking. However, in case of non-structured and non-disguised techniques like the in-depth interviews such probing is called for.

- The interviewer may have the tendency to contact some other person; similar to the respondent to complete his quota of respondents. This affects the accuracy of results thus necessitating a tight control on field work.

- A complete list of the respondents would be required to draw a representative sample. However, the interviewer has at times to use his own discretion and access respondents with similar demography characteristic in case of non-availability.

2.   Mail Survey Method

Mail survey involves contacting the respondents through post. A questionnaire is dispatched to elicit views. The features of this method are as follows:

- A large number of respondents can be contacted using the available database of addresses.
- When the time available is again fairly large, and respondents are very distantly located this method is preferred.
- The cost involved is not very high and it is mainly just the cost of mailing which is often very cheap.
- The accuracy obtained is not very high since the response rate is not very high, not more than 20%. Also, the right respondent may not have filled up the questionnaire. Again, the chances of interpreting the questions incorrectly by the respondents are high, resulting in wrong responses which may be inconsistent with the responses in the rest of the questionnaire.
- The mail method most suited to contact people scattered over large geographical areas when the time available for contact is fairly enough An updated database of respondent addresses would go a long way in obtaining a good response rate. With the availability of fax, internet and courier facilities, time can be saved.
- The size of field force required is almost negligible and the agency could function with few data entry operators to take care of the data collected.
- The mail method can be used to contact only people who can read and write and definitely has limitations for social research at the slum level or rural levels.
- This is the method best suited when the questionnaire is very length. The respondents does not have to fill it up in one stroke. He also has time to think about the questions and answer them. Errors on account of fatigue or monotonous nature of the dialogue with the interviewer are not likely to creep in.
- The interviewer bias is not of any consequence in this case.
- The questions which require spontaneous answers would not lend themselves suitable to the mail survey. However, personal questions or those involving certain thought processes are best suited to the mail questionnaire method.
- The questionnaires are out of the control of the agency. The person who fills up the questionnaire may not be the desired respondent but someone in the same office or household.
- The mailing would not solve the purpose if the addresses of the respondents have not been updated. The existence of a mailing list is essential.

3.   Telephone Survey Method

In telephone survey voice contact is directly established with the respondents. The features of this method are as follows:

- The number of respondents who can be contacted is fairly large, as the time to contact them is less than that for a personal interview.
- The cost involved is moderately high as skilled telephone operators need to be employed. Also if the respondent is not available he needs to be contacted more than once.
- The accuracy obtained is fairly high in this case as the response rate is comparable to the personally administered questions. In certain cases, it might be higher also. The skill of the

telephone interviewer makes the respondent at ease and comfortable to answer the questions. Also, certain questions, which need explanations can also be posed through the telephone.

- The telephone method can be used for respondents having the ability to communicate and express themselves. As such, only a certain class of respondents lend themselves useful to such methods.
- The length of the questionnaire has to be extremely short in this case. The issue which is addressed through the questions has to be focused one so that, less time is required to be spent over the telephone to explain the purpose of the research, etc. The telephone method would thus have a limited use.
- The skill of the operator/interviewer largely is responsible for the size of bias in recording the respondents incorrectly.
- The questions requiring spontaneous answers or of a personal nature can be administered over the telephone but those which require thinking would be difficult to take care of using this method.

4. Internet Survey Method

This is the world of connectivity through Internet. Internet survey involves using Internet for survey. The superiority of this survey is that it has no limitations of geography. The questionnaire may be put through a websites, forums, blogs, wikis, mail-groups, etc. The survey may be advertised through Internet or other mode inviting the attention of the prospective respondents. They may send their responses again over the Internet. This is the most modern type of survey and has great potentials. It is not prohibitively expensive.

3. Questionnaire

It is most commonly used survey method. It is list of questions, that is, either open-ended or closed-ended for which respondent gives an answer. It can be conducted via telephone, mail, face to face or other methods. A questionnaire is a form prepared and distributed to respondents to secure responses to certain questions. It is a device for securing answers to questions by using a form which the respondent fills by himself. It is a systematic compilation of questions that are submitted to a sample drawn from the population from which information is desired. It is an important instrument in normative survey research, being used to gather information from widely scattered sources. The questionnaire procedure normally comes into use where one cannot readily see personally all the people from whom one desires responses or where there is no particular reason to see them personally.

Purposes of questionnaire in research are twofold:

- To collect information from the respondents who are scattered in a vast area and
- To achieve success in collecting reliable and dependable data.

Types of Questionnaire

There are diverse forms of questionnaire used in research. These are discussed briefly here.

1. **Structured and Non-structured Questionnaires**: The structured questionnaire contains definite, concrete and direct questions, whereas non-structured questionnaire may consist of partially completed questions or statements. A non-structured questionnaire is often used as the interview guide, which is non-directive. The interviewer possesses only a blueprint of the enquiries and he is largely free to arrange the form or statements of the questions. The

enquiries framed in a general form beforehand are given a specific form during the actual process of interview.

2. **Closed Form and Open Form:** The questions that call for short or check responses are known as restricted or closed form type. This provides for making a yes or no, a short response, or checking an item from a list of given responses. It restricts the choice of response for the respondent. He has simply to select a response out of supplied responses and has not to frame his response in his own way. It is easy to fill out, takes less time, keeps the respondent on the subject, is relatively more objective, more acceptable and convenient to the respondent, and is fairly easy to tabulate and analyze. The open form, open-end or unrestricted type questionnaire calls for a free response in the respondent's own words. The respondent – frames and supplies his own response. No clues are provided. It probably provides for greater depth of response. The subject reveals his mind, gives his frame of reference and possibly the reasons for his responses. This type of item is sometimes difficult to interpret, tabulate and summarize in the research report. When the respondent is allowed freedom of response his expressions, may take any unique direction which may not find any uniformity with earlier responses.

3. **The Mixed Questionnaire:** The mixed questionnaire consists of both closed-end and open-end type questions. For social research, this method is very useful. Many questionnaires include both open and closed type items. Each type has its specific merits and limitations and the research worker has to decide which type is more likely to supply the information he wants.

4. **Fact and Opinion Questionnaires**: Questionnaire are also classified as: (1) Questionnaire of fact, which requires certain information of facts from the respondent without any reference to his opinion or attitude about them, and (2) Questionnaire of opinion and attitude in which the informant's opinion, attitude or preference regarding some phenomena is sought.

5. **Pictorial and Verbal Questionnaires**: In the pictorial questionnaire, pictures are used to promote interest in answering questions. It is used extensively in studies of social attitudes and prejudices in children or illiterate persons. In a pictorial questionnaire, the selected alternative answers in the form of pictures are given and the respondent is required to tick the concerned picture. This questionnaire may be very useful for collecting data in a developing country like India, specially from the rural masses who are mostly illiterate and less knowledgeable. The serious limitation of this questionnaire is that it is lengthy in form. Also it is highly expensive. Verbal questionnaire uses words and numbers only. It is the usual form meant for literate respondents.

In the questionnaire technique, great reliance is placed on the respondent's verbal report for data on the stimulus experiences in which he is exposed and for knowledge of his behaviour. The questionnaire is effective only when the respondent is able or willing to express his reactions clearly. A good questionnaire can elicit cooperation of the respondent to get frank answers on almost any subject, even such personal matters as sex and income. Thus, it is clear that the respondent can judge the study only by what he can see. The questionnaire, by its very nature, is an impersonal technique and it is several pieces of paper appeals/persuades the respondent that he ought to participate.

4. Interview

Interview is face to face conversation with respondents. It is slow, expensive and takes people away from regular work. Interviewer can not only record the statements the interviewee speaks but

also can observe the body language or non verbal communication such as face-pulling, shrugging, hand gestures that add further meaning to spoken words. **Interview** is one of the popular **methods of research data collection.** The term interview can be dissected into two terms as, 'inter' and 'view'. The essence of interview is that one mind tries to read the other. The interviewer tries to assess the interviewed in terms of the aspects studied or issues analyzed.

Types of Interview used in Research

There are different types of interviews used in the research data collection. An interview is either structured or unstructured, depending upon whether a formal questionnaire has been formulated and the questions asked in a prearranged order or not. An interview is also either direct or indirect as a result of whether the purposes of the questions asked are plainly stated or intentionally disguised. Cross-classifying these two characteristics provides four different types of interviews. That is, an interview may be

1. structured and direct,
2. unstructured and direct,
3. structured and indirect, or
4. unstructured and indirect.

Types (1) and (2) are basically objective types; (3) and (4) are subjective types.

1. **Structured-Direct Interview**: The usual type of interview conducted during a consumer survey to obtain descriptive information is one using a formal questionnaire consisting of non-disguised questions, a questionnaire designed to "get the facts". If the marketing search manager of a television set manufacturer wants to find out how many and what kinds of people prefer various styles of television cabinets, for example, he may have a set of questions drawn up that asks for these facts directly. Assuming that personal interviewing is being used, each interviewer will be instructed to ask the questions in the order given on the questionnaire and to ask only those questions. The resulting interviews will be structured-direct in nature.

2. **Unstructured-Direct Interview**: In the unstructured-direct method of interviewing, the interviewer is given only general instructions on the type of information desired. He is left to ask the necessary direct questions to obtain this information, using the warding and the order that seems most appropriate in the context of each interview. Unstructured-direct interviews are often used in exploratory studies. Many research projects that use a formal questionnaire for the final interviews go through an exploratory phase in which respondents are contacted and unstructured interviews are held. These interviews are useful in obtaining a clearer understanding of the problem and determining what areas should be investigated.

3. **Structured-indirect interview**: In the case of structured indirect interview the questions are pre-decided and arranged in a structured way. However the purpose of the study is not revealed.

4. **Unstructured-indirect interview**: In the case of unstructured indirect interview the questions aren't pre-decided and neither the purpose of the study made known explicitly.

There are **other types of interviews**, like focus-group interview, depth interview, etc. All these are dealt here.

(i) **Focus-Group Interviews**: Perhaps the best-known and most widely used type of indirect interview is the one conducted with a focus group. A focus-group interview is one in which a group of people jointly participate in an unstructured-indirect interview. The group,

usually consisting of 8 to 12 people, is generally selected purposively to include persons who have a common background or similar buying or use experience that relates to the problem to be researched. The interviewer, moderator, as he or she is more often called, attempts to focus the discussion on the problem areas in a relaxed, nondirected manner. The objective is to foster involvement and interaction among the group members during the interview will lead to spontaneous discussion and the disclosure of attitudes, opinions, information on present or prospective buying and use behavior.

(ii) **Focused Interviews:** This is a semi-structured interview where the investigator attempts to focus the discussion on the actual effects of a given experience to which the respondents have been exposed. It takes place with the respondents known to have involved in a particular experience, e.g., seeing a particular film, viewing a particular program on TV., involved in a train/bus accident, etc. The situation is analyzed prior to the interview. An interview guide specifying topics relating to the research hypothesis is used. The interview is focused on the subjective experiences of the respondent, i.e., his attitudes and emotional responses regarding the situation under study. The focused interview permits the interviewer to obtain details of personal reactions, specific emotions and the like. The merits of using this type of interview is that, it's free from the inflexibility of formal methods, yet gives the interview a set form and insures adequate coverage of all the relevant topics. The respondent is asked for certain information, yet he has plenty of opportunity to present his views. The interviewer is also free to choose the sequence of questions and determine the extent of probing.

(iii) **The Third Person Technique**: The simplest way of obtaining information through indirect questioning of a respondent is to ask for the view of a neighbor, an (unnamed) associate, or some other person whose views on the subject at hand might reasonably be known. This permits the respondent to project his own views with no feeling of social pressure to give an "acceptable" answer.

(iv) **The Depth Interview**: There is substantial use of the unstructured, informal interview in marketing research to explore the underlying predispositions, needs, desires, feelings, and emotions of the consumer toward products and services. This method of interviewing is referred to as a "depth interview". The depth interview in marketing research may consist of either direct or indirect questions, or some combination of the two. The skilled interviewer will generally employ both types of questions, A direct, free answer question such as "What are the major reasons why you bought your iPhone? Might well be followed up, for example, with an indirect question such as "Why do you think people who own smart phones bought them?" By following leads and cues provided by respondents, phrasing questions to continue the flow and pattern of the conversation and to maintain the rapport established, the competent interviewer can explore and probe the underlying motivations of the respondent.

(v) **The Personal Interview**: As the name implies, the personal interview consists of an interviewer asking questions of one or more respondents in a face to face situation. The interviewer's role is to get in touch with the respondent(s), ask the desired questions, and to record the answers obtained. The recording of the information obtained may be done either during or after the interview. In either case, it is a part of the interviewer's responsibility to ensure that the content of the answers is clear and unambiguous and that it has been recorded correctly.

(vi) **The Telephone Interview**: Telephone interviews are sometimes used in lieu of personal interviews, especially when the information must be collected quickly and inexpensively

and the amount of information required is limited. The telephone interview is well suited to such research problems as determining "coincidental" viewing of television or listening to radio programmes. In this type of study, calls are placed to a sample of telephone subscribers during the time the programme is on the air. The person receiving the call is simply asked "Are you now watching television?" and, if so, "What programme are you watching?" Other questions such as "How often do you watch this programme?" "Who sponsors this programme?" and the like may also be asked. The result is a rapid and inexpensive measurement of audience level. Either a structured or an unstructured interview may be held. Since the amount of information sought is usually well defined, non-confidential in nature, and limited in amount, virtually all telephone interviews are structured in nature. This medium does not lend itself well to indirect interviews and has not been used for this purpose.

5. Observation:

Observation involves three processes, i.e.,

 (i) Sensation
 (ii) Attention
 (iii) Perception.

Sensation is gained through the sense organs which depend upon the physical alertness of the observer. The sense organs are receptive to stimuli and get attracted leading to the first stage in observation. Then comes attention or concentration which is largely a matter of commitment and will-power. Adequate training and experience can make it almost a matter of habit. The third is perception which comprises the interpretation of sensory reports. Thus, sensation merely reports the facts as observed but perception enables the mind to recognize the facts.

Through this process, observation serves the purpose of

 (i) studying collective behavior and complex social situations.
 (ii) following up of individual units composing the situations.
 (iii) understanding the whole and the parts in their interrelations.
 (iv) getting the out of the way details of the situation.

Types of Observation

There are different types of observation. The important ones are listed below:

1. Casual and Scientific Observation

An observation may be either casual or scientific. Casual observation occurs without any previous preparation. It is a matter of chance that the right thing is observed at the right time and in the right place. Scientific observation, on the other hand, is carried out with due preparations and is done with the help of right tools of measurement experienced enumerators and under able guidance. Scientific observations yield thorough and accurate data.

2. Simple and Systematic Observation

An observation may be either Simple or Systematic. Simple Observation is found in almost all research studies, at least in the initial stages of exploration. Its practice is not very standardized. It befits the heuristic nature of exploratory research. Participant studies are also usually classified as simple observation because participant roles do not permit systematic observation. Systematic observation, on the other hand, employs standardized

procedures, training of observers, schedules for recording and other devices to control the observer sometimes even the subject. Clearly some systematization is valuable in research observation, but the situation often limits what can be done. A systematic observation is a scientific observation too.

3. **Subjective and Objective Observation**

   An observation may be either Subjective or Objective. In every act of observation there are two components namely, the object (or what is observed) and the subject (or the observer). It may be that sometimes one may have to observe one's own immediate experience. That is called Subjective Observation or Self-observation or introspection. Prejudices and biases are generally parts of subjective observation. Many data of psychological interest are gathered by the method of subjective observation. To avoid such prejudices, the observer takes stock of him and discovers what prejudices and biases will prevent impartial study and disinterested points of view. Persistent self-observation and criticism by others may ultimately overcome prejudice and biases. Such introspection may have another social value, i.e., it sensitizes the observer to the problems of others and creates sympathetic insight which facilitates, at least to some degree, the understanding of people's behavior in similar circumstances and similar cultural contexts. The net result is impartial subjective observation. When the observer is an entity apart from the thing observed, the observation of this type is objective.

4. **Factual and Inferential Observation**

   Observation may be either factual or inferential. In factual observation things or phenomena observed with naked eyes are reported. In inferential observation behavior or psychological aspects are observed.

5. **Direct and Indirect Observation**

   Observation may be either Direct or Indirect. In the case of direct observation the observer is physically present and personally monitors what takes place. This approach is very flexible of events and behavior as they occur. He is also free to shift places, change the focus of the observation, concentrate on unexpected events if they should occur. In indirect observation recording is done by mechanical, photographic or electronic means. For example a special motion picture camera which takes one frame every second is mounted in a department of a large store to study customer and employee movement.

6. **Behavioral and Non-behavioral Observations**

   Observation may be either behavioral or non-behavioral. As pointed earlier the concept of observation involves not only watching but also listening and reading. Thus, observation includes the full range of monitoring behavioral and non-behavioral activities and conditions. Non-verbal analysis, linguistic analysis, extra-linguistic analysis and spatial analysis are the four major categories of behavioral observational study of persons. Record analysis, physical condition analysis and physical process analysis are the three major categories of non-behavioral study of persons. Non-verbal behavioral observation includes observation of body movement, motor expressions and even exchanged glances. Body movement, is an indicator of interest or boredom, anger or pleasure in a certain environment. Motor expressions such as facial movements can be observed as a sign of emotional studies. For instance, eye-blink rates are studied as indicators of interest in advertising messages. Finally, exchanged glances might be of interest in studies of interpersonal behavior Linguistic behavior is a second frequently used from of behavioral observation. One simple type, familiar to most students, is the tally of 'ahs' (or other annoying words or sounds) that a professor emits during a class.

7.6 SOURCES OF SECONDARY DATA

It is data that has been already collected by and readily available from other sources. When we use statistical methods with primary data from another purpose we are using secondary data. It means one purpose's primary data is another purpose's secondary data. So secondary data is data that is being reused. Such data are cheaper and more quickly obtainable than primary data.

Secondary data are data that are taken from research works already done by somebody and used for the purpose of the research data collection. The reason why secondary data are being increasingly used in research is that published statistics are now available covering diverse fields so that an investigator finds required data readily available to him in many cases. For certain studies like stock price behavior, interest and exchange rate scenario, etc., only secondary data are used.

Sources of secondary data

(1) Published printed sources: There are varieties of published printed sources. Their credibility depends on many factors like the writer, the publishing company, time and date of publication. New sources are preferred and old sources should be avoided as new technology and researchers bring new facts into light.

(2) Books: Books are available today on any topic that you want to research. Their use starts even before you have selected the topic. After the topic selection, books provide insights on how much work has already been done on the same topic and you can prepare the literature review.

(3) Journals/Periodicals: They are becoming more important as far as data collection is concerned. The reason is that journals provide up to date information which at times books cannot and secondly they can give information on very specific topic.

(4) Magazines and newspapers: Magazines are also effective but not very reliable sources. Newspapers on the other hand are more reliable.

(5) Published electronic sources:

As Internet is becoming more advance, fast and reachable to the masses, it has been seen that much information that is not available in printed form is available on internet. In the past the credibility of internet was questionable but today almost every journal and book are available online.

    1. e-Journals: e-Journals are more commonly available than printed journals. Latest journals are difficult to retrieve without subscription but if there is e-library then one can view any journal any time.

    2. General Websites: They are generally not very reliable hence their content should be checked for their reliability.

    3. Weblogs: Weblogs are becoming common. They are actually diaries written by different people. These are as reliable as personal written diaries.

(6) Unpublished personal records:

Some unpublished data may also be useful in some cases.

    1. Diaries: Diaries are personal records and rarely available. But if you are conducting descriptive research then they might be very useful. The Anne Franks diary is the most famous example of this. That diary contained the most accurate records of Nazi wars.

    2. Letters: Like diaries letters are also rich sources of data.

3. **Government records:** Government records are very important for marketing, management and social researches. Examples are census data, health records, and educational institute's records.

7.7 PRIMARY DATA V/S SECONDARY DATA

1. Primary data is data which has been collected by you, which is more reliable and up to date. Secondary data has been collected from a secondary source (Other people, business etc.) so it may not be valid or up to date.
2. "Primary data" are data collected for the need at hand. "Secondary data" are data that were collected for another reason but is being re-purposed to address the need at hand.
3. When describing the expertise of data analysts, it is not uncommon to distinguish between primary and secondary data analytics. Primary data analytics involves the ability to analyze data for the purpose by which it has been collected. Secondary data analytics involves identifying "secondary data sources" to solve a new problem and then the ability to re-purpose that data.
4. **Primary data** is a data which is created for the first time and there is no previous source available. **Secondary data** is a readily available data like data from trade directories, statistics from websites etc. In Dissertation, literature review is done through secondary data which includes the contents such as theories, models, compilation, research findings by some other scholar etc.

7.8 APPROPRIATENESS OF METHODS OF DATA COLLECTION

The choice of appropriate data collection methods should be based on the research questions, design, sample, and the possible data sources. The technique used for data collection should gather information that will allow the research questions to be answered, take into account the characteristics of the sample, and provide information that is linked to each intended learning outcome.

7.9 ADVANTAGES AND DISADVANTAGES OF SECONDARY DATA

Following merits are usually claimed for using secondary data source.

1. **Provides an insight into total situation:** The purpose of use of available materials is to explore the nature of the data and the subjects to get an insight into the total situation. While looking for the data required by the researcher he may uncover many more available data than are often assumed to exists and hence, contributes significantly to the unfolding of hidden information.
2. **Helps in the formulation of hypothesis:** The use of documentary sources sometimes, helps in the formulation of research hypothesis. While an investigator may have one or two hypotheses which he might have deduced from theory, the study of available materials may suggest further hypotheses. If a research idea or hypotheses can be formulated in such a manner that the available recorded material bears on the question, the use of such material becomes possible.
3. **Helps in testing the hypotheses:** The available records may also help in testing the hypothesis.
4. **Provides supplementary information:** Available documents may be used to supplement or to check information gathered specifically for the purposes of a given investigation. For

example, if one has drawn in random sample of a small group in order to interview individuals, the accuracy of one's sample could be checked by comparing socio-economic data of the sample, like income, education standard, caste, family size, etc., with the same data of the most recent census or with available data in local Government offices.

The following are the demerits of using secondary data source for research purpose.

1. **Collected for a specific purpose:** Data are often collected with a specific purpose in mind, a purpose that may produce deliberate or unintentional bias. Thus, secondary sources must be evaluated carefully. The fact that secondary data were collected originally for particular purposes may produce other problems. Category definitions, particular measures or treatment effects may not be the most appropriate for the purpose at hand.

2. **Old data:** Secondary data are by definition, old data. Thus, the data may not be particularly timely for same purposes.

3. **Aggregation of data in inappropriate unit:** Seldom are secondary data available at the individual observation level. This means that the data are aggregated in some form, and the unit of aggregation may be inappropriate for a particular purpose.

4. **Authenticity:** The authenticity of same secondary sources of data is doubtful.

5. **Context change:** Secondary data refer to a given situation. As situations change, the data lose their contextual validity.

7.10 QUESTIONS

1. What are the Sources of collecting Secondary and primary data?
2. Explain methods of data collection?
3. Distinguish between primary and Secondary data?
4. Explain the advantages and disadvantages of Secondary data?
5. Explain the appropriateness of methods of data collection.

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Chapter 9

Preparation of Report

Structure:

9.1 WHAT IS RESEARCH REPORT?

Research report is considered a major component of the research study for the research task remains incomplete till the report has been presented and/or written. As a matter of fact even the most brilliant hypothesis, highly well designed and conducted research study, and the most striking generalizations and findings are of little value unless they are effectively communicated to others.

The purpose of research is not well served unless the findings are made known to others. Research results must invariably enter the general store of knowledge. All this explains the significance of writing research report. There are people who do not consider writing of report as an integral part of the research process.

But the general opinion is in favour of treating the presentation of research results or the writing of report as part and parcel of the research project. Writing of report is the last step in a research study and requires a set of skills somewhat different from those called for in respect of the earlier stages of research. This task should be accomplished by the researcher with utmost care; he may seek the assistance and guidance of experts for the purpose.

9.2 TYPES OF REPORT

Research reports vary greatly in length and type. In each individual case, both the length and the form are largely dictated by the problems at hand. For instance, business firms prefer reports in the letter form, just one or two pages in length. Banks, insurance organisations and financial institutions are generally fond of the short balance-sheet type of tabulation for their annual reports to their

customers and shareholders. Mathematicians prefer to write the results of their investigations in the form of algebraic notations.

The reports can be prepared by governmental bureaus, special commissions, and similar other organisations are generally very comprehensive reports on the issues involved. Such reports are usually considered as important research products. Similarly, Ph.D. theses and dissertations are also a form of report writing, usually completed by students in academic institutions.

9.3 CONTENTS OF REPORT

The researcher must keep in mind that his research report must contain following aspects:

1. Purpose of study
2. Significance of his study or statement of the problem
3. Review of literature
4. Methodology
5. Interpretation of data
6. Conclusions and suggestions
7. Bibliography
8. Appendices

These can be discussed in detail as under:

(1) Purpose of Study

Research is one direction-oriented study. He should discuss the problem of his study. He must give background of the problem. He must lay down his hypothesis of the study. Hypothesis is the statement indicating the nature of the problem. He should be able to collect data, analyze it and prove the hypothesis. The importance of the problem for the advancement of knowledge or removal of some evil may also be explained. He must use review of literature or the data from secondary source for explaining the statement of the problems.

(2) Significance of Study

Research is re-search and hence the researcher may highlight the earlier research in new manner or establish new theory. He must refer earlier research work and distinguish his own research from earlier work. He must explain how his research is different and how his research topic is different and how his research topic is important. In a statement of his problem, he must be able to explain in brief the historical account of the topic and way in which he can make and attempt. In his study to conduct the research on his topic.

(3) Review of Literature

Research is a continuous process. He cannot avoid earlier research work. He must start with earlier work. He should note down all such research work, published in books, journals or unpublished thesis. He will get guidelines for his research from taking a review of literature. He should collect information in respect of earlier research work. He should enlist them in the manner given below:

1. Author/Researcher
2. Title of research /Name of book

3. Publisher
4. Year of publication
5. Objectives of his study
6. Conclusion/Suggestions

Then he can compare this information with his study to show separate identity of his study. He must be honest to point out similarities and differences of his study from earlier research work.

(4) Methodology

It is related to collection of data. There are two sources for collecting data; primary and secondary. Primary data is original and collected in field work, either through questionnaire/interviews. The secondary data relied on library work. Such primary data are collected by sampling method. The procedure for selecting the sample must be mentioned. The methodology must give various aspects of the problem that are studied for valid generalization about the phenomena. The scales of measurement must be explained along with different concepts used in the study.

While conducting a research based on field work, the procedural things like definition of universe, preparation of source list must be given. We use case study method, historical research, etc. He must make it clear as to which method is used in his research work. When questionnaire is prepared, a copy of it must be given in appendix.

(5) Interpretation of Data

Mainly the data collected from primary source need to be interpreted in a systematic manner. The tabulation must be completed to draw conclusions. All the questions are not useful for report writing. One has to select them or club them according to hypothesis or objectives of study.

(6) Conclusions/Suggestions

Data analysis forms the crux of the problem. The information collected in field work is useful to draw conclusions of study. In relation with the objectives of study the analysis of data may lead the researcher to pin point his suggestions. This is the most important part of study. The conclusions must be based on logical and statistical reasoning. The report should contain not only the generalization of inference but also the basis on which the inferences are drawn. All sorts of proofs, numerical and logical, must be given in support of any theory that has been advanced. He should point out the limitations of his study.

(7) Bibliography

The list of references must be arranged in alphabetical order and be presented in appendix. The books should be given in first section and articles are in second section and research projects in the third. The pattern of bibliography is considered convenient and satisfactory from the point of view of reader.

(8) Appendices

The general information in tabular form which is not directly used in the analysis of data but which is useful to understand the background of study can be given in appendix.

9.4 LAYOUT OF THE RESEARCH REPORT

There is scientific method for the layout of the research report. The layout of the report means as to what the research report should contain. The contents of the research report are noted below:

1. Preliminary Page
2. Main Text
3. End Matter

(1) Preliminary Pages

These must be title of the research topic and data. There must be preface or foreword to the research work. It should be followed by table of contents. The list of tables, maps should be given.

(2) Main Text

It provides the complete outline of research report along with all details. The title page is reported in the main text. Details of text are given continuously as divided in different chapters.

(a) Introduction
(b) Statement of the problem
(c) The analysis of data
(d) The implications drawn from the results
(e) The summary

(a) Introduction

Its purpose is to introduce the research topic to readers. It must cover statement of the problem, hypotheses, objectives of study, review of literature, and the methodology to cover primary and secondary data, limitations of study and chapter scheme. Some may give in brief in the first chapter the introduction of the research project highlighting the importance of study. This is followed by research methodology in separate chapter.

The methodology should point out the method of study, the research design and method of data collection.

(b) Statement of the Problem

This is crux of his research. It highlights main theme of his study. It must be in non technical language. It should be in simple manner so ordinary reader may follow it. The social research must be made available to common man. The research in agricultural problems must be easy for farmers to read it.

(c) Analysis of Data

Data so collected should be presented in systematic manner and with its help, conclusions can be drawn. This helps to test the hypothesis. Data analysis must be made to confirm the objectives of the study.

(d) Implications of Data

The results based on the analysis of data must be valid. This is the main body of research. It contains statistical summaries and analysis of data. There should be logical sequence in the analysis of data. The primary data may lead to establish the results. He must have separate chapter on conclusions and recommendations. The conclusions must be based on data analysis. The conclusions must be such which may lead to generalization and its applicability in similar circumstances. The conditions of research work limiting its scope for generalization must be made clear by the researcher.

(e) Summary

This is conclusive part of study. It makes the reader to understand by reading summary the knowledge of the research work. This is also a synopsis of study.

(3) End Matter

It covers relevant appendices covering general information, the concepts and bibliography. The index may also be added to the report.

9.5 PRINCIPLES OF REPORT WRITING

Following are some important principles for writing a good research report:

- **Make small sentences:** Reading begins to get strenuous when sentences used in the research report average more than 25 words.
- **Vary sentence length:** In using short sentences do not let the work become choppy. Sentences of considerable length are all right provided, they are balanced with enough short sentences.
- **Use simple words:** The researcher is advised to use simple words in his research report.
- **Use familiar words:** It is better to use familiar words in a research report.
- **Avoid unnecessary words:** The use of unnecessary words tire a reader and fog up the writing.
- **Write to express not to impress:** The best way to impress the reader of report is to express what you have to say clearly and directly.
- **Write as you talk:** The researcher should make his report writing as though it is his speech.
- **Keep as many active verbs as possible:** Use of active verbs puts life into report writing.
- **Tie in with reader's experience:** Always write research reports with a particular reader in mind. Relate what you have to tell him about your research report. This is the way to have the reader understand your report.
- **Make the report short and sweet:** A short report makes reading interesting and sweet. Short report should not mean short-cut report.

9.6 STEPS IN REPORT WRITING

It is the critical stage and hence, it requires patience. These is no mechanical formulate to present a report, though there are certain steps to be followed while writing a research report. The usual steps in report writing can be indicated in the following manner:

- Logical analysis of subject matter.
- Preparation of final outline.
- Preparation of rough draft.
- Rewriting and polishing.
- Preparation of final bibliography.
- Writing the final draft.

It is pertinent to follow these steps and hence, it is essential to understand these steps thoroughly.

(a) Logical Analysis of Subject Matter

When a researcher thinks of doing a research, he must select subject and topic of his research work. The subject must be of his own interest and there must be scope for further research. Such can be selected and developed logically or chronologically. He must find out mental connections and associations by way of analysis to finalize his subject. Logical treatment often consists in developing from the simple possible to the most complex strictures. He can use the deductive method or inductive method in his research work. Secondly, the alternative in selecting research subject is to use chronological method. In this method, he should concentrate on the connection or sequence in time or occurrence. The directions for doing or making something usually follow the chronological method. In this method, he should concentrate on the connection or sequence in time or occurrence. The directions for doing or making something usually follow the chronological order.

(b) Preparation of Final Outline

Outlines are the framework upon which long written works are constructed. It is an aid to logical organization of the material and remainder of the points to be stressed in the report. He should rely on review of literature. The earlier research works can provide basic information as well as thinking to the researcher to pursue his subject.

(c) Preparation of Rough Draft

The purpose of the report is to convey to the interested persons the whole result of the study in sufficient detail and so arranged as to enable each reader to comprehend the data and so determine for himself the validity of conclusions. Taking into account this purpose of research, the research report writing has its own significance. The researcher has already collected primary data and secondary data. He has also set his objectives of the study. Taking into account the objectives of his study, he should make an attempt to prepare a draft report on the basis of analysis of the data. He should prepare a procedure to be followed in report writing. He must mention the limitations of his study. He may analyze data systematically with the help of statistical methods to arrive at the conclusions. The research is fact finding study which may lead the researcher to point out suggestions or recommendations.

(d) Rewriting and Polishing the Rough Draft

Research is a continuous process. Research is not essay writing. Researcher must consider the data, write down his findings, reconsider them, and rewrite. This careful revision makes the difference between a mediocre and a good license of writing. The researcher must concentrate on weakness in the logical development or presentation. He should check the consistency in his presentation. He must be

aware that his report writing must be of definite pattern. He must also take atmost care of the language of writing a report.

(e) Bibliography

This helps the researcher to collect secondary source of the data. This is also useful to review the earlier research work. He should prepare the bibliography from the beginning of his research work. While selecting a topic or subject of research, he must refer books, journals, research projects and list the important documents in systematic manner. The bibliography must be in proper form. The researcher must have separate cards, indicating following details, readily available with him, so that he can make a note of it while he refers to a book/journal/research report.

The bibliography must be included in the appendix of his research report. It must be exhaustive to cover all types of works the researcher has used. It must be arranged alphabetically. He can divide it in different sections, such as books in first section, journals in second, research reports in third, etc. Generally the prescribed form for preparation of bibliography is as given below:

The book must be noted in following manner:

(1) Name of Author (Surname first).
(2) Title of book.
(3) Publisher's name, place and data of publication.
(4) Number of volumes.

The article can be mentioned in following manner:

(1) Name of author (surname first)
(2) Title of article (in quotation mark)
(3) Name of periodical (underline it)
(4) The volume or volume and number
(5) Data of issue
(6) The pagination

(f) Final Report

The final report must be written in a concise and objective style and in simple language. The researcher should avoid expressions in his report, such as "it seems", "there may be" and like ones. He should avoid abstract terminology and technical jargon. He may refer to usual and common experiences to illustrate his point. The report writing is an art. No two researchers may have common style of report writing. But it must be interesting for a common man to add to his knowledge.

However report on scientific subject may have most technical presentation. The scientists may be familiar with technical concepts and they may find it valuable if such report is mostly technical in form.

9.7 STEPS INVOLVED IN DRAFTING A RESEARCH REPORT

A research report must be well drafted so that it is seriously taken by others and all that have to be said are well said. Reader orientation, purpose orientation, time orientation, technology orientation, etc., are all needed. The steps in writing a research report are presented below.

1. Organization of Thought

Organization of thought as to how the report be presented is the most fundamental starting point in the journey of preparation a research report. Ideas come before the mind eye. These are thought over again and a frame of presentation is planned. This plan does not in itself constitute style, but it is the foundation.

2. Acquaintance with the Research

Full acquaintance with research is needed. This is facilitated by notes. It is desirable to make notes on separate cards or slips called form-facet. Accuracy and adequacy are required – The second facet of mastery over notes consists in the investigator's complete control over the data, called study facet, i.e., understanding each fact by itself and in terms of others and of the researcher's own thoughts; the notes to be compared; criticized and revalued in order to enable the investigator to direct and organize the data in his own way and perhaps differently from what others have done.

3. First Draft

The first draft concentrates on substance, i.e., fullness of facts. All the facts of value are to be brought together. In addition to fullness, accuracy of the facts incorporated into the text becomes necessary. Another requirement is that there should be balance, proportion and development in facts. Importance is to be given to the comprehensiveness of the report but not to the language and form. For writing the first draft the researcher should have control over his notes and should think continuously over the problem. In a way, the first draft is the most important of the different stages in reporting. This report may have to be re-written a number of times and still it continues to remain only a working draft. There are three purposes in writing the first draft, *viz.,* to weave the material together for making clear connections, to assure the investigator himself of a satisfactory organizations and fullness of the facts, and to avoid blank paper fright that may be present in every young researcher.

4. Second Draft

After a lapse of sometime from the completion of first draft, the revision is made for writing the second draft. While drafting the second one, the researcher should concentrate largely on form and language. The researcher should give the first draft, at this stage, a shape so that it can be readable, clear and lucid. Considerable trimming or editing will have to be done to make the writing precise, concise and brief. Finally, at the second draft stage, critical evaluation will have to be made of all that has been written-facts, findings, conclusions and recommendations. To make the report readable and effective, the language plays major part.

5. Third Draft

The final stage in drafting is the preparation of final report. It concentrates mainly on the finish and final touches, i.e., on documentation and polish to make the report weighty, authoritative, convincing and attractive. Documentation indicates the references to the sources, other previous and current work and view, additional data and discussion and suggested further reading on the specific problem as handled by the researcher. In other words, it indicates the thoroughness of the investigation and on the other a guide to further work. A good research paper depends not only upon the amount of reading or notes taken or upon the form of presentation but also upon the accurate and thorough recording of the investigation.

9.8 DOCUMENTATION

Documentation is the process of collecting and extracting the documents which are relevant to research.

Documents may be classified into:

- Personal documents;
- Company documents;
- Consultants' report and published materials; and
- Public documents.

Personal documents are those that are written by or on behalf of individuals. They may include autobiographies, biographies, diaries, memoirs, letters, observations and inscriptions, which are primarily written for the use and satisfaction of individuals and which can be utilized for research purposes. Personal documents play a very vital role in research, when certain information is not available from any other sources; however, such documents are subject to the difficulties of availability, reliability and validity of inferences.

Company documents are the most essential types of documents is management research, annual reports, statements of income and expenditure and balance sheets, files and records, policy statements, resolutions, minutes of board of directors, general bodies and executive conferences, performance records and evaluation files, specific forecasting and evaluation reports, directors' reports, etc. Many of these documents are reliable ones, though they are subject to the problems of availability and adequacy. Such documents can be published or unpublished.

Consultant's published materials consist of report of professional consultants, records of commodity boards, chambers of commerce, FICCI, manufacturers' associations and industry associations.

Public documents are documents, both published and unpublished, of government organizations and documents of public interest. They include government records and files, draft outlines of five-year plans, consultative committee reports, finance commission reports, special enquiry commission reports, Company Law Board reports, MRTP Commission reports, reports and files of the Registrar of Companies, the Registrar of Firms, the Ministry of Commerce and Industry, etc., report of population census, National Sample Survey and such other government research institutions. Such documents are valuable if they are reliable and suitable for a particular study if they can be obtained. Documentation is one of the most important needs of any management researcher at the primary sate of his research.

9.9 FOOTNOTES

Footnotes are meant to give complete bibliographical references and to provide the reader with information to enable him consult sources independently. These may be placed at the foot of a page or at the end of every chapter. When footnotes are given at the foot of the page, they are to be separated from the text by a fifteen space solid line drawn from the left margin and one double space below the last line of the text. If given at the end of a chapter, a centered heading 'FOOTNOTES' is necessary. Reference to footnotes is made by the use of superscripts i.e., numerals rose by one-half space. Footnotes should be numbered consecutively through a chapter, right after the statement. However, footnotes should not be resorted to common place statements or ordinary facts. They must be restricted to direct quotations, original ideas, statements, definitions, illustrations and diagrams. If a quotation found in one source that is obtained from another source, is used, both the sources should be listed in

the footnote. Footnotes should be given in single line spacing with the first line only indented. A double space should separate successive footnotes.

In this context, certain conventions in footnoting should be kept in mind. While writing the author's name, the first name or initials should be written first. Titles of completed works, such as books and reports should be underlined. Titles of articles should be enclosed by double quotation marks. The publisher's name, year or date of publication and the exact page(s) of the source of reference should also be given in this order.

9.10 BIBLIOGRAPHY

The 'works cited' form of bibliography is preferable over the 'sources consulted'. Every book, thesis, article, documents which has been cited should be included in the list of 'works cited'. The bibliography should follow a logical arrangement in alphabetical order. In report of current practice is to have one comprehensive listing - not to divide into books, journals, newspapers, official papers, documents and manuscripts.

The author(s) name, the title of the work, date of publication, name of the publisher and the place of publication be mentioned.

For articles, the volume number and inclusive pages be also given, the author's initials or surname should follow the name.

When there are three or more authors of a particular work, the co-authors may be referred alphabetically. If there be more than one work by the same author, the author's name should be listed only once; subsequently a line will substitute his name.

This bibliographical listing should not be numbered. It should be given only at the end of the thesis.

9.11 QUESTIONS

1. Explain what is a research report? And types of Research report?
2. Explain the contents of research report
3. Explain the principles in report writing
4. Explain the steps involved in research report writing

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