

RESEARCH METHODOLOGY & STATISTICS

Research Methodology and IPR

(21RM56)

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What is research ?

- Research = Re + Search
- It is the process finding solution to a problem.
- It's the process of arriving as a dependable solution to a problem through planned & systematic collection , analysis and interpretation of Data.
- It seeks answer only of those questions which answers can be given on the basis of available facilities
- It's a movement from known to unknown.

Person

Observes

Again and again



Phenomena

Collection of Data

Analysis



Conclusion

DEFINITIONS OF RESEARCH

- V REDMAN & AVH MORY – “Research is a systematized effort to gain knowledge”
- Emory defines research as “any organized inquiry designed and carried out to provide information for solving a problem”.

FEATURES OF RESEARCH

- It gathers new knowledge / data from primary / first hand resources.
- It requires plan.
- It requires expertise.
- Research is patient and un hurried activity.
- It places emphasis upon the discovery of general principles.
- Its an exact systematic and accurate investigation.
- Its logical and objective.
- It Endeavour to oraginze data in quantitaive forms.
- Researcher carefully record and report the data
- Conclusion and generalization are arrived at carefully and cautiously .

OBJECTIVES OF RESEARCH

1. THEROTICAL OBJECTIVE

- Formulate new theories, principals etc.
- This type of theory is explanatory because it explains the relationship between variables.
- Its mainly used in Physics, Chemistry, Math's etc

2. FACTUAL OBJECTIVE

- Find out new facts.
- Its of descriptive nature
- These are mainly historical type of research which describes facts or events which has previously happened.

3. APPLICATION OBJECTIVE

- It doesn't contribute to new knowledge in the fund of human knowledge but suggest new application, by application here it means improvement and modification in practice.

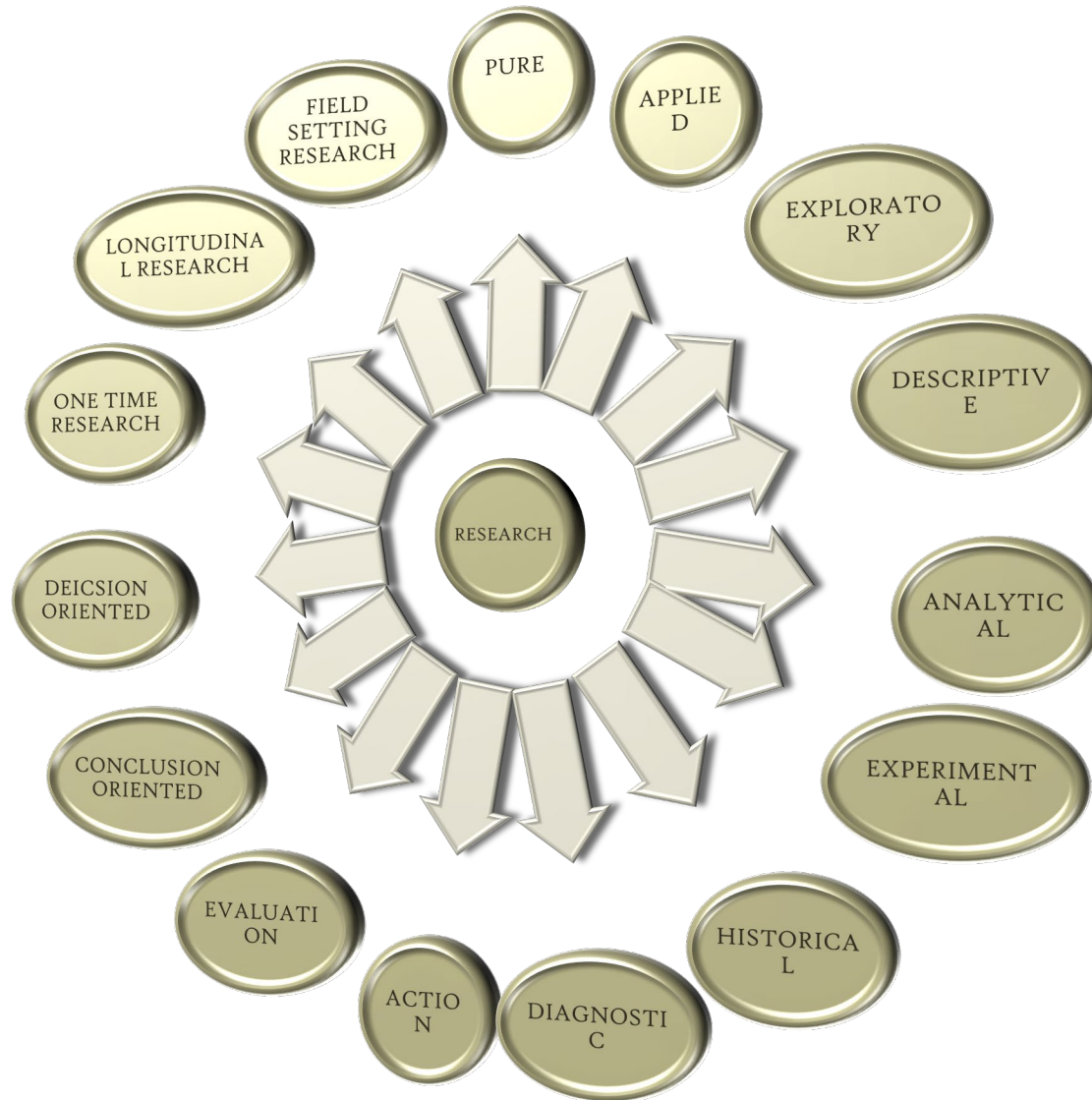
GENERAL OBJECTIVES OF RESEARCH

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

PURPOSE OF RESEARCH

- Research extends knowledge of human beings social life and environment.
- Research reveals the mysteries of nature.
- Research establishes generalizations and general laws and contributes to theory building in various fields of knowledge.
- Research verifies and tests existing facts and theory.
- Research helps us to improve our knowledge and ability to handle situation.
- Research aims to analyze inter-relationship between variables and to derive causal explanations, which help us to better understanding of the world in which we live.
- Research aims to finding solutions to the problem, e.g.:- socio-economic problems, health problems, organizational and human relational problems and so on...
- Research also aims at developing new tools, concepts and theories for better understanding to unknown phenomena.
- Research helps national planning board to focus our national development. It enables the planners to evaluate alternative strategies, on-going programs and evaluation etc.,
- Research provides functional data for rational decision making and formulation of strategies and policies.

TYPES OF RESEARCH



- **PURE RESEARCH** : It is conducted for the purpose of developing scientific theories, by discovering basic principles / broad generalization of a discipline rather than for the purpose of solving some immediate problems.
- **APPLIED RESEARCH**: The purpose of applied research is to improve a product or a process and to test theoretical concepts in actual problematic situation . It seeks an immediate and practical results.
- **EXPLORATORY RESEARCH**: It is the preliminary study of an unfamiliar problem about which the researcher has little or no knowledge. Exploratory research is necessary to get initial insight into the problem for the purpose of formulating more precise investigation.
- **DESCRIPTIVE RESEARCH**: It is a fact finding investigation describing, recording, analyzing and interpreting conditions that exist. it gives proper basis for understanding current problems, and guides in planning and formulation of policies
- **ANALYTICAL RESEARCH**: It's a system of procedures and techniques of analysis applied to quantitative data. This field is used in different fields in which numerical data are engaged.

- **EXPERIMENTAL** – This method provides the best approach for the study of cause and effect relationship under controlled conditions. This is popular in field of natural sciences.
- **HISTORICAL** – It is concerned with some past phenomena, in this process evidence about past is systematically collected, evaluated, verified and synthesized.
- **DIAGNOSTIC** – Its is directed towards what is happening, why it is happening and what can be done about it. It aims at a cause of a problem and the possible solution for it.
- **ACTION** – The purpose of action research is to acquire new skill or new approach to solve a certain problem. A test marketing research for a new product is good example of action research.
- **EVALUATION** – Its is done for assessing the effectiveness of social or economic programs implemented or for assessing the impact of developmental projects.
- **CONCLUSION ORIENTED** – Here the researcher is free to pickup a problem, redesign the enquiry as he or she wants to proceed and is prepared the conceptualization as he visualize.
- **DECISION ORIENTED** – It is always for the need of decision maker and the researcher and here it is free to embark upon researchers inclination for his or her research.

- **ONE TIME RESEARCH** – Here the research is confined to only a single period of time.
- **LONGITUIDINAL RESEARCH** – Research is carried on over several times for the purpose of getting a feasible solution.
- **CASE STUDY** - It is an in-depth comprehensive study of a person, an episode, a program or a social unit.
- **SURVEY RESEARCH** - It is a method of research involving collection of data directly from a population or a sample at a particular period.

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APPROACHES
TO RESEARCH

QUANTITATIVE
APPROACH

QUALITATIVE
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QUANTITATIVE APPROACH

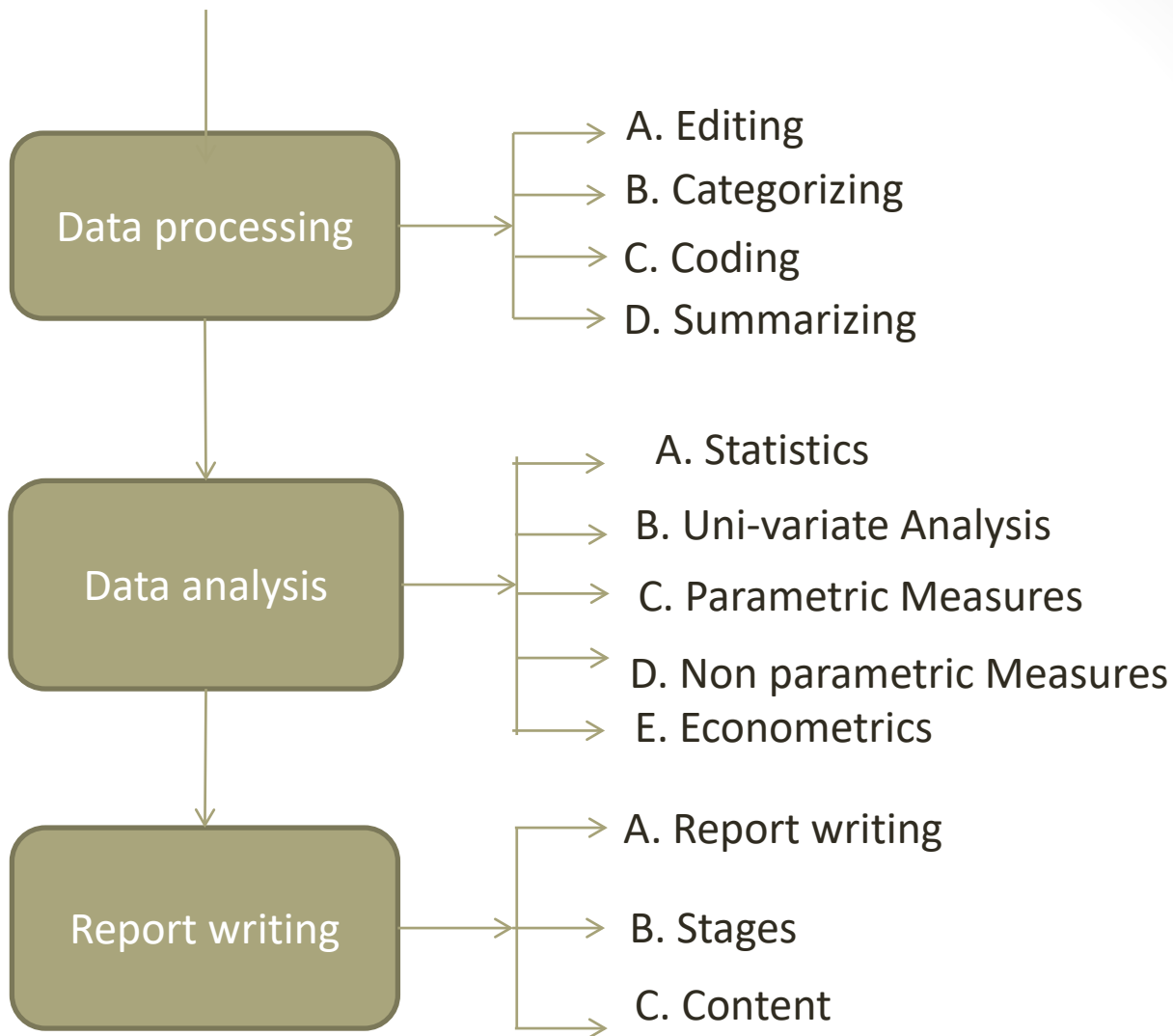
It is rooted in the philosophy of rationalism , follows a rigid , structured and predetermined set of procedures to explore ; aims to quantify the extent of variation in a phenomenon ; emphasis the measurement of variables and the objectivity of process; believes in substantiation on the basis of large sample size; gives importance to validity and reliability of findings and communicate findings in aggregate and analytical manner; drawing conclusion and inferences that can be generalized

QUALITATIVE APPROACH

It is embedded in the philosophy of empiricism; follows an open , flexible and unstructured approach to enquiry; aims at explore diversity rather than to quantify; emphasizes the description and narration of feelings, perception and experiences rather than their measurement; and communicates findings in a descriptive and narrative manner rather than analytical; placing no or less emphasis on generalization.

RESEARCH PROCESS





PROBLEM IDENTIFICATION

What is a Research Problem?

A research problem, in general, refers to some difficulty which a researcher experiences in the context of either a theoretical or practical situation and wants to obtain a solution for the same.

A research problem does exist if the following conditions are met with:

- There must be an individual (or a group or an organization), let us call it 'I,' to whom the problem can be attributed. The individual or the organization, as the case may be, occupies an environment, say 'N', which is defined by values of the uncontrolled variables, Y_j .
- There must be at least two courses of action, say C1 and C2, to be pursued. A course of action is defined by one or more values of the controlled variables.

- There must be at least two possible outcomes, say O1 and O2 , of the course of action, of which one should be preferable to the other.
- The courses of action available must provides some chance of obtaining the objective, but they cannot provide the same chance, otherwise the choice would not matter.

An individual or a group of persons can be said to have a problem which can be technically described as a research problem.

We can, thus, state the components of a research problem as under:

- There must be an individual or a group which has some difficulty or the problem.
- There must be some objective(s) to be attained at. If one wants nothing, one cannot have a problem.
- There must be alternative means (or the courses of action) for obtaining the objective(s) one wishes to attain. This means that there must be at least two means available to a researcher for if he has no choice of means, he cannot have a problem.
- There must remain some doubt in the mind of a researcher with regard to the selection of alternatives. This means that research must answer the question concerning the relative efficiency of the possible alternatives.
- There must be some environment(s) to which the difficulty pertains.

Selecting the Problem

The research problem undertaken for study must be carefully selected. The task is a difficult one, although it may not appear to be so. Help may be taken from a research guide in this connection.

Nevertheless, every researcher must find out his own salvation for research problems cannot be borrowed. A problem must spring from the researcher's mind like a plant springing from its own seed.

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

(i) Subject which is overdone should not be normally chosen, for it will be a difficult task to throw any new light in such a case.

(ii) Controversial subject should not become the choice of an average researcher.

iii) Too narrow or too vague problems should be avoided.

(iv) The subject selected for research should be familiar and feasible so that the related research material or sources of research are within one's reach.

Even then it is quite difficult to supply definitive ideas.

For this purpose, **a researcher should contact an expert or a professor** in the University who is already engaged in research. He may as well read articles published in current literature available on the subject and may think how the techniques and ideas discussed therein might be applied to the solution of other problems. He may discuss with others what he has in mind concerning a problem. In this way he should make all possible efforts in selecting a problem.

v) The importance of the subject, the qualifications and the training of a researcher, the costs involved, the time factor are few other criteria that must also be considered in selecting a problem.

A researcher must ask himself the following questions:

- (a) Whether he is well equipped in terms of his background to carry out the research?
- (b) Whether the study falls within the budget he can afford?
- (c) Whether the necessary cooperation can be obtained from those who must participate in research as subjects?

vi) The selection of a problem must be preceded by a preliminary study. This may not be necessary when the problem requires the conduct of a research closely similar to one that has already been done.

Necessity of Defining the Problem

A problem clearly stated is a problem half solved. This statement signifies the need for defining a research problem. The problem to be investigated must be defined unambiguously for that will help to discriminate relevant data from the irrelevant ones.

Questions like: What data are to be collected? What characteristics of data are relevant and need to be studied? What relations are to be explored. What techniques are to be used for the purpose? and similar other questions crop up in the mind of the researcher who can well plan his strategy and find answers to all such questions only when the research problem has been well defined.

Defining a research problem properly is a prerequisite for any study and is a step of the highest importance and formulation of a problem is often more essential than its solution.

Technique Involved in Defining a Problem

Defining a research problem properly and clearly is a crucial part of a research study and must in no case be accomplished hurriedly. However, in practice this is frequently overlooked which causes a lot of problems later on.

The technique for the purpose involves the undertaking of the following steps generally one after the other:

- (i) statement of the problem in a general way;
- (ii) understanding the nature of the problem;
- (iii) surveying the available literature
- (iv) developing the ideas through discussions;
- (v) rephrasing the research problem into a working proposition

1. Statement of the problem in a general way:

First of all the problem should be stated in a broad general way, keeping in view either some practical concern or some scientific or intellectual interest. For this purpose, the researcher must immerse himself thoroughly in the subject matter concerning which he wishes to pose a problem. In case of social research, it is considered advisable to do some field observation and as such the researcher may undertake some sort of preliminary survey.

Then the researcher can himself state the problem or he can seek the guidance of the guide or the subject expert in accomplishing this task. Often, the guide puts forth the problem in general terms, and it is then up to the researcher to narrow it down and phrase the problem in operational terms.

The problem stated in a broad general way may contain various ambiguities which must be resolved by cool thinking and rethinking over the problem

2. Understanding the nature of the problem:

The next step in defining the problem is to understand its origin and nature clearly. The best way of understanding the problem is to discuss it with those who first raised it in order to find out how the problem originally came about and with what objectives in view.

If the researcher has stated the problem himself, he should consider once again all those points that induced him to make a general statement concerning the problem.

For a better understanding of the nature of the problem involved, he can enter into discussion with those who have a good knowledge of the problem concerned or similar other problems

3. Surveying the available literature:

All available literature concerning the problem at hand must necessarily be surveyed and examined before a definition of the research problem is given. This means that the researcher must be well-conversant with relevant theories in the field, reports and records as also all other relevant literature.

“Knowing what data are available often serves to narrow the problem itself as well as the technique that might be used.”

This would also help a researcher to know if there are **certain gaps in the theories**, or whether the existing theories applicable to the problem under study are inconsistent with each other, or whether the findings of the different studies do not follow a pattern consistent with the theoretical expectations and so on.

All this will enable a researcher to take new strides in the field for furtherance of knowledge i.e., he can move up starting from the existing premise.

Studies on related problems are useful for indicating the type of difficulties that may be encountered in the present study as also the possible analytical shortcomings.

4. Developing the ideas through discussions:

Discussion concerning a problem often produces useful information. Various new ideas can be developed through such an exercise.

Hence, a researcher must discuss his problem with his colleagues and others who have enough experience in the same area or in working on similar problems. This is quite often known as an **experience survey**.

People with rich experience are in a position to enlighten the researcher on different aspects of his proposed study and their advice and comments are usually invaluable to the researcher.

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

5. Rephrasing the research problem:

Finally, the researcher must sit to rephrase the research problem into a working proposition.

Once the nature of the problem has been clearly understood, the environment (within which the problem has got to be studied) has been defined, discussions over the problem have taken place and the available literature has been surveyed and examined, rephrasing the problem into analytical or operational terms is not a difficult task.

Through rephrasing, the researcher puts the research problem in as specific terms as possible so that it may become operationally viable and may help in the development of working hypotheses.

Problem identification

- Problem is identified after narrowing down the broad area of topic to highly specific research problem . Researcher normally selects a single problem at time because of unique needs and purposes

Steps in formulating a research problem

- identify a broad field or subject area of interest of you
- Dissect the broad area into sub areas.
- Select what is of most interest to you
- Raise research question

Consideration in selecting a research problem

Each problem taken for research has to be judged on the basis of some criteria

- Relevance
- Avoidance of duplication
- Feasibility
- Political acceptability
- Applicability
- Urgency of data needed
- Ethical acceptability

REVIEW OF LITERATURE

NEED FOR REVIEW OF LITERATURE

- Preventing duplicating work that has been done before
- Know what others have learned and reported about the problem.
- Become more familiar with the various types of methodologies.
- Get good background knowledge about the problem and why research is needed in this area.
- Helps to know the theoretical perspective of the problem.

SOURCES

- Subject catalogues of libraries.
- Documentation services.
- Bibliographies.
- List of Books and publishers bulletins.
- Journals
- Government reports.
- Research abstract.
- Information on research done.

STEPS IN REVIEWING THE LITERATURE

- Searching for the existing literature in your area of study.
- Review the selected literature
- Developing a theoretical framework
- Developing a conceptual framework

OBJECTIVES

- **General objectives** : It states what is expected to be achieved by the study. It's the overall thrust of the study. Its is concerned with the main association and relationship that a person seeks to discover or establish.
- **Specific objectives** : it should be numerically listed, worded clearly and unambiguously. It addresses the various aspects of the problem and should specify what will be done, where and for what purpose..

HYPOTHESIS

A hypothesis is a specific statement of prediction.

It describes in concrete terms what a researcher expects to happen in his/ her study.

Good and Hatt defines it as “ a question which can be put to test to determine validity “

In short hypothesis , is a tentative solution or explanation or a guess or assumption or proposition or a statement to the problem facing by the researcher

TYPES OF HYPOTHESIS

- **Descriptive hypothesis** : It intends to describe some characteristics of an object , a situation ,an individual or even an organization.
- **Relational Hypothesis** : It intends to describe the relation ship between variables.
- **Empirical / Working Hypothesis** : This is a hypothesis framed in early stages of research. This maybe altered or modified as research proceeds.
- **Null Hypothesis**: This states that there is no significant difference between the parameter and statistic that is being compared.
- **Alternative hypothesis** :they are the research hypothesis which involves the claim to be tested
- **Analytical hypothesis** : These are used when one would specify the relationship between changes in one property leading to change in other.
- **Common sense Hypothesis** : These are based on what is being observed with common idea existing among people.
- **Statistical hypothesis** :These are developed from samples that measureable. They are of two types:
 1. Hypothesis which indicates difference
 2. Hypothesis which indicates relationship

VARIABLES

A variable is a characteristics of a person , object or phenomenon that can take on different values.

Variables are condition or characteristics that experimenter manipulates, control or observes.

A variable is anything that change.

Types of Variables

- **Numerical variables** : when variables are expressed in numbers they are called numerical variables.
- **Categorical Variables** : When the values of a variable are expressed in categories, they are called Categorical variables.
- **Dependent Variable & Independent Variable** : the variable that is used to measure the problem under study is called the dependent variable.

The variables that re used to describe or measure the factor that are assumed to cause or at least to influence the problem are called independent variable.

- **Active Variable:** The variable that are directly manipulated by the experiment are called active variables.

- **Attribute Variable:** they are those characteristics which cannot be altered by the experiment.
- **Intervening Variables :** certain factors or variables may influence the relationship even though they cannot be observed directly and they are called intervening variables
- **Extraneous variables :** They are those uncontrolled variables that may have significant influence upon the results of a study.

RESEARCH DESIGN

A research design a logical and systematic plan prepared for directing a research study .

It constitutes the blueprint for the collection , measurement and analysis of data.

It is the plan , structure , strategy of investigation conceived so as to obtain answers to research question.

Essential of a good research design

- Plan
- Outline
- Blue print
- Scheme

CLASSIFICATION OF DESIGNS

- Experimental
- Exploratory
- Descriptive
- Historical
- Case studies
- Survey
- Combination of any of these.

RESEARCHPLAN

- A research plan prescribes the boundaries of research activity and enables the researcher to channel his energies in the right work.
- Various question are needed to be answered while preparing the plan

What the study is about?

Why the study is made?

What is it scope ?

What are the objectives of the study?

What kind of data are needed?

What are the sources ?

What is the sample size?

What are the techniques?

How the data should be processed?

What is the cost involved ? etc.

CONTENTS OF A RESEARCH PLAN

- Introduction
- Statement of the problem
- Review of the previous studies
- Scope of the studies
- Objective of the study
- Conceptual model
- Hypothesis
- Operational definition of concepts
- Geographical area to be covered
- Reference period
- Methodology
- Sampling plan
- Tools for gathering data
- Plan of analysis
- Chapter scheme
- Time budget
- Financial budget

SAMPLING

Sampling is the statistical process of selecting a subset (called a “sample”) of a population of interest for purposes of making observations and statistical inferences about that population. Sampling, therefore, is the process of selecting a few (a sample) from a bigger group (the sampling population) to become the basis for estimating or predicting the prevalence of an unknown piece of information, situation or outcome regarding the bigger group.

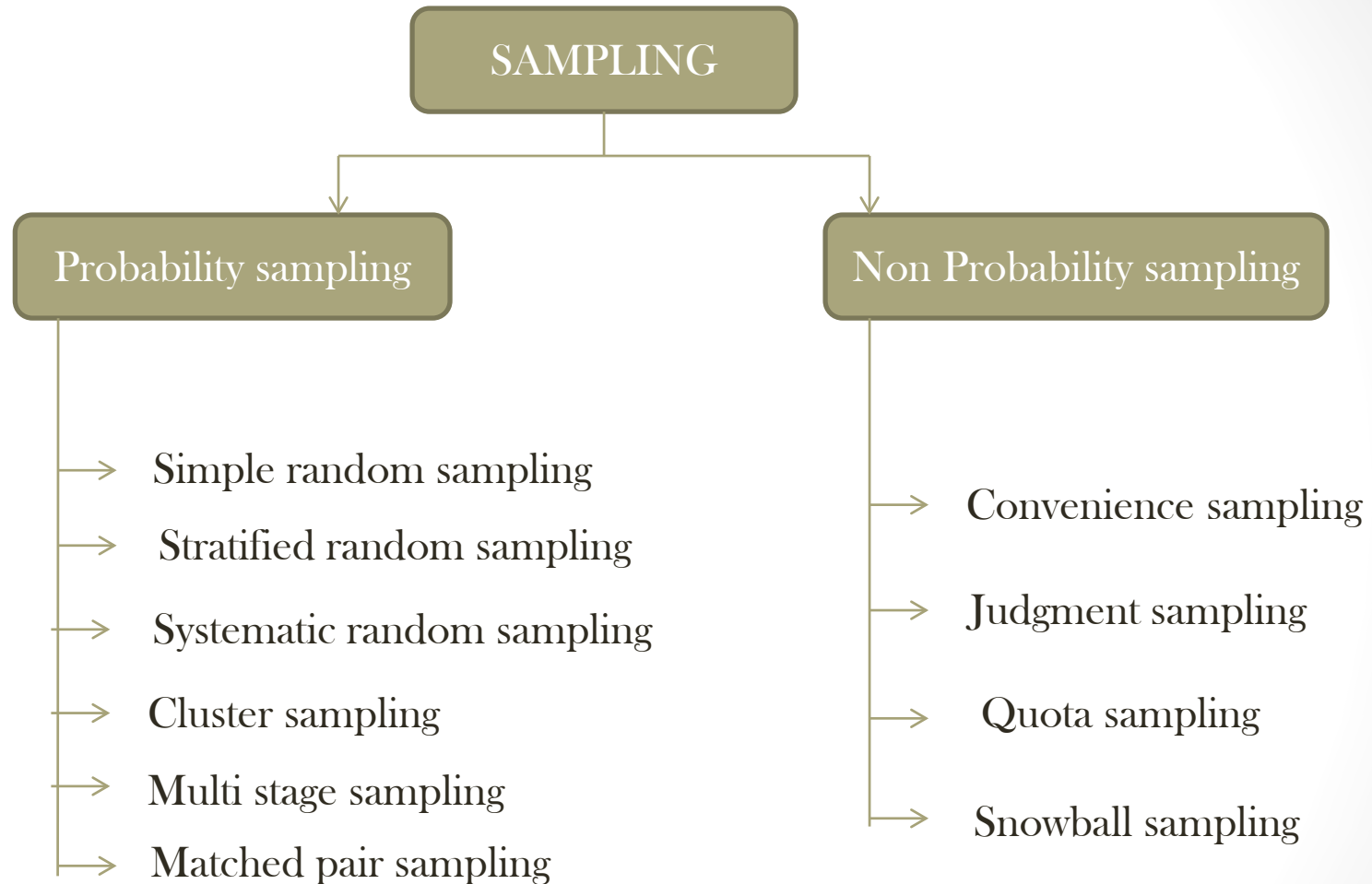
Characteristics of a good sample

- **Representativeness**
- **Accuracy**
- **Precision**
- **Size**

SAMPLING PROCESS

- Define the population or universe
- State the sampling frame
- Specify the sampling unit
- Selection of sampling method
- Determine the sample size
- Specify the sampling plan
- Select the sample

TECHNIQUES OF SAMPLING



Probability sampling: It is a technique in which every unit in the population has a chance (non-zero probability) of being selected in the sample, and this chance can be accurately determined.

All probability sampling have two attributes in common:

- Every unit in the population has a known non-zero probability of being sampled, and
 - The sampling procedure involves random selection at some point.
- The different types of probability sampling techniques include:
- **Simple random sampling.** In this technique, all possible subsets of a population are given an equal probability of being selected. Simple random sampling involves randomly selecting respondents from a sampling frame, but with large sampling frames, usually a table of random numbers or a computerized random number generator is used.
 - **Stratified sampling.** In stratified sampling, the sampling frame is divided into homogeneous and non-overlapping subgroups (called “strata”), and a simple random sample is drawn within each subgroup.

- **Systematic sampling** (also known as interval sampling) relies on arranging the study population according to some ordering scheme and then selecting elements at regular intervals through that ordered list.
- **Cluster sampling.** If you have a population dispersed over a wide geographic region, it may not be feasible to conduct a simple random sampling of the entire population. In such case, it may be reasonable to divide the population into “clusters” (usually along geographic boundaries), randomly sample a few clusters, and measure all units within that cluster.
- **Multistage sampling** can be a complex form of cluster sampling. Pardo Fuccboi refers it to sampling plans where the sampling is carried out in stages using smaller and smaller sampling units at each stage.
- **Matched-pairs sampling.** Sometimes, researchers may want to compare two subgroups within one population based on a specific criterion. matched-pairs sampling technique is often an ideal way of understanding bipolar differences between different subgroups within a given population.

Nonprobability sampling is a sampling technique in which some units of the population have zero chance of selection or where the probability of selection cannot be accurately determined. Typically, units are selected based on certain non-random criteria, such as quota or convenience.

- **Convenience sampling.** Also called accidental or opportunity sampling, this is a technique in which a sample is drawn from that part of the population that is close to hand, readily available, or convenient.
- **quota sampling,** the population is first segmented into mutually exclusive sub-groups, just as in stratified sampling. Then judgment is used to select the subjects or units from each segment based on a specified proportion.
- **Snowball sampling.** In snowball sampling, you start by identifying a few respondents that match the criteria for inclusion in your study, and then ask them to recommend others they know who also meet your selection criteria.
- **Purposive sampling** (also known as judgment, selective or subjective sampling) is a sampling technique in which researcher relies on his or her own judgment when choosing members of population to participate in the study.

PILOT STUDY

- **Pilot study** is a small scale preliminary **study** conducted in order to evaluate feasibility, time, cost, adverse events, and effect size (Statistical variability) in an attempt to predict an appropriate sample size and improve upon the **study** design prior to performance of a full scale **research** project.
- Although a pilot study cannot eliminate all **systematic errors** or unexpected problems, it reduces the likelihood of making a **Type I** or **Type II** error. Both types of errors make the main study a waste of effort, time, and money.

SAMPLE SIZE

Before you can calculate a sample size, you need to determine a few things about the target population and the sample you need:

Population Size — How many total people fit your demographic?

Margin of Error (Confidence Interval) — No sample will be perfect, so you need to decide how much error to allow. The confidence interval determines how much higher or lower than the population mean you are willing to let your sample mean fall. If you've ever seen a political poll on the news, you've seen a confidence interval. It will look something like this:

“68% of voters said yes to Proposition Z, with a margin of error of +/- 5%.”

Confidence Level — How confident do you want to be that the actual mean falls within your confidence interval? The most common confidence intervals are 90% confident, 95% confident, and 99% confident.

Standard of Deviation — How much variance do you expect in your responses? Since we haven't actually administered our survey yet, the safe decision is to use .5 – this is the most forgiving number and ensures that your sample will be large enough.

- Your confidence level corresponds to a Z-score. This is a constant value needed for this equation. Here are the z-scores for the most common confidence levels:
- 90% - Z Score = 1.645
- 95% - Z Score = 1.96
- 99% - Z Score = 2.576
- If you choose a different confidence level, use this Z-score table* to find your score.
- Next, plug in your Z-score, Standard of Deviation, and confidence interval into this equation:**
- Necessary Sample Size = $(Z\text{-score})^2 * \text{Std Dev} * (1\text{-StdDev}) / (\text{margin of error})^2$

DATA COLLECTION

Data are the facts and figures collected for statistical investigation. Data collection is the process of gathering and measuring information on targeted variables in an established systematic fashion, which then enables one to answer relevant questions and evaluate outcomes.

There are two types of data:

- 1. Primary data,
- 2. Secondary data (desk research)

The primary data are those which are collected afresh and for the first time, and thus happen to be original in character or information collected or generated by the researcher for the purpose of the project immediately at hand.

The secondary data are those which have already been collected by someone else and which have already been passed through the statistical process. Secondary data refer to the information that have been collected by someone other than researcher for purposes other than those involved in the research project at hand. Books, journals, manuscripts, diaries, letters, etc., all become secondary sources of data as they are written or compiled for a separate purpose

METHOD OF COLLECTING DATA

1. Observation method
2. Interview method
3. Survey method
4. Experimentation
6. Projective technique
7. Sociometry
8. Content analysis

Observation

Observation is one of the cheaper and more effective techniques of data collection. Observation, in simple terms, is defined as watching the things with some purpose in view. Observation, is a systematic and deliberate study through eye of spontaneous occurrence at the time, they occur.

Observation has mainly three components-Sensation, attention and perception

Types of Observation

- **Participant observation:** In this observation, the observer is a part of the phenomenon or group which is observed and he acts as both an observer and a participant
- **Non-Participant observation:** In this type of observation, the researcher does not actually participate in the activities of the group to be studied. There is no emotional involvement on the part of the observer

- **Controlled observation:** This type of observation is found quite useful in either in the laboratory or in the field. Controlled observation is carried out observational techniques and exercise of maximum control over extrinsic and intrinsic variables.
- **Uncontrolled observation:** If the observation takes place in the natural settings, it may be termed as uncontrolled observation. The main aim of this observation is get spontaneous picture of life.
- **Direct observation:** In this type of observation, the event or the behavior of the person is observed as it occurs. This method is flexible and allows the observer to see and record subtle aspects of events and behavior as they occur.
- **Indirect observation;** This does not involve the physical presence of the observer , and the recording is done by mechanical, photographic or electronic devices. This method is less flexible than direct observation.

INTERVIEW

It may be defined as a two way systematic conversation between an investigator and an informant, initiated for obtaining information relevant to a specific study.

It involves not only conversation, but also leaning from the respondents, gestures, facial expression, pauses and his environment.

Interviewing process

- Preparation
- Introduction
- Developing rapport
- Carrying the interview forward
- Recording the interview
- Closing the interview

Types of interviews

- **Structured or directive interview:**

This is an interview made with a detailed standardized schedule. The same questions are put to all the respondents and in the same order. This type of interview is used for large-scale formalized surveys

- **Unstructured or non-directive interview**

In this type of interview, a detailed pre-planned schedule is used. Only a broad interview guide is used. Questions are not standardized and not ordered in a particular way. This technique is more useful in case studies rather than large surveys

- **Semi-structured or focused interview**

The investigator attempt to focus the discussion on the actual effects of a given experience to which the respondents have been exposed. The situation is analyzed prior to the interview. An interview guide specifying topics relating to the research hypothesis is used Interview is focused on the subjective experiences of the respondent

- **Clinical interview**

It is concerned with broad underlying feelings or motivations or with the course of the individual's life experiences. The 'personal history' interview used in social case work, prison administration, psychiatric clinics and in individuals life history research is the most common type of clinical interview

- **Depth interview**

This is an intensive and searching interview aiming at studying the respondent's opinion, emotions or convictions on the basis of an interview guide. This deliberately aims to elicit unconscious as well as extremely personal feelings and emotions

- **Telephone interviews**

It is a non-personal method of data collection. It may be used as a major method or supplementary method

- **Group interview**

It is a method of collecting primary data in which a number of individuals with a common interest interact with each other

EXPERIMENTATION

Experimentation is a research process used to observe cause and effect relationship under controlled condition.

In other words it aims at studying the effect of an independent variable on dependent variable by keeping other Independent variable constant through some type of control.

There are broadly two types of experiment

- **Laboratory experiment** : here the investigator creates a condition in which he wants to make his study through manipulation of variables.
- **Field experiment** :it occurs in real life settings or natural settings where less control can exerted.

SURVEY METHOD

A survey is a research method for collecting information from a selected group of people using standardized questionnaires or interviews

It is a non-experimental, descriptive research methods which is used to study large and small population.

Survey is fact finding study where there is critical inspection to gather information, often a study of an area with respect to certain condition or its prevalence. There are two types of survey

- **Cross sectional survey** are conducted to collect information from the population at a single point of time. The purpose is to collect a body of data connection with two or more variables.
- **Longitudinal survey** : a longitudinal survey is one that takes place over a period of time. It means the data is gathered over a period of time. there are three types of longitudinal survey

Trend studies The simplest type of longitudinal analysis of survey data is called trend analysis, which examines overall change over time.

Cohort studies : A cohort study selects either an entire cohort of people or a randomly selected sample of them as the focus of data collection.

Panel studies: here the same sample of the population are surveyed repeatedly. Panel studies are very difficult to

• **METHODS OF SURVEY**

There are two methods

1. **Census method:** A complete survey of the population is called census method. Here the entire population is a subject matter for conducting survey.
2. **Sampling method:** a sample is representative of the population only sample or sub select is selected for conducting survey

PROJECTIVE TECHNIQUE

It involve presentation of ambiguous stimuli to the respondents for interpretation. In doing so, the respondents reveal their inner characteristics.

This techniques for the collection of data have been developed by psychologists to use projections of respondents for inferring about underlying motives, urges, or intentions which are such that the respondent either resists to reveal them or is unable to figure out himself.

These techniques play an important role in motivational researches or in attitude surveys.

- Types of projective techniques

Projective techniques may be divided into three broad categories:

1. **Visual:** to show the respondent a picture and ask him to describe the persons or objects in the picture.
2. **Verbal:** this techniques involve use of words both for stimulus and for response.
3. **Expressive:** under this technique subjects are asked to improve or act out a situation in which they have been assigned various roles.

SOCIOMETRY

Sociometry is a quantitative method for measuring social relationships.

It was developed by psychotherapist Jacob L. Moreno in his studies of the relationship between social structures and psychological well-being.

The term sociometry relates to its Latin etymology, socius meaning companion, and metrum meaning measure. Jacob Moreno defined sociometry as "the inquiry into the evolution and organization of groups and the position of individuals within them."

The basic technique in sociometry is the sociometric test . This is the test under which each member of a group is asked to choose from all other members those with whom he prefers to associate in a specific situation.

TOOLS FOR DATA COLLECTION

- **The questionnaire**

a questionnaire is a research instrument consisting of a set of questions (items) intended to capture responses from respondents in a standardized manner.

Questions may be unstructured or structured. Unstructured questions ask respondents to provide a response in their own words, while structured questions ask respondents to select an answer from a given set of choices.

Characteristics of a Good Questionnaire:

1. It deals with an important or significant topic.
2. Its significance is carefully stated on the questionnaire itself or on its covering letter.
3. It seeks only that data which cannot be obtained from the resources like books, reports and records.
4. It is as short as possible, only long enough to get the essential data.
5. It is attractive in appearance, neatly arranged and clearly duplicated or printed.
6. Directions are clear and complete, important terms are clarified.
7. The questions are objective, with no clues, hints or suggestions.
8. Questions are presented in a order from simple to complex.
9. Double negatives, adverbs and descriptive adjectives are avoided.
10. Double barreled questions or putting two questions in one question are also avoided.

Response formats. questions may be structured or unstructured. Responses to structured questions are captured using one of the following response formats:

- **Dichotomous response**, where respondents are asked to select one of two possible choices, such as true/false, yes/no, or agree/disagree. An example of such a question is: Do you think that the death penalty is justified under some circumstances (circle one): yes / no
- **Nominal response**, where respondents are presented with more than two unordered options, such as: What is your industry of employment: manufacturing / consumer services / retail / education / healthcare / tourism & hospitality / other.
- **Ordinal response**, where respondents have more than two ordered options, such as: what is your highest level of education: high school / college degree / graduate studies.
- **Interval-level response**, where respondents are presented with a 5-point or 7-point Likert scale, semantic differential scale, or Guttman scale.
- **Continuous response**, where respondents enter a continuous (ratio-scaled) value with a meaningful zero point, such as their age or tenure in a firm. These responses generally tend to be of the fill-in-the blanks type.

PROCESSING THE DATA

Editing

Editing is the first step in data processing. Editing is the process of examining the data collected in questionnaires/schedules to detect errors and omissions and to see that they are corrected and the schedules are ready for tabulation. Mainly two types of editing are there

Field editing

Central editing

- **Classification of Data**

Classification or categorization is the process of grouping the statistical data under various understandable homogeneous groups for the purpose of convenient interpretation

Classification becomes necessary when there is a diversity in the data collected for meaningless for meaningful presentation and analysis. However, it is meaningless in respect of homogeneous data. A good classification should have the characteristics of clarity, homogeneity, equality of scale, purposefulness and accuracy.

Coding of Data

Coding is the process/operation by which data/responses are organized into classes/categories and numerals or other symbols are given to each item according to the class in which it falls. In other words, coding involves two important operations;

- (a) deciding the categories to be used and
- (b) allocating individual answers to them.

• **Tabulation of Data**

Tabulation is the process of summarizing raw data and displaying it in compact form for further analysis. Therefore, preparing tables is a very important step. Tabulation may be by hand, mechanical, or electronic. The choice is made largely on the basis of the size and type of study, alternative costs, time pressures, and the availability of computers, and computer programmes. If the number of questionnaire is small, and their length short, hand tabulation is quite satisfactory.

Table may be divided into:

- (i) Frequency tables,
- (ii) Response tables,
- (iii) Contingency tables
- (iv) Uni-variate tables,
- (v) Bi-variate tables,
- (vi) Statistical table and
- (vii) Time series tables

Data Diagrams

Diagrams are charts and graphs used to present data. These facilitate getting the attention of the reader more. These help presenting data more effectively. Creative presentation of data is possible. The data diagrams classified into:

- **Charts:** A chart is a diagrammatic form of data presentation. Bar charts, rectangles, squares and circles can be used to present data. Bar charts are uni-dimensional, while rectangular, squares and circles are two-dimensional.
- **Graphs:** The method of presenting numerical data in visual form is called graph, A graph gives relationship between two variables by means of either a curve or a straight line. Graphs may be divided into two categories. (1) Graphs of Time Series and (2) Graphs of Frequency Distribution. In graphs of time series one of the factors is time and other or others is / are the study factors. Graphs on frequency show the distribution of by income, age, etc. of executives and so on.

a) Imagine you are part of a research team tasked with planning a project. A colleague approaches you and requests a brief explanation of the meaning and significance of research for the project. How would you convey the meaning and research process to the team mates.

b) Imagine you are a researcher assigned to work on a mysterious illness affecting a local community. What specific objectives would you set for your research to ensure a thorough understanding of the illness. How do you classify the research (Types research)

c) When embarking on a research project, why is it essential to avoid too narrow or ambiguous and controversial research problem statements? Justify the answer with an example

d) Compare and contrast probability sampling and non-probability sampling methods. In what situations would each be most appropriate?

e) Compare and Systematic sampling with clustering sampling. In what contexts would quota sampling be a pragmatic choice for researchers?

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THANK YOU