

# Research Methodology



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# What is research?



- **Research** can be defined as the search for knowledge or as any systematic investigation to establish facts.

# Characteristics of Research



- systematic
- logical
- empirical
- reductive
- replicable

# Types of Research



- Pure and Applied Research
- Exploratory or Formulative Research
- Descriptive Research
- Diagnostic Study
- Evaluation Studies
- Action Research
- Experimental Research
- Analytical study or statistical Method
- Historical Research
- Surveys
- Case Study

# Pure and Applied Research



## Pure

- it is the study of search of knowledge.

## Applied

- It is the study of finding solution to a problem.

# Purpose of Pure and Applied Research



## • **Pure**

- It can contribute new facts
- It can put theory to the rest
- It may aid in conceptual clarification
- It may integrate previously existing theories.

## **Applied**

- It offers solutions to many practical problems.
- To find the critical factors in a practical problem.

# Exploratory or Formulative Research



## **Exploratory**

Exploratory research is preliminary study of an unfamiliar problem about which the researcher has little or no knowledge.

# Purpose



- To Generate new ideas
- To increase the researcher's familiarity with the problem
- To Make a precise formulation of the problem
- To gather information for clarifying concepts
- To determine whether it is feasible to attempt the study.



# Descriptive Research



- Descriptive study is a fact- finding investigation with adequate interpretation.
- It is the simplest type of research.
- It is designed to gather descriptive information and provides information for formulating more sophisticated studies
- Data are collected using observation, interview and mail questionnaire.

# Purpose



- It can focus directly on a theoretical point.
- It can highlight important methodological aspects of data collection and interpretation.
- It obtained in a research may be useful for prediction about areas of social life outside in the boundaries of research.
- Descriptive studies are valuable in providing facts needed for planning social action programmes.

# Diagnostic Study



- It is directed towards discovering what is happening, why is it happening and what can be done about.
- It aims at identifying the causes of a problem and the possible solutions for it.

# Purpose



- This study may also be concerned with discovering and testing whether certain variables are associated.
- To determine the frequency with which something occurs or with which it is associated with something else.

# Evaluation Studies



- It is one type of applied research.
- It is made for assessing the effectiveness of social or economic programmes implemented or for assessing the impact of developmental projects area.
- The determination of the results attained by some activity designed to accomplish some valued goal or objectives.

# Purpose



- It directed to assess or appraise the quality and quantity of an activity and its performance.
- To specify its attributes and conditions required for its success.

# Action Research



- Researcher attempts to study action. E.g. Eradication of Malaria, Maritime Navigation
- Action research is a reflective process of progressive problem solving led by individuals working with others in teams or as part of a "community of practice" to improve the way they address issues and solve problems

# Purpose



- A baseline survey of the pre-action situation
- A feasibility study of the proposed action programme
- Planning and launching the programme
- Concurrent evaluation of the programme
- Making modifications and changes in the programme.



# Experimental Research



- Experimental research is commonly used in sciences such as sociology and psychology, physics, chemistry, biology and medicine etc.
- It is a systematic and scientific approach to research in which the researcher manipulates one or more variables, and controls and measures any change in other variables.

# Purpose



- Experiments are conducted to be able to predict phenomena.
- To maintain control over all factors
- A blueprint of the procedure that enables the researcher to test his hypothesis

# Analytical Study



- Analytical study is a system of procedures and techniques of analysis applied to quantitative data.
- A system of mathematical models or statistical techniques applicable to numerical data.
- Ex. Scientometrics

# Purpose



- It aims at testing hypothesis and specifying and interpreting relationship.
- It concentrates on analyzing data in depth and examining relationships from various angles by bringing in as many relevant variables as possible in the analysis plan.

# Historical Research



- The systematic collection and evaluation of data related to past occurrences in order to describe causes, effects, and trends of those events that may help explain present events and anticipate future events.
- Data is often archival-including newspaper clippings, photographs, etc.- and may include interviews.

# Purpose



- To draw explanations and generalizations from the past trends in order to understand the present and to anticipate the future.
- It enables us to grasp our relationship with the past and to plan more intelligently for the future.
- The past contains the key to the present and the past and the present influences the future.
- It helps us in visualizing the society as a dynamic organism and its structures and functions as evolving, steadily growing and undergoing change and transformation.

# Survey Research



- Survey research is one of the most important areas of measurement in applied social research. The broad area of survey research encompasses any measurement procedures that involve asking questions of respondents. A "survey" can be anything from a short paper-and-pencil feedback form to an intensive one-on-one in-depth interview.

# Purpose



- It is always conducted in a natural setting.
- It seeks responses directly from the respondents.
- It can cover a very large population
- A survey may involve an extensive study or an intensive study.
- A survey covers a definite geographical area, a city, district, state



# Case Study



- A case study is a research methodology common in social science.
- It is based on an in-depth investigation of a single individual, group, or event to explore causation in order to find underlying principles

# Purpose



- To examine limited number of variables
- case study methods involve an in-depth, longitudinal examination of a single instance or event.
- It provides a systematic way of looking at events, collecting data, analyzing information, and reporting the results

# Field research



- Field research has traditionally been thought different from methods of research conducted in a laboratory or academic setting.

## **Purpose**

- The advantages of field research are that people are closer to real world conditions and design the research in the best way to discover the particular information required.

# Research Design



- The term “research design” means ‘drawing for research’.
- It is a systematic planning of conducting research.
- It aims to achieve goals of the research.

# Definition



- ‘as the arrangement of conditions for collection and analysis of data in a manner that aims to combine the relevance to the research purpose with economy in procedure’-by Jahoda
- ‘a master plan, specifying the methods and procedures for collecting and analyzing the needed information’-by Zikmund

# Need and Purpose



- It helps in smooth sailing of the research process.
- It saves the money, manpower and materials.
- It helps the researchers for advance planning and avoids duplication.
- It helps to modify the research if any difficulties.
- It gives reality to research.

# Research Design Process



- Selection of research topic/problem,
- Framing research design,
- Framing sampling design,
- Collection of data,
- Data analysis/editing, coding, processing and preservation
- Writing research reports

# Characteristics of Good Research Design



- Theory-Grounded,
- Environment,
- Feasibility of Implementation,
- Redundancy,
- Efficient.

Cont...





- It should be flexible
- It should be economical
- It should be unbiased
- It should fulfill the objectives of the research
- It should be more appropriate to all the aspects of research.

Cont...



- It should guide him to achieve correct results.
- It provides scientific base for his research.
- It also should facilitate to complete the research work within the stipulated time.

# Functions of Research Design



- It provides a blueprint of research.
- It limits (dictates) the boundaries of the research activities.
- It enables investigation to anticipate potential problems

# Components of Research Design



- Title of the investigation
- Purpose of the study
- Review of related literature
- Statement of the problem
- Scope of the investigation

Cont...



- Objectives of the study
- Variables
- Hypothesis
- Selection of sample
- Data Collection
- Analysis of data

# Types of Research Design



- Experimental Designs
- Non- Experimental Designs

# Experimental Designs



- There are two types
  - Quasi-experimental
  - Experimental

# Non-Experimental Design



- Case study designs/method.
- Content analysis.
- Ethnography.
- Focus groups.
- Network analysis and sociometry.



# Hypotheses



- The purpose of hypothesis testing is to determine whether there is enough statistical evidence in favor of a certain belief about a parameter.
- An hypothesis is a preliminary or tentative explanation or postulate by the researcher of what the researcher considers the outcome of an investigation will be. It is an informed/educated guess.
- It indicates the expectations of the researcher regarding certain variables. It is the most specific way in which an answer to a problem can be stated.

# Define Hypothesis



- **A tentative statement about a population parameter that might be true or wrong**

# The Difference Between An Hypothesis And A Problem



- Both an hypothesis and a problem contribute to the body of knowledge which supports or refutes an existing theory.
- An hypothesis differs from a problem.
- A problem is formulated in the form of a question; it serves as the basis or origin from which an hypothesis is derived.
- An hypothesis is a suggested solution to a problem.
- A problem (question) cannot be directly tested, whereas an hypothesis can be tested and verified.

# When is an Hypothesis Formulated



- An hypothesis is formulated after the problem has been stated and the literature study has been concluded.
- It is formulated when the researcher is totally aware of the theoretical and empirical background to the problem.

# PURPOSE AND FUNCTION OF AN HYPOTHESIS



- It offers explanations for the relationships between those variables that can be empirically tested.
- It furnishes proof that the researcher has sufficient background knowledge to enable him/her to make suggestions in order to extend existing knowledge.
- It gives direction to an investigation.
- It structures the next phase in the investigation and therefore furnishes continuity to the examination of the problem.

# CHARACTERISTICS OF AN HYPOTHESIS



- It should have elucidating power.
- It should strive to furnish an acceptable explanation of the phenomenon.
- It must be verifiable.
- It must be formulated in simple, understandable terms.
- It should corresponds with existing knowledge.

# Types of Hypotheses



## 1. Descriptive Hypotheses:

- ✦ These are propositions that describe the characteristics ( such as size, form or distribution) of a variable. The variable may be an object, person, organization etc. ,

e.g., The rate of unemployment among arts graduates is higher than that of commerce graduates. The educational system is not oriented to human resource needs of a country.

## 2. Relational Hypotheses.

- ✦ These are propositions which describe the relationship between tow variables.

e. g. , Families with higher incomes spend more for recreation  
Upper – class people have fewer children than lower class people.

Cont...



### 3. Causal Hypotheses

- It states that the existence of, or a change in, one variable causes or leads to an effect on another variable.
- The first variable is called the independent variable, and the latter the dependent variable.
- When dealing with causal relationships between variables the researcher must consider the direction in which such relationship flows  
e.g: which is cause and which is effect

### 4. Working Hypotheses

- ✦ While planning the study of a problem, hypotheses are formed.
- ✦ Initially they may not be very specific. In such cases, they are referred to as ‘working hypotheses’ which are subject to modification as the investigation proceeds.

Cont...





## Null Hypotheses

- ✦ This hypotheses are formulated for testing statistical significance, since, this form is a convenient approach to statistical analysis. As the test would nullify the null hypotheses.

e.g., : There is a relationship between a family's income and expenditure on recreation, a null hypothesis may state: There is no relationship between families income level and expenditure on recreation.

## 6. Statistical Hypotheses

- ✦ These are statements about a statistical population. These are derived from a sample. These are quantitative in nature in that they are numerically measurable

eg: Group A is older than B'

Cont...



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## Common Sense Hypotheses

- ✦ It states the existence of empirical uniformities perceived through day to day observations.

e.g., “Shop-assistants in small shops lack motivation”

## 8. Complex Hypotheses

- ✦ These aim at testing the existence of logically derived relationships between empirical uniformities.

e.g., In the early stage human ecology described empirical uniformities in the distribution of land values, industrial concentrations, types of business and other phenomena.

## 9. Analytical Hypotheses:

- ✦ It is concerned with the relationship of analytic variables. These hypotheses occur at the highest level of abstraction.
- ✦ These specify relationship between changes in one property and changes in another.

Eg., The study of human fertility might show empirical regularities by wealth, education, region, and religion.

# Characteristics of a Good Hypotheses



- Conceptual Clarity
- Specificity
- Testability
- Availability of Techniques
- Theoretical relevance
- Consistency
- Objectivity
- Simplicity

# Sources of Hypotheses



- Theory
- Observation
- Analogies
- Intuition and personal experience
- Findings of studies
- State of Knowledge
- Culture
- Continuity of Research

# Sampling



**Sampling** is the process of selecting a small number of elements from a larger defined target group of elements such that the information gathered from the small group will allow judgments to be made about the larger groups

# Basics of Sampling Theory



Population

Element

Defined target  
population

Sampling unit

Sampling frame

# Sampling Error



**Sampling error** is any type of bias that is attributable to mistakes in either drawing a sample or determining the sample size

# Developing a Sampling Plan



1. Define the Population of Interest
2. Identify a Sampling Frame (if possible)
3. Select a Sampling Method
4. Determine Sample Size
5. Execute the Sampling Plan



# Defining Population of Interest



- Population of interest is entirely dependent on Management Problem, Research Problems, and Research Design.
- Some Bases for Defining Population:
  - Geographic Area
  - Demographics
  - Usage/Lifestyle
  - Awareness

# Sampling Frame



- A list of population elements (people, companies, houses, cities, etc.) from which units to be sampled can be selected.
- Difficult to get an accurate list.
- **Sample frame error** occurs when certain elements of the population are accidentally omitted or not included on the list.
- See Survey Sampling International for some good examples

<http://www.surveysampling.com/>

# Sampling Methods



**Probability  
sampling**

**Nonprobability  
sampling**

# Types of Sampling Methods

## Probability

- Simple random sampling
- Systematic random sampling
- Stratified random sampling
- Cluster sampling

## Nonprobability

- Convenience sampling
- Judgment sampling
- Quota sampling
- Snowball sampling

# Simple Random Sampling



**Simple random sampling** is a method of probability sampling in which every unit has an equal nonzero chance of being selected

# Systematic Random Sampling



**Systematic random sampling** is a method of probability sampling in which the defined target population is ordered and the sample is selected according to position using a skip interval

# Steps in Drawing a Systematic Random Sample



- 1: Obtain a list of units that contains an acceptable frame of the target population
- 2: Determine the number of units in the list and the desired sample size
- 3: Compute the skip interval
- 4: Determine a random start point
- 5: Beginning at the start point, select the units by choosing each unit that corresponds to the skip interval

# Stratified Random Sampling



**Stratified random sampling** is a method of probability sampling in which the population is divided into different subgroups and samples are selected from each



# Steps in Drawing a Stratified Random Sample



- 1: Divide the target population into homogeneous subgroups or strata
- 2: Draw random samples from each stratum
- 3: Combine the samples from each stratum into a single sample of the target population

# Cluster Sampling



- **Cluster sampling** is a sampling technique used when "natural" groupings are evident in a statistical population.
- It is often used in marketing research.
- It divide population into Comparable groups: Schools, Cities etc..
- cluster sampling is to reduce the average cost per interview
- the technique given more accurate results when most of the variation in the population is within the groups,

# Nonprobability Sampling Methods



Convenience sampling relies upon convenience and access

Judgment sampling relies upon belief that participants fit characteristics

Quota sampling emphasizes representation of specific characteristics

Snowball sampling relies upon respondent referrals of others with like characteristics



- **Convenience samples:** samples drawn at the convenience of the interviewer. People tend to make the selection at familiar locations and to choose respondents who are like themselves.
- **Judgment samples:** samples that require a judgment or an “educated guess” on the part of the interviewer as to who should represent the population. Also, “judges” (informed individuals) may be asked to suggest who should be in the sample.
- **Quota samples:** samples that set a specific number of certain types of individuals to be interviewed
- **snowball sampling:** is a technique for developing a research sample where existing study subjects recruit future subjects from among their acquaintances.

# Factors to Consider in Sample Design



Research objectives

Degree of accuracy

Resources

Time frame

Knowledge of  
target population

Research scope

Statistical analysis needs



# Data Collection



- Data collection possibilities are wide and varied with any one method of collection not inherently better than any other
- Each has pros and cons that must be weighed up in view of a rich and complex context

# The Data Collection Process



- All methods of collection require rigorous and systematic design and execution that includes
  - thorough planning
  - well considered development
  - effective piloting
  - weighed modification
  - deliberate implementation and execution
  - appropriate management and analysis

# Surveys



- Surveying involves gathering information from individuals using a questionnaire
- Surveys can
  - reach a large number of respondents
  - generate standardized, quantifiable, empirical data - as well as some qualitative data
  - and offer confidentiality / anonymity
- Designing survey instruments capable of generating credible data, however, can be difficult



# Survey Types



- Surveys can be
  - descriptive or explanatory
  - involve entire populations or samples of populations
  - capture a moment or map trends
  - can be administered in a number of ways

# Survey Construction



- Survey construction involves
  - formulating questions and response categories
  - writing up background information and instruction
  - working through organization and length
  - determining layout and design

# Interviewing



- Interviewing involves asking respondents a series of open-ended questions
- Interviews can generate both standardized quantifiable data, and more in-depth qualitative data
- However, the complexities of people and the complexities of communication can create many opportunities for miscommunication and misinterpretation

# Interview Types



- Interviews can range from
  - formal to informal
  - structured to unstructured
  - can be one on one or involve groups

# Conducting Interviews



- When conducting your interviews you will need to
  - question, prompt, and probe in ways that help you gather rich data
  - actively listen and make sense of what is being said
  - manage the overall process

# Observation



- Observation relies on the researchers' ability to gather data through their senses - and allows researchers to document actual behaviour rather than responses related to behaviour
- However, the observed can act differently when surveilled, and observations can be tainted by a researcher's worldview

# Observation Types



- Observation can range from
  - non-participant to participant
  - candid to covert
  - from structured to unstructured

# The Observation Process



- The observation process is sometimes treated casually, but is a method that needs to be treated as rigorously as any other
- The process should include planning, observing, recording, reflecting, and authenticating



# Experimentation



- Experimentation explores cause and effect relationships by manipulating independent variables in order to see if there is a corresponding effect on a dependent variable

# Experimentation



- Pure experimentation requires both a controlled environment and the use of a randomly assigned control group
- This can be difficult to achieve in human centred experiments conducted in the real-world

# Real-World Experiments



- There are many experiments that can only be carried out in the messy uncontrolled environments of the real-world, so the search for cause and effect will require tradeoffs between real-world contexts and a controlled environment

## questionnaire surveys (includes mail)

### Advantages:

- Quick and easy to administer.
- Can get a large amount of information in a short time.
- Allows for employee participation.
- Does not require trained interviewer.
- Relatively less expensive.

### Disadvantages:

- Quality of information related to the quality of the questionnaire.
- Must have high school reading and writing ability to complete one.
- Often needs follow-up interview or observation.
- May be difficult to construct.
- May have low response rate.
- Responses may be incomplete.
- Responses may be difficult to interpret (open-ended)

### Online surveys:

- The use of the Internet has made a huge difference to the way surveys are conducted and has become a science unto itself.
- quick to implement. Lower cost, higher

## **Face-to-face interviews :**

Most informative method of qualitative data collection because the human interaction of face-to-face interviews provides the opportunity to probe for insights and build on responses for greater value.

Door-to-door: People are contacted at home and in person (abandoned in Developed due to high cost of transport, staff)

Street / shopping mall intercepts: Popular in Developed Economies (some Malls consider a nuisance).

**Telephone interviews** are less time consuming and less expensive and the researcher has ready access to anyone on the planet who has a telephone. Disadvantages are that the response rate is not as high as the face-to-face interview but considerably higher than the mailed questionnaire. The sample may be biased to the extent that people without phones are part of the population about whom the researcher wants to draw inferences.

## **Web based questionnaires :**

A new and inevitably growing methodology is the use of Internet based research. This would mean receiving an e-mail on which you would click on an address that would take you to a secure web-site to fill in a questionnaire. This type of research is often quicker and less detailed. Some disadvantages of this method include the exclusion of people who do not have a computer or are unable to access a computer. Also the validity of such surveys are in question as people might be in a hurry to complete it and so might not give accurate responses.

**Computer Assisted Personal Interviewing (CAPI):** is a form of personal interviewing, but instead of completing a questionnaire, the interviewer brings along a laptop or hand-held computer to enter the information directly into the database. This method saves time involved in processing the data, as well as saving the interviewer from carrying around hundreds of questionnaires. However, this type of data collection method can be expensive to set up and requires that interviewers have computer and typing skills.

**QUESTION**



**THANK YOU**