

Unit - 1# What is Research?

- Research is search for knowledge.
- It is a scientific & systematic search for information on a specific topic.
- Definition of Research:-
 - * Research is a Careful Investigation / Inquiry specially through search for new facts in any branch of knowledge.
 - * It is a Journey of Discovery.

“Inquisitiveness is the mother of all ^{Inventions} knowledge”

Imp Acc to Clifford Wood → for exam
Research comprises defining and redefining problems, formulating hypotheses of suggested solutions, collecting, organising and Evaluating data, making Deductions and Research conclusions, and at last carefully Testing and determining Conclusion whether they fit the formulating hypotheses → assumptions

Objective / Purpose of Research

each research has its own specific purpose :-

- 1) Exploratory / Formulative Research →
To gain familiarity with a Phenomenon or to achieve new insights into it.
(eg - Role of Social Media as Marketing communication tool)
- 2) Descriptive Research →
To portray accurately the characteristics of a particular individual, situation or group.
(eg → observed the habit / preference of consumers)
- 3) Diagnostic Research →
To determine the frequency with which something occurs or with which it is associated with something else.
(ex → Study the characteristics of some infections)
- 4) Hypothesis-Testing Research Studies →
To test a hypothesis of a causal relationship between Variables.
ex - (Fall in car sale → (WPH) Lesson)

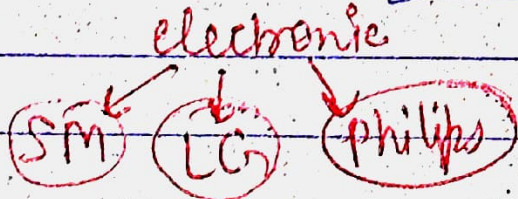
Types of Research :-

- 1) Descriptive Vs Analytical
- 2) Conceptual Vs Empirical
- 3) Applied Vs Fundamental
- 4) Quantitative Vs Qualitative
- 5) One-time Research Vs Longitudinal Research
- 6) Field-setting Research Vs Laboratory Research & Simulation Research
- 7) Historical Research

I) Descriptive Vs Analytical :-

1) Descriptive Research :-

- **Purpose** - Description of the state of affairs as it exists at present.
- **feature** - Research has No Control over the variables, (only observe and report what has happened or what is happening).
- **Example** - A survey to find customer satisfaction level or ~~level~~ customer preferences.
- **Method use** - Survey Methods



2) Analytical Research

- * ~~Here~~ use facts and info already available and Analyze these to make a critical Evaluation of the material.
- * It uses existing facts or data and Analyzes them to make evaluation or Conclusion.

Example:- Analyzing past sales to find market trend.

II) Applied Vs Fundamental Research

1) Applied Research

Purpose → to find solution for an immediate problem facing a society / industrial / Business.

Examples →

- Market research to understand customer pref preferences.
- Studying trends (social, economic or political) that affect business.

2) Fundamental Research — (Basic/Pure) also.

→ It is done for knowledge's sake, without focusing on solving immediate problems.

Inferential in Research → using a sample of population to make predictions or draw conclusion about the entire population.
(formulation of theories)

Aim → to create theories or generalizations

Example →

- Studying Natural phenomenon
- Research in pure Mathematics
- generalization about human behavior

III Quantitative Vs Qualitative Research

1) Quantitative Research

→ Based on Quantitative Measurements, applicable to phenomena that can be expressed in terms of Quantities.

→ Examples → Share Market

Types :-

① Inferential Approach → (Inference, relating to)
collect the data to infer characteristics.

Ex - Polling voters to predict election results.

② Experimental Approach

Researchers changes variables to see effects.

Ex - Testing how fertilizer affects plant growth.
→ clone, copy, counterfeit, duplicate, fake.

③ Simulation Approach

create an artificial environment to study behaviour. Ex - Testing traffic flow using computer model.

Simulation Approach
example

→ you can i/p the laws of gravitation into a computer, and use it to create 3D simulation of the Planets of solar system orbiting the sun.

2) Qualitative Approach

→ Deals with qualities (not numbers) like behavior opinions or experiences.

Ex → • Reasons for human behaviour.

• Motivation Research.

• Sentence Completion Tests.

• Story completion Tests etc.

Attitude / opinion Research:-

Research designed to find out how people feel or what they think about a particular subject matter. is also a qualitative research.

IV Conceptual Vs Empirical Research

1) Conceptual Research:-

focus → Abstract ideas or theories.

who uses it → Philosophers and thinkers.

Purpose → Develop or reinterpret concepts.

Ex → Exploring the idea of justice.

→ experimental

2) Empirical Research:-

how → Based on experience or observation.

- Key point → Uses ^{fresh} data and experiments to verify results.
- Purpose → Practical and data-driven.
- Example:- Testing if therapy / exercises improve mental health.

Other types of Research

(V) One-time Research Vs Longitudinal Research

- 1) One-time Research -
conducted during a single time period.
(Ex → A one-month survey of customer satisfaction)
- 2) Longitudinal
conducted over a long time with repeated observations.
(Ex → Tracking changes in student performance over years, Universe or galaxy research)

field setting VI field, Laboratory, and Simulation Research

- 1) Field Research → All these Research depend upon the Environment in which it is to be carried.

• Field-setting → conducted in real-world setting
ex → studying wildlife behaviour in a forest.

• Laboratory Research → in controlled environment
ex → Testing medicines in a lab.

• Simulation → An artificial environment created to mimic reality.
ex → using a simulator to test airplane safely.

VII Clinical or Diagnostic Research:

→ focus on identifying cause of problems & suggesting solutions.

ex → Researching the cause of a new disease.

VIII Exploratory vs formalized Research:

1) Exploratory → focus on developing hypotheses.

ex → studying market trends to identify potential ^{business} market ideas.

2) Formalized → focus on testing hypotheses in a structured way.

Ex → Testing if a new marketing strategy increases sales.

~~Def~~ IX → Historical Research

• what it does → Uses past records or documents to study events or philosophies.

Ex → Analyzing ancient texts to understand cultural beliefs.

★ Study past events.

Criteria for Good Research → (10)

① To conduct good research, follow these pts.

① 1) Systematic and Logical :- R should follow clear, organized and logical method.

② 2) Objective → R goal should be well-defined.

③ 3) Detailed Methodology → Describe the process so others can repeat it for further study.

④ 4) Accurate Sampling → sampling should minimize error.

- 3) Empirical → based on observation, experiments is a good Research.
- 4) Replicable → ^{copy} after ^{repeating the research} reproduce, same ^{part} result (verify)
- 5) Transparent writing → Be honest and don't hide anything that impacts the results.
- 6) Check for validity and Reliability → Ensure data and calculations are accurate.
- 7) Justified conclusion → conclusion should match the data.
- 8) Integrity → Research must be valid and ethical.

Significance of Research —

- 1) Promoting logical thinking
- 2) Government policies
- 3) Solving Business problems.
- 4) Studying social Problems.

Research Methodology (RM)

What is RM?

- RM is the systematic way to solve a research problem.
- It is the science of how research is conducted.

What does RM include?

Ans 1) Steps in Research → It explains the steps followed to study a research problem.

2) Logic Behind Steps:- It also explains why these steps are used.

Why RM is important?

Ans Researchers need to understand both methods (how to do research) and methodology (why to do it in a certain way)

Aspect	Research Methods	Research Methodology
<u>Meaning</u>	Techniques or tools to conduct research.	Science of how research is conducted, focusing on the logic behind methods.
<u>Focus</u>	How to collect or analyze data (Practical)	Why certain methods are chosen & their underlying reasoning (Theoretical)
<u>Example</u>	Conducting Survey, interview or statistical tools method.	Understanding why survey is better than interview in a particular study.
<u>Goal</u>	Achieving the specific tasks (eg- collecting data or testing a hypothesis).	Justifying the choice of method to ensure they align with the research objectives.

Example:-

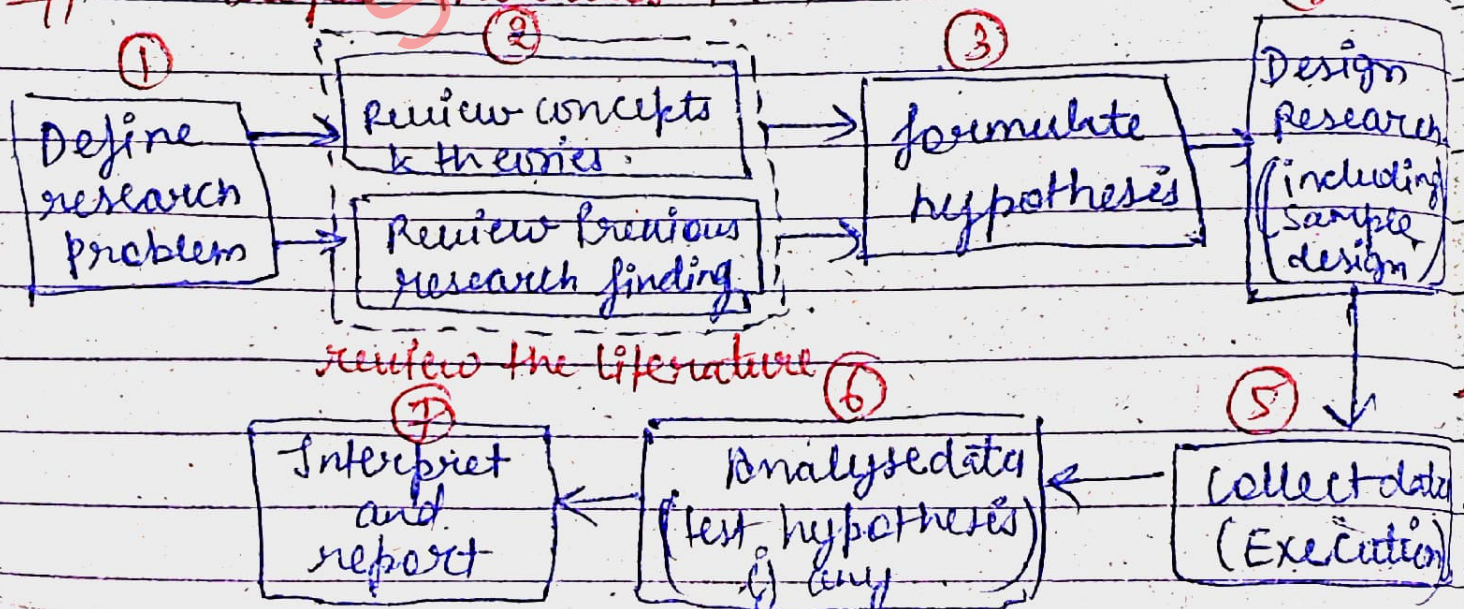
Research Method → Imagine you are trying to find out what food students like. You decide to conduct a survey, or organize a focus group discussion.

2) Research Methodology → This is about asking yourself why you chose a survey - maybe coz it's quicker and reaches more students than a focus group. basically it is better in terms of Accuracy.

* Methods → How you do research.

* Methodology → Why you do research that way.

Steps involved in research process



Step 1 Formulating the Research Problem

* Two types of Research Problem -

- 1) Those which relate to state of Nature
- 2) " " " " to relationships b/w variables
eg → Real Inflation & money supply.

* Two steps are involved in formulating the research problem.

- 1) Understanding the problem, thoroughly.
- 2) Rephrasing the same into meaningful terms from an analytical point of view.

S-2) Extensive Literature Survey / Review

Academic Journals, conference proceedings, Govt of Reports, Books etc. must be reviewed depending on the nature of problem.

eg → Google Scholars

(Research topic Problem/topic 4th 3rd gr see pre-existing info available & ? --- Read all that first

→ assumption

S-3 Development of working Hypothesis

* working hypothesis → Tentative Assumption made in order to draw out and Test it

logical or empirical consequences.

* Hypothesis should be very specific and limited to the piece of research in hand bcoz it has to be tested.

Role of Hypothesis ?

- To guide researcher by delimiting the area of research.
- To keep them on Right track.
- helps to focus Attention on more imp. facts of the Problem.
- It also indicate the Type of Data required and type of Methods of Data Analysis to be used.

Step 4 Preparing the Research Design ^{→ Structure}

* Conceptual structure / framework within which research would be conducted.

* There are several Research Design (will study later)

* Why suitable Research design is essential?

→ A suitable Research design will be one that minimizes bias and maximizes the reliability of data collected & analyzed

function of Research Design right

→ It also help to analyze - ~~function~~, optimization, Effort, Time & Expenditure.

How to identify appropriate Research Design?

Ans Research design, appropriate for a particular research problems : depends on —

- (i) Means of obtaining info.
- (ii) Skills of Researcher.
- (iii) Time Available (Intel time & hard pairs).
- (iv) Cost factor (finance Available)

Determining Sample Design

Step 5) Preparing the Research Design:-

* Sample → we select only a few items from the universe for our study purpose
ex → Blood sample

* Sample Design → the way of selecting a sample or a definite plan determined before

any data is actually collected for obtaining a sample from a given population.

Types of Samples - Probability samples
Non-probability sample

- Probability sample → each element has a known probability of being included in the sample.
- Non-probability sample → Don't allow the researcher to determine its probability.

Ex- Probability sample

- 1) Simple Random Sampling
- 2) Systematic Sampling
- 3) stratified Sampling
- 4) cluster area sampling

Non-Probability sample

- 1) convenience sampling
- 2) Judgement "
- 3) Quota " technique
- 4) Judgement → Quota → convenience

Step-6 collecting the data :-

* Data two type - Primary & Secondary

→ primary data can be collected by -

① Experiment

② by surveys.

→ How to collect secondary data -
• find research sources, published articles, govt rep.
• use only valid or well-defined data

Sources of S.S → Govt publications, company database, existing reports, paid for research publications, magazines, journals and can studies, websites and books.

How to collect data using survey —

- 1) By observation
- 2) through personal interview
- 3) " telephone interviews
- 4) By mailing of questionnaires.
- 5) through Schedules

Step 7. Execution of Project

- Now, after collecting data, the researcher should see that the project is executed in a systematic manner and on Time.
- Careful watch should be kept

Step-8 Analysis of Data

Data analysis involves several steps to organize and make sense of raw data.

Steps in DAnalysis

1) Organize the Data →

- Categorization :- ~~organ~~ divide data into groups or categories for better understanding.

- Coding :-

- Editing :-

- Tabulation :-

2) Statistical Analysis :- Drawing ^{Statistical} ~~Statistical~~ Inferences.

Then

• Hypothesis Testing $\rightarrow$ Chi-test, t-test, F-test

Step-9 Generalization & Interpretation

अगर hypothesis test किया है और उसके base पर
researcher arrives at generalization.

(to build a theory).

i.e. After hypothesis testing, researcher arrives
at generalization (build a theory).

Interpretation $\rightarrow$ Explain his finding on
basis of some theory.

(Theory से क्या समझ में आया क्या हमने find किया
उसके बारे में लिखना।)

Step-10 Preparation of Report / Thesis

writing of Report must be done
carefully (with proper layout).