RESEARCH METHODOLOGY

By:

Dr. Sudipta Ghosh

Assistant Professor

Dept. of Commerce (UG & PG)

Prabhat Kumar College, Contai

West Bengal, India

Chapter -1: Introduction

Concept of Research

- **Research is the process of finding solutions to a problem after a thorough study and analysis of the situational factors**
- **Research provides the needed information that guides managers to make informed decisions to successfully deal with problems**
- **The information provided could be the result of a careful analysis of data gathered firsthand or of data that are already available (in the company)**

Chapter -1: Introduction (Contd.)

Objectives of Research

❖**The purpose of research is to discover answers through the application of scientific procedures.**

❖**The objectives are:**

➢**To gain familiarity with a phenomenon or to achieve new insights into it – Exploratory or Formulative Research.**
➢**To portray accurately the characteristics of a particular individual, situation or a group – Descriptive Research.**
➢**To determine the frequency with which something occurs or with which it is associated with something else – Diagnostic Research.**
➢**To test a hypothesis of a causal relationship between variables – Hypothesis-Testing Research.**

Chapter -1: Introduction (Contd.)

Characteristics of Research

- ❖Research is directed towards the solution of a problem.
- ❖Research is based upon observable experience or empirical evidence.
- ❖Research demands accurate observation and description.
- ❖Research involves gathering new data from primary sources or using existing data for a new purpose.
- ❖Research activities are characterized by carefully designed procedures.
- ❖Research requires expertise i.e., skill necessary to carryout investigation, search the related literature and to understand and analyze the data gathered.
- ❖Research is objective and logical – applying every possible test to validate the data collected and conclusions reached.
- ❖Research involves the quest for answers to unsolved problems.
- ❖Research requires courage.
- ❖Research is characterized by patient and unhurried activity.
- ❖Research is carefully recorded and reported.

Chapter -1: Introduction (Contd.)

SCIENTIFIC METHOD

- **'Science' refers to the body of systematic and organised knowledge which makes use of scientific method to acquire knowledge in a particular field of enquiry.**

- **Scientific method is the systematic collection of data (facts) and their theoretical treatment through proper observation, experimentation and interpretation.**

- **Scientific method attempts to achieve a systematic interrelation of facts by experimentation, observation, and logical arguments from accepted postulates and a combination of these three in varying proportions.**

Chapter -1: Introduction (Contd.)

BASIC POSTULATES IN SCIENTIFIC METHOD

- It relies on empirical evidence.
- It utilizes relevant concepts.
- It is committed to only objective considerations.
- It presupposes ethical neutrality.
- It results into probabilistic predictions.
- The methodology is made known.
- Aims at formulating scientific theories.

Chapter -1: Introduction (Contd.)

CRITERIA OF A GOOD RESEARCH

- Purpose clearly defined.
- Research process detailed.
- Research design thoroughly planned.
- High ethical standards applied.
- Limitations frankly revealed.
- Adequate analysis for decision maker's needs.
- Findings presented unambiguously.
- Conclusions justified.
- Researcher's experience reflected.

QUALITIES OF A GOOD RESEARCH

- **Systematic**
- **Logical**
- **Empirical**
- **Replicable**
- **Creative**
- **Use of multiple methods**

Chapter -1: Introduction (Contd.)

NEED FOR RESEARCH

- EXPLORATION
- DESCRIBE
- DIAGNOSE
- HYPOTHESIS
- INDUCTIONS AND DEDUCTION

Chapter -1: Introduction (Contd.)

PROBLEMS IN RESEARCH

- **Not similar to science**
- **Uncontrollable variables**
- **Human tendencies**
- **Time and money**
- **Lack of computerization**
- **Lack of scientific training in the methodology of research**
- **Insufficient interaction between university research departments and business establishments**
- **Lack of confidence on the part of business units to give information**
- **Lack of code of conduct**
- Poor library management and functioning
- Difficulty of timely availability of published data.
- Ignorance

Chapter -1: Introduction (Contd.)

ROLE OF RESEARCH IN DECISION-MAKING

- **Decision-making is the process of selecting the best alternative from the available set of alternatives.**
- **Management is chiefly concerned with decision-making and its implementation.**
- **These decisions should be based on appropriate studies, evaluations and observations.**
- **Research provides us with knowledge and skills needed to solve the problems and to meet the challenges of a fast paced decision-making environment.**

Chapter -1: Introduction (Contd.)

- **INTERNAL FACTORS – factors present inside an organisation such as resources, technology, trade unions, cash flow, manpower etc.**

- **EXTERNAL FACTORS – factors present outside the organisation such as government policies, political factors, socio-economic factors, legal framework, geographic and cultural factors etc.**

- **QUANTITATIVE FACTORS – factors that can be measured in quantities such as time, resources, cost factors etc.**
- **QUALITATIVE FACTORS – factors that cannot be measured in quantities such as organizational cohesiveness, sense of belonging of employees, risk of technological change etc.**

- **UNCERTAINITY FACTORS – factors which cannot be predicted.**

Chapter -1: Introduction (Contd.)

TYPES OF RESEARCH

Descriptive vs Analytical Research

- **Descriptive Research is a fact finding investigation which is aimed at describing the characteristics of individual, situation or a group (or) describing the state of affairs as it exists at present.**
- **Analytical Research is primarily concerned with testing hypothesis and specifying and interpreting relationships, by analyzing the facts or information already available.**

Applied vs Fundamental Research

- **Applied Research or Action Research is carried out to find solution to a real life problem requiring an action or policy decision.**
- **Fundamental Research which is also known as basic or pure research is undertaken for the sake of knowledge without any intention to apply it in practice. It is undertaken out of intellectual curiosity and is not necessarily problem-oriented.**

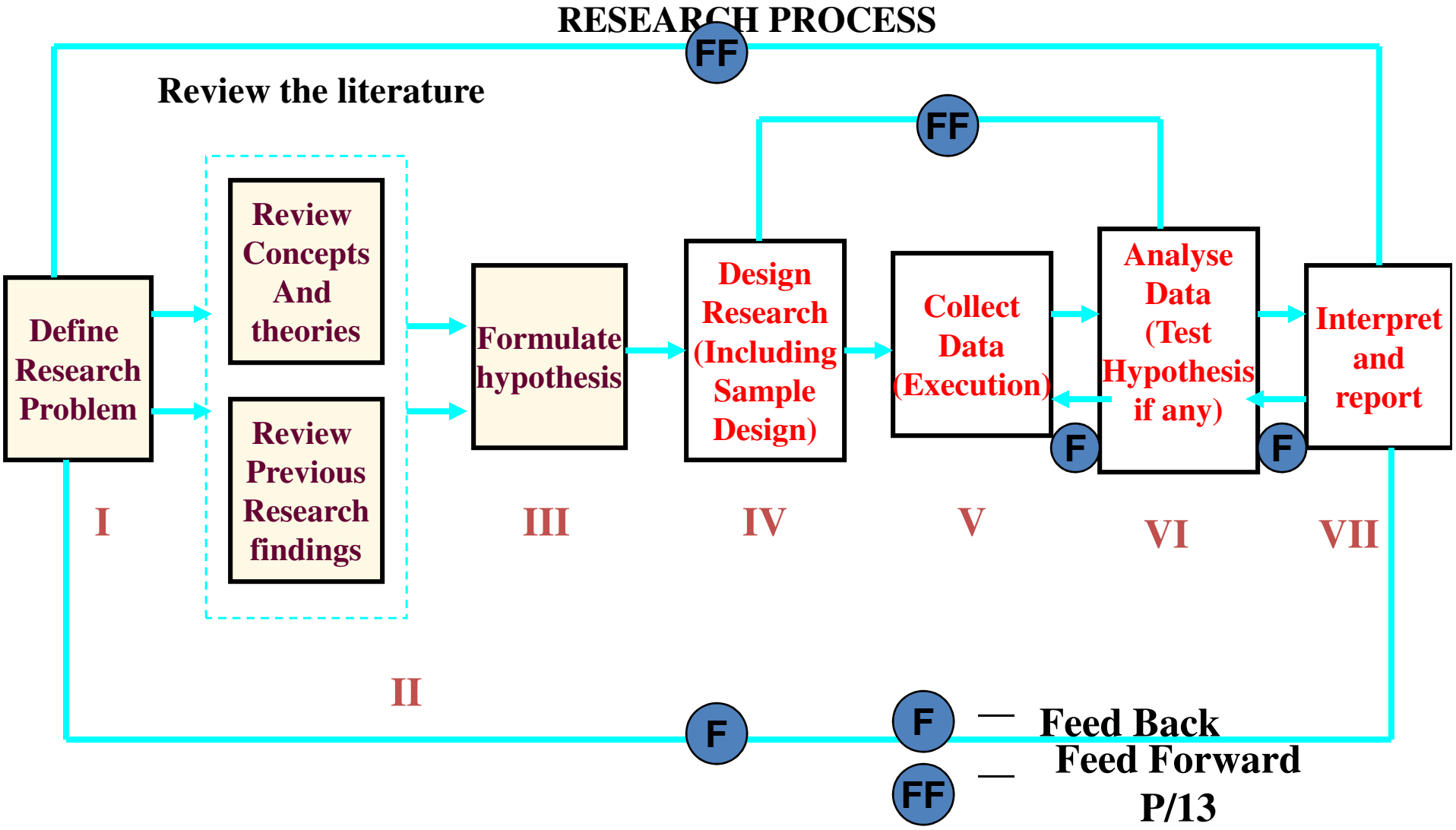
Quantitative vs Qualitative Research

- **Quantitative Research is employed for measuring the quantity or amount of a particular phenomena by the use of statistical analysis.**
- **Qualitative Research is a non-quantitative type of analysis which is aimed at finding out the quality of a particular phenomenon.**

Conceptual vs Empirical Research

- **Conceptual Research is generally used by philosophers and thinkers to develop new concepts or to reinterpret existing ones.**
- **Empirical Research is a data based research which depends on experience or observation alone. It is aimed at coming up with conclusions without due regard for system and theory.**

Chapter -1: Introduction (Contd.)



P/13

Chapter -1: Introduction (Contd.)

RESEARCH PROBLEM

What is a research problem?

- The term 'problem' means a question or issue to be examined.

- Research Problem refers to some difficulty /need which a researcher experiences in the context of either theoretical or practical situation and wants to obtain a solution for the same.

Chapter -1: Introduction (Contd.)

HOW DO WE KNOW WE HAVE A RESEARCH PROBLEM?

- Customer complaints
- Conversation with company employees
- Observation of inappropriate behaviour or conditions in the firm
- Deviation from the business plan
- Success of the firm's competitor's
- Relevant reading of published material (trends, regulations)
- Company records and reports.

Chapter -1: Introduction (Contd.)

IDENTIFICATION / SELECTION OF THE RESEARCH PROBLEM

☆This step involves identification of a few problems and selection of one out of them, after evaluating the alternatives against certain selection criteria.

Chapter -1: Introduction (Contd.)

SOURCES OF PROBLEMS

- Reading
- Academic Experience
- Daily Experience
- Exposure to Field Situations
- Consultations
- Brainstorming
- Research
- Intuition

Chapter -1: Introduction (Contd.)

CRITERIA OF SELECTION

The selection of one appropriate researchable problem out of the identified problems requires evaluation of those alternatives against certain criteria. They are:

- Internal / Personal criteria – Researcher's Interest, Researcher's Competence, Researcher's own Resource: finance and time.
- External Criteria or Factors – Researchability of the problem, Importance and Urgency, Novelty of the Problem, Feasibility, Facilities, Usefulness and Social Relevance, Research Personnel.

Chapter -1: Introduction (Contd.)

DEFINITION / FORMULATION OF THE RESEARCH PROBLEM

- Formulation is the process of refining the research ideas into research questions and objectives.
- Formulation means translating and transforming the selected research problem/topic/idea into a scientifically researchable question. It is concerned with specifying exactly what the research problem is.

- **Problem definition or Problem statement is a clear, precise and succinct statement of the question or issue that is to be investigated with the goal of finding an answer or solution.**
- **There are two ways of stating a problem:**
    1) **Posting question / questions**
    2) **Making declarative statement / statements**

Chapter -1: Introduction (Contd.)

- Clear and Unambiguous
- Empirical
- Verifiable
- Interesting
- Novel and Original
- Availability of Guidance

Chapter -2: Review of Literature

Concept of Review of Literature

- Literature Review is the documentation of a comprehensive review of the published and unpublished work from secondary sources of data in the areas of specific interest to the researcher.
- The main aim is to find out problems that are already investigated and those that need further investigation.
- It is an extensive survey of all available past studies relevant to the field of investigation.
- It gives us knowledge about what others have found out in the related field of study and how they have done so.

Chapter -2: Review of Literature (Contd.)

PURPOSE OF REVIEW

- To gain a background knowledge of the research topic.
- To identify the concepts relating to it, potential relationships between them and to formulate researchable hypothesis.
- To identify appropriate methodology, research design, methods of measuring concepts and techniques of analysis.
- To identify data sources used by other researchers.
- To learn how others structured their reports.

Chapter -2: Review of Literature (Contd.)

How to conduct the Literature Survey?

- Identify the relevant sources.
- Extract and Record relevant information.
- Write-up the Literature Review.

Chapter -2: Review of Literature (Contd.)

SOURCES OF LITERATURE

- Books and Journals
- Electronic Databases
  - Bibliographic Databases
  - Abstract Databases
  - Full-Text Databases
- Govt. and Industry Reports
- Internet
- Research Dissertations / Thesis

Chapter -2: Review of Literature (Contd.)

RECORDING THE LITERATURE

- The most suitable method of recording notes is the card system.
- The recording system involves use of two sets of cards:
  - Source cards (3”x 5”) – used for noting bibliographic information.
  - Note cards (5”x 8”) – used for actual note taking.

Chapter -2: Review of Literature (Contd.)

How to write the review?

- There are several ways of presenting the ideas of others within the body of the paper.
- For Example; If you are referring the major influencing factors in the Sheth's model of Industrial Buying Behaviour, it can be written as,

1) Sheth (1973, p-50) has suggested that, there are a number of influencing factors ……..
2) According to Sheth (1973) model of industrial buying behaviour, there are a number of influencing factors……..

In some models of industrial buying behaviour, there are a number of influencing factors (Sheth, 1973).

In some models of industrial buying behaviour, there are a number of influencing factors[1].

1. Sheth J.N (1973), A Model of Industrial Buying Behaviour, Journal of Marketing, 37(4), 50-56.

Chapter -2: Review of Literature (Contd.)

Points to be kept in mind while reviewing literature..

- Read relevant literature.
- Refer original works.
- Read with comprehension.
- Read in time.
- Index the literature.

Chapter -3: Formulation of Hypothesis

HYPOTHESIS

- A hypothesis is an assumption about relations between variables.

- Hypothesis can be defined as a logically conjectured relationship between two or more variables expressed in the form of a testable statement.

Relationships are conjectured on the basis of the network of associations established in the theoretical framework formulated for the research study.

Chapter -3: Formulation of Hypothesis (Contd.)

VARIABLES

- Anything that can vary can be considered as a variable.

- A variable is anything that can take on differing or varying values.

For example; Age, Production units, Absenteeism, Sex, Motivation, Income, Height, Weight etc.

Note: The values can differ at various times for the same object or person (or) at the same time for different objects or persons.

Chapter -3: Formulation of Hypothesis (Contd.)

Variable / Attribute

- A variable is a characteristic that takes on two or more values whereas, an attribute is a specific value on a variable (qualitative).

For example;

- The variable SEX/GENDER has 2 attributes - Male and Female.
- The variable AGREEMENT has 5 attributes – Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree.

Chapter -3: Formulation of Hypothesis (Contd.)

Types of Variables

- **Explanatory vs Extraneous Variable**

  The variables selected for analysis are called explanatory variables and all other variables that are not related to the purpose of the study but may affect the dependant variable are extraneous.

- **Dependant vs Independent Variable**

  The variable that changes in relationship to changes in another variable(s) is called dependant variable.

  The variable whose change results in the change in another variable is called an independent variable.

  OR

  An independent variable is the one that influences the dependant variable in either a positive or negative way.

Chapter -3: Formulation of Hypothesis (Contd.)

HYPOTHESIS

- Research Hypothesis is a predictive statement that relates an independent variable to a dependant variable.

  Hypothesis must contain atleast one independent variable and one dependant variable.
- Hypothesis are tentative, intelligent guesses as to the solution of the problem.
- Hypothesis is a specific statement of prediction. It describes in concrete terms what you expect to happen in the study.
- Hypothesis is an assumption about the population of the study.
- It delimits the area of research and keeps the researcher on the right track.

Chapter -3: Formulation of Hypothesis (Contd.)

PROBLEM (VS) HYPOTHESIS

- Hypothesis is an assumption, that can be tested and can be proved to be right or wrong.

- A problem is a broad question which cannot be directly tested. A problem can be scientifically investigated after converting it into a form of hypothesis.

Chapter -3: Formulation of Hypothesis (Contd.)

CHARACTERISTICS OF HYPOTHESIS

- Conceptual Clarity - It should be clear and precise.
- Specificity - It should be specific and limited in scope.
- Consistency - It should be consistent with the objectives of research.
- Testability - It should be capable of being tested.
- Expectancy - It should state the expected relationships between variables.
- Simplicity - It should be stated as far as possible in simple terms.
- Objectivity - It should not include value judgments, relative terms or any moral preaching.
- Theoretical Relevance - It should be consistent with a substantial body of established or known facts or existing theory.
- Availability of Techniques – Statistical methods should be available for testing the proposed hypothesis.

Chapter -3: Formulation of Hypothesis (Contd.)

SOURCES OF HYPOTHESIS

- Discussions with colleagues and experts about the problem, its origin and objectives in seeking a solution.
- Examination of data and records for possible trends, peculiarities.
- Review of similar studies.
- Exploratory personal investigation / Observation.
- Logical deduction from the existing theory.
- Continuity of research.
- Intuition and personal experience.

TYPES OF HYPOTHESIS

- **Descriptive Hypothesis**

  These are assumptions that describe the characteristics (such as size, form or distribution) of a variable. The variable may be an object, person, organization, situation or event.

Examples:

- **"Public enterprises are more amenable for centralized planning".**

Chapter -3: Formulation of Hypothesis (Contd.)

- **Relational Hypothesis** [Explanatory Hypothesis]

  These are assumptions that describe the relationship between two variables. The relationship suggested may be positive, negative or causal relationship.

Examples:

- "Families with higher incomes spend more for recreation".

Causal Hypothesis state that the existence of or change in one variable causes or leads to an effect on another variable. The first variable is called the independent variable and the latter is the dependant variable.

Chapter -3: Formulation of Hypothesis (Contd.)

Null Hypothesis

When a hypothesis is stated negatively, it is called null hypothesis. It is a 'no difference', 'no relationship' hypothesis. ie., It states that, no difference exists between the parameter and statistic being compared to or no relationship exists between the variables being compared.

It is usually represented as H_O or H_0.

Example:

- H_0: There is no relationship between a family's income and expenditure on recreation.

Alternate Hypothesis

It is the hypothesis that describes the researcher's prediction that, there exist a relationship between two variables or it is the opposite of null hypothesis. It is represented as H_A or H_1.

Example:

H_A: There is a definite relationship between family's income and expenditure on recreation.

Chapter -3: Formulation of Hypothesis (Contd.)

- If X increases, Y increases
- A **POSITIVE** relationship
- If X increase, Y decreases
- A **NEGATIVE** or **INVERSE** relationship
- As X changes, Y does NOT change...>
- No Change...>**NO RELATIONSHIP**

Chapter -3: Formulation of Hypothesis (Contd.)

FUNCTIONS OR ROLE OF HYPOTHESIS

- It gives a definite point to the investigation and provides direction to the study.
- It determines the data needs.
- It specifies the sources of data.
- It suggests which type of research is likely to be more appropriate.
- It determines the most appropriate technique of analysis.
- It contributes to the development of theory.

Cross-Sectional Design

- A cross-sectional design is used for research that collects data on relevant variables one time only from a variety of people, subjects, or phenomena.
- A cross-sectional designs provides a snapshot of the variables included in the study, at one particular point in time.
- Cross-sectional designs generally use survey techniques to gather data, for example, the U.S. Census.

Longitudinal Designs

- A longitudinal design collects data over long periods of time.

- Measurements are taken on each variable over two or more distinct time periods.

- This allows the researcher to measure change in variables over time.

Time Series Design

- A **Time Series Design** collects data on the same variable at regular intervals in the form of aggregate measures of a population.
- Time series designs are useful for:
  - establishing a baseline measure
  - describing changes over time
  - keeping track of trends
  - forecasting future (short term) trends

Panel Designs

- **Panel Designs** collect repeated measurements from the same people or subjects over time.
- Panel studies reveal changes at the individual level.
- Advantages: reveals individual level changes, establishes time order of variables, can show how relationships emerge
- Disadvantages: difficult to obtain initial sample of subjects, difficult to keep the same subjects over time, repeated measures may influence subjects behavior