

# Research methodology

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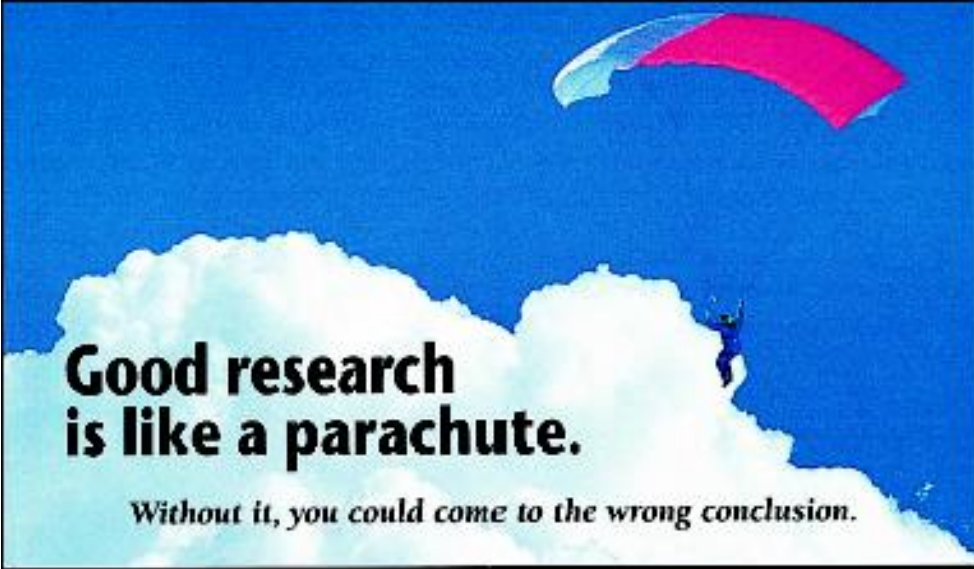
# Learning Objectives

## Understand . . .

What research is and how it differs from decision support systems and intelligence systems  
trends affecting research and the emerging hierarchy of decision makers  
the distinction between good research and research that falls short of professional quality  
the value of learning research  
process skills

# Why Study Research Methodology?

Research Methodology provides information to guide decisions



**Good research is like a parachute.**

*Without it, you could come to the wrong conclusion.*

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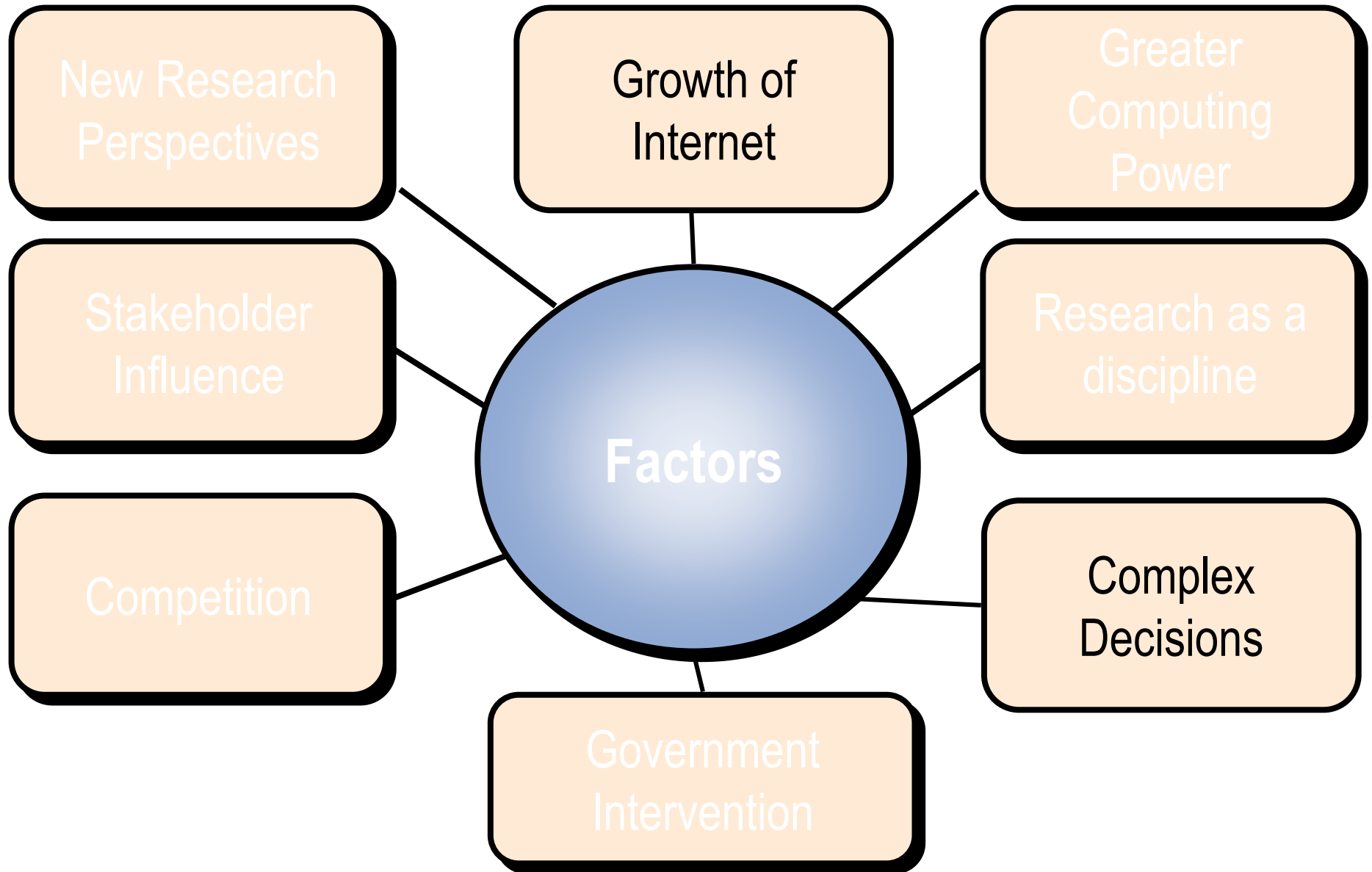
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# Research Defined

A process of **determining, acquiring, analyzing, synthesizing, and disseminating** relevant **data, information, and insights** to decision makers in ways that mobilize the organization to take appropriate **actions** that, in turn, **maximize performance**

# Studying Research



# What is Research ?

1. **A voyage of discovery; A journey; An attitude; An experience; A method of critical thinking; A careful critical enquiry in seeking facts for principles**
2. **An art of scientific investigation**
  - Scientific and systematic search for pertinent information on a specific topic**
  - Process of arriving at dependable solutions to problems through the planned and systematic collection, analysis and interpretation of data**
3. **A systematized effort to gain new knowledge; A movement from the known to the unknown**
  - Search for (new) knowledge/ facts through objective, systematic and scientific method of finding solution to a problem**
  - Implicit question + Explicit answer + data to answer the question**
  - Not synonymous with commonsense, but systematic, objective (purposeful), reproducible, relevant activity having control over some factors**
4. **An activity caused by instinct of inquisitiveness to gain fresh insight / find answers to question / acquire knowledge**

*In a broad sense, everyone does research, but don't write it up; Without trustworthy and tested published research available we are dangerously lost in the experience, opinions and hearsay*

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# Research Methodology

- **A science of studying how research is done scientifically**
- **A way to systematically solving the research problem by logically adopting various steps**
- **Methodology helps to understand not only the products of scientific inquiry but the process itself**
- **Aims to describe and analyze methods, throw light on their limitations and resources, clarify their presuppositions and consequences, relating their potentialities to the twilight zone at the 'frontiers of knowledge'**

# Benefits of Research Methodology

- 1. Advancement of wealth of human knowledge**
- 2. 'Tools of the trade' to carry out research; Provides tools to look at things in life objectively**
- 3. Develops a critical and scientific attitude, disciplined thinking or a 'bent of mind' to observe objectively (scientific deduction & inductive thinking); Skills of research will pay-off in long term particularly in the 'age of information' (or too often of misinformation)**
- 4. Enriches practitioner and his practices; Provides chance to study a subject in depth; Enable us to make intelligent decisions; Understand the material which no other kind of work can match**
- 5. As consumers of research output helps to inculcate the ability to evaluate and use results of earlier research with reasonable confidence and take rational decisions**
- 6. Doing research is the best way to learn to read and think critically**

# 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.**

# 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 carry out 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.

# 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.**

# 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.**

# 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**

# 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.**

# 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.

# Some other types of research..

- **One-time Research** – Research confined to a single time period.
- **Longitudinal Research** – Research carried on over several time periods.
- **Diagnostic Research** – It is also called clinical research which aims at identifying the causes of a problem, frequency with which it occurs and the possible solutions for it.
- **Exploratory Research** – It is the preliminary study of an unfamiliar problem, about which the researcher has little or no knowledge. It is aimed **to gain familiarity with the problem, to generate new ideas or to make a precise formulation of the problem.** Hence it is also known as formulative research.

- **Experimental Research** – It is designed to assess the effect of one particular variable on a phenomenon by keeping the other variables constant or controlled.
- **Historical Research** – It is the study of past records and other information sources, with a view to find the origin and development of a phenomenon and to discover the trends in the past, in order to understand the present and to anticipate the future.

# Research Process

1. **Selection & formulation of Research Problem**
2. **Literature survey**
3. **Development of working hypotheses**
4. **Research design**
5. **Sampling strategy or sample design**
6. **Pilot (quick & dirty) study**
7. **Data collection**
8. **Processing & analysis of data**
9. **Testing hypotheses**
10. **Interpretation & generalisation**
11. **Preparation of the report**

**NOTE: 1. Above steps are not exhaustive, nor mutually exclusive, but a series of closely related, continuously overlapping and interdependent nonlinear steps/ actions**

**2. What lies ahead is hard work as well as pleasure of the hunt; some frustration, but more of satisfaction; periods of confusion, but confidence that, at the end, it will all come together**

# Ethics of Research

- ❑ As a profound social activity research connects us to those who will use it, to those whose research we used, through them, to the research that our sources used; Hence beyond technique, we need to think about ethics of civil communication
- ❑ In addition to construction of bonds within any community, ethics deal with a range of moral and immoral choices; Research challenges us to define individual moral principles; Academic researchers are less tempted to sacrifice principle for a gain than commercial researchers
  - ✓ *Plagiarism, claiming credit for results of others, misreport sources or invent results, data with questionable accuracy, concealing objections that cannot be rebutted, caricaturing or distorting opposing views, destroy or conceal sources and data important for those who follow*
- ❑ Beyond simple moral **Do not** to what we should affirmatively **do, i.e.**, concern for the integrity of the work of the community combined with narrow moral standards with the larger ethical dimension
- ❑ Research done in the best interests of others is also in your own

# Assesement-1

1. .... is conducted to solve a problem.
2. In ..... research, an examination of relationship that exists between independent and dependent variable is studied.
3. . ..... research is generally used by philosophers.
4. Descriptive research deals with ..... characteristics of the consumer
5. Evaluation research is an example of ..... research

# Assesement-1

- 6. Evaluation research is an example of ..... research
- . 19. Gathering knowledge for knowledge's sake is known as ..... research.

# Answer

- 1. Action research
- 2. Ex-post Facto
- 3. Conceptual
- 4 demographic
- 5. applied
- 6. basic