

UNIT-1

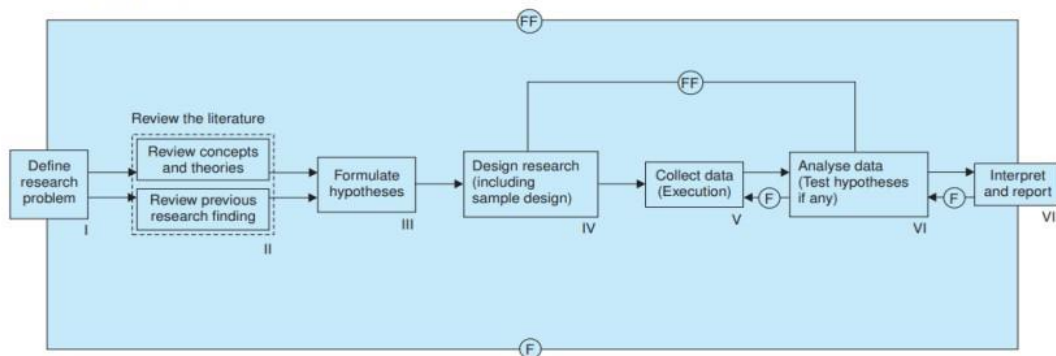
1. Briefly describe the different steps involved in a research process.

Research Process

Research process consists of series of actions or **steps** necessary to effectively carry out research and the desired sequencing of these **steps**. The chart shown in Figure below.

F- feed back

FF Feed forward



2. What is Research and What is the meaning of Research according to Clifford Woody?

Research is a systematic and organized process of inquiry that aims to discover, interpret, and increase knowledge or understanding of a particular subject. It involves the collection, analysis, and interpretation of data to answer a specific question or solve a problem. Research can be conducted in various fields, including science, social science, humanities, and business.

Clifford Woody, an American sociologist and researcher, is known for his definition of research. According to Woody:

"Research is a process of steps used to collect and analyze information to increase our understanding of a topic or issue."

Meaning of Research According to Clifford Woody Research means

- Defining and redefining problems, and formulating hypotheses/objectives.
- Collecting, organizing, and evaluating data
- Making deductions and reaching conclusions

- Testing the conclusions to determine whether they fit the formulating hypothesis/objectives.

3. What do you mean by research? Explain its significance in modern times.

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“All progress is born of inquiry. Doubt is often better than overconfidence, for it leads to inquiry, and inquiry leads to invention”- Hudson Maxim.

- For educationists, in studying various educational problems and in seeking solutions to the various educational problems.
- For social scientist, in studying social relationships and seeking answers to various social problems.
- Provides the basis nearly for all government policies and our economic system.
- For solving various operational and planning problems of businesses and industries.
- It inculcates scientific and inductive thinking.
- It promotes the development of logical habits of thinking and organization.
- To understand the new development in one's field in better way.

4. Distinguish between Research methods and Research methodology.

- **Research method:** It may be understood as all those methods/techniques used for conducting research. Research methods or techniques, thus, refer to the methods the researchers use in performing research operations.
- **Research Methodology:** It is a way to systematically solve the research problem. It may be understood as a science of studying how research is done scientifically. In it, we study the various steps that are generally adopted by a researcher in studying his research problem along with the logic behind them.

Methods	Methodology
The objective of methods is to find solution to the research problem.	The objective of methodology is to determine appropriateness of the methods applied with a view to ascertain solution.
Methods are just behavior or tools used to select a research technique.	Methodology is analysis of all the methods and procedures of the investigation.
Methods are applied during the later stage of the research study.	Methodologies are applied during the initial stage of the research process.
It comprises different investigation techniques of the study.	It is a systematic strategy to find solution to the research problem.
Methods encompasses of carrying out experiments, conducting surveys, tests, etc.	Methodology encompasses several techniques used while conducting these experiments, surveys, tests, etc.

5. Describe the several types of research.

Descriptive vs. Analytical:

- **Descriptive research** includes surveys and fact-finding enquiries of different kinds. The major purpose of descriptive research is a description of the state of affairs as it exists at present. The main characteristic of this method is that the researcher has no control over the variables; he can only report what has happened or what is happening.

- **Analytical research:** this kind of researcher has to use facts or information already available and analyze these to make a critical evaluation of the material Applied vs. Fundamental:
- Research can either be applied (or action) research or fundamental (to basic or pure) research.
- **Applied research** aims at finding a solution for an immediate problem facing a society or an industrial/business organization.
- **Fundamental research** is mainly concerned with generalizations and with the formulation of a theory.

Quantitative vs. Qualitative:

- **Quantitative research** is based on the measurement of quantity or amount. It is applicable to phenomena that can be expressed in terms of quantity.
- **Qualitative research**, on the other hand, is concerned with qualitative phenomenon, i.e., phenomena relating to or involving quality or kind.

Conceptual vs. Empirical:

- **Conceptual research** is related to some abstract idea(s) or theory. It is generally used by philosophers and thinkers to develop new concepts or to reinterpret existing ones.
- **Empirical research** relies on experience or observation alone, often without due regard for system and theory. It is databased research, coming up with conclusions that are capable of being verified by observation or experiment.

Longitudinal research:

- If the research is based on either the purpose of research, or the time required to accomplish research, or on the environment in which research is done then such kind of research is called one-time research or longitudinal research.

Laboratory research:

- if research is carried on over several time periods then such research is named as laboratory research or simulation research.

Clinical or diagnostic research:

- if research follow case-study methods or in-depth approaches to reach the basic causal relations then its called clinical or diagnostic research.

6. Discuss the objectives of the research.

Each research study has its own specific purpose, we may think of research objectives as falling into a number of following broad groupings:

- To gain familiarity with a phenomenon or to achieve new insights into it (studies with this object in view are termed as exploratory or formulative research studies)
- To portray accurately the characteristics of a particular individual, situation or a group (studies with this object in view are known as descriptive research studies)
- To determine the frequency with which something occurs or with which it is associated with something else (studies with this object in view are known as diagnostic research studies)
- To test a hypothesis of a causal relationship between variables (such studies are known as hypothesis testing research studies).

7. Write short notes on:

1.Design of the research project

The design of a research project is a crucial aspect that outlines the overall plan and structure of the study. It involves making decisions on various elements to ensure that the research is conducted effectively and yields reliable results. Here are key considerations in the design of a research project:

1.	Research Questions or Objectives:	<ul style="list-style-type: none">Clearly define the research questions or objectives that the study aims to address. These questions guide the entire research process and help focus efforts on relevant information.
2.	Research Type and Approach:	<ul style="list-style-type: none">Decide on the type of research (e.g., exploratory, descriptive, experimental) and the approach (qualitative, quantitative, or mixed methods) that aligns with the research goals. This choice influences the methods and tools used for data collection and analysis.
3.	Sampling Strategy:	<ul style="list-style-type: none">Determine the target population and select a sampling strategy. Whether using random sampling, stratified sampling, or other methods, this decision affects the representativeness of the study's findings.
4.	Data Collection Methods:	<ul style="list-style-type: none">Choose appropriate methods for gathering data. Common methods include surveys, interviews, observations, experiments, or a combination of these. The selection should align with the research questions and the nature of the phenomenon being studied.
5.	Variables and Measurement:	<ul style="list-style-type: none">Identify the variables under investigation and define how they will be measured. This includes selecting measurement tools or instruments and ensuring they are valid and reliable.
6.	Data Analysis Plan:	<ul style="list-style-type: none">Outline the plan for data analysis. Specify the statistical or qualitative techniques that will be used to interpret the data. This helps ensure that the analysis aligns with the research questions and objectives.

2.Motivation in research

The possible motives for doing research may be either one or more of the following:

1. Desire to get a research degree along with its consequential benefits.
2. Desire to face the challenge in solving unsolved problems,

i.e., concern over practical problems initiates research.

3. Desire to get the intellectual joy of doing some creative work.
4. Desire to be of service to society.
5. Desire to get respectability

3. Objectives of research

Objective of Research: Each research study has its specific purpose; we may think of research objectives as falling into several following broad groupings:

1. To gain familiarity with a phenomenon or to achieve new insights into it (studies with this object in view are termed exploratory or formulative research studies)
2. To portray accurately the characteristics of a particular individual, situation, or group (studies with this object in view are known as descriptive research studies)
3. To determine the frequency with which something occurs or with which it is associated with something else (studies with this object in view are known as diagnostic research studies)
4. To test a hypothesis of a causal relationship between variables (such studies are known as hypothesis-testing research studies).
5. **Research and scientific method.** The scientific method of research

The scientific method is a systematic step-by-step procedure following the logical processes of reasoning.

- Used to gain knowledge of the universe.
- According to Karl Pearson “Scientific method is one and same in all branches”.
- It refers to the procedure and mode of investigation.

Basics of the scientific method:

- Reliance on empirical evidence.
- Use of relevant concepts.
- Commitment to objectivity.
- Ethical neutrality
- Generalization
- Verifiability
- Logical reasoning process.

8. Describe fully the techniques of defining a research problem.

The techniques involved are:

- Statement of the problem in a general way
- Understanding the nature of the problem
- Surveying the available literature
- Developing ideas through discussions
- Rephrasing the research problem into a working proposition.

9. What is the research problem? Define the main issues which should receive the attention of the researcher in formulating the research problem.

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

- In a research process, the research problem is the first and foremost step.
- It can either be a real-life situation or it may also refer to a set of opportunities.

There are two types of research problems:

1. Problem which relates to states of nature E.g. – Status of working children in any Metropolitan city in 2012

2. Problems that relate to relationships between variables. E.g. – The lack of chemical fertilizer is the main cause of the low production of grain food.

9. How do you define a research problem?

Choose a Topic: Select a general area of interest for your research.

Review Existing Knowledge: Look at what's already known in the chosen area through a preliminary review of literature.

Identify Gaps: Find gaps or unanswered questions in the existing knowledge.

Narrow Focus: Decide on a specific aspect within your chosen topic to explore.

Formulate a Question or Statement: Clearly state the research problem in the form of a question or statement.

Define Objectives or Hypotheses: Outline specific goals or testable predictions for your research.

Consider Feasibility: Assess whether your research is doable with available resources and within time constraints.

Ensure Researchability: Confirm that your research problem can be studied systematically using empirical methods.

Seek Feedback: Share your problem definition with others to get input and improve clarity.

Refine Based on Feedback: Adjust your problem definition based on constructive feedback.

Document Definition: Clearly document the finalized definition of your research problem.

Precision and Relevance: Ensure that your problem is precise, relevant, and addresses a real gap in knowledge.

Avoid Vagueness: Stay away from problems that are too broad, vague, or impossible to study.

Manageable Scope: Ensure that the scope of your research is manageable within available resources.

Consider Ethical Concerns: Keep ethical considerations in mind when defining your research problem.

Researchable: Confirm that your problem can be researched and studied empirically.

Feasible Timeframe: Ensure your research can be completed within a reasonable timeframe.

Engage with Peers: Discuss your problem with peers, mentors, or experts for valuable input.

Iterate as Needed: Refine and iterate on your problem definition based on feedback and further thoughts.

Foundational Document: Consider your defined research problem as the foundational document for your research journey.

10.What is the necessity of defining a research problem?

Necessity of defining the research problem

- To avoid deviating from the goal, the definition of a problem sets the direction of the study.
- To derive the objective
- Proper methodology and selection of study
- Selection of variables of the study
- Clarity for readers
- Definition helps the researchers control the subjectivity or biases of the researcher
- Makes study feasible

10.Write a short note on:

a.Experience survey.

Definition: An experience survey is a research method that gathers information from individuals who have direct or indirect experience with a specific topic, product, or situation.

Purpose: It aims to capture firsthand insights and opinions by engaging participants who possess practical knowledge or observations related to the subject under investigation.

Participants: Individuals with diverse backgrounds and experiences are involved, providing a range of perspectives on the topic.

Data Collection: Information is gathered through interviews, questionnaires, or conversations, allowing participants to share detailed narratives about their experiences.

Subjectivity: The emphasis is on subjective insights, allowing participants to express their perceptions, preferences, and opinions based on personal experiences.

Application Areas: Experience surveys find applications in marketing, product development, social sciences, and healthcare, providing valuable insights into user satisfaction, preferences, or the effectiveness of interventions.

Open-Ended Questions: Questions are often open-ended, encouraging participants to express themselves freely rather than selecting from predetermined responses.

Qualitative Analysis: Data collected is qualitatively analyzed, focusing on themes, patterns, and nuances within participants' responses.

Iterative Process: Findings from experience surveys can inform the refinement of research questions, hypotheses, or the development of subsequent research instruments.

Limitations: While valuable for exploring subjective experiences, experience surveys may be subject to biases such as selective memory, and they may benefit from complementing with other research methods for a more comprehensive understanding

b. Pilot survey.

Definition: A pilot survey is a small-scale, preliminary study conducted before the main research to test and refine research instruments and methodologies.

Objective: The primary purpose of a pilot survey is to identify and address potential issues or challenges in data collection, ensuring the effectiveness of the research design.

Sample Size: Involves a smaller sample size compared to the main study, providing a manageable group for testing without the resource commitment of a full-scale investigation.

Instrument Testing: Tests the research instruments, such as questionnaires or interview protocols, to ensure clarity, relevance, and appropriateness for the target audience.

Procedure Refinement: Helps refine the procedures and logistics of data collection, identifying any practical challenges that may arise during the main study.

Feedback Collection: Gathers feedback from participants regarding the survey experience, question comprehension, and overall feasibility of the research process.

Data Analysis: Conducts a preliminary analysis of the collected data to identify trends or patterns that may guide adjustments to the research approach.

Time and Cost Efficient: Offers a cost-effective and time-efficient means of addressing potential issues before committing to a larger-scale research project.

a. Components of a research problem

- An individual or a group or an organization that has some difficulty or problem
- Some objectives to be attained
- Alternative means for attaining the objectives
- Some doubt in the mind of a researcher regarding the selection of alternatives
- Some environment(s) to which the difficulty pertains

d. Rephrasing the research problem

Understand the Original Problem: Begin by thoroughly understanding the original research problem or question.

Identify Key Components: Break down the problem into its key components and concepts to better grasp its nuances.

Consider Different Perspectives: Look at the problem from various angles to identify potential alternative ways of expressing the same underlying issue.

Clarify Ambiguous Terms: Address any ambiguous terms or unclear language in the original problem statement to enhance precision.

Use Synonyms: Replace certain words or phrases with synonyms to introduce variety and explore different ways of conveying the same idea.

Simplify Language: Strive for simplicity in language without compromising the depth and specificity of the research problem.

Focus on Core Objectives: Revisit the core objectives of the study and ensure that the rephrased problem aligns with these objectives.

Consider Audience Understanding: Keep the intended audience in mind, ensuring that the rephrased problem is accessible and understandable to the target readership.

10. Elaborate on research approaches.

Mainly there are two basic approaches to research, the quantitative approach and the qualitative approach.

Qualitative approach:

- This involves the generation of data in quantitative form which can be subjected to rigorous quantitative analysis in a formal and rigid fashion.
- This approach can be further sub-classified into inferential, experimental and simulation approaches to research.
- The purpose of the inferential approach is to form a database to conclude characteristics or relationships of the population. This usually means survey research where a sample of the population is studied to determine its characteristics, and it is then inferred that the population has the same characteristics.

- Experimental approach is characterized by much greater control over the research environment and in this case some variables are manipulated to observe their effect on other variables.

Qualitative approach:

- This research approach is concerned with the subjective assessment of attitudes, opinions and behavior. Research in such a situation is a function of researcher's insights and impressions. Such an approach to research generates results either in non-quantitative form or in the form which are not subjected to rigorous quantitative analysis. Generally, the techniques of focus group interviews, projective techniques and depth interviews are used.

10. Discuss about Literature Review

What is a Literature Review?

- A literature review is the research and evaluation of the available literature in your chosen topic area. It includes a survey of scholarly sources to provide an overview of the current research and available data and knowledge.
- These sources include books, journal articles, and newspapers, that relate to your research question.
- Moreover, it not only summarizes the sources. But it also analyzes, interprets, and evaluates the relevant theories, methods, points of view, and gaps in the existing literature.
- However, this does not mean that a literature review is based on previous searches only. The writer discusses the research question and its various aspects and discusses the relevant study to support this claim.

Importance of a Good Literature Review?

Some of the key reasons to add a literature review into your research paper, thesis, and dissertation include:

- It shows that the writer is familiar with the topic and the relevant literature.
- It helps to develop a theoretical framework and methodology for the research.
- It enables you to identify a research gap and contribute to filling that void by contributing to the field.
- It resolves any conflicts between the previous studies.
- Identify and highlight gaps and shortcomings in the existing body of knowledge and how things need to change.
- Convey to readers how your study is different or how it contributes to the research area.

How long should a literature review be?

- Ideally, the literature review should take up 15%-40% of the total length of your manuscript. So, if you have a 10,000word research paper, the minimum word count could be 1500.
- Your literature review format depends heavily on the kind of manuscript you are writing — an entire chapter in case of doctoral theses, a part of the introductory section in a research article, to a full-fledged review article that examines the previously published research on a topic.

Different types of literature reviews

- All literature reviews are not the same. There are a variety of possible approaches that you can take. It all depends on the type of research you are pursuing.

Here are the different types of literature reviews:

1. Argumentative review: It is called an argumentative review when you carefully present literature that only supports or counters a specific argument or premise to establish a viewpoint.
2. Methodological review: This approach delves into the "how" and the "what" of the research question, you cannot look at the outcome in isolation; you should also review the methodology used.

3. Systematic review: This form consists of an overview of existing evidence pertinent to a clearly formulated research question, which uses pre-specified and standardized methods to identify and critically appraise relevant research and collect, report, and analyze data from the studies included in the review.
4. Meta-analysis review: Meta-analysis uses statistical methods to summarize the results of independent studies. By combining information from all relevant studies, meta-analysis can provide more precise estimates of the effects than those derived from the individual studies included within a review.
5. Historical review: Historical literature reviews focus on examining research throughout a period, often starting with the first time an issue, concept, theory, or phenomenon emerged in the literature, then tracing its evolution within the scholarship of a discipline. The purpose to place research in a historical context to show familiarity with state-of-the-art developments and identify future research's likely directions.
6. Scoping Review: The Scoping Review is often used at the beginning of an article, dissertation, or research proposal. It is conducted before the research to highlight gaps in the existing body of knowledge and explains why the project should be greenlit.
7. State-of-the-Art Review: The State-of-the-Art review is conducted periodically, focusing on the most recent research. It describes what is currently known, understood, or agreed upon regarding the research topic and highlights where there are still disagreements.

How to Write the literature review:

- There are five key steps to writing a literature review:
 - i. Search for relevant literature
 - ii. Evaluate sources
 - iii. Identify themes, debates, and gaps
 - iv. Outline the structure
 - v. Write your literature review

UNIT-2

1. Explain different types of Research Design.

Different types of research design are:

- **Exploratory research design:** This is used when the researcher does not know much about the problem and wants to gain background information, define terms, clarify problems and hypotheses, and establish research priorities. It uses methods such as secondary data analysis, experience surveys, case analysis, and focus groups.
- **Descriptive research design:** This is used when the researcher wants to describe the characteristics of a population or phenomenon. It answers questions of who, what, where, when, and how. It uses methods such as cross-sectional studies and longitudinal studies.
- **Experimental research design:** This is used when the researcher wants to test the causal relationships between variables. It involves manipulating the independent variables and measuring their effects on the dependent variables. It uses methods such as two-group simple randomized design, randomized block design, factorial design, hybrid design, and covariance design.

2. Explain the basic principles of experimental design.

The basic principles of experimental design are:

1. **Control:** The researcher must control all other variables that could influence the outcome of the experiment. This is done by using a control group which is like the experimental group but is not exposed to the independent variable.
 2. **Randomization:** The subjects of the experiment should be randomly assigned to either the experimental group or the control group. This ensures that the experiment does not suffer from selection bias.
 3. **Replication:** The experiment should be repeated multiple times to ensure that the results are not due to chance. The more times an experiment is replicated, the more confidence we can have in the results.
 4. **Blocking:** If there are known variables that can influence the outcome of the experiment, the researcher can arrange the subjects into blocks based on these variables. This is done to isolate the effect of the independent variable.
3. Explain important experimental research design.

Important experimental research designs are:

- **Two group simple randomized design:** This design involves randomly selecting a sample from the population and then randomly assigning them to two groups: experimental and control. The experimental group receives a treatment of the independent variable, while the control group does not. The difference in the outcomes of the dependent variable between the two groups is then measured. This design is simple and reduces the bias due to individual differences, but it does not control for other extraneous variables that may affect the results.
- **Randomized block design:** This design involves dividing the sample into homogeneous blocks based on a variable that is related to the dependent variable. Within each block, the subjects are randomly assigned to different treatments of

the independent variable. This design reduces the variability due to the blocking variable and allows for a better estimate of the experimental error, but it requires more subjects and more complex analysis than the simple randomized design.

- **Factorial design:** This design involves varying more than one independent variable at the same time and observing their effects on the dependent variable². The independent variables can have two or more levels, and the design can include interactions between the variables. This design allows for testing multiple hypotheses and exploring the complex relationships between the variables, but it also requires more subjects and more sophisticated analysis than the simpler designs.

4. Explain the design of sample surveys conducted and types of the sampling errors.

The main steps in designing a sample survey are:

- Define the population of interest and the research objectives.
- Choose a sampling method, such as random, systematic, or stratified sampling.

1. Random sampling: It is like drawing numbers from a box. • It protects from the influence of all features of our population even ones that we may not have thought about.
Randomizing makes sure that on the average the sample looks like the rest of the population.
2. Systematic sampling: Ex – A group can choose to interview every 4th person leaving the theatre after watching a movie.
3. Stratified sampling: Ex- A group may choose to interview only people of age, gender, etc.

Benefits of Each Method

- **Random Sampling**

- simple to use
- equal opportunity of being chosen, no bias

- **Systematic Sampling**

- more uniform coverage of population compared to random
- simpler to use (just interview every 4th person, do not need to constantly check the random numbers)

- **Stratified Sampling**

- more precise data when sampling a specific subset/group e.g. focus only on a specific age group or gender

Sampling errors are the errors that arise from using a sample instead of the entire population.

They include:

- a. Sampling variability: the difference between the sample statistic and the population parameter due to chance
- b. Sampling bias: the difference between the sample statistic and the population parameter due to a systematic error in the sampling process
- c. Non-response bias: the difference between the sample statistic and the population parameter due to the failure to obtain data from some sample units.
- d. Measurement error: the difference between the sample statistic and the population parameter due to the inaccurate or imprecise measurement of the data

5. Explain different methods used for data collection.

It is a process by which the researcher collects the information needed to answer the research problem. The task of data collection begins after a research problem has been defined and research design is chalked out.

3. Observations

- Observation is watching behavior of persons who are under observations as it actually happens without controlling it.
- It includes recording information without asking any questions.

ADVANTAGES

1. Directness
2. Natural environment
3. Non-verbal behavior

DISADVANTAGES

1. Lack of control
2. Difficulties in quantification
3. Smallness in sample size
4. No opportunity to learn past.

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4. Focus groups



A focus group is a group interview of approximately six to twelve people who share similar characteristics or common interests. Focus groups are useful for gathering in-depth information on perceptions,



insights, attitudes, experiences, or beliefs. Focus groups are a qualitative data collection method, meaning that the data is descriptive and cannot be measured numerically.



The main methods of data collection during a focus group discussion include audio and tape recording, note-taking and participant observation

ADVANTAGES

1. Quick and relatively easy to setup
2. The group dynamic can provide useful info. That individual data collection cannot provide.

DISADVANTAGES

1. Susceptible to facilitator bias
2. No valid info at individual level
3. The info is not a representative of other groups.

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5. Experiments

- An experiment is a data collection method where a researcher change some variables and observe their effect on other variables and observe their effect on other variables.
- The variables that manipulate are referred to as independent variable while the variables that change as a result of manipulation are dependent variables.
- Applied to different fields such as medical research, agriculture, sociology and psychology.

ADVANTAGES

1. High level of control
2. Excellent results
3. Applied to different fields
4. Allows researchers to utilize many variations.

DISADVANTAGES

1. Leads to artificial situation
2. Can take a lot of time and money
3. Affected by errors

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Secondary data



Data gathered and recorded by someone else prior to and for a purpose other than the current project



Secondary data is data that has been collected for another purpose. It involves less cost, time and effort



Secondary data is data that is being reused. Usually in a different context.



For example: data from a book.

External sources (Financial applications): Journals, newspapers, magazines, internet sources etc.

Internal sources (Marketing applications) : Sales records, cost information, customer feedback.

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6. Compare Primary and Secondary data

Comparison of Primary and Secondary data

Basis For Comparison	Primary Data	Secondary Data
Meaning	Primary Data Refers To The Firsthand Data Gathered By The Researcher Himself.	Secondary Data Means Data Collected By Someone Else Earlier.
Data	Real Time Data	Past Data
Process	Very Involved	Quick And Easy
Source	Survey, Observations, Expérimentes, Questionnaire, Personale Interview, Etc.	Government Publications, Websites, Books, Journal Articles, Internal Records Etc.
Cost Effectiveness	Expensive	Economical
Collection Time	Long	Short
Specific	Always Specific To The Researcher's Needs.	May Or May Not Be Specific To The Researcher's Need.
Available In	Crude Form	Refined Form
Accuracy And Reliability	More	Relatively Less

7. Explain the importance of interpretation of data collected.

Interpretation is the process of making in the sense of numerical data that has been collected, analysed, and presented. A common method of assessing numerical data is known as statistical data analysis and the activity of analysing and interpreting data to make prediction is known as inferential statistics.

Interpretation refers to the task of drawing inferences from the collected facts after an analytical and or experimental study.

Interpretation helps to:

- i. Explain the meaning and significance of the results in relation to the research problem and objectives.
- ii. Identify the patterns, trends, relationships, and differences among the data.
- iii. Draw conclusions and inferences based on the data analysis and the theoretical framework.
- iv. Provide implications and recommendations for further research, policy, or practice.
- v. Communicate the findings to the relevant audience in a clear and concise manner.

8. Explain the steps involved in report writing.

Report writing

“A report is a statement of the result of an investigation or of any matter on which definite information is required”.

Different steps in writing report

1. Logical analysis of the subject matter:-

- Primarily concerned with the development of a

Report writing

2.Preparation of the final outline

- Outlines are the framework upon which long written works are constructed.
- They are an aid to the logical organization of the material and a reminder of the points to be stressed in the report.”

3. Preparation of the rough draft

- This follows the logical analysis of the subject and the preparation of the final outline.
- Such a step is of utmost importance for the researcher now sits to write down what he has done in the context of his research study.

Report writing

- He will write down the procedure adopted by him in collecting the material for his study along with various limitation faced by him.
- The various suggestion he wants to offer regarding the problem concerned.

4. Rewriting and polishing of the rough draft.

- This step happens to be most difficult part of all formal writing.
- "In addition the researcher should give due attention to fact that in his rough draft he has been consistent or not. He should the mechanics of writing- grammer, spelling and usage.

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Report writing

5. Preparation of the final bibliography:-

- Next in order come the task of the preparation of the final bibliography. The bibliography ,which is generally appended to the research report.
- The bibliography should be arranged alphabetically.
- Generally this pattern of bibliography is considered convenient and satisfactory from the point of view of reader.

Report writing

6. Writing the final draft:-

- The final draft should be written in a concise and objectives style and in simple language.
- Avoiding vague expression such as a "it seems", "there may be ", and the like once.
- It must be remembered that every report should be an attempt to solve some intellectual problem and must contribute to the solution of a problem and must add to the knowledge of both the researcher and the reader.

UNIT-3

1. What is a patent? Explain the conditions for patentability.

A patent is the granting of a property right by a sovereign authority to an inventor. This grant provides the inventor exclusive rights to the patented process, design, or invention for a designated period in exchange for a comprehensive disclosure of the invention. They are a form of [incorporeal right](#).

Government agencies typically handle and approve applications for patents. In the United States, the U.S. Patent and Trademark Office (USPTO), which is part of the Department of Commerce, handles applications and grants approvals.

KEY TAKEAWAYS

- A patent is the granting of a property right by a sovereign authority to an inventor.
- A patent provides the inventor exclusive rights to the patented process, design, or invention for a certain period in exchange for a complete disclosure of the invention.
- In June of 2018, the U.S. Patent and Trademark Office issued its 10 millionth patent.
- Utility patents are the most common patent issued in the United States, accounting for 90% of all issued patents.
- Utility and plant patents are granted for 20 years, whereas design patents are granted for either 14 or 15 years, depending on when filed.

Patentability Condition

The invention should satisfy 3 conditions to be patentable

Novelty:

- An invention must be new and not part of the existing body of knowledge in its respective field. This means that, before filing a patent application, the invention should not have been publicly disclosed, used, or described in any form anywhere in the world.

Non-Obviousness (Inventive Step):

- The invention must involve an inventive step or non-obviousness. This means that the invention should not be an obvious or straightforward development from what is already known in the field. If a person skilled in the relevant field would find the invention obvious based on existing knowledge, it may not meet the non-obviousness requirement.

Industrial Applicability:

- The invention should be capable of industrial application. It should be possible to make, use, or apply the invention in some kind of industry. This criterion is particularly relevant for utility patents.

2. What are the benefits of Intellectual Property rights.

Intellectual property rights not only protect the ideas or concepts of business but also protect the genuine business assets that are vital to the products and services.

Several advantages to secure intellectual property rights include:

- **Enhances market value** - Intellectual property rights can help you generate business through the licensing, sale and even commercialization of the products and services protected under IPRs. This will ultimately improve the market share and helps in raising profits. Having registered and protected intellectual property rights can also raise the business' value in case of sale, merger or acquisition.

- **Turn ideas and thoughts into profit-making assets** - Ideas have little value on their own but registering ideas under intellectual property rights can help you turn it into commercially successful products and services. Copyrighting or licensing the patents can lead to a steady stream of royalties and additional income.

- **Market your products and services** - Getting intellectual property rights can help your business' image. Intellectual property rights like trademark registration can help you separate your products and services from others.

- **Access or raise Capital** - Through sale, licensing, or by using IPRs as collateral for debt financing, an individual can monetize for debt financing. Intellectual property rights can be used as an advantage while applying for government funding like grants, subsidies, and loans.

- **Enhances export opportunities** – A business that has registered IPRs will be able to use brands and designs to market its products and services to other markets as well. A business can also tap

into the franchising agreements with overseas companies or export patented products.

3. Write short notes on:

a. Copy right

Copyright law protects the rights of the original creator of original works of

intellectual property. Unlike patents, copyrights must be tangible. For

instance, you can't copyright an idea. But you can write down an original speech, poem, or song and get a copyright.

Once someone creates an original work of authorship (OWA), the author automatically owns the copyright. But, registering with the U.S. Copyright Office gives owners a head-start in the legal system.

Exists automatically on creation of work

i. Legal registration enhances protection

Term

i. author's life + 70 years;

ii. lesser of 95 years from first publication or 120 years from creation

for works for hire

Creations and works of art

i. drawings/prints, musical works, text ii.

architectural plans, motion pictures,

software

iii. multimedia works internet-distributed content

b. Trademark

Trademarks protect logos, sounds, words, colors, or symbols used by a company to distinguish its service or product. Trademark examples include the Twitter logo, McDonald's golden arches, and the font used by Dunkin.

Although patents protect one product, trademarks may cover a group of products. The Lanham Act, also called the Trademark Act of 1946, governs trademarks, infringement, and service marks.

4. Trademark can be –

- sign , words, letters, numbers,
- drawings, pictures, emblem,
- colours or combination of colours,
- shape of goods,
- graphic representation or packaging or
- any combination of the above as applied to an article or a product.

c.Industrial designs

1. Industrial Design (three-dimensional) and Drawings (bidimensional) protect the external appearance of an object.
2. Industrial Designs and Drawings protection last 10 years from the filing date.
3. Aesthetic features of a product
4. Must be new, original and have an individual character
5. Adds value to the product by making it more appealing to consumers.
6. Enables customization of products to specific markets or target groups (e.g. women, children, etc.)

d.Geographical Indications

Geographical Indication is an indication which identifies goods as agricultural goods, natural goods or manufactured goods as originating, or manufactured in the territory of country, or a region or locality in that territory, where a given quality, reputation or other characteristic of such goods is essentially attributable to its geographical origin.

4. Why is it important to register intellectual property?

While talking about protecting IPRs, it is first necessary to understand the importance of registration. When an individual or an organization develops a new product, which involves a lot of processes, content, resources etc., a lot of time and money is invested. It is natural for the inventor or organization to have the expectation of being able to own exclusive rights over the invention, while excluding others from benefiting from it. This exclusivity is provided through IP systems and IP laws. Although it is not mandatory to register an IP or trademark, it provides the inventor certain advantages including the prima facie ownership proof that enables the owner to enforce IPR in a court of law, if deemed necessary. There are several dangers if IPRs are not protected. For instance, not protecting IP can result in getting benefits from the unprotected invention in an unauthorized manner to anyone. There is no law that can stop one from duplicating and seeking financial benefits from someone else's innovation if IP is not filed. Furthermore, it falls upon the owner to prove the ownership of the IP in a court of law if the IP is unregistered. If a trademark remains unprotected, the court cannot help the inventor, as it is not possible to claim ownership and/ or sue for infringement.

5. Need to protect IP

It is essential to protect IPRs. Firstly, inventors get exclusive control to use their IP to their benefits – both in terms of usage as well as financial benefits. The inventor can decide the price of the invention, the marketing and distribution channels and countless ways to turn a profit and earn a high return on investment.

Secondly, filing for IP allows the inventor to prohibit others from making financial benefits.

Thirdly, if a competitor violates the IP laws that protect the inventors, the inventor can exercise the right to file a court case against the party attempting to benefit from the invention. If found guilty, the court may award a financial reward to the inventor, to be paid by an individual or entity attempting to gain financial benefits from the invention attributed to the owner of the IP.

As such, IP rights are essential because they provide inventors the incentive to keep innovating and benefitting from their inventions.

Protecting IP is a complicated process that involves IP registration, followed by a long process of verifying the authenticity of the creation. The process – from registering IP to granting the patent, trademark, copyright or utility design involves a lot of research on the part of the individual or entity granting the IP. The entity granting the IP is required to ensure that the creation is original, authentic and not lifted from another innovation. It involves publishing the new creations in IP journals to fact-check any other individual or entity claiming IP rights against the same or similar creations.

The entire process – from registering to acquiring IP rights – can take anywhere between a few months to many years and includes various rounds of corrections on the part of the inventor.