

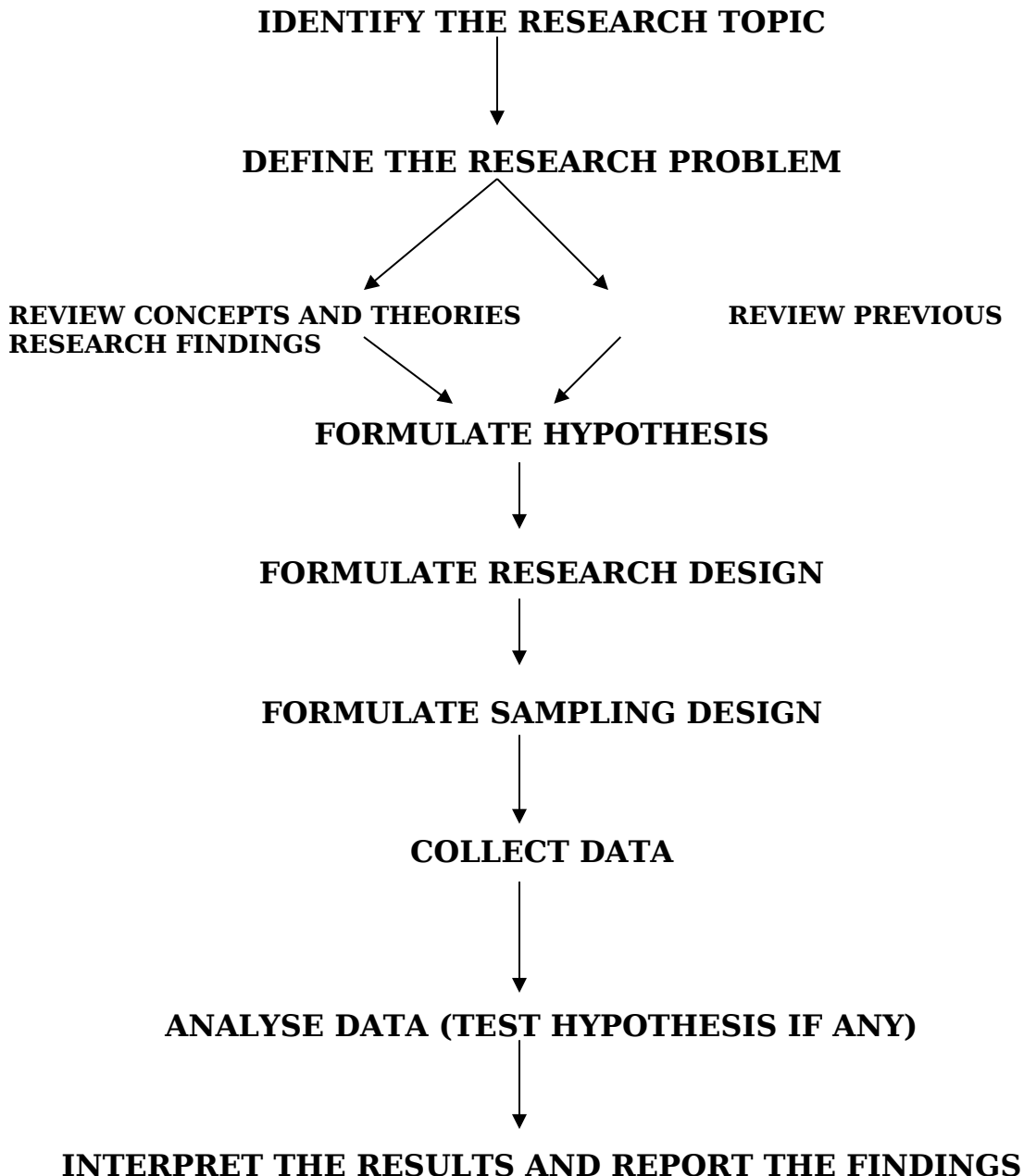
Unit-2

Research process and Problem formulation

Handout-2

The Research Process:

The research process consists of a series of actions or steps necessary to effectively carry out research and the desired sequencing of these steps. The following flow chart will illustrate the general research process:



The following order concerning the various steps provides a useful procedural guideline regarding the research process:

- (i) Identifying and formulating the research problem i.e., problem discovery and definition
- (ii) Extensive literature survey
- (iii) Developing the working hypothesis
- (iv) Preparing the research design i.e., selection of basic research method
- (v) Determining the sample design i.e., deciding on sampling technique
- (vi) Collecting data
- (vii) Analysis of the data
- (viii) Hypothesis testing
- (ix) Generalization and interpretations
- (x) Preparing the report and presentation of the results (formal write up of conclusions reached)

1. Identification of a Research topic/problem:

To do a research, a topic or a research problem must be identified. So, the first step in the research process is the choice of suitable problem for investigation. Research takes place when there is a problematic situation and a need to solve the problem. The identification of a research problem is a difficult phase of the entire research process.

Only when the problem is carefully and precisely defined can research be designed to provide pertinent information. Part of the process of problem identification includes specifying the objectives of the specific research that might be undertaken.

2. Literature Review:

It is also called document review or literature survey. It has to be directly related to the problem to be investigated. The materials to be reviewed may include academic journals, conference proceedings, dissertations, and government report, and policy report, publications of international organizations, books, and newsletters. The best place for the survey is library. In general, literature survey is used to familiarize oneself with the issue and establish credibility and to learn from other and stimulate new ideas.

3. Developing the hypothesis

Hypothesis is a tentative intelligent guess postulating from the purpose of directing the researcher towards the solution of problem. Or it is a statement which predicts the relationship between two or more variables. It is necessary link between theory and investigation, usually stated after an extensive survey of the literature.

Usually it is derived from the deductive logic of the objectives under investigation. A one-to-one correlation might exist between the objectives and their corresponding hypothesis. Thus there could be as many research hypotheses as there are objectives. There are also objectives that do not need formulation of hypothesis.

4. Determining research design

The sources of information for a study and the research design go hand in hand. They both depend upon how much is known about the problem. If little is known about the phenomenon to be investigated, exploratory research is feasible. If the problem is precisely and unambiguously formulated, descriptive or causal research is needed.

5. Design sample and collect data

Most of the empirical research depends on primary data, which are collected specifically for the study. Data collection method can be administered through observation, questionnaire, scheduling or indirect interviewing.

In designing the sample, the researcher must specify: (1) *the sampling frame* (2) *the sample selection process* (3) *the size of the sample*. The sampling frame is the list of population elements from which the sample will be drawn. The sample selection process requires that the form of the sample be specified. It can be either probability or non-probability sample. The decision on sample size involves determining how many elements should be studied to get sufficiently accurate and reliable answers that will allow a decision to be made regarding the problem without exceeding the time and money budgeted.

6. Analyze and interpret the data

The collected data are useless unless findings are analyzed and the results interpreted in the light of the problem at hand. Data analysis involves several steps. First, the data collection forms must be scanned to be sure that they are complete and consistent. This process is called *editing*. *Coding* involves assigning numbers to each of the answers so that they can be analyzed. The final step in analyzing data is *tabulation*, the orderly arrangement of data in a table or other summary format achieved by counting the frequency of responses to each question.

7. Prepare the research report

The research report summarizes the research results and conclusions. It is imperative that the research report be clear and accurate.

Problem formulation

What is a research problem?

It refers to some difficulty, which a researcher experiences in the context of either a theoretical or a practical situation and wants to obtain a solution for the problem. Generally, a research problem exists when there is /are.

- An individual or group, which has some difficulty or problem
- Some objectives to be attained
- Alternative measures
- Unanswered questions
- Some environment to which the difficulty pertains

Some potential source of research topic which may be helpful to a researcher for selecting a research problem may be suggested.

- a) **Own professional experience is the most important source.** In addition contacts and discussions with research oriented people, attending conferences, seminars and listening to the learned speakers
- b) **Inferences from theory and professional literature:** Research reports, bibliographies of books and articles, periodicals, research abstracts and research guides suggest areas that need research. In general a preliminary literature search is important in order to find out:
 - What other researchers have to say about the topic
 - Ensure that no one else has already exhausted the questions that you aim to examine
 - See how the topic has been discussed within the computing theoretical framework.
 - Make sure there is enough material available for you to work with productively.
- c) **Technological and social change:** New developments bring forth new development challenges for research. New innovations and changes need to be carefully evaluated through the research process.

The Research Question:

Usually the topics chosen are broad at first. It lacks focus for conducting research. Therefore it should be narrowed properly and focused into specific question. So, that the next step is to narrow down. Techniques that help us to narrow a research topic into research question:

- a) Examining of the past and present literature
- b) Discussing the idea with other people
- c) Applying the topic to specific context (specific time period, society or geographical unit or subgroups or categories etc)

- d) Defining the aim of the outcome (whether the research is exploratory research) ex: performance of agricultural industries performance of Awash Agro industry.

A topic is an area within a given field of study that you would like to explore in your research. It is the subject discussed or to be discussed.

Definition and the statement of the problem:

The next step is to clearly define the problem in unambiguous manner, i.e., explaining the problem in a clear and unambiguous term. A problem clearly defined is a problem half solved. If the problem is well defined it helps the researcher to:

- Discriminate relevant data from irrelevant ones
- To lay boundaries within which to study
- To be on the right track

Recommended steps in defining the research problem:

- a) Statement of the problem in general way
- b) Understand the nature of the problem more clearly i.e., by discussing it with others more acquainted or experienced people.
- c) Survey of the available literature, this would lead to review both empirical and theoretical literature this enables the researcher to:
 - Find out what data are available for operational purpose
 - Find out if there is gaps in theories
 - Find out whether the existing theory is applicable to the problem under study.
- d) Developing the ideas through discussion
 - It produces useful information
 - It sharpens his focus of attentions on a specific aspects of the study
 - Also called experience survey.
- e) Rephrasing the research problem: This helps to put the research problem in specific terms, as possible so that it may become operationally viable and may help in developing new hypothesis; Ex: research problem in broad terms “Why is productivity in Ethiopia lower than in other countries”, this has many ambiguities as to which set of productivity? Land, capital, labor....? With what industries is it related? With what period of time the productivity is being talked about?

Objectives of the study:

The next step after the statement of the problem is setting up the objective; it is the most important task in conducting research. It is here that the research can exactly determine what data is to be collected. Thus:

- Set an overall objective of the research
- Split the overall objectives in to smaller segments known as sub-objectives
- State the sub-objectives clearly and precisely/concisely in turn think of the overall objectives through those segments and conquer than in turn rather a frontal attack, upon the entire problem.

Research Hypothesis:

Definition: Hypothesis is a tentative intelligent guess postulating from the purpose of directing the researcher towards the solution of problem. Or it is a statement which predicts the relationship between two or more variables. It is necessary link between theory and investigation, usually stated after an extensive survey of the literature.

A Proposition is a statement about concepts that may be judged as true or false to observable phenomena. When a proposition is formulated for empirical testing, it is a hypothesis. A hypothesis is of a tentative and conjectural nature. Hypothesis has also been described as statement in which we assign variable to a case.

Importance of research Hypothesis:

- 1) It is an indicator of the type of data needed
- 2) It gives direction to the research objectives
- 3) It gives direction to data gathering techniques (procedures)
- 4) It facilitates the extension of knowledge because it links theory and investigation.
- 5) It guides the researcher by delimiting the area of research and keeps him on the right track.

Formulation of research hypothesis:

Usually it is derived form the deductive logic of the objectives under investigation. A one-to-one correlation might exist between the objectives and their corresponding hypothesis. Thus there could be as many research hypotheses as there are objectives. There are also objectives that do not need formulation of hypothesis.

The main approach to develop a working hypothesis includes:

- 1) Discussions with colleagues and experts about the problem, its origin and objective in seeking a solution
- 2) Examination of data and records if available concerning the problem for possible trends, peculiarities and clues

- 3) Review of similar studies in the area of the studies on similar problems and
- 4) Exploratory personal investigation which involves original field, interviews on a limited scale, with interested parties and individuals with a view to secure greater insight in to the practical aspects of the problems.

Note that a hypothesis can appear in your report on either:

- (i) **Deductive form:** makes positive statement about the outcome of the study. It can come in the form of directional or non-directional way.
 - **Directional:** stipulates the direction of the expected result. Ex: *The performance of young employees is significantly **higher** than those who are experienced and old.*
 - **Non- directional:** Does not specify the direction of expected difference or relationship. Ex: *There is a difference in performance of employees who are young and those who are old and experienced.*
- (ii) **Null Form:** Makes a statement that states no relationship.
Ex: *There is no significant difference in the performance of employees between those who are young and old*
- (iii) **Question form:** Put the hypothesis in question form. Ex: *Does the change in the experience of the employees affect the performance of employees?*
- (iv) **Alternative hypothesis:** This signifies a statement written opposite to the null form, i.e., when the final decision is made at a given significance level if the null hypothesis is to rejected alternative hypothesis gets accepted, the alternative hypothesis too on equal footing along with the null hypothesis provides direction to the research.
Ex: *There is significant difference in the performance of employees between those who are young and old*

Descriptive hypothesis

These are propositions that typically state the existence, size, form, or distribution of some variable.

E.g. American cities (case) are experiencing budget difficulties (variable).

Eighty percent of company "A" stakeholders (case) favours the company's cash dividend (variable)

Do a majority of high school- educated students aware of HIV/AIDS.

Descriptive hypothesis format has several advantages;

- ✓ It encourages researchers to crystallize their thinking about the likely relationships to be found.

- ✓ It further encourages them to think about the implications of a supported or rejected finding.
- ✓ It is useful for testing statistical significance.

Relational hypothesis

It is a statement that describes a relationship between two variables with respect to some case. For e.g. Foreign cars (variable) are perceived by consumers (case) to be of better quality (variable) than domestic cars.

Correlational hypothesis state merely that the variables occur together in some specified manner without implying that one causes the other. E.g. Young employees (under the age of 30) are less productive than those who are 30 years or older.

With *explanatory (causal) hypothesis* there is an implication that the existence of, or a change in one variable causes or leads to a change in other variable. The causal variable is called the independent variable (IV) and the other, the dependent variable (DV). E.g. An increase in family income (IV) leads to an increase in percentage of income saved (DV). An increase in advertisement (IV) expenditure leads to an increase in sales of the product (DV).

Significance of the study:

It is to mean the rationale to conduct the research. The significance or rationale to take a research may be stated as:

- 1) There is no detail local investigation before about the problem
- 2) The study may be conducted on the assumption that there is a strong need for local investigation
- 3) To alert decision makers
- 4) To fill the gap in the existing studies
- 5) To resolve some inconsistency in previous research
- 6) The finding may lead to new problem for further study
- 7) To provide basic data about the problem

Delimitation of the study:

It is also known as the scope of the study. In many research projects, researchers cannot treat all aspect of the research problem. The researcher, therefore, should carefully state the boundary of the problem to be investigated. This will be undertaken by specifying areas of all variables which will be considered in the study or by

eliminating all aspects and factors which will not be considered in the study.

Operation Definition / glossary of terms:

Is a list of words or phrases (terms or concepts). It is important to define all unusual terms and concepts that should be misinterpreted (or misunderstood). The technical terms, words, or phrases having special meaning should be defined operationally.

Limitation of the study: It refers to problems encountered during the research process and their effects on the quality of the research output.

Literature Review

Secondary sources of information are useful in exploratory research. The search may involve conceptual literature, trade literature or published statistics. The literature that is searched depends on the problem being addressed. In a literature search, the major emphasis is on the discovery of ideas and tentative explanations of the phenomenon.

In most cases, the exploration phase will begin with a literature search- a review of books as well as articles in journals or professional literature that relate to the problem. A literature search requires the use of library's online catalog and one or more bibliographic databases or indexes. Other reference materials will be incorporated in search strategy.

Literature review has five steps:

1. Define the management problem
2. Consult encyclopedias, dictionaries, handbooks and textbooks to identify key terms, people, or events relevant to management question.
3. Apply key terms, people, or events in searching indexes, bibliographies, and the web to identify specific secondary sources.
4. Locate and review specific secondary sources for relevance.
5. Evaluate the value of each source and its content.

Levels of information

In exploring the problem or topic, different types of information sources are to be considered. Information sources are generally categorized into three levels;

1. Primary sources
2. Secondary sources
3. Tertiary sources

1. Primary sources

Primary sources are original works of research or raw data without interpretation that represent an official opinion or position. Included among the primary sources are memos, letters, complete interviews or speeches. Primary sources are the most authoritative because the information has been filtered or interpreted by a second party. Internal sources of primary data include inventory records, personnel records, purchasing requisition forms, statistical process control charts etc.

2. Secondary sources

Secondary sources are interpretations of primary data. Encyclopedias, textbooks, handbooks, magazine and newspaper articles, and most newscasts are considered secondary information sources. All reference materials fall into this category. E.g. sales analysis summaries and investor annual reports are examples of secondary sources as they are compiled from a variety of primary sources. A firm searching for secondary sources can search internally or externally.

3. Tertiary sources

Tertiary sources may be an interpretation of a secondary source but generally are represented by indexes, bibliographies, and other finding aids. (E.g. Internet search engines).

Types of information sources

1. Indexes and bibliographies

Indexes and bibliographies are the mainstay of any library because they help to identify and locate a single book or journal article. The single most important bibliography in any library is its online catalog. There are many specialized indexes and bibliographies unique to business topics. These can be very useful in a literature search to find authors and titles of prior works on the topic of interest.

2. Dictionaries

There are many specialized business dictionaries that define words, terms, or jargon unique to a discipline. Most of these specialized dictionaries include in their word lists information on people, events, or organizations that shape the discipline. E.g. Dictionary of Business and Management. Information from dictionaries and glossaries may be used to identify key terms for a search of an online or printed database.

3. Encyclopedias

It is used to find background or historical information on a topic or to find names or terms that can enhance search results in other sources. They are helpful in identifying the experts in a field and the key writings on any topic.

4. Handbooks

A handbook is a collection of facts unique to a topic. It often includes statistics, directory information, a glossary of terms, and other data essential to a field. The best handbooks include source references for the facts they present.

5. Directories

Directories are used for finding names and addresses as well as other data. While many are available and useful in printed format, directories in digitized format that can be searched by certain characteristics or sorted and then downloaded are more useful.

Importance of literature review:

- 1) Helps us to know whether the problem has been studied or not, is the problem new
- 2) Shows the path of prior research and how current project is linked its relationship to your study is linked to it.
- 3) To get and summarize that is known in the area (Research gap)
Helps us to know the data collection rule, helps us to select appropriate method of data collection and helps us to know whether it is up to date.
- 4) To avoid an intentional duplication of well investigated problems
- 5) To avoid an intentional duplication of well investigated problems
- 6) To Identify the tools and instruments of data collection, to get supportive idea for discussion of the problem
- 7) To get basis for formulating hypothesis
- 8) To know about the recommendations of the previous research for further study which they have listed in the studies.

Criteria of a good research:

Whatever may be the type of research one that is important is that all meet on the common ground of scientific method employed by them.

The purpose of the research should be clearly defined and common concepts should be used. The research procedure used should be described in sufficient details to permit another researcher to repeat the result for further advancement. The procedural design of the research should be carefully planned to yield results that are as

objective as possible. The researchers should report the results with complete frankness, flaws in procedural design and estimate their effects up on the findings. The analysis of the data should be sufficiently adequate to reveal its significance. The method of analysis should be appropriate, the validity and reliability of the data should be checked. Conclusions should be confined to those justified by the data of the research.

In summary, good research is:

- (i) **Systematic:** structured with specified steps or specified sequence in accordance with the well defined rules.
- (ii) **Logical:** guided by the rules of logical reasoning i.e., logical process of induction and deductions
- (iii) **Empirical:** deals with concrete data that provides the basis for external validity to research results.
- (iv) **Replicable:** the results can be verified by replicating the study and thereby build a sound basis for decision.