Unit- 4
Research Design

Handout- 4

Meaning of research design

Research design is a comprehensive plan of the sequence of operations that a researcher intends to carry out to achieve the research objectives. It involves selecting the most appropriate methods and techniques to solve the problem under investigation. It is a plan or action and blue print for collective analysis and interpretation of data. It is a blue print that is used in completing a study. A research study ensures that the study (1) will be relevant to the problem and (2) will use economical procedures.

Definitions:

"Research design is the planned sequence of the entire process involved in conducting a research study" Miller. Designing a particular research depends mainly on research purpose.

"Research design is the plan and structure of investigation so as to obtain answers to research questions. The plan is the overall scheme or program of the research. It includes an outline of what the investigator will do from writing hypotheses and their operational implications to the final analysis of data. A research design expresses both the structure of the research problem and the plan of investigation used to obtain empirical evidence for the problem." Donald and Pamela.

Essentials of research design

1. It is an activity and time based plan.
2. It is always based on the research questions.
3. It guides the selection of sources and types of information.
4. It is a framework for specifying the relationships among the study variables.
5. It outlines procedures for every research activity.

Wilkinson and Bhandarkar have listed the following major research design decisions:

a. What the study is about and what are the types of data needed?
b. Why the study is being made?
c. Where the data needed can be found?
d. Where or in what area the study will be carried out?
e. How much material or how many samples will be needed?
f. What bases of selection (sample) will be used?
g. What techniques of gathering data will be adopted?
h. How will the data be analyzed? And
i. How best can these above questions be decided upon and decisions articulated in manner that the research purpose can be achieved with minimum expenditure of money, time and energy?

Classification of research designs

I. **Degree of research question that has been crystallized**

A study may be viewed as exploratory or formal. **Exploratory studies** tend towards loose structures with the objective of discovering future research tasks. It develops hypothesis or questions for further research.

The formal study begins where the exploration leaves off. The **formal study** begins with a hypothesis or research question and involves precise procedures and data source specifications. The goal is to test the hypothesis or answer the questions posed.

II. **Method of data collection**

Monitoring includes studies in which the researcher inspects the activities or the nature of some material without eliciting responses from anyone. E.g. traffic counts at an intersection, license plates recorded in a restaurant parking lot, a search for library collection, an observation of the actions of a group of decision makers are examples of monitoring.

In the **interrogation/ communication** study, the researcher questions the subjects ands collects their responses by personal or impersonal means. The collected data may result from (1) interview or telephone conversations, or (2) self-administered instruments sent through mails electronically or by other means.

III. **Research control of variables**

In an **experiment**, the researcher attempts to control or manipulate the variables in the study. It is enough that we can cause variables to be changed or held constant in keeping with our research objectives. It is appropriate to discover whether certain variables produce effects in other variables.

Ex post facto design has no control over the variables. They can only report what has happened or what is happening. It is important that researchers using this design not influence the variables. The researcher is limited to hold variables constant by judicious selection of subjects according to strict sampling procedures and by statistical manipulation of findings.

IV. **The purpose of the study**

If the research is concerned with finding out who, what, where, or how much, then the study is **descriptive**. Research on crime is descriptive when it measures the types of crimes committed, how often, when, where, and by whom.

If the study is concerned with learning why, that is, how one variable produces change in another, it is a **causal study**. In a causal study, the relationship among variables is explained. For instance, why the crime rate is higher in city A than in city B?

V. **The time dimension**

Cross sectional studies (sample survey) are carried at once and represent a snapshot of one point in time. It typically involves a sample of elements from the population of interest. Various characteristics of the elements or sample members are measured once.

Longitudinal studies (**time series analysis**) are repeated over an extended period. It can track changes over time. In longitudinal studies of the panel variety, the

researcher may study the same people over time. In marketing panels are set up to report consumption data on a variety of products, which provide relative market share, consumer response to new products, and new promotional methods. The elements may be stores, dealers, individuals etc. The panel or sample remains relatively remains constant through time. The sample members in a panel are measured repeatedly.

There are two types of panels; *true panels and omnibus panels*. *True panels* rely on repeated measurements of the same variables. Each sample member is measured each time on the same characteristics. In an *omnibus panel*, a sample of elements is selected and maintained, but the information collected from the member varies. Example; at one time, it may be attitude about a new product. At another time, the panel members may be asked to evaluate advertising copy.

VI. **The topical scope**

Statistical studies are designed for breadth rather than depth. They attempt to capture a population characteristic by making inferences from a sample's characteristics. Hypotheses are tested quantitatively. Generalizations about findings are presented based on the representativeness of the sample and the validity of the design.

Case studies place more emphasis on a full controlled analysis of fewer events or conditions and their interrelations. Although hypotheses are often used, the reliance on qualitative data makes support or rejection more difficult. They rely on quantitative data. An emphasis in detail provides valuable insight for problem solving, evaluation, and strategy.

VII. **The research environment**

Designs also differ as to whether they occur under actual environmental conditions (field conditions) or under staged or manipulated conditions (laboratory conditions). To simulate is to replicate the essence of a system or process. Simulations are increasingly used in research. The major characteristics of various conditions and relationships in actual situations are often represented in mathematical models. Role playing and other behavioral activities may also be viewed as simulations.

VIII. **Participants perceptions**

The usefulness of a design may be reduced when people in a disguised study perceive that research is being conducted. Participants' perceptions influence the outcomes of the research.

One useful classification in terms of the fundamental objective of the research is: exploratory, descriptive and causal.

Exploratory research

Exploration is particularly useful when researchers lack a clear idea of the problems they will meet during the study. Researchers develop concepts more clearly, establish priorities, develop operational definitions, and improve the final research design. Exploration study is required when the area of investigation is new or vague for the researcher. Important variables may not be known or thoroughly defined. Hypothesis for the research may be needed.

The objectives of exploration may be accomplished with different techniques. Both quantitative and qualitative techniques are applicable. Exploration relies heavily on qualitative techniques. When we consider the scope of qualitative research, several approaches are adaptable for exploratory investigations;

- In-depth interviewing
- Participant observation
- Projective techniques and psychological testing
- Case studies
- Films, photographs and video tape

Four exploratory techniques emerge with wide applicability for the management researcher:

1. Secondary data analysis (Literature search)
2. Experience surveys
3. Focus groups
4. Two-stage designs

1. **Secondary data analysis**

The first step in an exploratory study is a search of secondary literature. Studies made by others for their own purposes represent secondary data. Within secondary data exploration, a researcher should start first with an organization's own data archives. Reports of prior research studies often reveal an extensive amount of historical data or decision-making patterns. It is inefficient to discover anew through the collection of primary data or original research what has been done already and reported at a level sufficient for management to make a decision.

2. **Experience surveys**

When interview persons in an experience survey, we should seek ideas about important issues or aspects of the subject and discover what is important across the subject's range of knowledge.

3. **Focus groups**

A focus group is a panel of 6-10 people, led by a trained moderator. The facilitator or moderator uses group dynamics principles to focus or guide the group in an exchange of ideas, feelings, and experiences on a specific topic. The facilitator introduces the topic and encourages the group to discuss it among themselves. The topical objective of a focus group is often a new product or a product concept. The output of the session is a list of ideas and behavioral observations, with recommendations by the moderator.

4. **Two-stage designs**

A useful way to design a research study is as a two-stage design. With this approach, exploration becomes a separate first stage with limited objectives. (1) Clearly defining the research question and (2) developing the research question. In a two-stage approach, we recognize that much about the problem is not known and should be known before efforts and resources are committed.

The approach involves the intensive study of selected cases of the phenomenon under investigation. Examination of existing records, observation of the occurrence of the phenomenon, unstructured interviewing may be used.

Descriptive studies

A good descriptive study presupposes much prior knowledge about the phenomenon studied. It rests on one or more specific hypothesis. These statements guide the research in specific directions. Descriptive studies require a clear specification of the who, what, when, where, why and how of the research. Descriptive studies are typically structured with clearly stated hypothesis or investigative questions. They serve a variety of research objectives:

1. Descriptions of phenomena or characteristics associated with a subject population (who, what, when, where and how of a topic).
2. Estimates of the proportions of the population that have these characteristics.
3. Discovery of associations among different variables and to make specific predictions.

The simplest descriptive study concerns a univariate question or hypothesis in which we ask about, or state something about, the size, form, distribution, or existence of a variable. A descriptive study may be simple or complex. Whatever the form, a descriptive study can be just as demanding of research skills as the causal study, and should insist on high standards for design and execution. The various types of descriptive research are;

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Causal studies

Causal studies are concerned with how one variable affects changes in another variable. It focuses in understanding, explaining, predicting and controlling relationship between variables.

There are three possible relationships that can occur between two variables;

1. A *symmetrical relationship* is one in which two variables fluctuate together but we assume the changes in neither variable are due to changes in the other. Symmetrical conditions are most often found when two variables are alternate indicators of another cause or independent variable.
2. A *reciprocal relationship* exists when two variables mutually influence or reinforce each other. This could occur if the reading of an advertisement leads to

the use of a brand of product. The usage, in turn, sensitizes the person to notice and read more of the advertising of that particular brand.

3. With *asymmetrical relationships* we postulate that changes in one variable (the independent variable, IV) are responsible for changes in another variable (the dependent variable, DV). Most research analysts look for asymmetrical relationships.

Experimentation

An experiment is capable of providing more convincing evidence of causal relationships. An experiment is taken to mean a scientific investigation in which an investigator manipulates and controls one or more independent variables and observes the dependent variables for variation. An experimental design is one in which the investigator manipulates at least one independent variable.

Two types of experiments can be distinguished. A **laboratory experiment** is one in which an investigator creates a situation with the desired conditions and then manipulates some variables while controlling others. The investigator is consequently able to observe and measure the effect of the manipulation of the independent variables on the dependent variable in a situation in which the effect of the other relevant factors is minimized.

A **field experiment** is a research study in a realistic or natural situation that involves the manipulation of one or more independent variables under as carefully controlled condition as the situation will permit.

Types of research design	Uses	Types
Exploratory research	• Formulate problems more precisely • Develop hypothesis • Establish priorities for research • Eliminate impractical ideas • Clarify concepts	➢ Literature search ➢ Experience survey ➢ Focus groups ➢ Analysis of selected cases
Descriptive research	• Describe characteristics of certain groups • Estimate proportion of people in a population • Make specific predicitions	➢ Longitudinal study ❖ True panel ❖ Omnibus panel ➢ Sample survey
Causal research	• Provide evidence regarding the causal relationship between variables.	➢ Laboratory experiment ➢ Field experiment