

## Research process and Design

Meaning: In any research <sup>Project</sup> work the important task of defining the research problem is the preparation of the design of the research project is popularly known as "research Design". ①

Research Design Concentrate with following question:

what, where, why, when, how much.

① what is the study about?

• why is the study being made? i.e.,

② why you have to select this study?

• where will the study be carried out?

③ what type of data is required?

④ what will be the sample design?

⑤ what type of techniques will be used?

• how will be the data be analysed?

• In what style will the report be prepared.

• So in fact, the research design is the Conceptual Structure within which research is conducted,

• Research design also considered as ~~blue print~~ blueprint

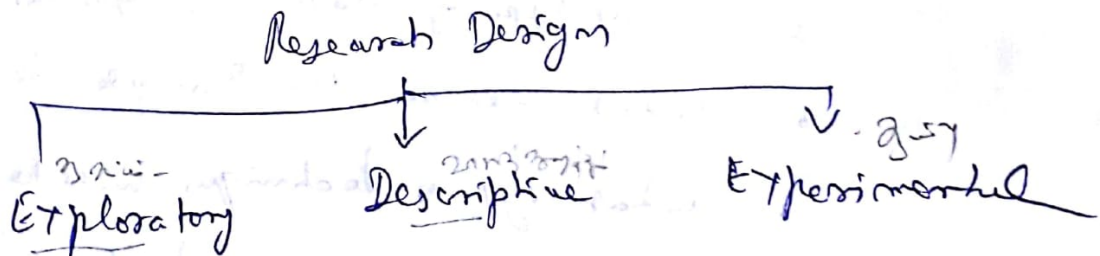
2. Research design includes an outlining  
what the researcher will do from writing  
the ...

Objective,  
Hypothesis,  
Concepts,  
Methodology, and  
Limitation.

### Need for Research Design:

There are three basic types of research design: viz.

1. Exploratory  
2. Descriptive &  
3. Correlational or experimental



↓  
Initial Step in the Continuous research process  
We start with the exploratory and go to  
Casual through the descriptive research.

All marketing research projects must  
start with exploratory research.

This is a preliminary phase and it is



(3)

essential in order to obtain a proper definition of problem at hand.

↳ whereas the exploratory studies help in formulating hypothesis for the further research.

• In India most of the researches such as market survey's to know the brand preferences:

- ↳ attitudes level of consumers,
- ↳ buyer's behaviour,
- ↳ market or sales potential,
- ↳ consumer awareness etc. of exploring nature.

Such projects are sponsored by big companies such as Hindustan Lever, etc.

## II. Descriptive Research Design:

↳ It implies the demographic characteristics of consumers who use the product.

• For example:

An investigation of the trends in consumption of soft drinks (Mirinda, Pepsi, 7up, Coca-cola ...) with respect to socio economic characteristics such as

↳ age ✓

↳ sex ✓

1. ethnic group
  2. Occupation
  3. Family income
  4. Educational level
  5. Geographic location as Socio.
- Would be a descriptive study.

Importance: to describe the

characteristics of certain groups:

Example: users of a product with different age, sex, education, etc.

- to determine whether certain variables are associated.

Example: income and usage of a product.

### III. Experimental Research Design:

Experimental design are the blueprints which provide guidelines to conduct the final experiments.

#### Experimental research design:

i) An experimental research design consists of two types of groups. They are:

i) Control group &

ii) non-control group. (Experimental group)

i) Control group which is not exposed to experimental variables and

ii) Experimental group which is exposed to experimental variables.

### 3.1 MEANING OF RESEARCH DESIGN

The formidable problem that follows the task of defining the research problem is the preparation of a design of the research project, popularly known as "research design". A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. In fact, the research design is the conceptual structure within which research is conducted; it constitutes the blueprint for the collection, measurement and analysis of data. As such the design includes an outline of what the researcher will do from writing the hypothesis and its operational implications to the final analysis of data. More explicitly, the design decisions happen to be in respect of:

- (i) What is the study about?
- (ii) Why is the study being made?
- (iii) Where will the study be carried out?
- (iv) What type of data is required?
- (v) Where can the required data be found?
- (vi) What periods of time will the study include?
- (vii) What will be the sample design?
- (viii) What techniques of data collection will be used?
- (ix) How will the data be analysed?
- (x) In what style will the report be prepared?

Keeping in view the above stated design decisions, one may split the overall research design into the following parts:

- (a) *The sampling design* which deals with the method of selecting items to be observed for the given study.



- (b) *The observational design* which relates to the conditions under which the observations are to be made.
- (c) *The statistical design* which concerns the question of how many items are to be observed and how the information and data gathered is to be analysed.
- (d) *The operational design* which deals with the techniques by which the procedures specified in the sampling, statistical and observational designs can be carried out.

From what has been stated above, we can state the important features of a research design as under:

- (i) It is a plan that specifies the sources and types of information relevant to the research problem.
- (ii) It is a strategy specifying which approach will be used for gathering and analysing the data.
- (iii) It also includes the time and cost budgets since most studies are done under these two constraints.

In brief, research design must, at least, contain (a) a clear statement of the research problem; (b) procedures and techniques to be used for gathering information; (c) the population to be studied; and (d) methods to be used in processing and analysing data.

### 3.2 NEED FOR RESEARCH DESIGN

Research design is needed because it facilitates the smooth sailing of the various research operations, thereby making research as efficient as possible yielding maximal information with minimal expenditure of effort, time and money. Just as for better, economical and attractive construction of a house, we need a blueprint (or what is commonly called the map of the house) well thought out and prepared by an expert architect, similarly, we need a research design or a plan in advance of data collection and analysis for our research project. Research design stands for advance planning of the methods to be adopted for collecting the relevant data and the techniques to be used in their analysis, keeping in view the objective of the research and the availability of staff, time and money. Preparation of the research design should be done with great care as any error in it may upset the entire project. Research design, in fact, has a great bearing on the reliability of the results arrived at and as such constitutes the firm foundation of the entire edifice of the research work.

Even then the need for a well thought out research design is at times not realised by many. The importance which this problem deserves is not given to it. As a result many researches do not serve the purpose for which they are undertaken. In fact, they may even give misleading conclusions. Thoughtlessness in designing the research project may result in rendering the research exercise futile. It is, therefore, imperative that an efficient and appropriate design must be prepared before starting research operations. The design helps the researcher to organize his ideas in a form whereby it will be possible for him to look for flaws and inadequacies. Such a design can even be given to others for their comments and critical evaluation. In the absence of such a course of action, it will be difficult for the critic to provide a comprehensive review of the proposed study.



### 3.3 FEATURES OF A GOOD DESIGN

A good design is often characterised by adjectives like flexible, appropriate, efficient, economical and so on. Generally, the design which minimises bias and maximises the reliability of the data collected and analysed is considered a good design. The design which gives the smallest experimental error is supposed to be the best design in many investigations. Similarly, a design which yields maximal information and provides an opportunity for considering many different aspects of a problem is considered most appropriate and efficient design in respect of many research problems. Thus, the question of good design is related to the purpose or objective of the research problem and also with the nature of the problem to be studied. A design may be quite suitable in one case, but may be found wanting in one respect or the other in the context of some other research problem. One single design cannot serve the purpose of all types of research problems.

A research design appropriate for a particular research problem, usually involves the consideration of the following factors:

- (i) the means of obtaining information;
- (ii) the availability and skills of the researcher and his staff, if any;
- (iii) the objective of the problem to be studied;
- (iv) the nature of the problem to be studied; and
- (v) the availability of time and money for the research work.

If the research study happens to be an exploratory or a formulative one, wherein the major emphasis is on discovery of ideas and insights, the research design most appropriate must be flexible enough to permit the consideration of many different aspects of a phenomenon. But when the purpose of a study is accurate description of a situation or of an association between variables (or in what are called the descriptive studies), accuracy becomes a major consideration and a research design which minimises bias and maximises the reliability of the evidence collected is considered a good design. Studies involving the testing of a hypothesis of a causal relationship between variables require a design which will permit inferences about causality in addition to the minimisation of bias and maximisation of reliability. But in practice it is the most difficult task to put a particular study in a particular group, for a given research may have in it elements of two or more of the functions of different studies. It is only on the basis of its primary function that a study can be categorised either as an exploratory or descriptive or hypothesis-testing study and accordingly the choice of a research design may be made in case of a particular study. Besides, the availability of time, money, skills of the research staff and the means of obtaining the information must be given due weightage while working out the relevant details of the research design such as experimental design, survey design, sample design and the like.



### 3.4.9 Experiment

The process of examining the truth of a statistical hypothesis, relating to some research problem, is known as an experiment. For example, we can conduct an experiment to examine the usefulness of a certain newly developed drug. Experiments can be of two types viz., absolute experiment and comparative experiment. If we want to determine the impact of a fertilizer on the yield of a crop, it is a case of absolute experiment; but if we want to determine the impact of one fertilizer as compared to the impact of some other fertilizer, our experiment then will be termed as a comparative experiment. Often, we undertake comparative experiments when we talk about designs of experiments.

### 3.4.10 Experimental Unit(s)

The pre-determined plots or the blocks, where different treatments are used, are known as experimental units. Such experimental units must be selected (defined) very carefully.

## 3.5 DIFFERENT RESEARCH DESIGNS

Different research designs can be categorized as below:

We take up each category separately.

### 3.5.1 Research Design in Case of Exploratory Research Studies

Exploratory research studies are also termed as formulative research studies. The main purpose of such studies is that of formulating a problem for more precise investigation or of developing the working hypothesis from an operational point of view. The major emphasis in such studies is on the discovery of ideas and insights. As such the research design appropriate for such studies must be flexible enough to provide opportunity for considering different aspects of a problem under study. Inbuilt flexibility in research design is needed because the research problem, broadly defined initially, is transformed into one with more precise meaning in exploratory studies, which infact may necessitate changes in the research procedure for gathering relevant data. Generally, the following three methods in the context of research design for such studies are talked about: (a) the survey of concerning literature; (b) the experience survey and (c) the analysis of 'insight-stimulating' examples.

*The survey of concerning literature* happens to be the most simple and fruitful method of formulating precisely the research problem or developing hypothesis. Hypothesis stated by earlier workers may be reviewed and their usefulness be evaluated as a basis for further research. It may also be considered whether the already stated hypothesis suggest new hypothesis. In this way the researcher should review and build upon the work already done by others, but in cases where hypothesis have not yet been formulated, his task is to review the available material for deriving the relevant hypothesis from it.

Besides, the bibliographical survey of studies, already made in one's area of interest may as well be made by the researcher for precisely formulating the problem. He should also make an attempt to apply concepts and develop theories in different research contexts to the area in which he is himself working. Sometimes the works of creative writers also provide a fertile ground for hypothesis-formulation and as such may be looked into by the researcher.



*Experience survey* means the survey of people who have had practical experience with the problem to be studied. The object of such a survey is to obtain insight into the relationships between variables and new ideas relating to the research problem. For such a survey people who are competent and can contribute new ideas may be carefully selected as respondents to ensure a representation of different types of experience. The respondents so selected may then be interviewed by the investigator. The researcher must prepare an interview schedule for the systematic questioning of informants. But the interview must ensure flexibility in the sense that the respondents should be allowed to raise issues and questions which the investigator has not previously considered. Generally, the experience-collecting interview is likely to be long and may last for few hours. Hence, it is often considered desirable to send a copy of the questions to be discussed to the respondents well in advance. This will also give an opportunity to the respondents for doing some advance thinking over the various issues involved so that, at the time of interview, they may be able to contribute effectively. Thus, an experience survey may enable the researcher to define the problem more concisely and help in the formulation of the research hypothesis. This survey may as well provide information about the practical possibilities for doing different types of research.

*Analysis of 'insight-stimulating' examples* is also a fruitful method for suggesting hypothesis for research. It is particularly suitable in areas where there is little experience to serve as a guide. This method consists of the intensive study of selected instances of the phenomenon in which one is interested. For this purpose the existing records, if any, may be examined, the unstructured interviewing may take place, or some other approach may be adopted. Attitude of the investigator, the intensity of the study and the ability of the researcher to draw together diverse information into a unified interpretation are the main features which make this method an appropriate procedure for evoking insights.

Now, what sort of examples are to be selected and studied? There is no clear cut answer to it. Experience indicates that for particular problems certain types of instances are more appropriate than others. One can mention few examples of 'insight-stimulating' cases such as the reactions of strangers, the reactions of marginal individuals, the study of individuals who are in transition from one stage to another, the reactions of individuals from different social strata and the like. In general, cases that provide sharp contrasts or have striking features are considered relatively more useful while adopting this method of hypothesis formulation.

Thus, in an exploratory or formulative research study which merely leads to insights or hypothesis, whatever method or research design outlined above is adopted, the only thing essential is that it must continue to remain flexible so that many different facets of a problem may be considered as and when they arise and come to the notice of the researcher.

### 3.5.2 Research Design in Case of Descriptive and Diagnostic Research Studies

Descriptive research studies are those studies which are concerned with describing the characteristics of a particular individual, or of a group, whereas diagnostic research studies determine the frequency with which something occurs or its association with something else. The studies concerning whether certain variables are associated are examples of diagnostic research studies. As against this, studies concerned with specific predictions, with narration of facts and characteristics concerning individual, group or situation are all examples of descriptive research studies. Most of the social research



comes under this category. From the point of view of the research design, the descriptive as well as diagnostic studies share common requirements and as such we may group together these two types of research studies. In descriptive as well as in diagnostic studies, the researcher must be able to define clearly, what he wants to measure and must find adequate methods for measuring it along with a clear cut definition of 'population' he wants to study. Since the aim is to obtain complete and accurate information in the said studies, the procedure to be used must be carefully planned. The research design must make enough provision for protection against bias and must maximise reliability with due concern for the economical completion of the research study. The design in such studies must be rigid and not flexible and must focus attention on the following:

- (a) Formulating the objective of the study (what the study is about and why is it being made?)
- (b) Designing the methods of data collection (what techniques of gathering data will be adopted?)
- (c) Selecting the sample (how much material will be needed?)
- (d) Collecting the data (where can the required data be found and with what time period should the data be related?)
- (e) Processing and analysing the data.
- (f) Reporting the findings.

In a descriptive/diagnostic study the first step is to specify the objectives with sufficient precision to ensure that the data collected is relevant. If this is not done carefully, the study may not provide the desired information.

Then comes the question of selecting the methods by which the data is to be obtained. In other words, techniques for collecting the information must be devised. Several methods (viz., observation, questionnaires, interviewing, examination of records, etc.), with their merits and limitations, are available for the purpose and the researcher may use one or more of these methods which have been discussed in detail in the later chapters. While designing data-collection procedure, adequate safeguards against bias and unreliability must be ensured. Whichever method is selected, questions must be well examined and be made unambiguous; interviewers must be instructed not to express their own opinion; observers must be trained so that they uniformly record a given item of behaviour. It is always desirable to pre-test the data collection instruments before they are finally used for the study purposes. In other words, we can say that "*structured instruments*" are used in such studies.

In most of the descriptive/diagnostic studies the researcher takes out sample(s) and then wishes to make statements about the population on the basis of the sample analysis or analyses. More often than not, sample has to be designed. Different sample designs have been discussed in detail in a separate chapter in this book. Here, we may only mention that the problem of designing samples should be tackled in such a fashion that the samples may yield accurate information with a minimum amount of research effort. Usually one or more forms of probability sampling, or what is often described as random sampling, are used.

To obtain data free from errors introduced by those responsible for collecting them, it is necessary to supervise closely the staff of field workers as they collect and record information. Checks may be set up to ensure that the data collecting staff perform their duty honestly and without prejudice. Collected should be examined for its completeness, comprehensibility, consistency and reliability.



The data collected must be processed and analysed. This includes steps like coding the interview replies, observations, etc.; tabulating the data; and performing several statistical computations. To the extent possible, the processing and analysing procedure should be planned in detail before actual work is started. This will prove economical in the sense that the researcher may avoid unnecessary labour such as preparing tables for which he later finds he has no use or on the other hand, re-doing some tables because he failed to include relevant data. Coding should be done carefully to avoid error in coding and for this purpose the reliability of coders needs to be checked. Similarly, the accuracy of tabulation may be checked by having a sample of the tables re-done. In case of mechanical tabulation the material (i.e., the collected data or information) must be entered on appropriate cards which is usually done by punching holes corresponding to a given code. The accuracy of punching is to be checked and ensured. Finally, statistical computations are needed and as such averages, percentages and various coefficients must be worked out. Probability and sampling analysis may as well be used. The appropriate statistical operations, along with the use of appropriate tests of significance should be carried out to safeguard the drawing of conclusions concerning the study.

Last of all comes the question of reporting the findings. This is the task of communicating the findings to others and the researcher must do it in an efficient manner. The layout of the report needs to be well planned so that all things relating to the research study may be well presented in simple and effective style.

Thus, the research design in case of descriptive/diagnostic studies is a comparative design throwing light on all points narrated above and must be prepared keeping in view the objective(s) of the study and the resources available. However, it must ensure the minimisation of bias and maximisation of reliability of the evidence collected. The said design can be appropriately referred to as a *survey design* since it takes into account all the steps involved in a survey concerning a phenomenon to be studied.

The difference between research designs in respect of the above two types of research studies can be conveniently summarised in tabular form as under:

Table 3.1

Research Design	Type of Study	
	Exploratory of Formulative	Descriptive/Diagnostic
Overall design	Flexible design (design must provide opportunity for considering different aspects of the problem)	Rigid design (design must make enough provision for protection against bias and must maximise reliability)
(i) Sampling design	Non-probability sampling design (purposive or judgement sampling)	Probability sampling design (random sampling)
(ii) Statistical design	No pre-planned design for analysis	Pre-planned design for analysis
(iii) Observational design	Unstructured instruments for collection of data	Structured or well thought out instruments for collection of data
(iv) Operational design	No fixed decisions about the operational procedures	Advanced decisions about operational procedures.

Step in preparation of Research Design. (www.google.com)

1. Review of Earlier Literature
2. Sources of information to be tapped.
3. Development of Bibliography
4. Objectives of the study
5. Socio-culture
6. Geographical areas to be covered.
7. Periods of Time to be covered (or) Time Dimension of the study.
8. Dimensions of the study
9. The basis for selecting the data.
10. Techniques of study
11. The Control of error
12. Establish the reliability and validity of test instruments.
13. Chapter Scheme.



## ⑥ Critique of Good Research Design

What is preparing a research design

When a research problem is formulated a specific topic is assigned and a hypothesis is formulated, the next stage is to work out a research design.

So preparing research design is an important stage in the process of conducting research.

## Need of Research Design

According to P.V. Young, a research design should be able to provide answers to the following queries:

i) What is the study about ~~and~~ and what type of data are required?

ii) What is the purpose of the study? What is the Scope?

iii) What are the sources of the needed data?

iv) What should be the place or area of study.

v) What time, approximately is required for the study?

Advertisements:

vi) What should be the amount of material or number of cases for the study.

vii) What type of sampling should be used.



⑧

viii) What method of data collection

( would be app. appropriate?

viii) ix) How was the data to be analysed.

Advantages:

ix) x) what should be approximate expenditure.

xi) what would be the methodology of study?

xii) what should be specific nature of study.