

# MBA

# Course Code: 104 GC 04

# **Course Name: Business Research Methods**

# Unit 1: Foundation of Research

Business Research can be described as systematic and scientific effort to explore the problem area or to solve a business problem encountered in a day to day business environment be generic or specific functional areas of management. Research comprises of series of well though steps to deal with a specific issue it may be exploring area of interest or solving a specific problem.

Managers with knowledge of research have an advantage over the other managers. Though manger himself may not be doing any research as a manager, but he need to understand and take decision. For example in a new product development, it may happen that product developed may not be paying off, in such cases manager need to conduct research and predict the future of product.

### **Definition of Research:**



"Research comprises defining and redefining problems, formulating hypothesis or suggested solutions collecting, organizing and evaluating data, making deductions and reaching conclusions; to determine whether they fit the formulating hypothesis."

## John W Best:

"Research is the systematic and objective analysis and recording of controlled similar findings and conclusion. Research is replicable it has more acceptability and confidence as being scientific. observations that may lead to development of generalization, principles, or theories resulting in prediction and perhaps ultimate control of events."



## P.V. Young:

"Research is a methods of studying, analyzing and conceptualizing social life in order to extend, modify, correct or verify knowledge, whether that knowledge aids in construction of theory or in practice of an art."

### **Robert Burns:**

"Research is a systematic investigation to find solutions to a problem."

### Uma Sekaran :

"While Business research is an *organized*, *systematic*, *data-based*, *critical*, *objective*, *scientific inquiry or investigation into a specific problem*, undertaken with the purpose of finding answers or solutions to it. "

## **Donald Cooper:**

**"Business research,** as we use it in this text, is a systematic inquiry that provides information to guide managerial decisions. More specifically, it is a process of planning, acquiring, analyzing, and disseminating relevant data, information, and insights to decision makers in ways that mobilize the organization to take appropriate actions that, in turn, maximize performance."

### In short Business research is a systematic investigation.

One may consider research as search again and again as it is movement from the known to unknown. In essence it provides information and insight to manager to solve problems arise in day to day working.

It is organized, systematic, scientific, planned, structured enquiry with specific objective to solve day to day business problems or sometimes add knowledge to domain knowledge of business.

In short Research can be:

Research can be defined as the search for knowledge, or as any systematic investigation, with an open mind to;

- Establish novel facts.
- Solve new or existing problems.
- $\circ$  Prove new ideas.
- Develop new theories.
- usually using a scientific method

# Need of Business Research

To understand, identify, analyze and solve business situation/problems and take appropriate decision in business. Undertaking business research is an important since it aids a business to plan for the future, based on historical data/information. If performed effectively it can help an organization to make plans on how to become more viable in its field. There are several reasons to study Business research methods.

While study management dilemma, the problem or opportunity to take management decision an organized enquiry has be conducted. There are various businesses, environment factors which stimulate our interest in studying business research such as information overload, technological connectivity, competition, government intervention, low cost data collection, real time access to data etc.



The main characteristics of scientific research may be listed as follows:

#### **Purposiveness:**

The manager should start the research with definite aim or purpose. All the activities of research are directly influenced by purpose of the research. Meaningful results from research can be obtained if research has purpose otherwise study will lead nowhere.

#### **Rigor:**

Scientific research must be carried out carefully with proper methodology. A good theoretical base and sound methodological design give rigor to the research. This will lead elimination of bias, facilitate proper data collection and analysis, which will provide sound and reliable findings. Suppose for carried out research regarding employee satisfaction, manager surveyed 8 to 10 employees. On the basis of their responses, manager concluded about employee satisfaction. This whole research is unscientific.

#### **Testability:**

Scientific research lends itself to testing logically developed hypothesis to see whether or not data support the hypothesis. For instance, in the above research of employee satisfaction, the researcher might hypothesize that those employees who perceive greater opportunities for participation in decision making will have a higher level of satisfaction. This is a hypothesis that can be tested when the data are collected. Using statistical test one could test whether the hypothesis is supported or not.

#### **Objectivity:**

Scientific research must deal with the facts. The conclusion drawn through the interpretation of the results of data analysis should be objective. It should be based on facts of the findings derived from actual data and not on our own subjective or values, beliefs and preferences.

#### **Replicability:**

Scientific research must be replicable that is if we use similar methods and data collection as compare to previous study, the other research also come out with

#### Generalizability:

Generalizability refers to the scope of applicability of the research findings in one organizational setting to other settings of almost similar nature. The more generalize the research, the more useful and value of the research to the users.

#### **Precision and Confidence:**

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Precision refers to the closeness of the findings to reality based on a sample. In business research we draw conclusion about universe on the basis of sample. Precision reflects the degree of exactness and accuracy of the results on the basis of samples. Results of research should be close reality.

Confidence refers to the probability that our estimation are correct so that we can confidently claim that 95% of the time our results would be true and there is only 5% chance of our results being false.

### **Parsimony:**

The research should be conducted in simple and economic manner. The simple solution or framework is always preferred as compared to complex research frame work.

### **Research Applications in Functional Areas of Business.**

Since generally applied business research deals with practical problem solving and decision making, now a day almost all the small, medium and large scale companies are using business research tools to take appropriate



decisions and obtain competitive advantage over the others. Managers using it in all functional areas of business like Marketing, Finance, Human Resource, Operations and others. Research enables manager to have deeper understanding of functional areas, some of them are discuss here:

### **Marketing Management:**

Marketing research deals with the study of market and study of consumers. Various tools of marketing research deals with the study of market, study of brands, study of competitive brands, customer loyalty, market penetration of product, market share etc. Marketing Research also deals with the study of sales, product, promotion, and price. Marketing research is widely use for taking competitive advantage of competitors in market. Objectives of marketing research is to provide the facts and direction that manager needs to make important marketing decisions. Some areas of marketing research are:

#### **Product Research:**

Competitive product studies, product testing, concept testing, Branding, packaging research etc.

#### **Consumer Research:**

Consumer Behaviour, Prospecting consumer profile, Panel discussion, Diary research etc.

#### **Sales Research :**

Market Analysis, Sales research, Sales analysis tests, Marketing distribution channel, comparative sales analysis. Etc.

#### Advertising Research:

Media Research, Readership survey, viewership survey, advertisement effectiveness survey.

#### **Corporate Research:**

Forecasting, Trend Analysis, pricing studies, product mix studies, environment analysis, corporate image etc.

#### Human Resource Management:

Various management principles /theories like Taylor Scientific Management, Fayol's Administrative Management and Weber's Bureaucratic Management (George, 1948) were the outcome of pioneer business research in Human Resource Management.

Research is extensively used in Human Resource Planning and to understand relationship between personnel variables. This involves the study of wages, cost of living, employee turnover rates, employee wellness, performance appraisal, incentives scheme etc. Following are some of applications of research in Human Resource Management.

- Research to understand training need of employees.
- Research to provide appropriate training to employees.
- Research to understand Attrition rate of employees.
- Research to understand association of demographic factors of employees and job performance.
- Research to understand traits of manager and appropriate job allocation.
- Research in selecting right candidate.

Overall research is applicable in all areas of human resource to provide understanding of human behaviors and its relationship with job performance, productivity and wellness of employees.

### **Operations Management (Production, Materials, logistics etc.):**

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Research in Operations management helps operation manager to decide what to produce, how much to produce, how much too stock etc. Various research tools optimize the efficiency, quality, production. There are various research done regarding logistics management to decide most affordable route from warehouse/factory to market.

There is separate brand of research in operations called as quality control which decides acceptable/tolerable quality control using various research tools and techniques. Some of the applications are as below

- Research to decide optimum production of product.
- Research to decide optimum inventory.
- Research to decide best available way of logistics to minimize the transportation cost.
- Applications of Quality Control Techniques.
- Applications of Networking and CPM.

#### **Financial Management:**

This is one of the most important functional area of any business. There is lot of applications of research in this area. Some of the applications are mentioned below.

- Research on cost of capital, valuation of firms, dividend policies, and investment decisions.
- o Research on Risk assessment, exchange rate fluctuations, and foreign investment.
- Research on tax implications of reorganization of firms or acquisition of companies.
- Research on collection of accounts receivable.
- Research on development of effective cost accounting procedures.
- Research on cost of capital, valuation of firms, dividend policies, and investment decisions.
- Research on Financial Literacy.
- Research on financial performance of organizations.
- Research on various ratios (Financial Indicators) of any business.

The business research process involves a series of steps that systematically investigate a problem or an opportunity facing the organization. It is not necessary that research requires completion of each step before going to the next. Some steps are begun out of sequence, some are carried out

Simultaneously, and some may be omitted. The sequence of steps involved in the business research process are as follows: problem/opportunity identification, formulation of research objectives, literature review, determine a research design, determine a data collection method, selecting the sampling procedure, data collection, analyzing the data and preparing the research report for presentation. The above steps provide a broad outline applicable to any business research project. The process of business research can be primarily divided into three phases— planning, execution and report preparation.

### Identifying and Defining the Problem/Opportunity:

The initial step in the research process is the identification of the problem or opportunity. Problem identification is the key to research process. For a researcher, problem definition means converting the management problem to a research problem. In order to attain clarity, the manager and researcher must articulate clearly so that perfect understanding of each other's is achieved. As businesses today operate in a highly volatile environment, they need to regularly evaluate their relative position and identify the



various problem areas or opportunities they need to work upon in order to sustain competitively in the market. The managers need to analyze the changing dynamics of business and to evolve a strategy to adapt to the changes taking place in the external environment. Whether these are potential problem areas or opportunities, it is very important for the manager to identify them accurately and at the earliest. Problem identification precedes the problem definition stage. For instance, a company producing mobile handsets may realize that its new product is not selling, but it may not know the reason for this. Although it has identified the problem in a broader perspective, it may be symptom. Manager need to find root cause of this problem. It is important to define the problem in a precise manner. A well-defined problem gives the researcher a proper direction for carrying out investigation. It also helps in utilizing the resources provided for the research effectively.

In defining identified problem, exploratory research is carried out. For defining the problem, researcher and manager need to carry out exploratory research through secondary data analysis, pilot study, environmental analysis or expert interview so on. Secondary data are the data that have already been collected previously for some other research purpose. It can be obtained from magazines, journals, online articles, company literature and so on. By analyzing secondary data, researcher might get insight to define the problem. Pilot study involves collecting data from the actual respondents in order to gain insight into the topic and help the researcher in conducting a larger study. Here, data are collected informally in order to find out the views of the respondents. The researchers may casually ask the respondent's opinion of the new cell phone.

In order to understand the background of research problem, researcher must understand the firm and industry. Researcher must analyze the factors that have an impact; these factors encompass resources of firm, customer, legal environment, economic environment, and technological skills etc.

After gaining an adequate understanding of the problem through exploratory research, the researcher can define problem.

### Preparing the Statement of Research Objectives:

Once the problem is clearly defined, it becomes absolutely essential to determine the objectives of the research. The objectives of the research should be stated in a formal research statement. The statement of objectives should be as precise as possible. Objectives act as guidelines for various steps in the research process, and therefore, they have to be developed by analyzing the purpose of the research thoroughly. The objectives of the research must be brief and specific; also, it is preferable to limit the number of objectives. The research objectives comprise the research question/s and the hypothesis. If the objective of the research is to study the perceptions of the customer, a typical research question could be: 'Do the customers perceive positively towards cell phones?' Once the objectives and the research questions are identified, a researcher has to develop a hypothesis statement that reflects these research objectives.

A hypothesis is a statement based on some presumptions about the existence of a relationship between two or more variables that can be tested through empirical data. For instance, the exploratory research for the above problem may have resulted in the hypothesis that consumers perceive that the cell phones are very costly. When a researcher is developing a hypothesis, he/ she will try to assume an answer for a particular research question and then test it for its validity.

A hypothesis normally makes the research question clearer to the researcher. The formulation of a



hypothesis allows the researcher to make a presumption or 'guess' and can thus ensure that all the relevant aspects of the research are included in the research design. However, a hypothesis cannot be developed for every research question.

### **Literature Review**

Once the problem is formulated the researcher should undertake literature review connected with the problem. A literature review is a directed search of published works, including periodicals and books, which discusses theory and presents empirical results that are relevant to the topic at hand. For this purpose, the abstracting and indexing journals and published or unpublished bibliographies are the first place to go to academic journals, conference proceedings, government reports, books etc. must be tapped depending on the nature of the problem. The literature review explains the need for the proposed work to appraise the shortcomings and/or informational gaps in secondary data sources. Literature review ensures that:

Important variables that are likely to influence the problem situation are not left out of the research.

A clearer idea emerges as to what variables will be most important to consider, why they are considered important, and how they should be investigated to solve the problem. Thus, the literature survey helps the development of the theoretical framework and hypotheses for testing.

The problem statement can be precise and clarify.

Whether particular research is already addressed or not that clarity researcher will get so that wasting effort on trying to rediscover something that is already known was reduced.

The problem investigated is perceived by the scientific community as relevant and significant.

Clarity regarding research methodology.

### **Determine a Research Design:**

Once the problem or opportunity identification and definition stage is complete, the process of research design begins. Planning the research design is a crucial step in the research design process. A research design is the actual framework of a research that provides specific details regarding the process to be followed in conducting the research. The research design includes all the details regarding the research such as where the information should be obtained from, the time and budget allotted for conducting the research, the appropriate measurement techniques and the sampling process. Factors like the research objective, the importance of the decision, costs involved in conducting the research and the availability of data sources determine the selection of an appropriate research design. The main function of a research design is to explain how you will find answers to your research questions. The research design sets out the specific details of research enquiry.

### **Determine a Data Collection Method**

After developing an appropriate research plan, it is important for the researcher to select a proper data collection method. There are mainly two basic methods of data collection—secondary data and primary data. The data collection method is chosen based on the objectives of the study, the costs involved in conducting the study, the availability of the data and finally the importance and urgency of the decision.

A secondary data method is concerned with the analysis of already existing data that is related to the research topic in question. Primary data are the data that are gathered first hand to answer the research question being investigated. For primary data different methods are employed like survey,



observation and experiments. A survey is a research technique, which is used to gather information from a sample of respondents by employing a questionnaire. In business research, experiments can be conducted for studying cause-and-effect relationships. Analyzing the changes in one variable, by manipulating another variable, helps one identify cause-and-effect relationships through experiments. Observation technique is a process where the respondents are merely observed without any interruption by the observers.

### **Selecting the Sampling Procedure:**

Sampling is a process that uses a small number of units or a small portion of a population to draw conclusions regarding the whole population. A well-defined sample has the same characteristics as the population as a whole, and therefore, when a research is conducted on such sample; the results obtained will represent the characteristics of the whole population. But if errors are made in selecting the sample, then the research results will be wrong, since a wrongly selected sample does not represent the characteristics of the population as a whole. For instance, to study the petrol and diesel consumption patterns of people, if a sample is selected from a list of vehicle owners, it may not represent the whole population, since there are several others who use petrol or diesel for running generators or for purposes other than travelling. It is therefore very important to define the population before selecting the sample; otherwise, the research results may not be helpful for the manager in taking effective decisions. For example, a television manufacturing company wanting to assess its future sales potential may select a sample from a population of households having no TV sets at all. But there may be several TV owners who may want to buy a second TV set or replace the existing one, and if they are not included in the population, then the research results may not be accurate. Another important aspect of sampling is to decide the size of the sample. How big should a sample be? The bigger the sample size the greater will be its precision. But for practical reasons, it is not feasible to select large samples. Therefore, a sample that is selected using probability sampling techniques will be sufficient for getting effective results. A sample can be selected in two ways from a population—through probability sampling, or through non-probability sampling. When the subsets of a population are chosen in such a way that it ensures a representative cross-section by giving every element in the population a known chance of being selected, it is called probability sampling. When subsets of a population in which little or no attempt is made to ensure a representative cross-section are chosen, it is called non-probability sampling.

### **Data Collection:**

After preparing a suitable sample, the researcher collects the data from the units in this sample. As there are several research techniques, there are a number of data collection methods as well. For instance, in the survey method, the data are collected by asking the respondents to fill out a questionnaire administered to them, while in the observation technique, the respondents are just observed without their direct participation in the research. Whatever the method used to collect the data, it is very important that the data are collected without any errors. Errors may creep in during the data collection process in several forms. Potential data collection errors may arise if the interviewee does not understand the question or if the interviewer records the answers inaccurately.

Data collection is done in two stages—pre-testing and the main study. Pretesting involves collecting data from a small subsample to test whether the data collection plan for the main study is



appropriate. This helps the researchers to minimize any potential errors that may crop up during the main study. The pre-test results may also be used to decide on a way of tabulating the collected data. If the results of a pre-test are not appropriate for decision-making, then the researcher may consider altering the research design. Once the data are collected to the satisfaction of the researcher, the research process enters the next stage, which is evaluation of the data.

### **Evaluating the Data:**

Once the data have been collected, the next important phase in the research process is analyzing the data. The most important aspect of data analysis is to convert the data collected into a format which will facilitate the manager in effective decision-making. The reason for analyzing the data is to obtain research results and to prepare the research report. Several mathematical and statistical models are used to evaluate the data. Analysis of data normally starts with editing and coding of the data.

The interpretation of the data that have been conducted by using different analytical techniques. Several statistical tools are used for data analysis, in order to make the analysis suitable for effective decision-making. The statistical analysis of the data may range from simple frequency distribution tables to complex multivariate analysis.

#### **Preparing and Presenting the Research Report:**

After the evaluation of the data, the last and the major phase that comes into picture is the preparation of a research report. The research reports can be presented either in oral or in written format. The research report should contain a brief description of the objectives of the research, a summary of the research design adopted, a summary of the major findings and conclude with the limitations and recommendations. The purpose of conducting any research is to obtain information that can aid in efficient decision-making. Therefore, it is very important to carefully analyze the information obtained and present it according to the requirements of the management of the company. At this stage, the research report should be developed most efficiently and it should portray the research findings most effectively. The amount of information provided in the research report should be based on the requirements of the manager. A research report also acts as a historical document, in the sense that the manager may refer to this document in the future if a research on the same lines is being conducted sometime in the future.





### **Management – Research Question Hierarchy**

The management-research question hierarchy process of sequential question formulation leads a manager or researcher from management dilemma to investigative questions

#### 1) Management Dilemma:

The process begins with the management dilemma—the problem or opportunity that requires a business decision. The management dilemma is usually a symptom of an actual problem, such as:

Rising costs.

The discovery of an expensive chemical compound that would increase the usefulness of a drug.

Increasing tenant move-outs from an apartment complex. o Declining sales.

o A larger number of product defects during the manufacture of an automobile.

o An increasing number of letters and phone complaints about post purchase.

### 2) Management Question:

**Management questions** are the restatement of the management dilemma in question form. The management questions that evolve from the management dilemma are too numerous to list, but we can categorize them. No matter how the management question is defined, many research directions can be taken. A specific question can lead to many studies. Therefore, it is the joint responsibility of the researcher and the manager to choose the most productive project.

Assume, for example, a business researcher is hired to help the management of a coffee shop. A coffee shop was concerned about low traffic and sales. The owner and the researcher discuss the problem facing the organization and settle on this management question: "How can we improve our profit picture?"

The management question does not specify what kind of business research is to be done. This question is strictly managerial in thrust. It implies that the coffee shop faces the task of developing a strategy for increasing profits. The question is broad. Notice that it doesn't indicate whether management should increase profits via changing ambience, taste, price, advertisements, or some other means.

## 3) The Research Question

Using his or her understanding of the basic theoretical concepts, the researcher's task is to assist the manager in formulating a research question that fits the need to resolve the management dilemma. A **research question** best states the objective of the business research study. It is a more specific management question that must be answered. It may be more than one question or just one. A business research process that answers this more specific question provides the manager with the information necessary to make the decision he or she is facing. Incorrectly defining the research question is the fundamental weakness in the business research process. Time and money can be wasted studying an alternative that won't help the manager rectify the original dilemma.

Meanwhile, at owner of coffee shop has agreed to have the business research be guided by the following research question:

- How does the coffee shop increase customer traffic?
- What is the product mix that would best satisfy customers?



- What is the awareness of the coffee shop?
- What needs do our customers have that are currently not being met?

# 4) Investigative Questions:

**Investigative questions** represent the information that the decision maker needs to know; they are the questions the researcher must answer to satisfactorily arrive at a conclusion about the research question. To study the market, the researcher working on the coffee shop project develops two major investigative questions. Each question has several sub questions. These questions provide insight into the lack of deposit growth:

- What is the public's position regarding coffee shop?
- What is overall awareness of the coffee shop in the town?
- What is the satisfaction among current coffee shop customers?
- What is competitive position of coffee shop?
- What are the geographic patterns of our customers and of our competitors' customers?
- What demographic differences are revealed among our customers and those of our competitors?
- What descriptive words or phrases does the public (both customers and noncustomers) associate with coffee shop? With coffee shop's competitors?
- How aware is the public of coffee's promotional efforts?
- What are perceptions of the coffee shop and its competitors?

# 5) Measurement Questions:

**Measurement questions** are the actual questions that researchers use to collect data in a study. They could become questions on a survey or elements of an observation checklist. Measurement questions should be outlined by the completion of the project planning activities but usually awaits pilot testing for refinement. Two types of measurement questions are common in business research:

o Predesigned, pretested questions. o Custom-designed

questions.

**Predesigned measurement questions** are questions that have been formulated and tested previously by other researchers, are recorded in the literature, and may be applied literally or be adapted for the project at hand. Some studies lend themselves to the use of these readily available measurement devices. Such questions provide enhanced validity and can reduce the cost of the project. Often, however, the measurement questions must be custom tailored to the investigative questions. The resources for developing **custom designed measurement questions**—questions formulated specifically for the project at hand—are the collective insights from all the activities in the business research process completed to this point, particularly insights from exploration. Later, during the pilot testing phase of the research process, these custom-designed questions will be refined.

While formulating research problem, researcher must be certain that the real decision problem is being addressed. Poor definition of research problem leads to awful, unfortunate consequences. The classic example for this is failure of New Coke.

In 1985 the Coca -Cola Company decided to terminate its most popular soft drink and replace it with a formula it would market as New Coke. New coke was a Coca cola brand failure story. The



relationship between Coca-Cola and Pepsi the arch-rivals had not been a healthy one. In 1981 Coke's number one status was starting to look vulnerable. It was losing market share not only to Pepsi but also to some of the drinks produced by the Coca-Cola Company itself, such as Fanta and Sprite. The problem, as Coca-Cola perceived it, came down to the product itself. So Coca-Cola started working on a new formula. A year later they had arrived at new product New Coke. Having produced its new formula, the Atlanta-based company conducted 200,000 taste tests to see how it fares. The results were great. Not only did it taste better than the original, but public preferred it to Pepsi -Cola as well. It therefore decided to scrap the original Coca-Cola and replace it by New Coke. As soon as the decision was announced, a large percentage of the US population immediately decided to boycott the new product. On 23 April 1985 New Coke was introduced and a few days later the production of original Coke was stopped. This joint decision has since been referred to as 'the biggest marketing blunder of all time'. Sales of New Coke were low and public outrage was high at the fact that the original was no longer available. On July 10, 1985, the Coca-Cola Company announced that it would bring back the old Coke and rebrand (rename) the drink "Coca-Cola Classic".

### The Research Proposal:

A proposal is an individual's or company's offer to produce a product or render service to a potential buyer or sponsor. The research proposal is a written statement of the research design (strategy, blueprint) that often includes:

- A statement explaining the purpose of the study (in the form of research objectives or deliverables).
- A definition of the problem (often in the form of a decision statement).
- The particular research methodology that will be employed.
- Details of procedures that will be used during each stage of the research process,
- A schedule of costs and deadlines.

The research proposal is essentially a road map, showing clearly the location from which a journey begins the destination to be reached and way or method to reach that destination. A proposal is also known as plan, outline, prospectus, draft or statement of intent. Research proposal tells about what is your plan, why you want to do it, how you are going to that, where it is going to carried out, how long it will take, who is going to carried out and how much cost it require.

### **Types of Research Proposals**

Research proposal can be divided into internal proposal and external proposal. An internal proposal is done by staff specialists or by the research department within the firm. External research proposals are sponsored by government agencies, university, government contractors, NGO's or corporate.

Internal research proposals are briefer than the external ones. The outline of internal proposal consists of management problem, study objectives, research design and schedule. In this literature review and bibliography are not stressed and can be often stated in research design.

An external proposal is either solicited or unsolicited. Solicited research proposal developed in response to request for proposal (RFP). While unsolicited proposal suggestion by a contract researcher

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for research that might be done.

## Structure of Research Proposal:

Each of the following module is flexible, so its content and length according to need of intended audience.

### **Executive Summary:**

The executive summary allows busy manager or sponsor to understand the thrust of the proposal quickly. It is really an informative summary, give chance to executives to grasp essentials without reading the details. As reading the summary, positive evaluation could be possible by executives who will pass the proposal to the staff for full evaluation, so summary should be persuasive, outlining and focused. The executive summary should include statement of management dilemma, research objectives or research question, and benefits of your approach. For unsolicited proposal include brief description of researcher's qualification.

### **Problem statement:**

Researcher should capture the attention of sponsor by stating management dilemma, its background, its consequences and the management questions. While stating a problem statement should be clear, precise and avoid broad statement of problem. If separate module on importance and benefits of the study is not included then it should be emphasized in this section.

### **Research Objectives:**

This section includes the purpose of research project. The objectives flow from problem statement, giving specific, achievable goal. It is advisable to list out the objectives either in order of importance or general to specific terms. It is essential to discuss each objective in the research design, data analysis and result sections.

#### Literature Review:

Literature review is a consideration of recent or past research studies, company reports or industry reports related to current study which act as basis for proposed study. It is likely to prepare a brief review of the information not comprehensive. In literature review confer about the important results and conclusions of other related studies, relevant data, and particular design that could be included. Discuss how literature is applies in proposed study; gap in the literature and how it is addressed in the proposed study.

### Importance / Benefits of the Study:

In this section you influence sponsor by describing benefits that will enlarge from your study. In this section, you have to persuade the sponsor by showing the importance of information and its implication. This section is particularly important in the unsolicited research proposal to convince the sponsoring organization that your plan will meet its need.

#### **Research Design**

In this section researcher has to include the details of research procedure you intend to follow while executing the research. Brief about your sample selection and size, data collection method, instrumentation, procedures. If more than one design approach is exists, justify superiority of your approach.

#### **Data Analysis:**

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Describe proposed strategy used for data analysis and its theoretical basis for the selected techniques. Researcher can make it easier to write, read and understand data analysis by using dummy charts and dummy table. Data analysis section is one of key parameter for evaluating competing research proposal so use latest technique for analysis. Company can check soundness of analysis by expertise or may hire analytical expertise professional.

### Nature and Form of Result

The aim of marketing research is to fulfill information gap. The market researcher is expected to flesh out

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information objectives with their own suggestion. This section contains the contractual statement telling the sponsor exactly what types of information will be received. Conclusions applied findings, suggestions, models and so forth are examples of the forms of results.

### **Qualifications of Researchers:**

As many individuals, research specialty firms and consultancies provide research services, sponsor needs assurance that the researcher is professionally competent.

The sponsor can judge competency of researcher through this section. This section should begin with qualification of the principal investigator and all the individuals involved with the project. The competency can be judge by past research experience, academic degree, so provide concise description of similar project. Often research companies subcontract specific research activities to firms or individuals that offer specific resources or facilities like qualitative research techniques such as focus groups and in depth interviews. Usually brief profiles of these companies are provided in this section only if their inclusion enhances the credibility of researcher.

### **Budget:**

The budget, researcher presents may vary depending on sponsor's requirement and contracting Research Company's policy. The budget may include salaries or wages of employees, traveling expenses, stationary, rent and equipment cost etc. The

budget statement in an internal research proposal is based on employee and overhead cost. The external research proposal should include total fee payable along with schedule of payment.

Budget Items	Rate	Total Days	Charge
<ul> <li>A. Salaries</li> <li>A. Secarch Director</li> <li>Associate</li> <li>Research Assistant (2)</li> <li>Secretarial (1)</li> </ul>	1500/hr 800/hr 100/hr 50/hr	20 hours 10 hours 200 hours 100 hours	30000 8000 20000 5000 63000
<ul> <li>B. Other Costs</li> <li>5. Travel</li> <li>6. Stationary</li> <li>7. Telephone</li> <li>8. Internet</li> <li>9. Publication</li> <li>Subtotal</li> </ul>		nyansagar Inst anagement & Rese	tute of 15000 2000 500 1000 1500 Rs 20000/-
C. Overhead			Rs 7000/-

Table: 1: Sample Proposal Budget



Total Funding Requested Rs 90,000/-	hadula
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The schedule should include the major phases of the research project, their timetables and milestones that signify completion of major phase. Researcher can use Gantt chart or if the project is large scale, Critical Path Method.

### Bibliography

ClAs for all research projects literature review required, a bibliography is necessary. Researcher should present bibliography in the format provided by the sponsor. If none is specified, a standard style will be used to prepare the bibliography.

## **Evaluating the Research Proposal**

Research proposal is reviewed either formally or informally. For review processes following steps are included

- By using RFP guidelines, develop review criteria.
- On universal scale, assignment of points for each criterion.
- Based on importance of each criterion assign weight.
- Calculation of a score for each proposal.
- The proposal with highest number of score wins the contract.

This formal method is generally used for competitive government, university, public sector grants or large scale contracts. In the informal review, project has criteria of evaluation but it is not well documented.

The research proposal content should be according to sponsor's RFP. Beyond required modules, other factors can quickly eliminate a proposal from consideration or improve the acceptance of proposal like

- Neatness
- Logical and easy to understood organization of content
- Fulfilling each criteria of sponsor's RFP including budget and schedule
- Appropriate writing style
- Submitting proposal within time bound

If the research proposal is poorly presented, unorganized or having ambiguous content will not be accepted from reviewing sponsor. In terms of writing style, the problem statement, the research design and the methodology should be logically designed and clear understanding to sponsor through the research proposal. The proposal must be according to guidelines of RFP including budget and deadline. If budget is beyond the limit, proposal will be rejected while low budget may suggest that something is missing or wrong in the research proposal. If proposal is submitted late will not be review. Late submission reflect professional incompetency hence it creates long term effect.

# **Ethics in Business Research:**

Ethics in business research refers to a code of conduct or expected societal norms of behaviour

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while conducting research. Ethical conduct applies to the organization and the members that sponsor the research, the researchers who undertake the research, and the respondents who provide them with the necessary data. The observance of ethics begins with the person instituting the research, who should do so in good faith, pay attention to what the results indicate, and, surrendering the ego, pursue organizational rather than self-interests. Ethical conduct should also be reflected in the behavior of the researchers who conduct the investigation, the participants who provide the data, the analysts who provide the results, and the entire research team that presents the interpretation of the results and suggests alternative solutions.

Thus, ethical behavior pervades each step of the research process – data collection, data analysis, reporting, and dissemination of information on the Internet, if such an activity is undertaken. How the subjects are treated and how confidential information is safeguarded are all guided by business ethics.

# **Ethical Treatment of Participants**

When ethics are discussed in research design, we often think first about protecting the rights of the participant, or subject. Whether data are gathered in an experiment, interview, observation, or survey, the participant has many rights to be safeguarded.

**Voluntary participation** means that all research subjects are free to choose to participate without any pressure or coercion. All participants can withdraw from, or leave, the study at any point without feeling an obligation to continue. Your participants don't need to provide a reason for leaving the study. It's important to make it clear to participants that there are no negative consequences or repercussions to their refusal to participate. After all, they're taking the time to help you in the research process, so you should respect their decisions without trying to change their minds.

**Informed consent** refers to a situation in which all potential participants receive and understand all the information they need to decide whether they want to participate. This includes information about the study's benefits, risks, funding, and institutional approval. Usually, you'll provide participants with a text for them to read and ask them if they have any questions. If they agree to participate, they can sign or initial the consent form. Note that this may not be sufficient for informed consent when you work with particularly vulnerable groups of people. If you're collecting data from people with low literacy, make sure to verbally explain the consent form to them before they agree to participate. For participants with very limited English proficiency, you should always translate the study materials or work with an interpreter, so they have all the information in their first language. In research with children, you'll often need informed consent, it's best to also ask for their assent (agreement) to participate, depending on their age and maturity level.

Anonymity means that you don't know who the participants are and you can't link any individual participant to their data. You can only guarantee anonymity by **not** collecting any personally identifying information—for example, names, phone numbers, email addresses, IP addresses, physical characteristics, photos, and videos. In many cases, it may be impossible to truly anonymize data collection. For example, data collected in person or by phone cannot be considered fully anonymous because some personal



identifiers (demographic information or phone numbers) are impossible to hide. You'll also need to collect some identifying information if you give your participants the option to withdraw their data at a later stage.

**Confidentiality** means that you know who the participants are, but you remove all identifying information from your report. All participants have a right to privacy, so you should protect their personal data for as long as you store or use it. Even when you can't collect data anonymously, you should secure confidentiality whenever you can. Some research designs aren't conducive to confidentiality, but it's important to make all attempts and inform participants of the risks involved.

**Potential of Harm :** As a researcher, you must consider all possible sources of harm to participants. Harm can come in many different forms.

- **Psychological harm:** sensitive questions or tasks may trigger negative emotions such as shame or anxiety.
- Social harm: participation can involve social risks, public embarrassment, or stigma.
- Physical harm: pain or injury can result from the study procedures.
- Legal harm: reporting sensitive data could lead to legal risks or a breach of privacy.

It's best to consider every possible source of harm in your study as well as concrete ways to mitigate them. Involve your supervisor to discuss steps for harm reduction. Make sure to disclose all possible risks of harm to participants before the study to get informed consent. If there is a risk of harm, prepare to provide participants with resources or counseling or medical services if needed.

# **Ethics and Data**

# Plagiarism

Plagiarism means submitting others' works as your own. Although it can be unintentional, copying someone else's work without proper credit amounts to stealing. It's an ethical problem in research communication because you may benefit by harming other researchers. Self- plagiarism is when you republish or re-submit parts of your own papers or reports without properly citing your original work.

This is problematic because you may benefit from presenting your ideas as new and original even though they've already been published elsewhere in the past. You may also be infringing on your previous publisher's copyright, violating an ethical code, or wasting time and resources by doing so. In extreme cases of self-plagiarism, entire datasets or papers are sometimes duplicated. These are major ethical violations because they can <u>skew</u> research findings if taken as original data.

# **Research Misconduct**

Research misconduct means making up or falsifying data, manipulating data analyses, or misrepresenting results in research reports. It's a form of academic fraud. These actions are committed intentionally and can have serious consequences; research misconduct is not a simple mistake or a point of disagreement about data analyses. Research misconduct is a serious ethical issue because it can undermine academic integrity and institutional credibility. It leads to a waste of funding and resources that could have been used for alternative research.

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# Unit 2

# **Research Design**

It is nothing but the blue print or action plan of how to conduct research. In a lay man view answers to the questions what, where, how, why in regard to research is research design. Deciding journey map is research design. It is a plan how researcher will start from detecting situation/ problem to final report writing. This process of planning may consist of blueprint of venue, time, budget, manpower, and collection of sample data, measurement of data, analysis of data, formulating hypothesis, writing report and everything needed for conducting valid, reliable, useful research.

### Need of Research Design:

As we know research design is well thought plan or blue print, so it facilitates the smooth running of all research activities. 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.

## **Overall Research Design Can be Split into The Following Designs:**

### 1) Sampling Design

Way of selecting samples from the populations so that there should not be bias in selecting samples. In another way one can say that all samples must be proper representative of population/universe.

### **Observational Design:**

Relates to the conditional under which the observations are made.

### **Statistical Design:**

This has concern with sample size determination and statistical analysis used for the data collected such a way that objectives should get fulfilled.

### **Operational Design:**

Overall operations in a research, Way of conduction research. It is procedure part of all other design.

## Features of Good f Rese<mark>arch De</mark>sign

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A research design (plan) which gives maximum output by minimizing errors produce is research is said to be good research. Following are some the features of good research design.

It should be flexible and appropriate for situation discussed.

It should be economical (planned considering budget.).

It should minimize bias and maximize reliability.

The design should be an activity and time based plan.

It is always based on research question.

It guides the selection of sources and types of information.

It indicates a framework for specifying the relationship among the study's variables.

Outlines procedures for every research activity.

It must be appropriate, efficient and economical.

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It should be flexible.

It must be adequate.

Once single research design cannot serve the purpose of all types of research problems, infact research design varies according to research problem explored. When researcher wants to explore some new ideas or concepts then design should be flexible in operation. Whereas in descriptive or experimental types of research, design adopted should be rigid.

# Use of Good Research Design:

If the research design is an exploratory in nature or new concept to be studied or wherein the major focus on discovery of ideas and insights, the research design most appropriate must be flexible enough to permit the research to act freely. But when the purpose of a study is to describe phenomena deeply or association between categories or describing/ forecasting trends of market or business where accuracy becomes a major consideration and a research design which minimizes bias and maximizes 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 minimization of bias and maximization 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 categorized 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.

Keep in mind quantitative research deals with quantity expressed in absolute numerical values, it may be wages, number of customers, sales etc., whereas qualitative research is associated with quality, attribute, rank, order, perception, behavior of customer which cannot be expressed as quantity directly. Every qualitative attribute expressed quality of phenomena which can be converted into quantity such as median, rank, number of attributes. If we research sales trend then it becomes quantitative research, but if we are studying brand loyalty then it may be qualitative research.

Quantitative research is projectable. This methodology should be adopted for larger sample which is representative of the entire universal/ population being researched (customers, prospects, employees etc.). Quantitative research is usually done by mail, telephone, or now even through the Internet. Because it's conducted on a larger scale, rather than through a two-hour conversation with a handful of people, it won't provide the depth of information available through qualitative work. However, the information is projectable to the entire population – if 35% of the customer surveyed have concerns about your quality, you know that the figure is about the same in your entire population.

Qualitative research is an in-depth exploration of what makes people tick on a particular subject: their feelings, perceptions, decision-making processes, etc. The most common form of qualitative research is focus groups, but one-on-one depth interviews are also used.



Qualitative research will provide a much deeper understanding of how the target market thinks, but it does not provide projectable data. In other words, you can't legitimately walk away from a focus group with the feeling that since eight out of the ten respondents liked your organization, this signals strong public acceptance in the general population.

The most basic question in whether to do qualitative or quantitative research is whether the research needs to produce projectable data. Organizations frequently make the mistake of using focus groups to gather numerical data, such as how many people liked the advertisement, or what proportion of the respondents mentioned that they would like to receive a monthly newsletter.

Criteria	Qualitative Research	Quantitative Research
Purpose	To understand & interpret social or unexplored area.	To describe or predict phenomena. To test hypotheses, look at cause & effect, & make predictions.
Group Studied	Smaller & not randomly selected.	Larger & randomly Selected.
Variables	Study of the whole, not variables.	Specific variables studied
Type of Data Collected	Words, images, or objects.	Numbers and statistics.
Form of Data Collected	Qualitative data such as open- ended responses, interviews, participant observations, field notes, & reflections.	Quantitative data based on precise measurements using structured & validated data-collection instruments.
Type of Data Analysis	Identif y patterns, features, themes.	Downsagar Institute of Identify on & Resistatistical relationships.
Subjectivity	Subjectivity is expected.	Objectivity is critical.
Role of Researcher	Researcher & their biases may be known to participants in the study, & participant characteristics may be known to the researcher	Researcher & their biases are not known to participants in the study, &participant characteristics are deliberately hidden

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		from the researcher (double blind studies).
Results	Particular or specialized findings that is less generalizable.	Generalizable findings that can be applied to other populations.
Scientific Method	Exploratory or bottom–up: the researcher generates a new hypothesis and theory from the data collected.	Confirmatory or top-down: the researcher tests the hypothesis and theory with the data.
View of Human Behavior	Dynamic, situational, social, & personal.	Regular & predictable.
Most Common Research Objectives	Explore, discover, & construct.	Describe, explain, & predict.
Focus	Wide-angle lens; examines the breadth & depth of phenomena.	Narrow-angle lens; tests a specific hypotheses.
Nature of Observation	Study behavior in a natural environment.	Study behavior under controlled conditions; isolate causal effects.
Nature of Reality	Multiple realities; subjective.	Single reality; objective.
Final Report	Narrative report with contextual description & direct fro quotations m research participants.	Statistical report with correlations, comparisons of means, & statistical significance of findings.

# **Exploratory Research Design**

An exploratory study is undertaken when not much is known about the situation at hand, or no information is available on how similar problems or research issues have been solved in the past. In such cases, extensive preliminary work needs to be done to gain familiarity with the phenomena in the situation, and understand what is occurring, before we develop a model and set up a rigorous design for comprehensive investigation. In essence, exploratory studies are undertaken to better understand the nature of the problem since very few studies might have been conducted in that area. Extensive interviews with many people might have to be undertaken to get a handle on the situation and understand the phenomena. More rigorous research could then proceed. Some qualitative studies (as opposed to



quantitative data gathered through questionnaires, etc.) where data are collected through observation or interviews, are exploratory in nature. When the data reveal some pattern regarding the phenomena of interest, theories are developed and hypotheses formulated for subsequent testing. For example, Henry Mintzberg interviewed managers to explore the nature of managerial work. Based on the analysis of his interview data, he formulated theories of managerial roles, the nature and types of managerial activities, and so on. These have been tested in different settings through both interviews and questionnaire surveys.

Exploratory studies are also necessary when some facts are known, but more information is needed for developing a viable theoretical framework. For instance,

when we want to get at the important factors that influence the advancement of women in organizations, previous studies might indicate that women are increasingly taking on qualities such as assertiveness, competitiveness, and independence. There is also a perception that a judicious blend of masculine and feminine traits—such as being strong but not tough, kind but not soft—is conducive to women's organizational advancement.

These notions apart, there is a need for interviewing women managers who have made it to the top to explore all the relevant variables. This will help to build a robust theory. In sum, exploratory studies are important for obtaining a good grasp of the phenomena of interest and advancing knowledge through subsequent theory building and hypothesis

testing. Explorative Research design is appropriate when the research objective is to provide insights into

- Identifying the problems or opportunities.
- Identifying the problems or opportunities
- defining the problem more precisely,
- gaining deeper insights into the variables operating in a situation
- identifying relevant courses of action
- establishing priorities regarding the potential significance of a problems or opportunities
- gaining additional insights before an approach can be developed and

Gathering information on the problems associated with doing conclusive research. Much research has been of an exploratory nature; emphasizing on finding practices or policies that needed changing and on developing possible alternatives. On examination of the objectives of exploratory research, it is well understood that it could be used at the initial stages of the decision making process. It allows the marketer to gain a greater understanding of something that the researcher doesn't know enough about. This helps the decision maker and the researcher in situations when they have inadequate knowledge of the problem situation and/or alternative courses of action. In short, exploratory research is used in the absence of tried models and definite concepts. Exploratory research could also be used in conjunction with other research. As mentioned below, since it is used as a first step

in the research process, defining the problem, other designs will be used later as steps to solve the problem. For instance, it could be used in situations when a firm finds the going gets tough in terms of sales volume, the researcher may develop use exploratory research to develop probable explanations. Analysis of data generated using exploratory research is essentially abstraction and generalization. Abstraction refers to translation of the empirical observations, measurements etc. into concepts; generalization means arranging the material so that it focuses on those structures that are common to all



or most of the cases. The exploratory research design is best characterized by its flexibility and versatility. This is so, because of the absence of the non-imperativeness of a structure in its design. It predominantly involves imagination, creativity, and ingenuity of the researcher. Examples of exploratory research are:

Some of methods of explorative research design are

### **Projective Methods:**

Certain ideas and thoughts that cannot be easily verbalized or that remain at the unconscious levels in the respondents minds can usually be brought to the surface through motivational research. This is typically done by trained professionals who apply different probing techniques in order to bring to the surface deep-rooted ideas and thoughts in the respondents. Familiar techniques for gathering such data are word associations, sentence completion, thematic apperception tests (TAT), inkblot tests, and the like. Word association techniques, such as asking the respondent to quickly associate a word—say, work—with the first thing that comes to mind, are often used to get at the true attitudes and feelings. The reply would be an indication of what work means to the individual. Similarly, sentence completion would have the respondent quickly complete a sentence, such as -Work is-. I One respondent might say, —Work is a lot of fun, whereas another might say —Work is drudgery. These responses may provide some insights into individuals' feelings and attitudes toward work. Thematic Apperception Tests (TAT) call for the respondent to weave a story around a picture that is shown. Several need patterns and personality characteristics of employees could be traced through these tests. Inkblot tests, another form of motivational research, use colored inkblots that are interpreted by the respondents, who explain what they see in the various patterns and colors. Although these types of projective tests are useful for tapping attitudes and feelings that are difficult to obtain otherwise, they cannot be resorted to by researchers who are not trained to conduct motivational research.

### **Focus Groups:**

Focus groups consist typically of 8 to 10 members with a moderator leading the discussions for about 2 hours on a particular topic, concept, or product. Members are generally chosen on the basis of their expertise in the topic on which information is sought. For example, computer specialists may be selected to form a focus group to discuss matters related to computers and computing, and women with children may compose the focus group to identify how organizations can help working mothers. The focus sessions are aimed at obtaining respondents'impressions, interpretations, and opinions, as the members talk about the event, concept, product, or service. The moderator plays a vital role in steering the discussions in a manner that would draw out the information sought, and keeping the members on track. Focus group discussions on a specific topic at a particular location and at a specified time provide the opportunity for a flexible, free-flowing format for the members. The unstructured and spontaneous responses are expected to reflect the genuine opinions, ideas, and feelings of the members about the topic under discussion. Focus groups are relatively inexpensive and can provide fairly dependable data within a short time frame.

### **Role of the Moderator:**

The selection of and role played by the moderator are critical. The moderator introduces the topic, observes, and takes notes and/or tapes the discussions. The moderator never becomes an integral part of the discussions, but merely steers the group persuasively to obtain all the relevant information, and



helps the group members to get through any impasse that might occur. The moderator also ensures that all members participate in the discussion and that no member dominates the group. Someone from the research team may also observe the proceedings through a one-way mirror, listening to the verbal statements and noticing the nonverbal cues of the members.

## The Nature of Data Obtained Through Focus Groups:

It should be noted that though data obtained through these homogeneous group members are the least expensive of the various data collection methods, and also lend themselves for quick analysis, the content analysis of the data so obtained provides only qualitative and not quantitative information. Also, since the members are not selected scientifically to reflect the opinions of the population at large (see the next chapter on sampling for more details on this), their opinions cannot be considered to be truly representative. However, when exploratory information is collected as a basis for further scientific research, focus groups serve important function. Consider for example, the value of focus groups in exploring the concept of —Intellectual Property. When animated discussions take place, there is a groups are used for (1) exploratory studies, (2) making generalizations based on the information generated by them, and (3) conducting sample surveys. Focus groups

have been credited with enlightening investigators as to why certain products are not doing well, why certain advertising strategies are effective, why specific management techniques do not work, and the like.

### Videoconferencing:

If regional variations in responses are expected, several focus groups formed

including trained moderators at different locations. This process is easily facilitated through videoconferencing. By zooming in on a particular member the nonverbal cues and gestures of that individual can be captured, as when desired. This also obviates the need for an observer looking through one-way mirror. With the great strides in technological advancement, and with the facility communication with the moderator by relaying instant messages, videoconferencing as a means of gathering information from different groups in distant locations is indeed a promising prospect for the future. It should be noted that online focus groups are also common. E-mail, web sites, and Internet chat rooms facilitate focus group sessions as well.

## 6) Panels:

Panels, like focus groups, are another source of primary information for research purposes. Whereas focus groups meet for a one-time group session, panels (of members) meet more than once. In cases where the effects of certain interventions or changes are to be studied over a period of time, panel studies are very useful. Individuals are randomly chosen to serve as panel members for a research study. For instance, if the effects of a proposed advertisement for a certain brand of coffee are to be assessed quickly, the panel members can be exposed to the advertisement and their intentions of purchasing that brand assessed. This can be taken as the response that could be expected of consumers if, in fact, they had been exposed to the advertisement. A few months later, the product manager might think of introducing a change in the flavor of the same product and explore its effects on this panel. Thus, a continuing set of —expertsI serves as the sample base or the sounding board for assessing the effects of change. Such expert members compose the panel, and research that uses them is called a panel study. The Nielsen television index is based on the television viewing patterns of a panel. The

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index is designed to provide estimates of the size and nature of the audience for individual television programs. The data are gathered through audimeter instruments hooked to television sets in approximately 1,200 cooperating households. The audimeters are connected to a central computer, which records when the set is turned on and spotlights what channel is tuned. From these data, Nielsen develops estimates of the number and percentage of all TV households viewing a given TV show. Other panels used in marketing research include the National Purchase Diary Panel, the National Family Opinion Panel, and the Consumer Mail Panel.

### **Observational Surveys:**

Whereas interviews and questionnaires elicit responses from the subjects, it is possible to gather data without asking questions of respondents. People can be

observed in their natural work environment or in the lab setting, and their activities' and behaviors or other items of interest can be noted and recorded. Apart from the activities performed by the individuals under study, their movements, work habits, the statements made and meetings conducted by them, their facial expressions of joy, anger, and other emotions, and body language can be observed. Other environmental factors such as layout, work-flow patterns, the closeness of the seating arrangement, and the like, can also be noted. Children can be observed as to their interests and attention span with various stimuli, such as their involvement with different toys. Such observation would help toy manufacturers, child educators, day-care administrators, and others deeply involved in or responsible for children's development, to design and model ideas based on children's interests, which are more easily observed than traced in any other manner. The researcher can play one of two roles while gathering field observational data— that of a nonparticipant-observer or participant-observer.

#### **Nonparticipant-Observer:**

The researcher may collect the needed data in that capacity without becoming an integral part of the organizational system. For example, the researcher might sit in the corner of an office and watch and record how the manager spends her time. Observation of all the activities of managers, over a period of several days, will allow the researcher to make some generalizations on how managers typically spend their time. By merely observing the activities, recording them systematically, and tabulating them, the researcher is able to come up with some findings. This, however, renders it necessary that observers are physically pre-sent at the workplace for extended periods of time and makes observational studies time consuming.

### **Participant-Observer:**

The researcher may also play the role of the participant-observer. Here, the researcher enters the organization or the research setting, and becomes a part of the work team. For instance, if a researcher wants to study group dynamics in work organizations, then she may join the organization as an employee and observe the dynamics in groups while being a part of the work organization and work groups. Much anthropological research is conducted in this manner, where researchers become a part of the alien culture, which they are interested in studying in depth.

### **Structured versus Unstructured Observational Studies:**

### **Structured Observational Studies:**

As we have seen, observational studies could be of either the nonparticipant-observer or the participant-observer type. Both of these, again, could be either



structured or unstructured. Where the observer has a predetermined set of categories of activities or phenomena planned to be studied, it is a structured observational study. Formats for recording the observations can be specifically designed and tailored to each study to suit the goal of that research. Usually, such matters that pertain to the feature of interest, such as the duration and frequency of the event, as well as certain activities that precede and follow it, are recorded. Environmental conditions and any changes in setting are also noted, if considered relevant. Task-relevant behaviors of the actors, their perceived emotions, verbal and nonverbal communication, and such, are recorded. Observations that are recorded in worksheets or field notes are then systematically analyzed, with minimal personal inferences made by the investigator. Categories can then be developed for further analysis, as described in Chapter 12 on Data Analysis.

### **Unstructured Observational Studies:**

At the beginning of a study, it is possible that the observer has no definite ideas of the particular aspects that need focus. Observing events as they take place may also be a part of the plan as in many qualitative studies. In such cases, the observer will record practically everything that is observed. Such a study will be an unstructured observational study. Unstructured observational studies are claimed to be the hallmark of qualitative research. The investigator might entertain a set of tentative hypotheses that might serve as a guide as to who, when, where, and how the individual will observe. Once the needed information is observed and recorded over a period of time, patterns can be traced, and inductive discovery can then pave the way for subsequent theory building and hypotheses testing.

#### Advantages and Disadvantages of Observational Studies :

There are some specific advantages and disadvantages to gathering data through observation as listed below:

#### Advantages of Observational Studies:

The following are among the advantages of observational studies.

The data obtained through observation of events as they normally occur are generally more reliable and free from respondent bias.

In observational studies, it is easier to note the effects of environmental influences on specific outcomes. For example, the weather (hot, cold, rainy), the day of the week (midweek as opposed to Monday or Friday), and such other factors that might have a bearing on, for example, the sales of a product, traffic patterns, absenteeism, and the like, can be noted and meaningful patterns might emerge from this type of data.

It is easier to observe certain groups of individuals—for example, very young children and extremely busy executives—from whom it may be otherwise difficult to obtain information. The above three

advantages are perhaps unique to observational studies.

### **Drawbacks of Observational Studies:**

The following drawbacks of observational studies have also to be noted:

It is necessary for the observer to be physically present (unless a camera or another mechanical system can capture the events of interest), often for pro-longed periods of time.

This method of collecting data is not only slow, but also tedious and expensive.

Because of the long periods for which subjects are observed, observer fatigue could easily set in, which might bias the recorded data.

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Though moods, feelings, and attitudes can be guessed by observing facial expressions and other nonverbal behaviors, the cognitive thought processes of individuals cannot be captured.

Observers have to be trained in what and how to observe, and ways to avoid observer bias.

# **Biases in Observational Studies:**

Data observed from the researcher's point of view are likely to be prone to observer biases. There could be recording errors, memory lapses, and errors in interpreting activities, behaviors, events, and nonverbal cues. Moreover, where several observers are involved, inter observer reliability has to be established before the data can be accepted. Observation of the happenings day in and day out, over extended periods of time, could afflict the observers with ennui and introduce biases in the recording of the observations. To minimize observer bias, observers are usually given training on how to observe and what to record. Good observational studies would also establish inter observer reliability. This could also be established during the training of the observers when videotaped stimuli could be used to determine inter observer reliability. A simple formula can be used for the purpose- dividing the number of agreements among the trainees by the number of agreements and disagreements thus establishing the reliability coefficient. Respondent bias could also be a threat to the validity of the results of observational studies, because those who are observed may behave differently during the period of the study, especially if the observations are confined to a short period of time. However, in studies of longer duration, the employees become more relaxed as the study progresses and tend to behave normally. For these reasons, researchers doing observational studies discount the data recorded in the first few days, if they seem to be quite different from what is observed later.

## **Conclusive Research Design:**

It involves providing information on evaluation of alternative courses of action and selecting one from among a number available to the researcher. Conclusive Research is again classified as:

Descriptive research, and

Causal research.

It is simple to understand as the name itself suggests that it involves describing something, for example:

Market conditions;

Characteristics or functions;

Estimate the percentage of customers in a particular group exhibiting the same purchase behavior;

Perceptions of product characteristics; and

To predict the pattern of behavior of characteristic versus the other

Majority of research studies are descriptive studies. As research studies involve investigating the customers/consumers, collection of data includes interrogating the respondents in the market and data available from secondary data sources. However, it cannot be concluded that descriptive studies should be simply fact-gathering process. Descriptive study deals with the respondents in the market and hence, extreme caution has to be exercised in developing this study. Much planning should be done, objectives should be clear than exploratory studies. In descriptive research, the data is collected for a specific and definite purpose and involves analysis and interpretation by the researcher. The major difference between exploratory and descriptive research is that descriptive research is characterised by the formulation of specific objectives. The success of descriptive studies depends on the degree to which a specific



hypothesis acts as a guide. Descriptive studies restrict flexibility and versatility as compared to exploratory research. It involves a higher degree of formal design specifying the methods for selecting the sources of information and for collecting data from those sources. Formal design is required in order to ensure that the description covers all phases desired. It is also required to restrain collection of unnecessary data. Descriptive studies require a clear specification of the who, when, where, what, why and how. While designing a descriptive research, the researcher should also have sufficient knowledge on the nature and type of statistical techniques he/she is going to use. This will greatly help to have the right design in place. Mostly descriptive studies are conducted using questionnaire, structured interviews and observations. The results of description studies are directly used for marketing decisions. Descriptive studies are again classified into two types:

### Longitudinal:

Longitudinal research relies on panel data and panel methods. It involves fixing a panel Consisting of fixed sample of subjects that are measured repeatedly. The panel members are those who have agreed to provide information at a specific

intervals over an extended period. For example, data obtained from panels formed to provide information on market shares are based on an extended period of time, but also allow the researcher to examine changes in market share over time. New members may be included in the panel as an when there is a dropout of the existing members or to maintain representativeness. Panel data is analytical and possess. advantages with respect to the information collected in the study. They are also considered to be more accurate than cross sectional data because panel data better handle the problem associated with the errors that arise in reporting past behaviour and the errors that arise because of the necessary interaction between interviewer and respondent.

### **Cross-sectional research (One time):**

Data is collected at a cross section of community/customers such as various surveys. It is the most predominantly and frequently used descriptive research design in marketing. It involves a sample of elements from the population of interest. The sample elements are measured on a number of characteristics. There are two types of cross-sectional studies:

It may appear that field studies and surveys are no different but the same. However, for practical reasons, they are classified into two categories cross sectional research. The fundamental difference lies in the depth of what these research cover. While survey has a larger scope, field study has greater depth. Survey attempts to be representative of some known universe and filed study is less concerned with the generation of large representative samples and is more concerned with the in-depth study of a few typical situations. Cross sectional design may be either single or multiple cross sectional design, only one sample respondents are drawn whereas in multiple cross sectional designs, there are two or more samples of respondents. A type of multiple cross sectional design of special interest is Cohort analysis.

Cohort analysis consists of a series of surveys conducted at appropriate time intervals, where the cohort serves as the basic unit of analysis. A cohort is a group of respondents who experience the same event within the same time interval. (a) Case Study: This study involves intensive study of a relatively small number of cases. In this method, much emphasis is on obtaining a complete description and understanding of factors in each case, regardless of the number involved. It could be used significantly,



particularly when one is seeking help on a problem in which interrelationships of number of factors are involved, and in which it is difficult to understand the individual factors without considering them in their relationships with each other. As in the case of exploratory research, case method is also used in conjunction with exploratory research as first step in a research process. It is of prime value when the researcher is seeking help on a market problem in which the interrelationships of a number of factors are involved, and in which it is difficult to understand the individual factors without considering them in their relationships with each other.

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:

Formulating the objective of the study (what the study is about and why is it being made?)

Designing the methods of data collection (what techniques of gathering data will be adopted?)

Selecting the sample (how much material will be needed?)

Collecting the data (where can the required data be found and with what time period should the data be related?)

Processing and analysing the data.

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 are 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 are 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 user one or more of these methods which have been discussed in detail in 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 pretest 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.

It is used to obtain evidence of cause-and-effect relationships known as the independent-dependent relationship or the predictive relationships. This is an important type of research useful for marketers as this allows marketers to base their decision on assumed causal relationships. Causal research is done in the following situations:

- To identify which variables are the cause and which are the effect. In statistical terms, causal variables are called independent variables and effectual variables are called dependent variables.
- To determine the nature of the relationship between the causal variables and the effect to be predicted. Causal research requires a strong degree of planning on the design as its success depends on the structure of the design.

Before studying Experimental Research Design, we need to understand important concept relating to experimental research design.

## Dependent and Independent Variables:

A concept which can take on different quantitative values is called a variable. As such the concepts like weight, height, income are all examples of variables. Qualitative phenomena (or the attributes) are also quantified on the basis of the presence or absence of the concerning attribute. If one variable depends upon or is a consequence of the other variable, it is termed as a dependent variable, and the variable that is antecedent to the dependent variable is termed as an independent variable. For instance, if we say that height depends upon age, then height is a dependent variable and age is an independent variable. Further, if in addition to being dependent upon age, height also depends upon the individual's sex, then

height is a dependent variable and age and sex are independent variables. Similarly, readymade films and lectures are examples of independent variables, whereas behavioural changes, occurring as a result of the environmental manipulations, are examples of dependent variables.

### **Extraneous Variable:**

Independent variables that are not related to the purpose of the study, but may affect the dependent variable are termed as extraneous variables. Suppose the researcher wants to test the hypothesis that there is a relationship between children's gains in social studies achievement and their self-concepts. In this case self-concept is an independent variable and social studies achievement is a dependent variable. Intelligence may as well affect the social studies achievement, but since it is not related to the purpose of the study undertaken by the researcher, it will be termed as an extraneous variable. Whatever effect is noticed on dependent variable as a result of extraneous variable(s) is technically described as an 'experimental error'. A study must always be so designed that the effect upon the

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dependent variable is attributed entirely to the independent variable(s), and not to some extraneous variable or variables.

### **Control:**

One important characteristic of a good research design is to minimise the influence or effect of extraneous variable(s). The technical term 'control' is used when we design the study minimising the effects of extraneous independent variables. In experimental researches, the term 'control' is used to refer to restrain experimental conditions.

## **Confounded Relationship:**

When the dependent variable is not free from the influence of extraneous variable(s), the relationship between the dependent and independent variables is said to be confounded by an extraneous variable(s).

### **Research Hypothesis:**

When a prediction or a hypothesised relationship is to be tested by scientific methods, it is termed as research hypothesis. The research hypothesis is a predictive statement that relates an independent variable to a dependent variable. Usually a research hypothesis must contain, at least, one independent and one dependent variable. Predictive statements which are not to be objectively verified or the relationships that are assumed but not to be tested, are not termed research hypotheses.

### Experimental and Non-Experimental Hypothesis-Testing Research:

When the purpose of research is to test a research hypothesis, it is termed as hypothesis-testing research. It can be of the experimental design or of the non-experimental design. Research in which the independent variable is manipulated is termed 'experimental hypothesis-testing research' and a research in which an

independent variable is not manipulated is called 'non-experimental hypothesis-testing research'. For instance, suppose a researcher wants to study whether intelligence affects reading ability for a group of students and for this purpose he randomly selects 50 students and tests their intelligence and reading ability by calculating the coefficient of correlation between the two sets of scores. This is an example of non-experimental hypothesis-testing research because herein the independent variable, intelligence, is not manipulated. But now suppose that our researcher randomly selects 50 students from a group of students who are to take a course in statistics and then divides them into two groups by randomly assigning 25 to Group A, the usual studies programme, and 25 to Group B, the special studies programme. At the end of the course, he administers a test to each group in order to judge the effectiveness of the training programme on the student's performance-level. This is an example of experimental hypothesis-testing research because in this case the independent variable, viz., the type of training programme, is manipulated.

## **Experimental and Control Groups:**

In an experimental hypothesis-testing research when a group is exposed to usual conditions, it is termed a 'control group', but when the group is exposed to some novel or special condition, it is termed an 'experimental group'. In the above illustration, the Group A can be called a control group and the Group B an experimental group. If both groups A and B are exposed to special studies programmes, then both groups would be termed 'experimental groups.' It is possible to design studies which include only experimental groups or studies which include both experimental and control groups.



### **Treatments:**

The different conditions under which experimental and control groups are put are usually referred to as 'treatments'. In the illustration taken above, the two treatments are the usual studies programme and the special studies programme. Similarly, if we want to determine through an experiment the comparative impact of three varieties of fertilizers on the yield of wheat, in that case the three varieties of fertilizers will be treated as three treatments.

### **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 of designs of experiments.

### **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.

### **Experimental Design:**

Research design in case of hypothesis-testing research studies: Hypothesis-testing research studies (generally known as experimental studies) are those where the researcher tests the hypotheses of causal relationships between variables. Such studies require procedures that will not only reduce bias and increase reliability, but will permit drawing inferences about causality. Usually experiments meet this requirement. Hence, when we talk of research design in such studies, we often mean the design of experiments. Professor R.A. Fisher's name is associated with experimental designs. Beginning of such designs was made by him when he was working at Rothamsted Experimental Station (Centre for Agricultural Research in England). As such the study of experimental designs has its origin in agricultural research. Professor Fisher found that by dividing agricultural fields or plots into different blocks and then by conducting experiments in each of these blocks, whatever information is collected and inferences drawn from them, happens to be more reliable. This fact inspired him to develop certain experimental designs for testing hypotheses concerning scientific investigations. Today, the experimental designs originated in the context of agricultural operations, we still use, though in a technical sense, several terms of agriculture (such as treatment, yield, plot, block etc.) in experimental designs.

## **Basic Principles of Experimental Designs:**

Professor Fisher has enumerated three principles of experimental designs: (1) the Principle of Replication; (2) the Principle of Randomization; and the (3) Principle of Local Control.

According to the Principle of Replication, the experiment should be repeated more than once. Thus, each treatment is applied in many experimental units instead of one. By doing so the statistical accuracy of the experiments is increased. For example, suppose we are to examine the effect of two varieties of rice. For this purpose we may divide the field into two parts and grow one variety in one part and the other

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variety in the other part. We can then compare the yield of the two parts and draw conclusion on that basis. But if we are to apply the principle of replication to this experiment, then we first divide the field into several parts, grow one variety in half of these parts and the other variety in the remaining parts. We can then collect the data of yield of the two varieties and draw conclusion by comparing the same. The result so obtained will be more reliable in comparison to the conclusion we draw without applying the principle of replication. The entire experiment can even be repeated several times for better results. Conceptually replication does not present any difficulty, but computationally it does. For example, if an experiment requiring a two-way analysis of variance is replicated, it will then require a three-way analysis of variance since replication is introduced in order to increase the precision of a study; that is to say, to increase the accuracy with which the main effects and interactions can be estimated.

The Principle of Randomization provides protection, when we conduct an experiment, against the effect of extraneous factors by randomization. In other words, this principle indicates that we should design or plan the experiment in such a way that the variations caused by extraneous factors can all be combined under the general heading of "chance." For instance, if we grow one variety of rice, say, in the first half of the parts of a field and the other variety is grown in the other half, then it is just possible that the soil fertility may be different in the first half in comparison to the other half. If this is so, our results would not be realistic. In such a situation, we may assign the variety of rice to be grown in different parts of the field on the basis of some random sampling technique i.e., we may apply randomization principle and protect ourselves against the effects of the extraneous factors (soil fertility differences in the given case). As such, through the application of the principle of randomization, we can have a better estimate of the experimental error.

The Principle of Local Control is another important principle of experimental designs. Under it the extraneous factor, the known source of variability, is made to vary deliberately over as wide a range as necessary and this needs to be done in such a way that the variability it causes can be measured and hence eliminated from the experimental error. This means that we should plan the experiment in a manner that we can perform a two-way analysis of variance, in which the total variability of the data is divided into three components attributed to treatments (varieties of rice in our case), the extraneous factor (soil fertility in our case) and experimental error.\* In other words, according to the principle of local control, we first divide the field into several homogeneous parts, known as blocks, and then each such block is divided into parts equal to the number of treatments. Then the treatments are randomly assigned to these parts of a block. Dividing the field into several homogenous parts is known as 'blocking'. In general, blocks are the levels at which we hold an extraneous factor fixed, so that we can measure its contribution to the total variability of the data by means of a two-way analysis of variance. In brief, through the principle of local control we can eliminate the variability due to extraneous factor(s) from the experimental error.

### **Important Experimental Designs:**

Experimental design refers to the framework or structure of an experiment and as such there are several experimental designs. We can classify experimental designs into two broad categories, viz., informal experimental designs and formal experimental designs. Informal experimental designs are those designs that normally use a less sophisticated form of analysis based on differences in magnitudes, whereas formal experimental designs offer relatively more control and use precise



statistical procedures for analysis. Important experiment designs are as follows:

### **Experimental designs:**

Before-and-after without control design.

After-only with control design.

Before-and-after with control design.

### Formal experimental designs:

Completely randomized design (C.R. Design).

Randomized block design (R.B. Design).

Latin square design (L.S. Design).

Factorial designs.

We may briefly deal with each of the above stated informal as well as formal experimental designs.

## Before-and-after without control design:

In such a design a single test group or area is selected and the dependent variable is measured before the introduction of the treatment. The treatment is then introduced and the dependent variable is measured again after the treatment has been introduced. The effect of the treatment would be equal to the level of the phenomenon after the treatment minus the level of the phenomenon before the treatment. The design can be represented thus: Fig. 3.1

The main difficulty of such a design is that with the passage of time considerable extraneous variations may be there in its treatment effect.

## After-only with control design:

In this design two groups or areas (test area and control area) are selected and the treatment is introduced into the test area only. The dependent variable is then measured in both the areas at the same time. Treatment impact is assessed by subtracting the value of the dependent variable in the control area from its value in the test area. This can be exhibited in the following form:

Test area: Level of phenomenon before treatment (X) Treatment Effect

 $= (\mathbf{Y}) - (\mathbf{X})$ 

Treatment introduced

Level of phenomenon after treatment (Y)

The basic assumption in such a design is that the two areas are identical with respect to their behaviour towards the phenomenon considered. If this assumption is not true, there is the possibility of extraneous variation entering into the treatment effect. However, data can be collected in such a design without the introduction of problems with the passage of time. In this respect the design is superior to before-and-after without control design.

## Before-and-after with control design:

In this design two areas are selected and the dependent variable is measured in both the areas for an identical time-period before the treatment. The treatment is then introduced into the test area only, and the dependent variable is measured in both for an identical time-period after the introduction of the treatment. The treatment effect is determined by subtracting the change in the dependent variable in the control area from the change in the dependent variable in test area. This design can be shown in this way: Fig. 3.3

This design is superior to the above two designs for the simple reason that it avoids extraneous



variation resulting both from the passage of time and from non-comparability of the test and control areas. But at times, due to lack of historical data, time or a comparable control area, we should prefer to select one of the first two informal designs stated above.

## Completely randomized design (C.R. design):

Involves only two principles viz., the principle of replication and the principle of randomization of experimental designs. It is the simplest possible design and its procedure of analysis is also easier. The essential characteristic of the design is that subjects are randomly assigned to experimental treatments (or vice-versa). For instance, if we have 10 subjects and if we wish to test 5 under treatment A and 5 under treatment B, the randomization process gives every possible group of 5 subjects selected from a set of 10 an equal opportunity of being assigned to treatment A and treatment B. One-way analysis of variance (or one-way ANOVA)\* is used to analyse such a design. Even unequal replications can also work in this design. It provides maximum number of degrees of freedom to the error. Such a design is generally used when experimental areas happen to be homogeneous. Technically, when all the variations due to uncontrolled extraneous factors are included under the heading of chance variation, we refer to the design of experiment as C.R. design. We can present a brief description of the two forms of such a design as given in Fig 3.4.

### Two-group simple randomized design:

In a two-group simple randomized design, first of all the population is defined and

then from the population a sample is selected randomly. Further, requirement of this

## design is that items, after being selected randomly from the population, be

randomly assigned to the experimental and control groups (Such random assignment of items to two groups is technically described as principle of randomization). Thus, this design yields two groups as representatives of the population. In a diagram form this design can be shown in this way: Since in the sample randomized design the elements constituting the sample are randomly drawn from the same population and randomly assigned to the experimental and control groups, it becomes possible to draw conclusions on the basis of samples applicable for the population. The two groups (experimental and control groups) of such a design are given different treatments of the independent variable. This design of experiment is quite common in research studies concerning behavioural sciences. The merit of such a design is that it is simple and randomizes the differences among the sample items. But the limitation of it is that the individual differences among those conducting the treatments are not eliminated, i.e., it does not control the extraneous variable and as such the result of the experiment may not depict a correct picture. This can be illustrated by taking an example. Suppose the researcher wants to compare two groups of students who have been randomly selected and randomly assigned. Two different treatments viz., the usual training and the specialized training are being given to the two groups. The researcher hypothesizes greater gains for the group receiving specialised training. To determine this, he tests each group before and after the training, and then compares the amount of gain for the two groups to accept or reject his hypothesis. This is an illustration of the two- groups randomized design, wherein individual differences among students are being randomized. But this does not control the differential effects of the extraneous independent variables (in this case, the individual differences among those conducting the training programme).

Random replications design:


The limitation of the two-group randomized design is usually eliminated within the random replications design. In the illustration just cited above, the *teacher differences* on the dependent variable were ignored, i.e., the extraneous variable was not controlled. But in a random replications design, the effect of such differences are minimised (or reduced) by providing a number of repetitions for each treatment. Each repetition is technically called a 'replication'. Random replication design serves two purposes viz., it provides controls for the differential effects of the

extraneous independent variables and secondly, it randomizes any individual differences among those conducting the treatments. Diagrammatically we can illustrate the random replications design thus:

# Randomized block design (R.B. design):

**Randomized block design (R.B. design)** is an improvement over the C.R. design. In the R.B. design the principle of local control can be applied along with the other two principles of experimental designs. In the R.B. design, subjects are first divided into groups, known as blocks, such that within each group the subjects are relatively homogeneous in respect to some selected variable. The variable selected for grouping the subjects is one that is believed to be related to the measures to be obtained in respect of the dependent variable. The number of subjects in a given block would be equal to the number of treatments and one subject in each block would be randomly assigned to each treatment. In general, blocks are the levels at which we hold the extraneous factor fixed, so that its contribution to the total variability of data can be measured. The main feature of the R.B. design is that in this each treatment appears the same number of times in each block. The R.B. design is analysed by the two-way analysis of variance (two-way ANOVA)\* technique.

#### Latin square design (L.S. design):

Latin square design (L.S. design) is an experimental design very frequently used in agricultural research. The conditions under which agricultural investigations are carried out are different from those in other studies for nature plays an important role in agriculture. For instance, an experiment has to be made through which the effects of five different varieties of fertilizers on the yield of a certain crop, say wheat, it to be judged. In such a case the varying fertility of the soil in different blocks in which the experiment has to be performed must be taken into consideration; otherwise the results obtained may not be very dependable because the output happens to be the effect not only of fertilizers, but it may also be the effect of fertility of soil. Similarly, there may be impact of varying seeds on the yield. To overcome such difficulties, the L.S. design is used when there are two major extraneous factors such as the varying soil fertility and varying seeds. The Latin-square design is one wherein each fertilizer, in our example, appears five times but is used only once in each row and in each column of the design. In other words, the treatments in a L.S. design are so allocated among the plots that no treatment occurs more than once in any one row or any one column. The two blocking factors may be represented through rows and columns (one through rows and the other through columns). The following is a diagrammatic form of such a design in respect of, say, five types of fertilizers, viz., A, B, C, D and E and the two blocking factor viz., the varying soil fertility and the varying seeds: Fig. 3.7 The above diagram clearly shows that in a L.S. design the field is divided into as many blocks as there are varieties of fertilizers and then each block is again divided into as many parts as there are varieties of fertilizers in such a way that each of the fertilizer variety is used in each of the block (whether columnwise or row-wise) only once. The analysis of the L.S. design is very similar to the two-way ANOVA

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technique. The merit of this experimental design is that it enables differences in fertility gradients in the field to be eliminated in comparison to the effects of different varieties of fertilizers on the yield of the crop. But this design suffers from one limitation, and it is that although each row and each column represents equally all fertilizer varieties, there may be considerable difference in the row and column means both up and across the field. This, in other words, means that in L.S. design we must assume that there is no interaction between treatments and blocking factors. This defect can, however, be removed by taking the means of rows and columns equal to the field mean by adjusting the results. Another limitation of this design is that it requires number of rows, columns and treatments to be

#### **Factorial designs:**

Factorial designs are used in experiments where the effects of varying more than one factor are to be determined. They are especially important in several economic and social phenomena where usually a large number of factors affect a particular problem. Factorial designs can be of two types: (i) simple factorial designs and (ii) complex factorial designs. We take them separately Factorial designs are used mainly because of the two advantages. (i) They provide equivalent accuracy (as happens in the case of experiments with only one factor) with less labour and as such are a source of economy. Using factorial designs, we can determine the main effects of two (in simple factorial design) or more (in case of complex factorial design) factors (or variables) in one single experiment. (ii) They permit various other comparisons of interest. For example, they give information about such effects which cannot be obtained by treating one single factor at a time. The determination of interaction effects is possible in case of factorial designs.

*Hypotheses:* One of the most important considerations when beginning your research work and formulating the research problem is constructing the hypothesis. Generally, hypothesis provides clarity so that you can focus on a research problem. Hypotheses are intelligent hunches, guesses, or predictions that assist the researcher in seeking the solution or answer to the research question. A *theory's* validity is not directly examined. Instead, it is through the hypotheses that the merit of a theory can be evaluated.

# The Role of the Hypothesis

- imes Guides the direction of the study.
- ★ Identifies facts that are relevant.
- $\mathbf{x}$  Suggests which form of research design is appropriate.
- $\mathbf{x}$  Provides a framework for organizing the conclusions that result.

# Characteristics of a Good Hypothesis

- ★ A good hypothesis should fulfill conditions:
  - + **Purpose:** A good hypothesis should be adequate to its purpose of research.
  - + **Testable:** In research work, there must be methods and techniques used for data collection and analysis. Formulating a hypothesis that cannot be tested will lead to nowhere. There must be techniques to test your hypothesis.



- + Existing Body of Knowledge: Constructed hypothesis must emerge from an existing body of knowledge and adds to it. This is crucial in academic research. This criterion can only be achieved if the hypothesis has its foundation in existing knowledge.
- + Logical, simple, consistent: To be able to develop a good hypothesis, you need to equip yourself well in the literature review of your subject area. The hypothesis should be able to test one relationship at a time. The hypothesis shows a clear and specific statement.

#### **Types of Hypothesis**

# ★ Descriptive/ Declarative Hypothesis:

- + Hypothesis which describes the existence, size, form or distribution of some variables. For e.g. Eighty percent of shareholders of HLL favor increasing the company's cash dividend.
- ★ Relational Hypotheses:

Statements that describe the relationship between two variables with respect to some case. For example, "Foreign (variable) cars are perceived by Indian consumers (case) to be of better quality (variable) than domestic cars.OR There is association between income and saving.

**Correlational hypotheses** state that the variables occur together in some specified manner without implying that one causes the other. For example,

- + In an office old employees are more responsive than young employees.
- + Young women (under 35 years of age) purchase more units of our product than women who are 35 years of age or older.

With **explanatory** (causal) hypotheses, there is an implication that the existence of or a change in one variable causes or leads to a change in the other variable. As we noted previously, the causal variable is typically called the independent variable (IV) and the other the dependent variable (DV).

- + Employee training program will reduce employee absenteeism.
- + Increase in income leads to higher savings

#### Null and Alternative Hypothesis:

There are several ways of formulating a hypothesis. For example:

- + People in Kerela and Punjab give equal importance to education.
- + In an office old employees are more responsive than young employees
- + Employee training program will reduce employee absenteeism.
- + On an average income of people in Pune is Rs 30000/ month.

The first hypothesis has been formulated indicates that there is no difference either in the extent of education in both states Kerala and Punjab. When you construct a hypothesis stipulating that there is no difference between two situations, groups, outcomes, or the prevalence of a condition or phenomenon, this is called a **null hypothesis** and is usually written as H0.

The second hypothesis has been stated that old employees are more responsive than young, which indicates that there is difference in responsiveness due to age, such hypotheses are **alternative hypothesis**. An



alternative hypothesis is one in which a difference (or an effect) between two or more variables is anticipated by the researchers; that is, the observed pattern of the data is not due to a chance occurrence.

## Errors in testing a hypothesis:

As already mentioned, a hypothesis is an assumption that may prove to be either correct or incorrect. It is possible to arrive at an incorrect conclusion about a hypothesis for a variety of reasons. Incorrect conclusions about the validity of a hypothesis may be drawn if:

- the study design selected is faulty;
- the sampling procedure adopted is faulty;
- the method of data collection is inaccurate;
- the analysis is wrong;
- the statistical procedures applied are inappropriate; or
- the conclusions drawn are incorrect.

	Decision		
	Accept $H_0$	Reject $H_0$	
H <sub>0</sub> (true)	Correct decision	Type I error (α error)	
H <sub>0</sub> (false)	Туре II епог (β епог)	Correct decision	

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# Unit 3

# **Measurement and Data**

#### **Concept of Measurement :**

Sometimes, the information needed for our research may be quite simple and easy to get it.

If we are conducting a study for theme park in the city, we need answers to following questions. Whether more male consumers are visiting or female visitors are more? What is the age profile of the visitors? How much time an average visitor spends in the theme park? What factors determine the satisfaction of the visitors? How loyalty status groomed? What are the drivers of loyalty?

So we will define measurement as;

Measurement is defined as determining the amount or intensity of some characteristic of interest to the researcher. A measurable characteristic is called a property.

Measurement property, in general may be viewed as subjective and objective properties.

Objective properties are physically verifiable characteristics such as age, income, number of bottles purchased, store last visited, and so on. For example, we conduct a study on Laundry detergent. Some of the obvious but non-functional properties we might measure are weight, volume, texture, color, odor, cost, etc. Functional properties might include dirt-removing power, effect on colors, speed of cleaning action, and skin irritation power.

Subjective properties are those which cannot be directly observed because they are largely influenced by a person's judgments or impressions. A study to conduct job satisfaction among the employees, we may seek to measure attitudes toward work, attitudes toward the job environment, perceptions of fair treatment and compensation, and absenteeism.

In this case, the marketing researcher must ask a respondent to translate his or her feelings onto a continuum of intensity.

# **Observed Rules :**

Measurement means assigning numbers or other symbols to characteristics of objects according to certain pre-specified rules.

# **Assigning Numbers:**

What is measured is not the object, but some characteristic of it. Thus, we do not measure consumers only their perceptions, attitudes, preferences, or other relevant characteristics. In marketing research, numbers are usually assigned for one of two reasons. First, numbers permit statistical analysis of the resulting data. Second, numbers facilitate the communication of measurement rules and results.

# **Rules:**

The most important aspect of measurement is the specification of rules for assigning numbers to the characteristics. There must be one-to-one correspondence between the numbers and the characteristics being measured. The rules for assigning numbers should be standardized and applied uniformly. They must not change over objects or time.

# Scaling :

Scaling is an extension of measurement where it involves the generation of a continuum upon which



measured objects are located. Consider a scale from 1 to 100 for locating consumers according to the characteristic "attitude toward department stores." Each respondent is assigned a number from 1 to 100 indicating the degree of (un) favourableness, with 1 = extremely unfavourable, and 100 = extremely favourable.

Scaling' is the process of developing a continuum with respect to attitude toward department stores. 'Measurement' is the actual assignment of a number from 1 to 100 to each respondent on the scale.

#### **Measurement Utility:**

Any researcher need to understand the purpose of measurement; this will help you to decide how to structure your study, analyse the data and interpret the findings and draw conclusion about the variable(s).

#### Level of Measurement:

#### Scale Characteristics and Levels of Measurement:

All the scales that we use in research can be described in terms of four basic characteristics. These characteristics are description, order, distance and origin. The assignment of numbers is made according to rules that should correspond to the properties of whatever is being measured.

#### **Description Property:**

The description property is also known as assignment or category property. By description, we mean the unique labels or descriptors are used to designate each value of the scale. For example, 1. Married, 2. Unmarried; 1. Male, 2. Female; 1= extremely unsatisfied, 2= Somewhat Unsatisfied, 3= Unsatisfied, 4= neither unsatisfied nor satisfied, 5= Satisfied, 6= somewhat satisfied, 7= Extremely Satisfied; and the number of years of a respondent's age. All scale possess includes description in the form of unique labels that are used to define the scale values or response options.

#### **Order Property:**

Order refers relative sizes of the descriptors. Here, the key word is "relative" and include descriptors such as "greater than", "less than" and "equal to". For example, respondents are asked about preferred brand of Car. Respondent is expresses by the following order, with the most preferred brand being listed first and the least preferred brand last.

#### **BMW: Mercedes**

#### Volkswagen Toyota

In this, the preference to BMW is greater than Mercedes brand. Likewise, preference to Toyota is less than preference for Volkswagen brand. All scales do not possess the order property. In case of marital status (1. Married, 2. Unmarried) considered earlier, we can't say that unmarried is greater than or less than a married person. Thus, the marital scale, gender do not possess order property. **5**)

#### **Distance Property:**

The distance property refers to a measurement where exact differences between each of the descriptors are expressed known, in absolute and expressed in units. For example, if you bought 5 water bottles and your friend bought 3 water bottles of the same drink you bought two more bottles than your friend. Normally, the distance property is restricted to those situations where the raw responses represent some type of natural numerical answer. Notice, that a scale has distance also has order.

#### **Origin Property:**

The origin property refers to a measurement where it exists a unique or fixed beginning or true zero point. For example, annual income of household is



\_\_\_\_\_\_. It has a fixed origin or true zero. An answer of zero would mean that household has no income at all. Many scales in marketing research do not have a fixed origin or zero point, as in case of dissatisfied-satisfied scale considered earlier description. It has defined as 1= extremely unsatisfied, 2= Mostly Unsatisfied, 3= Somewhat Unsatisfied, 4= neither unsatisfied nor satisfied, 5= somewhat Satisfied, 6= Mostly satisfied, 7= Extremely Satisfied. Here, 1 is an arbitrary origin. This scale could have been defined as 0= extremely unsatisfied, 1= Mostly Unsatisfied, 2= Somewhat Unsatisfied, 3= neither unsatisfied nor satisfied, 4= somewhat Satisfied, 5= Mostly satisfied, 6= Extremely Satisfied., with 0 as origin. Or might be -3= extremely unsatisfied, -2= Mostly Unsatisfied, -1= Somewhat Unsatisfied, 0= neither unsatisfied nor satisfied, 1= somewhat Satisfied, 2= Mostly satisfied, 3= Extremely Satisfied. All these three forms of scale origin 1, 0 or -3 are equivalent. Thus this scale does not possess of property origin as it does not have fixed origin.

#### **Primary Scales of Measurement:**

There are four basic scales of measurement: nominal, ordinal, interval and ratio. These are listed in order of least sophisticated to the most sophisticated in terms of amount of information each provides. The scale classification of a measure determines the appropriate statistical procedure to use in analyzing the data generated through the measurement process.

#### **Nominal Scale:**

Nominal scales represent the most elementary level of measurement. A nominal scale is scale whose numbers serve only as labels or tags for identifying and classifying objects. It possesses only property of description. If one entity is assigned the same number as another, they are identical with respect to nominal variable. Otherwise, they are just different. Common examples include Aadhar card number and numbers assigned to player in a team. In marketing research, nominal scales are used for identifying respondents, brands, sex, marital status, attributes, and other objects. The only permissible operation on the numbers in a nominal scale is counting of observations or relative frequency. A mode, Percentages, chi-square and binomial tests are the permissible statistical analysis tools for nominal data.

#### **Ordinal Scale:**

An ordinal scale is a ranking scale in which numbers are assigned to objects to indicate the relative extent to which the objects possess some characteristics. It is possible to determine whether an object has more or less of a characteristic than some other object. It possesses the property of description and order but do not possess the property of distance or origin. Ordinal scales are frequently used in ranking items such as best, second best, etc. Such a ranking reveals

position, but not degree. In marketing research, brand preference, ranking of store or brands are examples of ordinal scale. Statistics which can be used on ordinal scale are the median, quartiles, rank correlation, frequency tables, cross tabulation etc.

# Interval Scale :

Interval scales are those in which distance between each descriptor is known. An interval scale possesses property of description, order and distance but not origin. The distance between any two scale values is identical to the difference between any other two adjacent values of an interval scale. There is a constant interval between the scale values. The distance between descriptors is known. The



classic example of an interval scale is the measurement of the temperature. Bothe the Fahrenheit and Centigrade scales belong to this type. One can say, a temperature of 70 degrees is 30 degrees warmer than 50 degrees and 30 degrees cooler than 100 degrees. The difference between 10 degrees and 20 degrees is same as 20 degrees and 30 degrees, but is only half the difference between 20 degrees and 40 degrees. These scales are used very commonly in marketing research and they are also described as 'rating scales'. All statistical techniques which can be used for nominal and ordinal scale can be used in an interval scale of measurement. Besides that other statistical techniques used for interval scale are arithmetic mean, standard deviation, Pearson correlation coefficient, t- test, regression, ANOVA and Factor analysis etc.

#### **Ratio Scale:**

A ratio scale possesses all the properties of the nominal, ordinal and interval scales and, in addition, an absolute zero point. With such a scale of weight, height, market share, income, sales, cost for example – it is possible to say how many times greater or smaller one object is than another. For example, we can say that an annual income of Rs 70,000 is twice as large as an income of Rs 35,000. All statistical techniques can be applied to ratio data. These include specialized statistics such as geometric mean, harmonic mean and coefficient of variations.

Scale	Basic	Common	Marketing	Permissible Statistics	
	Characteristics	Examples	Examples	Descriptive	Inferential
Nominal	Numbers	Aadhar no.,	Brand nos,	Percentage,	Chi-
	identify &	numbering	Store types	Mode	square,
	classify objects	of cricket			Binomial
		players			Test
Ordinal	Nos. indicate	Quality	Preference	Percentile/	Rank
	the relative	rankings,	rankings,	quartile,	correlation,
	positions of	ranking of	market	Median	Friedman
	objects but not	teams in a	position,		ANOVA
	the magnitude	tournament	social class		
	of difference				
	between them				
Interval	Difference	Temperature	Attitude,	Range,	Product-
	between objects		Opinions,	Mean,	Moment
			index	Standard	correlation,
				Deviation	ANOVA
Ratio	Zero point is	Length,	Age, sales,	Geometric	Coefficient
	fixed, ratios of	weight	income,	mean,	of variation
	scale values		costs	harmonic	
	can be			mean	
	compared				

# Attitude Scaling Techniques :

If someone asks you of your favorite restaurant, your mind may create a list and you shall decide your most favorite restaurant from that. While deciding on that favorite restaurant your mind would have used several criteria such as location, availability of the menu, price, and various other features such as service,



advertisement and ambience. Furthermore, your mind would have also told you the most preferred the second most preferred and even least preferred restaurant. The criteria your mind is using in deciding the favorite restaurant is called measurement. In research terms, measurement is nothing but the assignment of numbers or other symbols to characteristics of objects according to certain pre-specified rules. One of the important things to note here is that researchers do not measure objects but some characteristics of it. Thus, in marketing research, product/consumers are not measured, what is measured are their attitude, perception or any other relevant characteristics. There are two reasons for which numbers are usually used. First of all, number permit statistical analysis of the resulting collected data and secondly, they facilitate the communication of measurement results.

Scaling is an extension of measurement. Scaling involves creating a continuum on which measurements on objects are located. Scale development is designing questions to measure the characteristics of an object. For example, you want to measure the satisfaction level of customer and scale of 1 to 7 is used for the said purpose. This scale indicates degree of satisfaction, with 1: extremely dissatisfied and 7: extremely satisfied. Measurement is an actual assignment of a number 1 to 7 to each respondent. Scaling is the process of placing the respondents on a continuum with respect to satisfaction.

# **Scaling Techniques:**

The scaling techniques commonly employed in marketing research can be classified into comparative and non-comparative scales. As name suggests comparative scales involve the direct comparison of stimulus objects. For example, managers are generally interested in knowing consumer preference regarding their brand in comparison to a competitor's brand. A researcher can ask question to customer which two brands he/ she prefer and this would provide the manager a clear idea of consumer preference. A comparative scale includes paired comparison, rank order, constant sum scales, Q-sort and other procedures.

In non-comparative scales, each object is scaled independently of the others in the stimulus set. This is also referred as monadic or metric scales. The resulting data in non-comparative scale are generally assumed to be interval or ratio scaled. For example, respondent may be asked to evaluate brand separately on a 1 to 6 preference scale (1= not at all preferred, 6= highly preferred). Non-comparative scales can be continuous rating or itemized rating scales. The itemized rating scales can be further classified as Likert, semantic differential and staple scale.

#### **Comparative Scale:**

#### **Paired Comparison Scale:**

In paired comparison scale, a respondent is presented with two objects and is asked to select one according to whatever criterion he or she wants to use. The resulting data from this scale is ordinal. A classic example of when paired comparison is used is during taste tests. For example you could have a taste test in which you have someone try both Coke and Pepsi and then ask them which one they prefer. In general, with n brands,[n(n-1)/2] paired comparisons are required to include all possible pairings of objects.

Figure shows paired comparison data obtained to assess 100 consumer's cosmetics brand preference.



Brand	Lakme	VLCC	Himalaya Herbal	Elle 18	L'Oreal	
Lakme		20*	32	34	23	
VLCC	80**	-	60	46	56	
Himalaya	68	40	-	61	60	
Herbal						
Elle 18	66	54	39	-	65	
L'Oreal	77	44	40	35	-	
Total	291	158	171	176	204	

Number indicates that many times brand in that column was preferred over the brand in the corresponding row.

20 consumers preferred VLCC brand over Lakme while rest \*\*80 consumers preferred Lakme over VLCC. By c sum calculating sum of each column which indicates that many times particular column brand is preferred over other brands. Here researcher can conclude that Lakme is most popular brand. Therefore, this respondent's rank order of preference, from most to least preferred, is Lakme, L'oreal, Elle 18, Himalaya and VLCC.

This method is simple to understand and is mainly used when the number of attributes or brands is limited.

# **Rank Order Scaling**

In rank order scaling, respondents are presented with several objects simultaneously and asked to rank them according to some criterion. For example, Rank the following cosmetics brand in order, the most preferred cosmetic brand should be ranked one, the second most preferred should be ranked two and so on

<b>Cosmetics Brand</b>	Rank
Lakme	
VLCC	
Himalaya Herbal	
Elle 18	
L,Oreal	

Like, paired comparison, this approach is also comparative in nature, and it is possible that the respondent may give rank 1 to east disliked brand. This scale is commonly used to measure preferences for brands as well as attributes. The rank order scaling also results in ordinal data.

#### **Constant Sum Scaling:**

In constant sum scaling, respondents allocate a total 100 points among a set of stimulus objects with respect to some criterion. As shown in the following figure respondents may be asked to distribute 100 points among the importance of different attributes while selecting a banking service. The points should be allocated in such a way that the sum total of the points allocated to various attributes adds up



to 100. The more points an attribute receives, the more important the attribute is. If an attribute is not at all important, assign it zero points.

Attribute	of	Banking	Points
Service			
Courteous S	ervice		
Convenient	Hours		
Convenient	Locati	on	_
Low Interest	t Rate		_
Convenient	ATM	Location	
Friendly Sta	ff		

Suppose convenient ATM location receives 40 points, whereas convenient hours receives 20 points, one can make a statement that for the respondent ATM location is twice important than hours of bank. This type of data is not only comparative in nature but could result in ratio scale.

# **Q-Sort Technique:**

It is used to discriminate quickly among a relatively large number of objects. This technique uses a rank order procedure in which objects are sorted into piles based on similarity with respect to some criterion. Suppose there are 100 attitude statements and respondents are asked to pile them into 5 piles, in such a way, that the strongly agree could be put in one pile, agreed statements could be put in another pile, neutral statement form the third pile, disagreed statements come in the forth pile and strongly agreed statements the fifth pile and so on. The number of objects to be sorted should not be less than 60 nor more than 140; 60 to 90 objects is a reasonable range. The data generated in this would be ordinal in nature.

# **Non- Comparative Scales:**

In the non-comparative scales, the respondents do not make use any frame of reference before answering the questions. They do not compare the object being rated either to another object or some specified standard such as "your ideal brand". They evaluate only one object at a time, and for this reason non-comparative are often referred as monadic scales. The non-comparative scales are divided into two categories, namely, graphic rating scale and the itemized rating scales. The itemized rating scales are further divided into Likert scale, sematic differential scale and staple scale. All itemized scale come under the category of the multiple item scales.

# **Graphic Rating Scale:**

In graphic rating scale, also referred as a continuous rating scale, the respondents indicate their rating by marking the appropriate point on a line that runs from one extreme of the attribute to the other (See Figure). The line may be vertical or horizontal; scale points, in the form of numbers or brief descriptions, may be provided; the scale points may be few or many. Three versions of a graphic rating scale are illustrated below:

Please put a tick mark ( $\sqrt{}$ ) on the following line to indicate your rating regarding taste of food of Restaurant X.

Version 1





Another way of presenting the graphic rating scale is through smiling face. For example, please indicate how much do you like taste of food of restaurant X by pointing to face that shows taste. If you do not like taste of the food at all, you would point to face one. In case you like the food most, you would point to face seven.



Fig. 1. Faces Scale of Andrews. Source: Diagram adapted from Lorish and Maisiak, 1986.

The main advantage of the graphic rating scale is that it is easy to construct. However, scoring is burdensome and unreliable, and these scales do not provide much new information. Hence, graphic rating scales are not widely used in marketing research.

	Strongly	Disagree	Neither agree	Agree	Strongly
	Disagree		Nor disagree		Agree
	1	2	3	4	5
1.Online shopping is					
more convenient					

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		1	
2. Online shopping		$\checkmark$	
offers more variety			
3. Online shopping			
offers value for money.			
4. Online shopping is			
more expensive.			
5. Online shopping			
provide variety of			
Merchandise			
6. Online shopping			
does not offer a good			
mix of different brands			
within a product			
category.			
7. Online shopping			
transactions are			
unsafe.			
8. Online shopping is	$\checkmark$		
time consuming.			
9. Online shopping			
provides flexible timing			
of purchase.			
10. Online shopping			
helps us to avoid traffic			
congestion.			

# **Itemized Rating Scale:**

In the itemized rating scale, the respondents are provided with a scale that has a number or brief description associated with each response category. The response categories are ordered in terms of the scale position, and the respondents are required to select the specified category that best describes the object being rated. Itemized rating scales are widely used in marketing research and form the basic components of more complex scales, such as a multi-item rating scale. The most frequently employed methods are Likert, Semantic differential and staple scale.

#### Likert Scale:

The scale is named after Rensis Likert who developed the scale. Likert scales require a respondent to indicate a degree of agreement or disagreement with a variety of statements related to the attitude or object. A typical Likert scale constitutes of five items ranging from 'strongly agree' to 'strongly disagree'. This is also called a summated scale because the scores on individual items can be added together to produce a total score for the respondent. An important assumption of this scaling method is that each of the items (statements) measures some aspect of a single common factor, otherwise scores on the items cannot logically summed up. In typical marketing research study, there are generally 25 to 30 items on a Likert scale. The data are typically treated as interval.

We illustrate with a Likert scale for evaluating attitudes toward online shopping. Instructions:



Listed here are different opinions about online shopping. Please indicate how strongly agree or disagree with each statement by using the following scale:

1= strongly disagree; 2= disagree; 3= neither agree nor disagree; 4= agree; 5= strongly agree

In the above statements, out of ten statements given, statements numbering 1, 2, 3, 5, 9 and 10 are favorable statements, whereas the remaining are unfavorable statements. The reason for having both favorable and unfavorable statements is to control the tendency of some respondents to mark one or the other end of the scale without reading the items. Once the scale is administered, numerical values are assigned to the responses. The rule is that a 'strongly agree' response for a favorable statement. Suppose for a favorable statement the numbering is done as strongly disagree = 1, Disagree = 2, neither agree nor disagree = 3, agree =4 and strongly agree =5. Accordingly, an unfavorable statement would get the numerical values as strongly disagree = 5, Disagree = 4, neither agree nor disagree = 3, agree =2 and strongly agree = 5. In order to measure the attitude respondent towards online shopping, the scores are added.

For example, if a respondent has ticked ( $\sqrt{}$ ) statements numbering from one to ten, the total score would be 4+3+5+4+3+5+4+5=41 out of 50. This means that respondent has favorable attitude towards online shopping.

The Likert scale has several advantages. It is easy to construct and administer. It can be administer using any survey method. On the other hand, Likert scale can take much time to complete as respondents have to read each statement. Sometimes, it may be difficult to interpret the response to a Likert item, especially if it is an unfavorable statement.

#### **Semantic Differential Scale:**

Semantic differential scale includes a seven- point rating scale with endpoints associated with bipolar labels that have semantic meaning. This scale is widely used to compare the images of competing brands, product or services. Bipolar rating scales involve respondents choosing between opposite adjectives, like "good" and "bad," "unreliable" and " reliable" "cheap" and "costly," or "clean" and "dirty." One adjective anchors the beginning and the other the end (or poles) of the scale. The respondent chooses one of the seven scale positions that most closely reflect his or her feelings.

Following example shows semantic differential approach for assessing attitude towards Mega-Mart store.

Please mark  $\sqrt{}$  the blank that best indicates how accurately one or the other adjective describes what the Mega Mart store means to you

Form Mega-Mart is

Reliable: \_ : \_ : \_ : \_ : \_ : \_ : \_ : Unreliable

Inconvenient: \_ : \_ : \_ : \_ : \_ : \_ : Convenient

Location Location Pictorial Profile based on semantic

differential ratings

Modern: \_ : \_ : \_ : \_ : \_ : \_ : Old-fashioned

Boring: \_ : \_ : \_ : \_ : \_ : \_ : Exciting

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Expensive: \_ : \_ : \_ : \_ : \_ : \_ : Cheap

Reliable: \_ : \_ : \_ : \_ : Unreliable

Inconvenient: \_ : \_ : \_ : \_ : \_ : \_ : \_ : Convenient

Location

One of the most appealing aspects of semantic differential scale is the ability of the researcher to compute averages and then to plot a "profile" of the brand or company image. The numbers are assigned to each check line, beginning from the left side like 1,2,3, and so on. Then average is computed for each bipolar pair.

# **Stapel Scale:**

Location

The stapel scale is unipolar, interval rating with values ranging from -5 to +5 the respondent is asked to select a numerical category, which best describes his/her

attitude. In semantic differential scale there is problem in creating bipolar adjectives. The stapel scale overcomes this problem by using only single adjective. This scale is usually presented vertically. Respondents are asked to indicate how accurately each term describes the object by selecting an appropriate numerical response category. The higher the numerical response category, the more the term describes the concept. For example, Mega-Mart store is evaluated on parameter quality and service.

#### Instructions:

Please evaluate how accurately each word or phrase describes the store. Select a plus number for the phrases you think describe Mega Mart Store accurately. The more accurately you think the phrase describes Mega Mart store, the larger the plus number you should choose. Select a minus number for words you think do not describe Mega Mart accurately. The less accurately you think a phrase describes Mega Mart store, the larger minus number you should choose. Therefore, you can select any number, from +5 for phrase you think are very accurate to -5 for phrase you think are very inaccurate.

Mega	a Mart Store provide
+5	+5
+4	+4
+3	+3
+2	+2
+1	+1
Poor Quality	High Service
-1	-1
-2	-2
-3	-3
-4	-4
-5	-5

We can analyze data obtained through Stapel scales by using procedures similar to semantic differential scales. The Stapel scale's advantage is that we do not have to develop complete statements or come up with pairs of bipolar phrases-tasks that can be very tedious. It can be administered over the telephone. However, some researchers believe the Stapel scale is confusing and difficult to apply.

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# Types of Data – Secondary Data

Data collection is a critical phase in research. It requires proper identification of data sources and accessing them through appropriate data collection formats or instruments. Data collection methods are primarily classified into primary and secondary data sources. With the emergence of internet, we have a new opportunity for primary data collection – on line data collection. In this lesson, we shall examine on –line data collection and secondary data sources.

#### **Objectives of Secondary Data Research :**

Secondary data are gathered and recorded by "someone else" prior to (and for purposes other than) the current needs of the researcher. Secondary data are usually historical in nature, have already been assembled, and do not require access to respondents or subjects. Data are simply facts.

There are two general categories of research objectives: fact finding and model building.

#### Fact finding:

A typical secondary research objective for a study might be to uncover all available information about consumption patterns for a particular product category or to identify demographic trends that affect an industry or preference pattern for the brands and so on.

For example, if we want to understand the nature of 'MEDIA and ENTERTAINMENT' industry in India; a common secondary data study designed to find facts might be a market tracking study. Market tracking refers to the observation and analysis of trends in industry volume and brand share over time, typical media vehicles used by the marketers, product wise / brand wise spending pattern from various published reports.

# Model building :

As a general objective for secondary research, it is more complicated than simple fact finding. Model building involves specifying relationships between two or more variables. Model building can involve the development of descriptive or predictive equations.

Sales forecasting is the process of predicting sales totals over a specific future time period. Different models are used for predicting the sales. Managers often estimate market potential using secondary data. The researcher may estimate market potential by converting different types of data that are available from two or more sources.

For example, if you are consulting for a real estimate equipment manufacturer, if one source of data indicates that 10 percent of all electrical contractors intend to buy a drill and another source indicates that there are 80,000 electrical contractors then it may be estimated that 8,000 drills will be sold to electrical contractors

Business researchers often use internal company sales records to project sales. This is a popular method adopted by many organizations. The term data mining refers to the use of powerful computers, to dig through volumes of data to discover patterns about an organization's customers and products.

Market basket analysis is a form of data mining that analyze anonymous point of sale transaction logs to identify coinciding purchases or relationships between products purchased and other retail shopping information. When the identity of the customer who makes repeated purchases from the same



organization is known, an analysis can be made of sequences of purchases. Sequence discover, the use of data mining to detect sequence patterns, is a popular application among direct marketers, such as catalogue retailers.

# **Secondary Data**

The sources of secondary data can be classified as internal or external.

#### **Internal Data**

Data that are internal to the organization refers to data created, recorded, or generated by another entity. Most organizations routinely gather, record, and store internal data for solving future problems. For example, sales departments continually gather data through their sales representatives159

Aggregating or desegregating internal data is a frequent form of internal research. To collect the internal data more efficiently and effectively, the researcher should know the company's operating procedures very clearly; then only he can establish very systematic methods for gathering / recording the information required.

In the recent years, many companies use the advantage of internet / personal computer evolution; many dealers / distributors are networked with the respective companies and the companies can quickly collect vast amount of data in no time. Sales data are valuable information for any marketing project because it shows the exact results of a program, salesperson, or sales region.

Detailed information can be gathered on precise questions; for example, the percentage of sales to industry versus government, or sales broken out by company accounts. With planning, sales data can be recorded in the companies' management information systems to allow for optimal use by analysts.

#### **External Data**

External data sources can be broadly classified into a) Books and periodical, b) Web sources c) Media sources d) Government Sources, and e) Commercial Sources.

# **Books and periodicals**:

Books and periodicals provide a wealth of information. Libraries stock many bibliographies, guides, directories, and indexes. Professional journals and commercial business periodicals can be especially valuable sources of data. Original research works, research abstracts, opinions and discussions are available for researcher. Besides this, reports are found in library. They include reports published by state and central governments, colleges and universities, professional associations like Federation of Indian Chambers of Commerce and Industry [FICCI], Confederation of Indian Industries [CII], and catalogues of publishers like Macmillan, Excel and Serial.

# Web sources:

The web has become a rich repository of information. Different search engines like Google, Yahoo and others provide access to a variety of data sources.

# Government sources:

Indian government provides census data, which can give important information on demographics, manufacturers, retail trade agriculture, transportation, and so on. Moreover, we know that the quality of census data is very high, making it a very reliable and useful source.

State and central government's ministries periodically publishes many reports on census, industrial production, production details of various products and commodities, human resources development activities, policy documents; again, these reports provide depth insight about the research topics /



objectives / problems. Government agencies produce a prolific amount of data. Reserve Bank of India periodically published information about various parameters like production details various products, growth in deposits, growth in exports / imports, industries growth, investment made by Foreign countries; these information are valid for any marketers to understand the macro scenario before getting into any research perspectives.

#### Media sources:

Information on a broad range of subjects is available from broadcast and print media. Annual Industry surveys, periodical reports on Industry banking and finance and reviews of stock markets, are common products in news papers. Dedicated News channels daily present some reviews and trends on business, markets and interviews with experts. Besides this there are advertisements.

#### **Commercial sources:**

Numerous firms specialize in selling information. They present Demographic and census updates, Attitude and public opinion research, Stock market trends and many compilations of data on other interesting aspects.

The growing demand for marketing data in recent years has given rise to a number of companies which make a business of collecting and selling marketing information. Few companies restrict their activities to research on specific issues faced by their clients; certain others collect certain marketing data on a continuing basis. Market tracking refers to the observation and analysis of trends in industry volume and brand share over time. Market tracking through optical character recognition such as the Universal Product Code and other optical scanners provides a wealth of accurate and rapid product and brand sales information collectively known as scanner data. Scanner data are collected by passing merchandise over a laser scanner that optically reads the bar coded description printed on the merchandise and compiles a database of sales/inventory. Its advantages and disadvantages can simply be listed.

For example – AC Nielsen is one such firm keeps working on continuous efforts on various industries like 'Retail Audit Survey' on an annual basis. This information is sold on subscription to all buyers. Even government organisation like National Council for Applied Economic Research [NCAER] conducts researches on Indian Consumers periodically and these reports are sold for a price. Both online and offline databases are available for sale consisting of bibliographic, numeric, full-text, directory, and specialized databases. In addition, directories of databases exist to aid in locating the proper information. While databases are not without their disadvantages, their use by marketing researchers and market research firms is becoming indispensable.

#### Advantages and Disadvantages of Secondary Data:

The advantages and disadvantages of secondary data can be stated as follows.

#### Advantages:

Secondary data can cover a broad range of factors that affect the problem at hand. It does not always fit the specific problem at hand, but can be useful in developing an approach to the problem and providing a comprehensive understanding of the problem environment. Examination of available secondary data is a prerequisite to the collection of primary data. Proceed to primary data only when the secondary data sources have been exhausted or yield marginal returns.

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## Disadvantages:

Because secondary data have been collected for purposes other than the problem at hand, their usefulness to the current problem may be limited in several important ways, including relevance and accuracy.

#### Criteria for Evaluating the Quality of Secondary Data :

The marketing researchers have to be very cautious when using secondary data sources; he may evaluate the data based on criteria like - error, currency, objectives, nature, and dependability.

#### Error :

Researchers should be aware of the fact that no single source of secondary data can provide information that completely answers the need of the present problem. Moreover, methods used for analysis by different sources may have certain weaknesses. One may suffer from biases, the other may be older and the third may not be very accurate, and so on.

#### Currency:

The data may not be recent one. Sometimes it may be outdated too.

#### **Objectives**:

The objective of the researcher in compiling data may be different from the objective of research. In such cases, its use will be limited to providing back ground information.

#### Nature:

The data may be different in terms of quantitative or qualitative aspects and researcher may not be able to appreciate it.

#### **Dependability:**

Four ethical issues that are the most pertinent are:

The researcher should aware of the needless collection of primary data when the problem can be addressed based only on secondary data.

Also, overriding importance to secondary data sources whereby, limiting the research to only secondary data when primary data are needed to answer the research question.

The use of secondary data that is not relevant or applicable to the research problem.

The use of secondary data that has been gathered through morally questionable means.

#### Primary Data :

While the secondary data is collected from various established sources, primary data are originated by the researcher for the specific purpose of addressing the research problems faced by him /her. This primary data may be quantitative or qualitative in nature; it may be collected using structured or unstructured format to interpret them. Many research problems being unique in nature, the researchers have to collect primary data by asking respondents.

#### **Primary Data Collection Methods:**

There are some more variables like personal or impersonal / structured telephonic through mechanical devices and traditional one-to-one conversations methods are also considered as method of classifying primary data collection methods. In the following sections, we will briefly discuss them. A classification



#### scheme is given Table.

**Respondent's knowledge about Objectives of research Undisguised** Focus group Depth Observations 1.

2. Techniques Psychological tests – such as some attitude measurements.

# Non-structured – Undisguised Method:

This method is found in qualitative research, where the data collected are of highly qualitative in nature and scope of applying statistical techniques are almost impossible or not warranted.

# **Focus Groups:**

A focus group is a small group of people. A trained moderator conducts an interview in a nonstructured manner in a natural manner. The moderator's role is to introduce a topic and to encourage the group to discuss it among themselves. This is suitable for 'Exploratory Research Designs'.

# **Depth Interview Method:**

Depth interview method is also often applied in the case of 'Exploratory Research designs'. Concepts may be discussed with top executives and knowledgeable managers who have had personal experience in the field being researched. This constitutes an informal experience survey. Such a study may be conducted by the business manager rather than the research department for the following purposes.

- Detailed probing of the individual.
- Discussions on topics considered confidential, sensitive, or embarrassing.
- Situations where strong social norms exist and the individual may be easily swayed by group response.
- Detailed understanding of complicated behaviour.
- Interviews with professional people.
- Interviews with competitors who are unlikely to reveal the information in a group setting.
- Situations where the product consumption experience is sensory in nature affecting mood states and emotions.

# **Observation Method :**

Organizations trace huge amount of data through observation mode. *Scientific observation* is the systematic process of recording behavioural patterns of people, objects, and occurrences without questioning or communicating with them.

# **Types of observation:**

The researcher utilizes different observation methods.

# Structured Vs. Unstructured observation:

Structured observation is appropriate when the marketing research problem has been clearly defined and the information needed has been specified. It requires that the researcher specify in detail what is to be observed and how the measurements are to be recorded. Unstructured observation is appropriate when the problem has yet to be formulated precisely, and flexibility is needed in observation to identify key components of the problem and to develop hypotheses.

# Disguised Vs. undisguised observation:

In disguised observation, the respondents are not aware that they are being observed, whereas in undisguised observation the respondents are aware that they are under observation. Disguised

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observation is used when it is felt that the respondents would act differently under direct observation.

For example, while making a study on the purchase of sensitive or personal products, the researchers often use the disguised method of observations. Many of the retail branded apparel stores, the Closed Circuit Camera Footage (CC TV) are fixed by the manufacturer to know the consumer preference for various colour of apparel, which is often known the customers.

## Natural Vs. Contrived Observation:

Natural observation involves observing behaviour as it normally takes place in the environment. Contrived observation takes place in an artificial environment that has been created by the researcher. Natural observations allow the researcher to observe actual behaviour, but do not allow for inferences on the causes of behaviour. Contrived observation enables the researcher to control more of the variables that affect behaviour.

Observation can be classified based on the observer as personal or mechanical

#### **Personal observation**:

The researcher himself goes to the field and personally observes actual behaviour as it occurs, and the observer merely records what takes place. The researcher does not attempt to control or manipulate the phenomenon being observed. This method requires researcher's efforts and time; if field forces are employed, then the researcher has to train them on method of observing.

#### Mechanical observation:

These are devices used to continually record ongoing behaviour for later analysis. Closed circuit camera, Toll Plaza Tracking system, Customer Shopping Behaviour Tracing Equipments and many more to say, are some of the equipment's used in the recent times, to trace the consumer behaviour. Observation can be classified based on what is observed.

#### Audit :

This process involves collection of data by examining physical records or performing inventory analysis. There are two distinguishing features of an audit:

(1) Data are collected personally by the researcher or by representatives of the researcher and

(2) The data are based upon counts, usually of physical objects other than people.

# Content analysis:

It is the objective, systematic, and quantitative description of the manifest content of a communication. Marketing research applications involve observing and analyzing the content or message of advertisements, newspaper articles, television and radio programs, can be considered as examples. **Trace analysis**:

# It is an approach in which data collection is based on physical traces of past behavior where physical traces are evidence of some past event or occurrence.

#### **Structured – Undisguised Method**

The response generated from the study is highly structured and the respondents know for what purpose [undisguised] the data have been collected by the researchers. This method is used for descriptive studies / quantitative research. The data can be analysed using sophisticated statistical methods.

#### Survey Method :

Surveys require asking people, respondents, for information using either written or verbal questioning.



Questionnaires or interviews collect data through the mail, on the telephone, or face-to-face.

# **Interviews** :

Interview method can be employed in different ways.

## Personal in-home interview:

In this method, the researcher or field data collection executives visit residences of respondents and ask questions face-to-face in their homes. This method requires more of field work and costlier and expensive.

#### Mall-intercept personal interview:

Respondents are intercepted while they are shopping in a mall, and then a questionnaire is administered to them by the interviewer. The method may result in poor quality responses. Since the sampling method falls under the category of convenience, it is difficult to generalize the findings.

#### Computer-assisted personal interview:

Respondents are requested to sit in front of a computer terminal. She or he answers the questionnaire on the screen by using the keyboard and/or mouse.

#### **Telephone interview**:

It involves phoning a sample of respondents and asking them a series of questions. It is more appropriate, when the amount of information required is limited and highly structured. It is one of the quickest methods and consumes less time than other methods.

#### Computer-assisted telephone interview:

The computer dials a telephone number, the interviewer asks the questions on the screen of the computer, and the interviewer records the respondents' answers directly into the computer. There are computer softwares, which links the responses to a database directly.

#### Mail interview:

In this method, the researchers sends by postal/ mail the questionnaires to pre-selected potential respondents. The respondents complete and return the questionnaires by return mail. If an incentive is attached to the filled responses, the respondents may be motivated to answer promptly. Poor response rate and more time to collect the responses are some of the weakness with this method.

#### Mail panel:

This method consists of a large and nationally representative sample of households which have agreed to periodically participate in mail questionnaires, product tests, and telephone surveys conducted by the specific marketing research organization. For such panel enrolment, the firm has to pay a nominal amount as participation fees.

#### **E-mail interview:**

The survey request and questionnaire is written within the body of the e-mail message and send to the identified respondents [whose emails have been collected]. The e-mails are sent out over the Internet.

#### **Internet interview:**

Internet or Web surveys use 'hypertext mark-up language' (HTML), the language of the Web, and are posted on a Web site. Respondents may be recruited over the Internet from potential respondent databases maintained by the marketing research firm or they can be recruited by conventional methods (mail, telephone). In India, today we have access to websites such as 'SurveyMoneky.com' and 'Qualtrics. com', which allow us to build online questionnaire and email them selected respondents.



# Questionnaires:

Questionnaires are common tools of data collection in many research projects. However, questionnaire is not an easy task. It has to consider mainly the (i) purpose of research (ii) information relevant to research objectives and (iii) ability and willingness of respondent to answer the questions. Relevance and accuracy are the two most basic criteria to be met if the questionnaire is to achieve the researcher's purpose. In order to achieve this, several decisions must be made.

#### **Questionnaire relevancy:**

A questionnaire is relevant if no unnecessary information is collected and if only the information needed to solve the marketing problem is obtained. To ensure information relevance, the researcher must be specific about data needs; there should be a rationale for each item, and all possible omissions should be considered.

#### **Questionnaire accuracy:**

Accuracy refers to right data. It can be obtained only when questions do not make misrepresentation or lead to misunderstanding. It means the wording and sequence should be right.

While it is generally believed that one should use simple, understandable, unbiased, unambiguous, and non-irritating words, no step-by-step procedure can be generalized. Respondents tend to be most cooperative when the subject of the research is interesting - if questions are lengthy, difficult to answer, or ego threatening, there is a high probability of biased answers. '

#### **Phrasing Questions:**

There are many ways to phrase questions and many standard question formats have been developed in previous research. We may categorize two basic types of questions asked on the amount of freedom respondents are given in answering: Open-ended response versus fixed-alternative questions.

**Open-ended response questions** require respondent to write the answers in their own words. They are free response questions.

# Merits:

Open-ended response questions are most beneficial when the researcher is conducting exploratory research. By gaining free and uninhibited responses, the researcher may find some unanticipated reaction toward the project. They may also be useful at the beginning of an interview as they allow the respondent to warm up to the questioning process.

#### **Demerits:**

The cost of open-ended response questions is substantially higher than that of fixed-alternative questions, since the job of coding, editing, and analyzing the data is quite extensive. Also, open-ended response questions allow potential interviewer bias to influence the answer - even the best interviewer can take shortcuts in recording answers

**Fixed-alternative questions** or closed questions, give the respondents specific, limited, alternative responses and ask the respondent to choose the response closest to his or her viewpoint. The following types of fixed alternative questions are in use.

# Single-dichotomy or dichotomous:

Alternative questions: require that the respondents choose one of two alternatives. The answer can be a simple "yes" or "no" or a choice between "this" and "that."

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# Multi-choice alternatives:

They ask a respondent to choose one and only one - response from among several possible alternatives.

The frequency determination question is a determinant choice question that asks for an answer about the general frequency of occurrence.

Attitude rating scales, such as the Likert 5 point scale (Strongly agree- Agree – Neutral-Disagree-Strongly disagree).

The check list question allows respondents to provide multiple answers to a single question. In many cases, the choices are adjectives that describe a particular object. There should be no overlap among categories in the check list - each alternative should be mutually exclusive, that is, only one dimension of an issue should be related to that alternative. The researcher should strive to ensure that there are sufficient response choices to include almost all possible answers.

# Merit:

Fixed-alternative questions require less interviewer skill, take less time, and are easier for the respondent to answer.

# Demerits:

The forced choice limit the scope of getting accurate presentation of views from respondents. They tend to approximate their answers.

However, including a category lower than the answers you expect often helps to negate the potential bias caused by respondents avoiding an extreme category. Respondents, rather than stating why they chose a given product, may select an alternative among those presented. Or, as a matter of convenience, they may select a given alternative rather than thinking of the most correct alternative.

# What is the choice of researcher?

Most questionnaires include a mixture of open-ended and closed questions. Each form has unique benefits; in addition, respondent boredom and fatigue are eliminated with a change of pace offered by a mixture of question types. In general, mail and telephone questions must be less complex than those utilized in personal interviews. Questionnaires for telephone and personal interviews should be written in a "conversational" manner.

# Art of Asking Questions:

In developing a questionnaire, there are no hard and fast rules. Some guidelines have been developed to avoid the most common mistakes.

# **Questions in simple language**:

Words used in a questionnaire should be readily understandable to all respondents. The technical jargon of top executives should be avoided.

# Avoid leading questions:

Leading questions suggest or imply certain answers. Is not Pepsi a tasty brand ? Such questions may lead one to say yes and result in a "bandwagon effect" which threatens the study's validity. Partial mention of alternatives is a variation of these phenomena. If you are asked to mention a tasty brand , which brands like Pepsi, Coke and so on come to your mind? A question statement may be leading because it is phrased to reflect either the negative or positive aspects of an issue. To control for this bias, split-ballot technique, which reverses the wording of attitudinal questions for 50 percent of the sample, can be used.



**Avoid loaded Questions** suggest social desirability or are emotionally charged. Some questions invite only positive answers. Invoking the status quo is a form of loading that result in bias because the majority of people tend to be resistant to change.

Asking respondents "how often" leads them to generalize about their behavior and one is more likely to portray one's ideal behavior rather than one's average behavior.

An introductory counter-biasing statement to a question, that reassures respondents that their "embarrassing" behavior is not abnormal, may help yield truthful responses. Also, an assurance of anonymity may help elicit honest responses to embarrassing questions.

#### Avoid Ambiguity:

Items on questionnaires are often ambiguous because they are too general. Indefinite words such as frequently, often, ready, etc., have many different meanings. Use of such words should be avoided - the questions should be as specific as possible.

#### **Avoid Double-barreled Items**:

A question covering several items at once is referred to as a double-barreled question. It leads to confusion. Example: Do you like Pepsi and Coke ? If a consumer likes Pepsi and not Coke, how can he answer this question?

#### **Sequencing the Questions:**

The order of questions is important. . For example, if the respondents' curiosity is not aroused with the initial questions, they can become disinterested and terminate the interview.180

**Order bias** It results from the sequencing of questions. Order bias tends to distort survey results. Questions which ask specific information tend to take time and need thinking, than the general questions. It is advisable to ask the general questions before the specific questions to obtain the freest of open-ended responses. This technique is known as the funnel technique, and it allows researchers to understand the respondent's frame of reference before asking more specific questions

When using attitude scales, there also may be an **anchoring effect**. That is, the first concept measured tends to become a comparison point from which subsequent evaluations are made. Randomization of these items on a questionnaire helps to minimize this order bias.

#### Layout of a Questionnaire;

The layout and attractiveness of the questionnaire are of crucial importance. In mail questionnaires, often the rate of return can be improved by adding the money that might have been used as an incentive, to improve the attractiveness and quality of the questionnaire. Questionnaires should be designed to appear as short as possible and experienced researchers have found that it pays to carefully phrase the title to be printed on the questionnaire.

The researcher can design the questionnaire to make the interviewee's job of following interconnected questions much easier by utilizing several forms, special instructions, and other tricks of the trade. One researcher-client issue worth mentioning is piggybacking, which occurs when a questionnaire contains questions pertaining to more than one client. One client's questions take up a part of the questionnaire, while a second client's study takes up the rest. In these cases all clients must be aware of and consent to the arrangement. Unfortunately, piggybacking is sometimes used without disclosure to the clients for the sole purpose of increasing the researcher's profit. This is unethical.

Finally, the researcher has the ethical responsibility of designing the questionnaire so as to obtain



the required information in an unbiased manner. Also, the questionnaire should be thoroughly pretested before fieldwork begins or an ethical breach has occurred.

# Advantages of the Survey Method :

The questionnaire is simple to administer.

The data obtained are reliable as the responses are limited to the alternatives stated and the standardization of the questionnaire reduces the variability in the results caused by differences in interviewer characteristics.

The coding, analysis, and interpretation of data are also relatively simple.

#### **Disadvantages :**

The respondents may not be able or willing to provide the desired information.

Respondents may be unwilling to respond if the information requested is sensitive or of a personal nature.



# Unit 4 Sampling

Sampling is one of the key decisions in research process; for example, a leading mobile handset company faces competition in the adjacent districts of the state capital. Adjacent districts of the state capital are always potential market for any mobile handset company, since it is easy to go and work. The company wants to have research in this area. If we assume, the adjacent districts population is approximate 75 lacs people, how many people should the company study to draw meaning conclusion?

Obviously, the company cannot meet all the people in the districts and conduct the study and draw meaningful inferences. Marketing research projects like this usually have budget and time constraints. Neither, it would not be possible to contact the whole population within a short period of time, nor adequate resources [both man power and financial support] to undertake the study.

Here we need to take some representative part of total population. Thus, sampling is a handy tool, which cuts costs, reduces manpower requirements, and gathers vital information quickly.

#### **Basic Concepts of Sampling:**

Population (universe) : is any complete group ( set ) of people/ customer/ consumer/ respondent , sharing some common set of characteristics. It is aggregate of all objects ( people ) under study consideration. Population may be finite or infinite. Sample is a subset or some part of a larger population. Sampling involves using a small number of items or parts or portion of the population to make conclusions regarding the whole population. Sample is proper representative of population.

For instance, if you conduct a study on brand preference cars in state then all people using cars will constitute the population for this study; if you want to conduct a dealer satisfaction survey for a Cement Manufacturer (Say ABC Ltd), then those dealers, appointed by the company will be the population for your study; if you conduct a study on mobile user satisfaction survey among the students in a university for a mobile service provider, then, those students of the university, who use a particular brand of service will be the population for the study.

Thus, sampling is the process of selecting units, which may consist of people / organizations, from a population of interest so that by studying the sample we may can generalize our results back to the population from which they are chosen.

#### Response

It is a specific measurement value that a sampling unit supplies. For example, if a respondent is responding to a survey instrument and gives a response of '4'. Such responses we collect for the sample.

#### Statistic

Based on the responses, we compute a value for our entire sample. That value is called a statistic. There are a wide variety of statistics we can use — mean, median, mode, and so on.

#### Parameter

If you measure the entire population and calculate a value like a mean or average, we call it a parameter of the population. Population element refers to an individual member of the population.

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# **Census or Complete Enumeration:**

Census or complete enumeration is an investigation of all the individual elements in the population - a total enumeration rather than selection of portion from the whole population.

If you are conducting a dealer satisfaction survey for new marketing company, the firm may be more interested to know the satisfaction level of each and every dealer it has appointed; in this instance, you may be collecting data from each and every elements of the population or you are doing a census based study. On the other hand, if the firm is interested to know only those dealers who are producing more volume sales, but the total number of dealers is in 1000s and spread across the entire country, it may be difficult for a researcher to make a field trip and collect data from all the population members. In this case, the firm may prefer to select a small portion and try to make inferences from that; thus, sample is a small portion, which possess the characteristics of the population.

# **Census:**

It is process making an investigation / study of all the individual elements making up the population. **Sample:** 

It is a small portion of the population, which possess the characteristics of the population.

# **Target Population and Sampling Frame:**

Another concept is the target population. Once the decision to sample has been made, the first question concerns identifying the target population. What is the relevant population? The following key parameters might be more useful to define the target population accurately.

Well thought out research objectives

Available alternatives for data collection

Knowledge of market size and characteristics

Considerations regarding the appropriate sampling unit

Identification of what is to be excluded

The possibility of repeating survey with them- reproducible

Convenience

A sampling frame is a list of elements from which the sample may be drawn. The sampling frame is also called the working population, because it provides the list that can be operationally worked with.

# a) Target Population:

It is the population the researcher would like to study for the given objective.

# **b) Sampling Frame:**

It is the enumerated list of target population elements that can be identified and accessed for data collection.

# **Sampling Frame Error:**

The discrepancy between the definition of the population and a sampling frame is the first potential source of error associated with sample selection.

For instance, you are able to identify perfectly the population of interest, say the full information of the people who live in adjacent district of the state capital, you may not have access to all of them. And even if you do, you may not have a complete and accurate enumeration or sampling frame from which to select. And, even if you do, you may not draw the sample correctly or accurately – since many houses might be locked on that day or people who lived in the street would have left that area and yet



to update their residential details with government agencies like Panchayat Office / Postal Department and so on. And, even if you do, they may not all come and co-operate with our research work. This results in sampling frame error. Sampling Frame Error:

Sampling frame error occurs when certain elements are excluded or when the entire population is not accurately represented in the sample frame. It is possible for elements to be either over- or underrepresented in a sampling frame.

#### Census vs. Sample:

The decision to use population for survey is influenced by the following factors.

#### **Population Size Itself Is Quite Small:**

For example, if you are conducting a market survey of forecasting the sale of automobiles, using expert opinion, you may directly contact the officials of the manufacturers who are very less in number. If you want to study the new product development process for soft drink manufacturing firm, only 5-6 major firms are in the country, you may prefer to meet all top officials of these firms and come to conclusion. Thus, when the number of elements is very small in a population, the researcher would like to meet all the elements and draw conclusion rather than selecting a small portion of it.

#### Information is Needed from Every Individual in The Population:

When the study is of strategic importance, and cannot afford to miss any member as a choice. For example, if a pollution control board conducts a survey for acceptability of newer technology in an industrial cluster like Ranipet [Vellore], they need information from each and every member of the industrial estate.

#### Cost of Making an Incorrect Decision is High:

Sample studies result in some errors. When such errors are not tolerable, census study is right alternative. On certain occasions the researcher would prefer to use sampling rather than census method to draw conclusions.

#### Used if Census is Impossible:

In case of consumer goods companies, like the tea manufacturing firm, it would be highly improbable to meet the entire population. In such cases, it would be preferable to undertake sample survey rather than census method.

#### **Quick Decision is Needed:**

Sometimes a company might be looking for information at the earliest time frame to take a quick decision. For example, a marketing company, of Liquid Pain Balm product, faced competition. The competitor lowered prices. What should be done? The company already spent huge amount on promotional programmes like advertisement, trade and consumer promotions. If the price is lowered, will consumers think it a low quality product? Is it necessary to reduce price? If decision is not taken immediately, firm may lose sales

#### Infeasibility of Studying Population:

The cost associated with the project is always a constraint for any marketing research project. If population study benefits are larger than costs of studying population, it is advisable to study population. Otherwise, sample is the right alternative.

#### **Homogeneous Population:**

If the firm conducts a study on a population, which is highly homogeneous, it is sufficient to conduct the study based on samples rather than a complete enumeration. For example, if the study is to



understand the spending pattern of the sales force, who are in-charge of all the retail outlets and dealer management in their respective territory, the spending pattern of the sales force is highly homogeneous; the travel, other incidental expenses are expected to be highly homogeneous; so one would prefer to use sampling rather than census.

## Sampling Design:

A researcher investigating a population with an extremely small number of population elements may elect to conduct a census rather than a sample because the cost, manpower, and time drawbacks are relatively insignificant. On the other hand, sampling is preferred when there are cost, resource, and time advantages. In some cases, sampling can be very accurate, and, in some cases, more accurate than a survey.

#### **Error in Sample**

There are two types of error that may occur while we are trying to estimate population parameters from the sample. These are sampling and non-sampling error.

#### **Sampling Error**

The difference between the sample results and the result of a census conducted using identical procedures is called sampling error. This statistical fluctuation occur due to chance variations. The sampling error can be reduced by :

- By increasing sample size
- Use a statistically efficient sampling plan
- Make the sample as representative of the population as possible

# Non-sampling (Systematic) Errors:

This type of errors are not due to sampling. They are result of a study's design and execution. Sample biases account for a large portion of errors in business research. *Non sampling errors* are more serious and are due to mistakes made in the acquisition of data or due to the sample observations being selected improperly. Most likely caused be poor planning, sloppy work etc.

Non-sampling errors can be of various types

Coverage (or Frame) errors: In surveys, the sample is selected from a list, i.e. a *sampling frame*, of all population members. An inadequate frame leads to coverage errors. Often can have either *under-coverage* (missing elements), or

over-coverage (duplicates).Both lead to biased results.

- Non-response errors: Non-response errors are all errors arising from: Unit non-response: Failure to obtain information from a pre-chosen sampling unit or population unit
- **Item non-response:** Failure to get a response to a specific question or item in the data recording form.



- Measurement errors: Measurement errors arise when the *recorded* response differs from the *true* value. They can occur for a variety of reasons, e.g.
  - > by *respondent* (e.g. heads of households) giving an incorrect answer
  - because of *instrument* or question error
  - ➢ by *interviewer* error.
- **Data handling errors:** Data handling errors can occur from the stage of data collection up to the final stages of data analysis. Types of errors that can arise include:-
  - > errors in transmission of data from the field to the office
  - > errors in preparing the data in a suitable format for computerisation, e.g. during coding of qualitative answers
    - errors in computerisation of the data
    - > errors during data analysis, e.g. imputation and weighting.

#### **Probability Versus Non-Probability Sampling**

The major alternative sampling plans may be grouped into probability techniques and non-probability techniques.

**Probability sampling** every element in the population has a known nonzero probability of selection; each member of the population has an equal probability of being selected.

**Non-probability sampling,** the probability of any particular member of the population being chosen is unknown.

#### **Probability Sampling Techniques:**

If the researchers are interested in ensuring maximum precision and accuracy in a sample, then probability sampling is the answer for them. Probability sampling method is any method of sampling that utilizes some form of random selection of sample elements from the population. In order to have a random selection method, you must set up some process or procedure that assures that the different units in your population have prior defied probabilities of being chosen.

#### Simple Random Sampling:

A simple random sample is a sampling procedure that assures that each element in the population will have an equal chance of being included in the sample.

Drawing names from a bowl is a typical example of simple random sampling; each person has an equal chance of being selected. When populations consist of large numbers of elements, tables of random numbers or computer-generated random numbers are utilized for sample selection.

The researcher has to make use of a table of random numbers, which are available in many statistical text books and open source materials, to assign random number for each respondent. Thus, a serial number random number is generated and assigned to each element of the population. Then, assuming a population of 99,999 or less, five-digit numbers are selected from the table of random numbers merely by reading the numbers in any column or row, by moving upward, downward, left, or



right. A random starting point should be selected at the outset.

An Illustration of Selection Sample for a Dealer Survey

Let us assume that we are doing a dealer satisfaction research for a FMCG manufacturer like Hindustan Unilever Ltd [HUL] that wishes to assess various aspects of distribution and quality of service over the past year.

As a first step, the researcher has to define the sampling frame. To do this, we will go through dealers' records to identify every dealer for the past one /two years. As a next step, the researcher has to decide the number of dealers he would like to have in the final sample. For example, let us assume the researcher wishes to select 100 dealers to survey out of the 1000 dealers it has appointed. Then, the sampling fraction is f = n/N = 100/1000 = .10 or 10%. Now, to actually draw the sample of dealers, you have several options.

You may write down or print off the list of 1000 dealers, tear the list into separate strips, put the strips in a big basket, mix them up real good, close your eyes and pull out the first 100. But this mechanical procedure would be tedious and the quality of the sample would depend on how thoroughly you mixed them up and how randomly you reached in.

Alternatively, a better procedure would be to make use the kind of ball machine that is popular with many of the state lotteries [which once upon a time popular in many states of India]. You would need three sets of balls numbered 0 to 9, one set for each of the digits from 000 to 999 (if we select 000 we'll call that 1000). Number the list of names from 1 to 1000 and then use the ball machine to select the three digits that selects each person. The obvious disadvantage here is that you need to get the ball machines, which may be slightly expensive and you should have provisions in your budget.

Neither of these mechanical procedures is very feasible and little bit cumbersome; with the development of inexpensive computers there is a much easier way. One such simple procedure, especially useful, if you have the names of the clients already on the computer, programmes like MS-EXCEL can generate a series of random numbers. Let us assume that the researcher can copy and paste the list of all the 1000 dealers' names into a column in an EXCEL spreadsheet. Then, in the next column right column, paste the function =RAND() which is EXCEL command of generating random number between 0 and 1 in the cells. Then, you can sort both columns -the list of names and the random number – based on the random numbers. This will rearrange the list in random order from the lowest to the highest random number. Then, you have to take the first hundred names in this sorted list. This could probably accomplish within a minute time.

Among the many sampling method, this random sampling is simple to accomplish and is easy to explain to others. Because simple random sampling is a fair way to select a sample, it is reasonable to generalize the results from the sample back to the population. However, it is not the most statistically efficient method of sampling and you may, just because of the luck of the draw, not get good representation of subgroups in a population. To deal with these issues, we have to turn to other sampling methods.

# 2) Stratified Random Sampling:

When population elements are heterogeneous, researcher cannot make use of simple random sampling.



A researcher selecting a stratified sample will proceed in the following stages. First, a variable (sometimes several variables) is identified as an efficient basis for stratification. The variable chosen should increase the homogeneity within each stratum and increase the heterogeneity between strata. The stratification variable is usually a categorical variable or one easily converted into categories, that is, subgroups.

Next, for each separate subgroup or strata, a list of population elements must be obtained. If a complete listing is not available, a true stratified probability cannot be selected. A table of random numbers or some other device is then used to take a separate random sample within each stratum. Of course, the research must determine how large a sample must be drawn for each stratum.

#### **Proportional versus Disproportional Strata:**

If the researcher wishes to choose number of sampling units from each group / stratum is in proportion to the relative population size of the stratum, the sample is known as proportional stratified sample. However, if the primary purpose of the research is to estimate some characteristic of the total among strata, disproportional stratified sampling should be used.

For example, in the tea marketing company study, if the percentage of retail food outlets is not equal in size, there is a small percentage of large independent stores and a large percentage of other stores. To avoid under representing the medium-sized and smaller stores in the sample, a disproportionate sample may be more appropriate and is taken.

In a disproportional stratified sample, sample size for each stratum is not allocated on a proportional basis with the population but dictated by analytical considerations. Thus, the strata exhibiting the greatest variability are sampled more heavily to increase sample efficiency, that is, smaller random sampling error. A simplified rule of thumb for understanding the concept of optimal allocation is that the stratum sample size increases for strata of larger sizes with the greatest relative variability.

There are several reasons for any researchers to prefer a stratified sampling over simple random sampling.

First, it gives an assurance for the researchers to represent not only the large size population, but also appropriate key subgroups of the population, especially small minority groups. If the researcher does not recognize such subgroups, many estimates from the sample may wrong. For example, when you are conducting a study with various distribution partners like dealers, obviously, you need to divide the dealers based on their annual sales volume. Many firms, irrespective of the product categories, normally give higher importance for those views expressed by major dealers rather than those who do smaller volume / value.

A stratified random sample is recommended when the researcher desires to:

Increase a sample's statistical efficiency,

Provide for separate analysis of sub-populations, or

Enable different research methods and procedures to be used in various strata.

#### **3)** Systematic Sampling:

Systematic sampling is extremely simple to apply: An initial starting point is selected by a random process; then every n-th number on the list is selected. To illustrate this procedure, suppose the researcher wishes to take a sample of 100 dealers from a list consisting of 1000 names for a FMCG marketing company.



Using systematic selection every 10th name from the list will be drawn. In this example, the sampling interval is 10. The first step, you have to divide the entire dealer population into 100 groups of size 10 each; then should select a sample randomly from the first group - say the number -5 of the list; thereafter, you will be selecting 15, 25, 35... and so on.

While this procedure is not actually a complete random selection procedure, it does yield random results if the arrangement of the items in the list is random in character. The problem of periodicity occurs if a list has a systematic pattern, that is, if it is not random in character, however, periodicity is rarely a problem for most sampling in business research, but researchers should be aware of its possibility.

#### Advantages of Systematic Sampling:

Systematic sampling is less costly and easier than simple random sampling, because random selection is done only once. It does not require preparation of population lists.Systematic sampling can even be used without knowledge of the composition (elements) of the sampling frame. For example, every ith person leaving a department store or mall can be intercepted. For these reasons, systematic sampling is often employed in consumer mail, telephone, and mall intercept interviews.

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#### **Cluster Sampling:**

The purpose of cluster sampling is to sample economically while retaining the characteristics of a probability sample. In a cluster sample, the primary sampling unit is no longer the individual element in the population (for example, grocery stores or individual respondents or dealers) but a larger cluster of elements located in proximity to one another (for example, cities, two very large apartments consisting of 100s of houses). The area sample is the most popular type of cluster sample.

Cluster samples are frequently utilized when there are no lists of the sample population available. Ideally a cluster should be as heterogeneous as the population itself - indeed, a mirror image of the population. A problem may arise with cluster sampling if the characteristics and the attitudes of the elements within the cluster are too similar. To an extent this problem may be resolved by the cluster construction process that consists of diverse elements and by selecting a large number of sampled clusters.

#### **Multistage Sampling:**

The four methods discussed above covered so far —simple, strati– fied, systematic and cluster—are the simplest random sampling strategies. In most real applied research situations, it will not so easy to select the respondents so easily; we may have to make use sampling methods that are considerably more complex than these simple variations. However, it is not a completely different method; this procedure combines the simple methods described earlier in appropriate manners which would help the researcher to address sampling related requirements more efficiently and effective manner as possible. Since, we combine many of the sampling methods, we call this multi-stage sampling.

Thus, multistage area sampling involves two or more steps that combine some of the probability techniques already described. It is possible to take as many steps as are necessary to achieve a



representative sample. The Department of Census, Government of India provides maps, population information, and demographic characteristics of the population, and so on broken down into several small geographical areas that may be useful in sampling.

#### **Internet Sampling**

With the advent of internet surveys are organized using the medium.

# **Non-Probability Sampling**

If population is unknown or infinite, one cannot calculate probability of any particular member of population. In this case when probability sampling methods cannot be applied we use non probability sampling methods. This methods are easy to implement with compare to probability sampling methods. The reliability and accuracy of these methods are less with compared to probability sampling methods. As there are no appropriate statistical techniques for measuring random sampling error from a non-probability sample, the results cannot be generalized.

We can divide non-probability sampling methods into two broad types: accidental or purposive.

Most sampling methods are purposive in nature because we usually approach the sampling problem with a specific plan in mind. For example, if the researcher would like to conduct 'customer experience management survey' he would prefer to stay near a theme park and conduct survey with the customers / visitors, who have at least one visit to the theme park to respond the questions.

#### **Convenience Sampling:**

Convenience sampling (also called haphazard or accidental sampling) refers to the sampling procedure of obtaining / gathering responses from the people who are most conveniently available. For example, a college professor wishes to conduct a media study- say celebrity endorsement and recall rate / credibility of the celebrity endorser, taking a sample of youth. He uses his or her students as it is convenient.

Convenience sampling is the least expensive and least time consuming of all sampling techniques. The sampling units are accessible, easy to measure, and cooperative. In spite of these advantages, this form of sampling has serious limitations. Many potential sources of selection bias are present, including respondent self-selection. Convenience samples are most suited for an exploratory research stage. It forms basis for additional research to be conducted with a probability sample Convenience samples can be used for focus groups, pretesting questionnaires, or pilot studies. Even in these cases, caution should be exercised in interpreting the results. Nevertheless, this technique is sometimes used even in large surveys.

#### **Quota Sampling:**

This is another accidental sampling method. When the population is not homogeneous, it is necessary to create representation for each of such groups in the study. The purpose of quota sampling is to ensure that the various such subgroups in a population are represented on pertinent sample characteristics to the exact extent that the marketing researcher desire. In quota sampling, the interviewer has a quota to achieve.

For example, an interviewer in a particular city, who conduct coffee/tea drinkers habits/satisfaction/brand preference may be assigned 100 interviews, in which 40 respondents may be taken from residential area, 30 respondents may be taken from tea shops and 15 respondents may be

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from the hotels, 10 respondents may be from government/private offices and 5 may be student population. Thus, by collecting samples from various interview quotas yields a sample representing the desired proportion of the subgroups. There are two types of quota sampling – namely, proportional and non proportional.

Proportional quota sampling method, if you want to represent the major characteristics of the population by sampling a proportional amount of each. For instance, in the theme park study, if you know the population has 60 per cent youth/college –school students and the remaining 40 per cent are general public/household visitors of elderly age group, and that you want a total sample size of 100, you will continue sampling until you get those percentages and then you will stop. So, for example, if you have already got the 40 general public/household visitors of elderly age group for your sample, but not the sixty youths /college – school students, you will continue to sample youth/college –school students but even if legitimate elderly age group respondents come along, you will not sample them because you have already "completed your quota."

Non-proportional quota sampling is a method with least restric- tions. In this method, the marketing researcher specifies the minimum number of sampled units you want in each category. However, the researcher is not concerned about the numbers that match the proportions in the population. Quota samples have the tendency to include people who are easily found, willing to be interviewed, and middle class. In spite of these limitations, the method has various advantages, which include speed of data collection, lower costs, and convenience. Although there are many problems with this method, careful supervision of the data collection may provide a representative for analyzing the various subgroups within a population.

#### **Judgment Sampling:**

Judgment or purposive sampling is another non-probability technique in which an experienced individual selects the sample upon his or her judgment about some appropriate characteristic required of the sample members. For example, a fashion manufacturer regularly selects a sample of key accounts that it believes are capable of providing the information to predict what will sell in the nearer time period; the sample has been selected to satisfy a specific objective.

If a garment manufacturing company desires to introduce 'organic cotton product' in India- obviously these garments manufacturing requires a newer technology, different kind of raw material, expected to be priced higher than the 'premium' brands in the market. If a market research for consumer acceptance of these goods is initiated, one needs to make use of those sample respondents, who already use 'premium' brands regularly. Judgment sampling is often used in attempts to forecast election results. Political and sampling experts judge which small voting districts approximate overall state returns from previous election years. Of course, the assumption is that the past voting nature of these districts is still representative of the state's political behaviour.

This approach has been found empirically to produce unsatisfactory results more often than expected. Moreover it is difficult to evaluate the reliability of such samples. This method may be more useful, when the total population size itself is a small number.

#### **Snowball Sampling:**

In this initial respondents are selected by probability methods, but additional respondents are then obtained from information provided by the initial respondents. This technique is used to locate


members of rare populations by referrals.

For Example, if you are interested to conduct a study on Information Technology Entrepreneurs marketing strategy / new product development strategies, it would be difficult to undertake probability sampling method; since entrepreneurs may be reluctant to share the information with you. In this instance, the methods like snow ball sampling could be very handy.

If you convince the president of an IT Entrepreneur Association, he will give some references to generate responses. You contact them and ask them to recommend others who they may know.

Snowball sampling is especially useful when you are trying to reach populations that are inaccessible or hard to find. Reduced costs and sample sizes are the major advantages of snowball sampling. There is a chance of potential bias likely to take the centre stage of the study, because a person who is known to someone also in the sample has a higher probability of being similar to the first person. If there are major differences between those who are widely known by others and those who are not, there may be some serious problems with this technique. Since the focus group is not expected to be a generalized sample, snowball sampling may be very appropriate.